

**PRELIMINARY STATISTICAL REPORT ON THE REGIONAL SURVEY
OF BORER PESTS OF SUGARCANE :
DECEMBER 1940 - MARCH 1941**

By

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OF MOWER PESTS OF SUGARCANE : DECEMBER 1940 - MARCH 1941.

CHAPTER 1. INTRODUCTION

1. This is an introductory chapter which gives a brief history of the scheme and a general description of procedure adopted in writing this Report. The arrangement of the Report is also explained here.

History of the Scheme

2. This Report is concerned with only what may be called the revised version of the old scheme for the regional survey of sugarcane borers. I had nothing to do with the planning of the original scheme; and I am not familiar with its technical programme or procedure. Mr. P. V. Isaac, I believe, was in charge of the original scheme from the very beginning; and he will deal with it in a separate report.

3. In March 1938, when the old scheme I believe was already in operation, I was asked to help Mr. Isaac in preparing standard entry forms; and I gave him my suggestions. For one year I had no further contact with the scheme. In March 1939 I was asked to suggest methods "for securing random samples". A little later in May 1939 in Simla I had the opportunity of examining the scheme for the first time during its consideration at an ad hoc Entomological Committee. I have an impression that field work had already started in a large number of regions but the observations were confined to a single small area in the neighbourhood of the central station of the region, and that no arrangements had been made for locating the samples at random.

4. As a result of the detailed examination by the ad hoc committee several changes were introduced in the revised scheme. Instead of concentrating the whole of the field work in one small area it was proposed to divide each region into eleven localities each of which would cover an area of about 100 sq. miles. Secondly, all sample-units were to be located at random.

5. There was a considerable difference of opinion among the entomologists as to the best method of making field observations. After three days of discussion a procedure was recommended as the best compromise that could be reached by the committee. In forwarding these recommendations I had suggested that the scheme should be restricted to a small number of regions in the first instance to enable an efficient technique being evolved on an experimental basis for an All-India survey. The authorities concerned, however, decided to proceed with the scheme in 9 or 10 regions. A complete list is given in Chapter 2, para 22, pp.8-9.

6. It apparently took a good deal of time to bring the revised scheme into operation. In a few regions this was done in November 1940, but in many of the regions the new procedure was started in December 1940. The present report therefore covers a period of four months from December 1940 to March 1941.

The General Plan of the Survey

7. According to the technical programme of work 11 localities were selected in each region; from each locality 2 villages and from each village 5 sugarcane fields were picked up at random. Detailed specifications were supplied from the Statistical Laboratory for choosing the samples at random.

8. The field work was entrusted to a team of three workers one of whom was an entomological assistant and the other two were field men. Each field was divided into 3 portions; and each portion was allotted to one worker. Each worker then selected 3 stools at random from his portion of the field, examined every shoot and cane, and recorded the number of damaged shoots and canes by each type of borer in each stool. Each worker also recorded in Form IV (Field Diary) various details about each field such as the variety of crop, date of planting, ratooning, etc. So far as practicable the same fields were examined every month, so that the same stools alone were selected independently each month by a random process. General observations on the weather conditions of each locality and village were also included in the programme.

Scope of the Report

9. The element studied in this Report is the intensity of attack by a borer pest defined as the proportion (percentage) of canes damaged by the borer. Although various details, such as, variety of crop, date of planting, ratooning, type of manure, irrigation, cultural practices, etc were recorded for each field, and details of weather conditions for each village, and meteorological records for a central station in each region were also available, no attempt has been made in this preliminary report for lack of time to assess the influence of any of the above factors on the incidence of borer pests except that of 'ratooning' which is generally believed to have an adverse influence in increasing the borer attack.

10. With respect to ratooning the fields were grouped under three classes as follows :-

(i) Planted fields in which fresh sets were used without ratooning.

(ii) Ratooned fields in which canes were ratooned after the previous harvest.

(iii) Mixed fields in which both planted and ratooned canes were grown simultaneously.

In most regions the fields were 'planted', and 'mixed' ; in some cases, however, fields came under all three categories.

Nature of the Material

11. I shall now briefly describe the primary data on which this Report is based. An abstract statement is shown in Table (A-1) in which col.(1) gives the serial number and col.(2) the name of the region; col.(3) the name of the province in which the region is situated; col.(4) the number of localities surveyed in the month of November 1940 and col.(5) shows the date on which the field books were received in the Statistical Laboratory. Similar information for December 1940 is given in cols.(6) and (7); for January 1941 in cols.(8) and (9); for February in cols.(10) and (11); and for March in cols.(12) and (13).

Table (A.1)

Regional Survey of Poorer Areas of Singapore 1940-41

Date of Receipt of Field Records

No.	Region	Province	November 1940		December 1940		January 1941		February 1941		March 1941	
			No. of localities	Date *	No. of localities	Date *	No. of localities	Date *	No. of localities	Date *	No. of localities	Date *
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1	Gurdakpur	Punjab			9	21 st January	11	11 th March	11	12 th April	9	5 th April
2	Muzaffargarh	A.P.			11	25 th January	11	"	11	"	11	17 th April
3	Gorakhpur	"	11	12 th May	11	"	11	"	11	"	11	10 th April
4	Lahaya	Uttar Pradesh	9	10 th April	11	10 th April	11	10 th April	11	"	11	16 th April
5	Puna	"	10	"	11	"	11	"	11	8 th April	11	12 th April
6	Dacca	Bengal	6	2 nd February	6	21 st January	11	11 th March			1	17 th April
7	Cuttack	Orissa			11	22 nd February	11	12 th April	11	16 th April	11	16 th April
8	Gudiyattan	Madras	9	2 nd January	0	25 th January	11	11 th March	11	"	9	12 th April
9	Podagan	Frontier					9	"	9	"	11	17 th April
	All Regions		45				97				85	

* Date on which the records were received in the Statistical Laboratory, Calcutta

12. It will be seen from Table (A-1) that four regions did not send any records for November 1940. Mr. Isaac informed me that the old procedure was used in these regions even in November. Other records came in very late, for example, from two regions on the 10th April, and from another region on the 12th May. In view of the incomplete nature of the records it was decided to exclude November 1940 from the present Report.

13. There are other gaps in the field data as can be easily seen from Table (A-1). Dacca has easily the worst record. In November and December 1940 only 6 localities (instead of 11) were surveyed in this region; in January 1941 all 11 localities were covered; but in February no field work was done at all, apparently for lack of funds to pay travelling allowances; and for March records of only one single locality was received by us. Among the remaining regions, Gurdaspur, Gudiyattam and Padegaon surveyed less than 11 localities in certain months. The other five regions, namely, Misaffarnagar, Gorakhpur, Seprya, Pusa and Cuttack surveyed 11 localities in each of the four months December 1940 to March 1941.

Arrangements for Statistical Analysis

14. I was asked by the Special Entomological Committee which met in New Delhi on the 15th March 1941 to prepare by 15th June a preliminary report on the above material. Nominally this gave me three months to write this Report, but in actual fact the time at my disposal was much less. We started primary classification and tabulation immediately on my return to Calcutta, but the work was greatly hampered by the delay in receiving the field records from various regions. From the dates given in cols.(5), (7), (9), (11) and (13) it will be seen that the bulk of the records reached us in April in some cases on the 16th or 17th April. It took us another week to get things ready, and it was so late as 24th April before the statistical analysis could get into full swing.

15. The total number of field books for the four months under review was 1044. In each book there were records for ten borers for only one-third of a field. Records from three books for each worker had to be gathered together before completing tabulation for each field. The

volume of primary data was enormous, and we were obliged to work under high pressure. Sometimes we had to put 40 or occasionally even 50 men on the job to keep up to our scheduled programme. This interfered seriously with other work in the Statistical Laboratory. However the computational work proceeded smoothly on the whole and was completed on the 7th June in just about six weeks time. Great credit is due to K. Raghavan Nair on the scientific side and Jitendra Mohan Sen Gupta and Jitendra Nath Taluqdar of the computing section for organising the work with ability and success.

16. Besides the statistical tables numbering over 170 we had also to get ready a large number of maps showing the regional distribution of damage by borers. I had to draw the contour lines on each of these 140 maps by my own hand, and I could finish this work only on the 11th June. The bulk of the Report had to be written up therefore in the course of five or six days. Naturally it has not been possible to go into details. I hope, however, that this Report will serve a useful purpose in showing what kind of results we are likely to get out of the present scheme.

Seasonal Fluctuations

17. As already mentioned, this Report covers the four months December 1940, January, February and March 1941. This is too short a period to give us a clear picture of the seasonal changes. It would have been of great help to me if we had the opportunity of examining the results for the previous months which are being dealt with by Mr. Isaac. When I went to Delhi for a committee meeting in April I discussed this question with Mr. Isaac, and I offered to send Mr. K. Raghavan Nair of our Laboratory to Delhi for three or four days to obtain some information regarding the seasonal changes in the data for 1939-40. It was however informed later on by Mr. Isaac that this could not be arranged owing to administrative difficulties. I have been obliged therefore to handle the question of seasonal changes purely on the basis of the material for four months.

Arrangement of the Report

18. This first part is purely introductory. We are giving the results for each region separately in Chapter 2. The text and tables for each region have been intentionally kept together for convenience of reference. In Chapter 3 on the other hand we have discussed the results for each borer in a consolidated form for all regions. The geographical distribution of damage done by borers has been studied with the help of contour maps and the results by regions as well as by borers have been discussed in Chapter 4. A table of contents is given from which the page number of statistical tables can be easily ascertained.

19. In this part we have discussed the results for each region separately. But before doing so it will be convenient to explain the general arrangements of the statistical analysis and tables.

Tables (1) and (2) : Damage by Individual Borers.

20. The percentage of canes damaged by each of the ten borers whose Latin names were printed in Form IV (Field Diary) was calculated for each field; and the mean percentage for each type of borer was obtained for each locality and each month separately for 'planted', 'ratoon' and 'mixed' fields. The results for each region are given in the ten Tables (1.1) - (1.10) pertaining to that region. The standard errors of the mean percentages have been calculated in all cases in which the number of fields was not too small and the attack was not negligible.

21. In each of these Tables col.(1) gives the serial number of the locality; col.(2) the name of the locality, and col.(3) the district to which each locality belongs. In regions where there were 'planted', 'ratoon' and 'mixed' fields cols.(4) - (11) give the results for December 1940; cols.(4), (6), (8) and (10) show the number of 'planted', 'ratoon', 'mixed' and 'total' fields in each locality; and cols.(5), (7), (9) and (11) the mean with standard error of the percentage of canes damaged in each locality by the borer in question in 'planted', 'ratoon', 'mixed' and 'total' fields respectively. In regions where only either 'planted' and 'ratoon' or 'planted' and 'mixed' fields occurred there would be only 6 columns namely, cols.(4) - (9) of which cols.(4), (6) and (8) give the number of 'planted', 'ratoon' or 'mixed', and 'total' fields in each locality; and cols.(5), (7) and (9) the mean with standard error of the percentage of canes damaged in each locality by the borer in question in 'planted', 'ratoon' or 'mixed', and 'total' fields respectively. The succeeding columns similarly give relevant information for January, February and March 1941.

Regional Symbols

22. The serial numbers of the Tables have been kept the same in each region. But in order to indicate the region the following symbols have been prefixed as necessary.

(1) G : Gurdaspur (Punjab)

(2) M : Muzaffarnagar (U.P.)

- (3) GK : Gorakhpur (U.P.)
- (4) S : Sepaya (Bihar)
- (5) PU : Pusa (Bihar)
- (6) D : Dacca (Bengal)
- (7) C : Cuttack (Orissa)
- (8) GD : Gudiyattam (Madras)
- (9) PD : Padegaon (Bombay)

Thus Table GU(1.5) signifies the Table for borer No.(5) in region Gurdaspur and so on.

Table (2)

23. Table (2) for each region gives the mean percentage of canes attacked in every month by each borer within the region as a whole. This Table therefore gives a comparison of the intensity of attack by different borers, and shows how this intensity of attack of each borer fluctuates from month to month. In this Table for any given region, col.(1) gives the serial number and col.(2) the Latin name of the borer. The remaining columns (3), (4), etc correspond exactly to cols.(4), (5) etc of Tables (1.1) - (1.10).

Tables (3) and (4) : Spread of Borers

24. The above Tables however do not tell us how many stools or fields or villages were observed as having been attacked by a particular borer. In other words, they do not show how widespread the incidence of each borer was within each region. Table (3) for each region gives this information, namely, the number of canes, stools, fields, villages and localities affected by each borer in each month. In Table (3) col.(1) gives the name of the borer, cols.(2) - (6) the number of canes, stools, fields, villages and localities affected by each borer in December 1940; cols.(7) - (11), cols.(12) - (16) and cols.(17) - (21) give similar information for January, February and March 1941 respectively. Table (4) gives the corresponding percentages of canes, stools, fields, villages and localities affected by the borers.

25. Tables (3) and (4) give us information as to the geographical distribution of each borer. In most of the regions the percentage of canes damaged was not necessarily a sure index of the extent of spread of each borer. This aspect appears to be of importance in connexion with schemes for the control of borer pests.

Table (5) : Results by Workers

26. In Tables (1.1) - (1.10) and Table (2) we have used a single percentage for each field for each borer. In the remaining portion of our analysis we have studied only the attack by all borers combined but with separate percentages for each individual stool. From these percentages we can calculate the mean percentage of canes attacked by borers in each worker-portion of each field; and combining all the fields in a village, we get the percentage of borer attack for each worker and village in each month. The results for the different regions are given in Table (5) in which col.(1) gives the serial number of the locality, col.(2) the serial numbers of the villages; and cols.(3) - (10) the results relating to December 1940. Here cols.(3), (5) and (7) give the number of stools in each village examined by worker Nos.(1), (2) and (3) respectively, and col.(9) their total; cols.(4), (6) and (8) give the mean percentage of damaged canes observed by each of the worker Nos.(1), (2) and (3) and col.(10) gives the mean of these three worker-percentages. The succeeding columns give similar information for the remaining three months.

27. Table (5) helps us to find out whether there was any personal bias in the field work, and if so whether this bias remained steady or decreased as the scheme progressed. This Table also helps us in comparing the intensity of attack in the two villages within each locality.

28. It has not been possible for want of time to make tests of significance for the existence or otherwise of bias among workers for each region. But to serve as a model, we have investigated this question in detail in the case of Pusa region. The analyses of variance for this region brought out significant differences between workers in each month, but apparently this bias gradually decreased with the progress of the scheme. Similar analysis can be undertaken for the other regions.

Tables (6) and (7) : Results by Localities and Months

29. For greater facility in comparing the percentage of attack among localities Table (6) has been prepared by combining the figures for the two villages given in Table (5) for each locality. In Table (7) the figures for workers also are combined to give the mean percentage of damaged canes for each locality in each month. We can study the variation between localities and between months and their interaction as compared to that between

villages within localities by an analysis of variance. This has been done for 7 regions only for which the data were orthogonal; and the results are given in Table (8) for these regions.

Table (8) : Analysis of Variance

30. In the analysis of variance* we have to assume that the two villages within a locality were selected independently every month if we are to make tests of significance of variations 'between months', 'between localities' and their interaction as compared to the residual variance. This assumption is only partly valid as in some months and for some localities, villages were not changed. In any case the residual variance obtained by us may be expected to provide a stringent test of significance. In practically every region we get significant results even on this stringent test. But the more important point to consider is whether, granting that variation 'between months', 'between localities' and that due to 'interaction between months and localities' are all significant, there is any regular ordering of the magnitude of the variations due to these three sources. This point is still under examination. In this report I am only able to give tentative results in an abstract without entering into details.

31. We are now giving a general discussion of the results in a condensed form for each region. For convenience of reference the tables relating to each region have been inserted immediately after the text.

*The primary data in our case conform mostly to a binomial distribution. The method of analysis of variance which is based on the assumption of a normal distribution, is not strictly speaking applicable. In this situation Bartlett's sine-inverse transformation may be used as an approximation. At my suggestion Mr. M. P. Shrivastava of the Statistical Laboratory, has examined this question, and has shown that, within fairly wide limits, the ratio of variance remains fairly steady whether the analysis of variance is based on binomial proportions or on transformed variates.

REGION NO.(1) : GURDASPUR (PUNJAB)

Material

32. In December 1940 only 9 localities or 90 fields were surveyed. But in January and February 1941 all the 11 localities or 110 fields were covered. However in March 1941 again only 9 localities with 64 (instead of 90) fields were surveyed; we do not know why the remaining 26 fields were omitted. Most of the fields were 'planted' and only a few came under 'mixed' cropping. There was no field completely under 'ratoon'.

Damage by Individual Borers

33. Tables GU(1.1) - GU(1.10) give the percentage of canes damaged by each of the ten borers whose Latin names were printed in Form IV (Field Diary). The results for the region as a whole are given in the standard form in Table GU(2).

34. We notice that borer No.(1) occurred most frequently in this region, the rate of attack being 23, 32, 34 and 32 per cent in December 1940, January February and March 1941 respectively. The difference between December and the other months is statistically significant.

35. The next important borer was No.(7) with percentage damage equal to 10, 8, 11 and 16 per cent in the four months December 1940 to March 1941. Borer No.(2) was third in order of intensity of attack causing about 3 per cent damage on an average over the whole period of four months.

36. From Tables GU(1.1) - (1.10) it will be seen that there was considerable variation between localities in the damage caused by each borer. For the most important borer No.(1), we see from Table GU(1.1) that the percentage varied from 11 to 44 per cent in December 1940 (col.9); from 14 to 57 per cent in January 1941 (col.15); from 20 to 41 per cent in February 1941 (col.(21)); and from 20 to 45 per cent in March 1941 (col.27). For borer No.(7) we see from Table GU(1.7) that the rate of attack varied from 0 to 20 per cent in December 1940; from 0 to 18 per cent in January 1941; from 0 to 31 per cent in February 1941; and from 0 to 38 per cent in March 1941.

Effect of 'Ratooning'

37. Although the number of 'mixed' fields was too small for reliable comparisons being made it will be seen that the percentage of canes damaged by borer No.(1) was uniformly greater in such fields as compared to 'planted' fields in every month. For borer No.(7) also this was true for three months out of four.

Spread of Borers

38. Tables GU(3) and GU(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. Borer No.(1) was present in every field of every village of each locality surveyed whereas borer No.(7) was less widespread having been found only in about 60 per cent of the fields and in 7 or 8 localities. In contrast to this borer No.(2) affected more fields, villages and localities in December 1940 than borer No.(7), but damaged a smaller number of canes. In fact borer No.(2) was found in all the 9 localities of the region in December 1940 whereas borer No.(7) was present only in 5 localities. Borer No.(4) was absent in this region. Table GU(1.4) has therefore been omitted.

Results by Workers and Localities

39. Table GU(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table GU(6) gives the consolidated percentages for each locality; and Table GU(7) the mean percentage of damaged canes for each locality in each month. Without entering into detailed tests for which we have no time we may note that in this region bias among workers, if any, does not appear to be high.

Monthly Fluctuations

40. From Table GU(7) we notice that the percentage damage caused by all borers taken together was 36 per cent in December 1940. After this there was steady rise to 41 per cent in January; to 44 per cent in February and to 50 per cent in March 1941.

Variation between Localities

41. The variation between localities was also considerable. The incidence varied from 28 to 46 per cent in December; from 24 to 62 per cent in January; from 33 to 60 per cent in February; and from 20 to 76 per cent in March. The geographical distribution is shown in the contour maps.

42. The data of Table GU(7) has been statistically analysed and the results are given in Table GU(8). It will be seen from this Table that although the variation due to interaction between months and localities is statistically significant it is much less in magnitude than the variation between months and between localities which are highly significant.

Plot: **GU. (1)**

Mean Percentage with Nodes: Mean % of Nodes to Total Cane.

Sampling Unit = Field (or other unit required)

Region No. **1** Name **Gurdaspur** Province **Punjab** Station No. **No. (1) Scirpophaga sp.**

Locality		District	Month..... December, 1940.....						Month..... January, 1941.....					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
A	Amritsar	Amritsar	10	17.20 ± 3.61			10	17.20 ± 3.61	10	24.20 ± 0.47			10	24.20 ± 0.47
B	Sialkot	Sialkot	10	12.40 ± 1.14			10	12.40 ± 1.14	10	29.10 ± 2.45			10	29.10 ± 2.45
C	Karawal	"							10	57.20 ± 2.13			10	57.20 ± 2.13
D	Pathankot	Gurdaspur	10	11.30 ± 1.36			10	11.30 ± 1.36	10	24.20 ± 18.01			10	24.20 ± 18.01
E	Gurdaspur	"	10	21.90 ± 2.04			10	21.90 ± 2.04	7	33.14 ± 3.51	3	36.37 ± 4.67	10	14.20 ± 2.19
F	Batala	"	10	11.90 ± 2.35			10	11.90 ± 2.35	5	38.60 ± 6.48	5	37.80 ± 7.39	10	38.20 ± 4.64
G	Dhariswal	"							10	27.30 ± 3.44			10	27.30 ± 3.44
H	Mukherian	Hoshiarpur	9	26.11 ± 1.93	1	24.00	10	25.90 ± 1.74	10	15.30 ± 1.72			10	15.30 ± 1.72
I	Hoshiarpur	"	10	37.24 ± 0.86			10	37.24 ± 0.86	10	32.80 ± 4.13			10	32.80 ± 4.13
J	Gujranwala	Gujranwala	10	27.50 ± 0.80			10	27.50 ± 0.80	10	24.70 ± 1.27			10	24.70 ± 1.27
K	Jullundur	Jullundur	9	44.44 ± 2.27	1	40.00	10	44.00 ± 2.08	10	40.60 ± 4.62			10	40.60 ± 4.62
	Total		88	22.51 ± 1.28	2	32.00 ± 8.00	90	22.72 ± 1.26	102	31.17 ± 1.38	8	37.25 ± 4.68	110	31.61 ± 1.33

Collected **1/1/41** Date **1/1/41** Checked **Chajin** Date **1/5/41**

Sawling Unit = Field (or 2 or more combined)

Region No. 1 Name: Gurdaspur Province: Punjab No. (2) A. Stictocraspis Hampson

No.	Locality Name	District	Month..... December, 1940						Month..... January, 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Amritsar	Amritsar	10	10.10 ± 3.68			10	10.10 ± 3.68	10	0.00			10	0.00
B	Sialkot	Sialkot	10	0.70 ± 0.39			10	0.70 ± 0.39	10	1.30 ± 0.45			10	1.30 ± 0.45
C	Karawal	"							10	7.60 ± 1.99			10	7.60 ± 1.99
D	Pathankot	Gurdaspur	10	11.30 ± 1.36			10	11.30 ± 1.36	10	2.40 ± 0.76			10	2.40 ± 0.76
E	Gurdaspur	"	10	1.90 ± 0.53			10	1.90 ± 0.53	7	0.00	3	0.00	10	0.00
F	Batala	"	10	1.70 ± 0.99			10	1.70 ± 0.99	5	0.00	5	0.00	10	0.00
G	Dharsival	"							10	4.40 ± 1.84			10	4.40 ± 1.84
H	Mukhrian	Hoshiarpur	9	0.89 ± 0.35	1	4.00	10	1.20 ± 0.45	10	0.00			10	0.00
I	Hoshiarpur	"	10	4.10 ± 0.69			10	4.10 ± 0.69	10	0.00			10	0.00
J	Gujranwala	Gujranwala	10	1.80 ± 0.67			10	1.80 ± 0.67	10	1.40 ± 0.60			10	1.40 ± 0.60
K	Jullundur	Jullundur	9	3.98 ± 0.85	1	2.00	10	3.60 ± 0.77	10	0.40 ± 0.26			10	0.40 ± 0.26
	Total		88	3.23 ± 0.53	2	3.00 ± 1.00	90	3.22 ± 0.53	102	1.72 ± 0.36	8	0.00	110	1.59 ± 0.34

Chief: S. K. Gupta Roll: 12 Date: 8/8/41 Location: C Roll: 165 Date: 11/6/41

Table GU(12) Contd. Mean Percentage with Standard Error of Mixed Cane to Total Cane.

Sampling Unit = Field (or 10 rows combined)

Region No. 1 Name: Gurdaspur Province: Punjab No. (2) Sticticraspis Himpan

No.	Locality	District	Month: <u>February, 1941</u>						Month: <u>March, 1941</u>											
			Planted			Mixed			Total			Planted			Mixed			Total		
			N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.	
(4)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)									
A	Amritsar	Amritsar	10	14.90 ± 4.41				10	14.90 ± 4.41		5	9.00 ± 3.10				5	9.00 ± 3.10			
B	Sialkot	Sialkot	10	1.60 ± 0.36				10	1.60 ± 0.36											
C	Karawal	"	10	10.60 ± 1.65				10	10.60 ± 1.65											
D	Pathankot	Gurdaspur	8	1.75 ± 0.40	2	0.00		10	1.40 ± 0.30	5	3.40 ± 2.04				5	3.40 ± 2.04				
E	Gurdaspur	"	8	0.00	2	0.00		10	0.00	7	0.00	1	0.00		8	0.00				
F	Batala	"	8	0.00	2	6.00 ± 6.00		10	1.20 ± 1.20	6	1.33 ± 0.98	1	2.00		7	1.43 ± 0.76				
G	Dhariwal	"	8	0.25 ± 0.23	2	0.50 ± 0.00		10	0.03 ± 0.02	8	0.25 ± 0.23	2	1.50 ± 1.41		10	0.50 ± 0.33				
H	Mukherian	Hoshiarpur	10	0.10 ± 0.10				10	0.10 ± 0.10	9	1.11 ± 0.75	1	2.00		10	1.20 ± 0.68				
I	Hoshiarpur	"	10	14.30 ± 4.54				10	14.30 ± 4.54	9	4.44 ± 0.82	1	4.00		10	4.50 ± 0.66				
J	Gujranwala	Gujranwala	10	0.70 ± 0.36				10	0.70 ± 0.36	1	6.00				1	6.00				
K	Jullundur	Jullundur	10	2.90 ± 0.66				10	2.90 ± 0.66	8	3.00 ± 0.89				8	3.00 ± 0.89				
	Total		102	4.58 ± 0.84	8	1.62 ± 1.49		110	4.36 ± 0.79	58	2.62 ± 0.50	6	1.83 ± 0.66		64	2.55 ± 0.43				

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No. 70(13)

Mean Percentages with Standard Error of Sampled Cane to Total Cane.

Sampling Unit = Field (or 3 or 4 rows combined)

Station No. 1 Name Gurdaspur Province Punjab No. (3) *A. tumidicostalis* Hampson

No.	Locality Name	District	Month..... December, 1940						Month..... January, 1941						
			Planted		Mixed		Total		Planted		Mixed		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
	Amritsar	Amritsar	10	0.10				10	0.10	10	0.00			10	0.00
	Sialkot	Sialkot	10	0.00				10	0.00	10	0.00			10	0.00
	Karawal	"								10	0.00			10	0.00
	Pathankot	Gurdaspur	10	0.00				10	0.00	10	0.30			10	0.30
	Gurdaspur	"	10	0.00				10	0.00	7	0.00	3	0.00	10	0.00
	Batala	"	10	0.10				10	0.10	5	0.00	5	0.00	10	0.00
	Dharival	"								10	0.00			10	0.00
	Mukhrian	Hoshiarpur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00	
	Hoshiarpur	"	10	0.00				10	0.00	10	0.00			10	0.00
	Gujranwala	Gujranwala	10	0.00				10	0.00	10	0.00			10	0.00
	Jullundur	Jullundur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00	
	Total		88	0.02	2	0.00	90	0.02	102	0.03	8	0.00	110	0.03	

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Table GU(13) Contd. Mean Percentages with Standard Errors of Mean and Total S.E. Total Sand.

Sampling Unit = Field (or 2 workers combined)

Section No. 7 Name Gurdaspur Province Punjab Locality Name No. (3) A. tumidicostalis Hampson

No.	Locality	District	Month February 1941						Month March 1941						
			Planted		Mixed		Total		Planted		Mixed		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
A	Amritsar	Amritsar	10	0.00			10	0.00	5	0.00				5	0.00
E	Sialkot	Sialkot	10	0.00			10	0.00							
C	Narowal	"	10	0.00			10	0.00							
D	Palhankot	Gurdaspur	8	0.00	2	0.00	10	0.00	5	0.00				5	0.00
E	Gurdaspur	"	8	0.00	2	0.00	10	0.00	7	0.00	1	0.00		8	0.00
F	Batala	"	8	0.00	2	0.00	10	0.00	6	0.00	1	0.00		7	0.00
G	Dhariesal	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00		10	0.00
H	Muthrian	Hoshiarpur	10	0.00			10	0.00	9	0.00	1	0.00		10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	9	0.00	1	0.00		10	0.00
J	Gujranwala	Gujranwala	10	0.00			10	0.00	1	0.00				1	0.00
K	Jullundur	Jullundur	10	0.00			10	0.00	8	0.00				8	0.00
	Total		102	0.00	8	0.00	110	0.00	58	0.00	6	0.00		64	0.00

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GU(15)

Punjab State Government

General Department

Gurdaspur

Punjab

No(5) D. Venkata wtk

No.	Name	December, 1940				January, 1941								
		Mixed		Mixed		Mixed		Mixed						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Amritsar	Amritsar	10	0.00			10	0.00	10	0.00			10	0.00
	Sialkot	Sialkot	10	0.00			10	0.00	10	0.00			10	0.00
	Karawal	.							10	0.00			10	0.00
	Pathankot	Gurdaspur	10	0.00			10	0.00	10	0.00			10	0.00
	Gurdaspur	.	10	0.00			10	0.00	7	0.00	3	0.00	10	0.00
	Batala	.	10	0.10			10	0.10	5	0.00	5	0.00	10	0.00
	Dharawal	.							10	0.00			10	0.00
	Mukhian	Hoshiarpur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Hoshiarpur	.	10	0.00			10	0.00	10	0.00			10	0.00
	Gujranwala	Gujranwala	10	0.00			10	0.00	10	0.00			10	0.00
	Jullundur	Jullundur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Total		88	0.01	2	0.00	90	0.01	102	0.00	8	0.00	110	0.00

1. G.U.F.S) Contd. Mean Percentage with Standard Error of Difference due to Total Date.

Sampling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab No. (5) D. Venosata with

Locality		District	Month <u>February 1941</u>						Month <u>March 1941</u>					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	Amritsar	Amritsar	10	0.00			10	0.00	5	0.00			5	0.00
E	Sialkot	Sialkot	10	0.00			10	0.00						
C	Narowal	"	10	0.00			10	0.00						
D	Pathankot	Gurdaspur	8	0.00	2	0.00	10	0.00	5	0.00			5	0.00
E	Gurdaspur	"	8	0.00	2	0.00	10	0.00	7	0.00	1	0.00	8	0.00
F	Batala	"	8	0.00	2	0.00	10	0.00	6	0.00	1	0.00	7	0.00
G	Dhariwal	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
H	Mukhrian	Hoshiarpur	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
J	Gujranwala	Gujranwala	10	0.00			10	0.00	1	0.00			1	0.00
K	Jullundur	Jullundur	10	0.00			10	0.00	8	0.00			8	0.00
Total			102	0.00	8	0.00	110	0.00	58	0.00	6	0.00	64	0.00

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Table GU(16)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Loror's Name No. (6) C. Zonellus Srinik

Locality		District	Month..... December, 1949.....						Month..... January, 1941.....					
			Planted		Mixed		Total		Planted		Mixed		Total	
No.	Name		N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Amritsar	Amritsar	10	0.00			10	0.00	10	0.00			10	0.00
B	Sialkot	Sialkot	10	1.00			10	1.00	10	0.00			10	0.00
C	Karawal	"							10	0.00			10	0.00
D	Pathankot	Gurdaspur	10	1.70			10	1.70	10	0.60			10	0.60
E	Gurdaspur	"	10	1.40			10	1.40	7	0.00	3	0.00	10	0.00
F	Batala	"	10	1.60			10	1.60	5	2.00	5	1.20	10	1.60
G	Bharnawal	"							10	0.20			10	0.20
H	Mukhian	Hoshiarpur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	10	0.00			10	0.00
J	Gujranwala	Gujranwala	10	0.00			10	0.00	10	0.00			10	0.00
K	Jullundur	Jullundur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Total		88	0.65	2	0.00	90	0.63	102	0.17	8	0.75	110	0.22

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Table GU-6 Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Worker's Name No. (6) C. Zonellus Swink

No.	Locality	District	Month <u>February 1941</u>						Month <u>March 1941</u>					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
A	Amritsar	Amritsar	10	0.00			10	0.00	5	0.00			5	0.00
B	Sialkot	Sialkot	10	1.70			10	1.70						
C	Karawal	"	10	0.00			10	0.00						
D	Pathankot	Gurdaspur	8	0.00	2	0.00	10	0.00	5	1.00			5	1.00
E	Gurdaspur	"	8	0.00	2	0.00	10	0.00	7	0.00	1	0.00	8	0.00
F	Batala	"	8	0.00	2	0.00	10	0.00	6	0.00	1	0.00	7	0.00
G	Dharawal	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
H	Mukhrian	Hoshiarpur	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
J	Gujranwala	Gujranwala	10	0.00			10	0.00	1	0.00			1	0.00
K	Jullundur	Jullundur	10	0.00			10	0.00	8	0.50			8	0.50
	Total		102	0.17	8	0.00	110	0.15	58	0.16	6	0.00	64	0.14

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Sampling Unit - Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Borer's Name No. (7) C. tryf. ~~to Bisset~~

No.	Locality	District	Month. December, 1940						Month. January, 1941						
			Planted		Mixed		Total		Planted		Mixed		Total		
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
A	Amritsar	Amritsar	10	0.00				10	0.00	10	0.00			10	0.00
B	Sialkot	Sialkot	10	19.80 ± 3.99				10	19.80 ± 3.99	10	5.00 ± 3.34			10	5.00 ± 3.34
C	Karawal	"								10	5.10 ± 1.50			10	5.10 ± 1.50
D	Rathankot	Gurdaspur	10	17.50 ± 1.63				10	17.50 ± 1.63	10	15.60 ± 1.90			10	15.60 ± 1.90
E	Gurdaspur	"	10	17.90 ± 1.27				10	17.90 ± 1.27	7	14.86 ± 2.97	3	12.67 ± 2.86	10	14.20 ± 2.19
F	Batala	"	10	16.20 ± 2.59				10	16.20 ± 2.59	5	14.50 ± 1.99	5	15.00 ± 4.26	10	15.00 ± 2.21
G	Bharawal	"								10	18.30 ± 2.82			10	18.30 ± 2.82
H	Mukherian	Hoshiarpur	9	15.11 ± 9.03	1	9.00		10	14.50 ± 8.10	10	15.40 ± 2.73			10	15.40 ± 2.73
I	Hoshiarpur	"	10	0.00				10	0.00	10	0.00			10	0.00
J	Gujranwala	Gujranwala	10	0.00				10	0.00	10	0.50 ± 0.31			10	0.50 ± 0.31
K	Jullundur	Jullundur	9	0.00	1	0.00		10	0.00	10	0.00			10	0.00
	Total		88	9.66 ± 1.71	2	4.50 ± 4.48	90	9.54 ± 1.37	102	7.62 ± 0.92	8	14.25 ± 2.74	110	8.10 ± 1.16	

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Checked C.B. Roll 165 Date 11/8/41

Table (17) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Letter's Name No. (7) C. tryfates Biset

No.	Locality	District	Month.....February, 1941.....						Month.....March, 1941.....					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
A	Amritsar	Amritsar	10	0.00			10	0.00	5	0.00			5	0.00
E	Siakkot	Siakkot	10	14.80 ± 4.05			10	14.80 ± 4.05						
C	Narawal	"	10	12.50 ± 3.20			10	12.50 ± 3.20						
D	Pathankot	Gurdaspur	8	10.13 ± 1.97	2	5.00 ± 0.99	10	9.10 ± 1.70	5	28.80 ± 3.03			5	28.80 ± 3.03
E	Gurdaspur	"	8	31.13 ± 3.56	2	31.00 ± 4.03	10	31.10 ± 2.87	7	25.43 ± 3.43	1	30.00	8	26.00 ± 3.02
F	Batala	"	8	18.00 ± 2.84	2	51.00 ± 3.20	10	24.60 ± 1.39	6	24.67 ± 5.95	1	23.00	7	24.43 ± 5.04
G	Sharawal	"	8	6.50 ± 2.26	2	18.00 ± 2.05	10	8.80 ± 2.37	8	37.50 ± 4.86	2	42.00 ± 6.00	10	38.40 ± 3.90
H	Mukhrian	Hoshiarpur	10	23.40 ± 3.16			10	23.40 ± 3.16	9	31.00 ± 5.54	1	7.00	10	28.60 ± 5.50
I	Hoshiarpur	"	10	0.00			10	0.00	9	0.44 ± 0.44	1	0.00	10	0.40 ± 0.39
J	Gujranwala	Gujranwala	10	0.00			10	0.00	1	0.00			1	0.00
K	Jullundur	Jullundur	10	0.00			10	0.00	8	11.37 ± 1.61			8	11.37 ± 1.61
	Total		102	10.13 ± 1.22	8	26.25 ± 8.86	110	11.30 ± 2.47	58	19.72 ± 2.21	6	24.00 ± 7.35	64	16.45 ± 2.28

Collected.....Roll.....Date.....Checked. May.....Roll 56.....Date 1/6.....

Table (11a)

Mean Percentage with Standard Error of Sample of Cane to Total Cane.

Sawling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Locality Name No. (8) R. ablutella Zell

No.	Locality Name	District	Month December, 1940						Month January, 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Amritsar	Amritsar	10	0.00			10	0.00	10	0.00			10	0.00
E	Sialkot	Sialkot	10	0.20			10	0.20	10	0.00			10	0.00
C	Karawal	"							10	0.00			10	0.00
D	Pathankot	Gurdaspur	10	0.00			10	0.00	10	0.30			10	0.30
E	Gurdaspur	"	10	0.30			10	0.30	7	0.00	3	0.00	10	0.00
F	Batala	"	10	0.00			10	0.00	5	0.20	5	0.00	10	0.10
G	Dhariwal	"							10	0.00			10	0.00
H	Mukherian	Hoshiarpur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	10	0.00			10	0.00
J	Gujranwala	Gujranwala	10	0.30			10	0.30	10	0.00			10	0.00
K	Jullundur	Jullundur	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Total		88	0.09	2	0.00	90	0.09	102	0.04	8	0.00	110	0.04

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Completed (Wpt. thin)

J. Ruy + C. L. S. 1/41

Gurdaspur

Punjab

to (9) Sesamia Sp.

Locality		District	December, 1940							January, 1941				
Name			Sample		Mixed		Mixed			Sample		Mixed		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Amritsar	Amritsar		10	0.20			10	0.20	10	0.00			10	0.00
Sialkot	Sialkot		10	0.30			10	0.30	10	0.20			10	0.20
Karawal	.								10	0.10			10	0.10
Pathankot	Gurdaspur		10	0.10			10	0.10	10	1.10			10	1.10
Gurdaspur	.		10	0.00			10	0.00	7	0.00	3	0.00	10	0.00
Batala	.		10	0.40			10	0.40	5	0.00	5	0.00	10	0.00
Dhriwal	.								10	0.00			10	0.00
Mukherian	Hoshiarpur		9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
Hoshiarpur	.		10	0.00			10	0.00	10	0.00			10	0.00
Gujranwala	Gujranwala		10	0.30			10	0.30	10	0.30			10	0.30
Jullundur	Jullundur		9	1.33	1	0.00	10	1.00	10	0.00			10	0.00
Total			88	0.29	2	0.00	90	0.28	102	0.16	8	0.00	110	0.16

Public 62(9) could have been done with Standard Survey of the time to total cost.

Sampling Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab Locality Name No (9) Sesamia sp.

Locality		District	Month..... February, 1941.....						Month..... March, 1941.....					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
			(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Amritsar	Amritsar	10	0.00			10	0.00	5	0.00			5	0.00
B	Sialkot	Sialkot	10	0.00			10	0.00						
C	Karawal	"	10	0.00			10	0.00						
D	Pathankot	Gurdaspur	8	0.00	2	0.00	10	0.00	5	0.00			5	0.00
E	Gurdaspur	"	8	0.00	2	0.00	10	0.00	7	0.00	1	0.00	8	0.00
F	Batala	"	8	0.13	2	0.00	10	0.13	6	0.00	1	0.00	7	0.00
G	Dharawal	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
H	Mukhrian	Hoshiarpur	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
I	Hoshiarpur	"	10	0.00			10	0.00	9	0.22	1	0.00	10	0.20
J	Gujranwala	Gujranwala	10	0.00			10	0.00	1	0.00			1	0.00
K	Jullundur	Jullundur	10	0.00			10	0.00	8	0.00			8	0.00
	Total		102	0.01	8	0.00	110	0.01	58	0.01	6	0.00	64	0.01

Collected S.K. Gupta Page 63 Date 8/6/41 Checked S.K. Gupta

No. 64(119)

Mean Percentage of *S. depresso* in *S. depresso* (Total) = 0.52 ± 0.37

Sampling Unit = Field (or other combination)

Region No. 1 Name Gurdaspur Province Punjab Locality Name No. (10) E. depressella Smith

No.	Locality Name	District	Month... December, 1940						Month... January, 1941					
			Planted	Mixed		Total	Planted	Mixed		Total				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Amritsar	Amritsar	10	2.40 ± 0.82			10	2.40 ± 0.82	10	0.00			10	0.00
	Sialkot	Sialkot	10	0.10 ± 0.10			10	0.10 ± 0.10	10	5.00 ± 3.34			10	5.00 ± 3.34
	Karawal	"							10	0.00			10	0.00
	Pathankot	Gurdaspur	10	0.30 ± 0.30			10	0.30 ± 0.30	10	0.20 ± 0.20			10	0.20 ± 0.20
	Gurdaspur	"	10	0.40 ± 0.33			10	0.43 ± 0.33	7	0.00	3	0.00	10	0.00
	Batala	"	10	0.00			10	0.00	5	0.00	5	0.00	10	0.00
	Dharawal	"							10	0.00			10	0.00
	Mukherian	Hoshiarpur	9	0.00	1	2.00	10	0.20 ± 0.20	10	0.00			10	0.00
	Hoshiarpur	"	10	0.60 ± 0.30			10	0.60 ± 0.30	10	0.00			10	0.00
	Gujranwala	Gujranwala	10	0.50 ± 0.15			10	0.50 ± 0.15	10	0.20 ± 0.15			10	0.20 ± 0.15
	Jullundur	Jullundur	9	0.00	1	2.00	10	0.20 ± 0.20	10	0.00			10	0.00
	Total		88	0.49 ± 0.38	2	2.00 ± 0.00	90	0.52 ± 0.37	102	0.50 ± 0.30	8	0.00	110	0.50 ± 0.30

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Scale *Gull 10g Contd.* Mean Percentage with Standard Error of Mean for Same to Total Count

Sampling Unit = Field (or 3 workers combined)

Station No. 1. Name: *Gurdaspur* Province: *Punjab* No. (10) *E. depressella* Swinh

No.	Locality	District	Month: <i>February, 1941</i>						Month: <i>March, 1941</i>						
			Planted		<i>Mixed</i>		Total		Planted		<i>Mixed</i>		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
A	<i>Amritsar</i>	<i>Amritsar</i>	10	1.10 ± 0.46				10	1.10 ± 0.46	5	0.00			5	0.00
E	<i>Sialkot</i>	<i>Sialkot</i>	10	0.00				10	0.00						
C	<i>Narowal</i>	"	10	0.60 ± 0.33				10	0.60 ± 0.33						
D	<i>Pathankot</i>	<i>Gurdaspur</i>	8	0.00	2	0.00		10	0.00	5	0.00			5	0.00
F	<i>Gurdaspur</i>	"	8	0.00	2	0.00		10	0.00	7	0.00	1	0.00	8	0.00
H	<i>Batala</i>	"	8	0.00	2	0.00		10	0.00	6	0.00	1	0.00	7	0.00
G	<i>Dharawal</i>	"	8	0.00	2	0.00		10	0.00	8	0.00	2	0.00	10	0.00
I	<i>Mukherian</i>	<i>Hoshiarpur</i>	10	0.00				10	0.00	9	0.00	1	0.00	10	0.00
J	<i>Hoshiarpur</i>	"	10	0.00				10	0.00	9	0.00	1	0.00	10	0.00
K	<i>Gujranwala</i>	<i>Gujranwala</i>	10	1.60 ± 0.47				10	1.60 ± 0.47	1	0.00			1	0.00
L	<i>Jullundur</i>	<i>Jullundur</i>	10	0.00				10	0.00	8	0.00			8	0.00
	Total		102	0.30 ± 0.06	8	0.00		110	0.30 ± 0.06	58	0.00	6	0.00	64	0.00

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Table 6u(2)

Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 1 worker combined)

Region No. 1 Name Gurdaspur Province Punjab

Borer		Month.....December, 1940.						Month.....January, 1941.					
		Planted		Mixed		Total		Planted		Mixed		Total	
No.	Name	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> sp.	88	22.57 ± 1.28	2	32.00 ± 8.00	90	22.72 ± 1.26	102	31.17 ± 1.38	8	37.25 ± 4.68	110	31.61 ± 1.33
2	<i>A. Sticticnaspis</i> Hampf.	88	3.23 ± 0.53	2	3.00 ± 1.00	90	3.22 ± 0.53	102	1.72 ± 0.36	8	0.00	110	1.59 ± 0.34
3	<i>A. tunidicatalis</i> Hampf.	88	0.02	2	0.00	90	0.02	102	0.03	8	0.00	110	0.03
4	<i>D. auricilia</i> Dudgeon	88	0.00	2	0.00	90	0.00	102	0.00	8	0.00	110	0.00
5	<i>D. venosata</i> Wlk.	88	0.01	2	0.00	90	0.01	102	0.00	8	0.00	110	0.00
6	<i>C. zonellus</i> Swinh.	88	0.65	2	0.00	90	0.63	102	0.17	8	0.75	110	0.22
7	<i>C. trypheta</i> Bissat	88	9.66 ± 1.71	2	4.50 ± 4.48	90	9.54 ± 1.37	102	7.62 ± 0.92	8	14.25 ± 2.74	110	8.10 ± 1.16
8	<i>R. ablutella</i> Zell.	88	0.09	2	0.00	90	0.09	102	0.04	8	0.00	110	0.04
9	<i>Sesamia</i> sp.	88	0.29	2	0.00	90	0.28	102	0.16	8	0.00	110	0.16
10	<i>E. depressella</i> Swinh.	88	0.49 ± 0.38	2	2.00 ± 0.00	90	0.52 ± 0.37	102	0.50 ± 0.30	8	0.00	110	0.50 ± 0.30

Collected..... Roll..... Date..... Checked..... Roll..... Date.....

Table GU(2) Contd. Mean Percentage with Standard Error of Unpaired Cane to Total Cane.

Sample Unit = Field (or 3 workers combined)

Region No. 1 Name Gurdaspur Province Punjab

Borer	Month... February, 1941						Month... March, 1941						
	Planted		Mixed		Total		Planted		Mixed		Total		
	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	<i>Scirpophaga</i> sp.	102	30.94 ± 1.08	8	34.00 ± 2.90	110	33.70 ± 1.78	58	32.14 ± 1.42	6	34.00 ± 9.69	64	32.31 ± 1.47
2	<i>A. sticticraspis</i> Hampf	102	4.58 ± 0.84	8	1.62 ± 1.49	110	4.36 ± 0.79	58	2.62 ± 0.50	6	1.83 ± 0.66	64	2.55 ± 0.43
3	<i>A. tumidicostalis</i> Hampf	102	0.00	8	0.00	110	0.00	58	0.00	6	0.00	64	0.00
4	<i>D. auricilia</i> Dudge	102	0.00	8	0.00	110	0.00	58	0.00	6	0.00	64	0.00
5	<i>D. venosata</i> Wlk	102	0.00	8	0.00	110	0.00	58	0.00	6	0.00	64	0.00
6	<i>C. zonellus</i> Swink	102	0.17	8	0.00	110	0.15	58	0.16	6	0.00	64	0.14
7	<i>C. tryphates</i> Bisset	102	10.13 ± 1.22	8	26.25 ± 8.86	110	11.30 ± 2.47	58	19.72 ± 2.21	6	24.00 ± 7.35	64	16.45 ± 2.28
8	<i>R. ablutella</i> Zell	102	0.03	8	0.00	110	0.03	58	0.12	6	0.00	64	0.11
9	<i>Sesamia</i> sp.	102	0.01	8	0.00	110	0.01	58	0.01	6	0.00	64	0.01
10	<i>E. depressella</i> Swink	102	0.30 ± 0.06	8	0.00	110	0.30 ± 0.06	58	0.00	6	0.00	64	0.00

Collected..... Filled..... Filled..... Checked..... Roll.....

REGIONAL SURVEY OF FOREN PESTS OF SUGARCANE, 1940-41

no. 3) Number of Canes, stools, fields, villages, and localities affected by different borers.

Region No. 1 Name Gurdaspur District Punjab

	September 1940					October 1940					November 1940					March 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
	(4)	(5)	(6)	(45)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	1339	639	90	18	9	2417	896	110	22	11	2190	919	110	22	11	1219	510	64	16	9
	218	139	61	17	9	105	67	34	11	6	264	144	57	18	10	108	67	33	13	8
	2	2	2	2	2	2	1	1	1	1										
	1	1	1	1	1															
	43	27	19	8	4	15	7	7	4	3	10	5	4	2	1	5	3	3	2	2
	601	298	49	10	5	564	306	61	15	8	715	382	66	14	7	746	329	49	13	7
	6	4	3	3	3	4	4	2	2	2	2	1	1	1	1	3	3	1	1	1
	21	21	13	9	6	10	9	9	6	4	1	1	1	1	1	1	1	1	1	1
	44	37	22	12	8	3	3	3	2	2	22	18	14	6	3					
Total damaged	2175	793	90	18	9	2888	962	110	22	11	3070	979	110	22	11	2057	567	64	16	9
Grand Total	6162	810	90	18	9	7095	990	110	22	11	7064	990	110	22	11	3823	576	64	16	9

N₁ = Number of canes affected; N₂ = Number of stools affected; N₃ = Number of fields affected; N₄ = Number of villages affected; N₅ = Number of localities affected.

Roll..... Date..... Checked..... Roll..... Date.....

REGIONAL SURVEY OF BORER PESTS OF CUSCUMB, 1940-41

Table (4) Percentage of Canees, stools, fields, villages & localities affected by different borers
 District.....! Name..... Gurdaspur. Taluk..... Punjab.

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Common	21.7	78.9	100.0	100.0	100.0	34.1	90.5	100.0	100.0	100.0	31.1	92.8	100.0	100.0	100.0	31.9	88.5	100.0	100.0	100.0
...	3.5	17.2	67.8	94.4	100.0	1.5	6.8	30.9	50.0	54.5	3.7	14.5	51.8	81.8	90.9	2.8	11.6	51.6	81.2	88.9
...	0.0	0.2	2.2	11.1	22.2	0.0	0.1	0.9	4.5	9.1										
...	0.0	0.1	1.1	5.6	11.1															
...	0.7	3.3	21.1	44.4	44.4	0.2	0.7	6.4	18.2	27.3	0.1	0.5	3.6	9.1	9.1	0.1	0.5	4.7	12.5	22.2
...	9.7	36.8	54.4	55.6	55.6	7.9	30.9	55.4	68.2	72.7	10.1	38.6	60.0	63.6	63.6	19.5	57.1	76.6	81.2	77.8
...	0.1	0.5	3.3	16.7	33.3	0.1	0.4	1.8	9.1	18.2	0.0	0.1	0.9	4.5	4.5	0.1	0.5	1.6	6.2	11.1
...	0.3	2.6	14.4	50.0	66.7	0.1	0.9	8.2	27.3	36.4	0.0	0.1	0.9	4.5	4.5	0.0	0.2	1.6	6.2	11.1
...	0.7	4.6	24.4	66.7	88.9	0.0	0.3	2.7	9.1	18.2	0.3	1.8	12.7	27.3	27.3					
Total Damaged	35.2	97.9	100.0	100.0	100.0	40.7	97.2	100.0	100.0	100.0	43.6	98.9	100.0	100.0	100.0	53.9	98.4	100.0	100.0	100.0

Percentages of Canees, stools, fields, villages & localities affected by different borers. The number of fields surveyed, the number of fields affected, the number of villages surveyed, the number of villages affected.

REGIONAL SURVEY OF BOREH PESTS OF SUGARCANE 1940-41

G.H.
Table (5). Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 1 Name Gurdaspur Province Punjab

Village No	Month. <u>December - 1940</u>								Month. <u>January - 1941</u>							
	Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	15	27.40	15	37.87	15	23.27	45	29.51	15	26.40	15	30.53	15	21.13	45	26.02
2	15	22.00	15	34.00	15	24.80	45	26.93	15	20.20	15	22.00	15	22.40	45	21.53
1	15	38.60	15	30.07	15	30.67	45	33.11	15	24.93	15	45.40	15	39.93	45	36.75
2	15	28.60	15	32.07	15	28.13	45	29.60	15	27.13	15	37.80	15	37.67	45	34.20
1									15	68.53	15	62.07	15	60.74	45	63.78
2									15	65.87	15	65.67	15	51.27	45	60.94
1	15	36.00	15	40.33	15	26.87	45	34.40	15	37.40	15	43.53	15	41.47	45	40.80
2	15	30.40	15	37.27	15	29.13	45	32.27	15	45.93	15	56.80	15	41.60	45	48.11
1	15	58.33	15	37.40	15	36.67	45	44.13	15	50.80	15	51.40	15	63.60	45	55.27
2	15	43.40	15	40.53	15	20.00	45	34.64	15	49.40	15	44.20	15	41.53	45	45.04
1	15	40.07	15	34.53	15	33.53	45	36.04	15	56.20	15	66.00	15	67.20	45	63.13
2	15	21.80	15	29.20	15	31.20	45	30.73	15	43.93	15	51.80	15	48.07	45	47.93
1									15	48.60	15	60.07	15	49.93	45	52.87
2									15	37.67	15	50.00	15	53.40	45	47.02
1	15	38.47	15	48.67	15	41.20	45	42.78	15	33.87	15	36.27	15	43.47	45	37.87
2	15	34.20	15	51.20	15	41.13	45	42.18	15	24.07	15	30.40	15	17.20	45	23.89
1	15	39.53	15	32.73	15	34.27	45	35.51	15	31.20	15	41.33	15	32.80	45	35.11
2	15	40.80	15	39.60	15	32.33	45	37.58	15	35.07	15	32.00	15	29.47	45	32.18
1	15	26.33	15	30.33	15	31.13	45	29.26	15	20.53	15	27.87	15	24.13	45	24.18
2	15	29.33	15	37.33	15	29.73	45	32.13	15	25.47	15	25.13	15	31.00	45	27.20
1	15	40.67	15	48.60	15	48.73	45	46.00	15	39.47	15	37.07	15	40.13	45	38.89
2	15	40.47	15	45.47	15	50.33	45	45.42	15	45.00	15	42.73	15	46.40	45	44.71
Total	270	25.91	270	37.81	270	34.08	810	35.90	330	38.99	330	43.64	330	41.39	990	41.39

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REGULATED SURVEY OF BOPPER PLANTS OF SUGARCANE 1940-41

GH-5) GH-1 Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. . . . 1 District. Guruchaspur Province. Punjab

Village No.	Month. February - 1941.								Month. March -									
	Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total			
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N		
(1)	(2)	(9)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	
1	15	34.07	15	27.53	15	38.13	45	33.24	15	38.40	15	38.87	15	30.60	45	35.96		
2	15	36.87	15	34.73	15	40.53	45	37.38										
3	1	15	33.80	15	48.80	15	53.80	45	45.47									
2	15	38.27	15	34.27	15	33.53	45	35.36										
4	1	15	59.60	15	58.20	15	54.73	45	57.51									
2	15	51.33	15	55.07	15	60.07	45	55.49										
5	1	15	33.93	15	40.60	15	37.67	45	37.42	9	49.78	9	48.56	9	65.44	27	55.78	
2	15	39.27	15	37.87	15	38.20	45	38.45	6	57.83	6	57.50	6	77.83	18	45.22		
6	1	15	62.60	15	65.60	15	49.73	45	59.31	15	58.67	15	61.20	15	64.00	45	61.29	
2	15	61.53	15	60.47	15	59.07	45	60.36	9	57.67	9	29.93	9	43.44	27	43.71		
7	1	15	51.27	15	50.60	15	60.93	45	54.27	15	68.13	15	66.07	15	62.20	45	65.47	
2	15	60.13	15	58.07	15	53.93	45	57.38	6	78.83	6	24.33	6	72.50	18	58.53		
8	1	15	32.40	15	50.13	15	31.87	45	38.13	15	71.80	15	65.00	15	61.67	45	66.16	
2	15	49.07	15	49.27	15	49.13	45	49.16	15	87.33	15	83.33	15	89.40	45	86.87		
9	1	15	42.93	15	52.67	15	41.67	45	45.76	15	56.20	15	57.07	15	57.27	45	56.85	
2	15	32.07	15	43.87	15	50.53	45	42.16	15	47.93	15	45.53	15	39.27	45	44.24		
10	1	15	38.20	15	38.93	15	35.20	45	37.44	15	33.67	15	34.00	15	38.73	45	35.47	
2	15	39.27	15	38.47	15	38.67	45	38.80	15	38.20	15	42.07	15	38.60	45	39.62		
11	1	15	31.00	15	34.07	15	22.73	45	29.27	3	14.00	3	9.40	3	38.00	9	20.47	
2	15	37.73	15	42.53	15	29.00	45	36.42										
12	1	15	39.67	15	42.73	15	42.07	45	41.49	15	47.93	15	45.53	15	39.27	45	44.24	
2	15	45.73	15	46.13	15	43.67	45	45.18	9	60.77	9	30.33	9	64.22	27	51.81		
Total	330	43.22	330	45.94	330	43.86	990	44.24	192	51.32	192	44.20	192	53.94	576	49.89		

Copied. M. S. Singh Roll. 254 Date. 6.6.41

Checked. Roll. Date.

1000 Gu. (6)

Statement of Income and Expenditure for the year ending 31st December 1940

Statement of Income and Expenditure for the year ending 31st December 1940

Part I

Name **Gurdaspur**

Punjab

		Month: December, 1940.								Month: January, 1941.								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Amritsar	Amritsar	30	24.70	30	35.93	30	24.03	90	27.89	30	23.20	30	26.27	30	21.77	90	23.78	
Sialkot	Sialkot	30	33.60	30	31.07	30	29.40	90	31.36	30	26.03	30	41.60	30	38.80	90	35.48	
Narowal	"									30	67.20	30	63.87	30	56.00	90	62.36	
Pathankot	Gurdaspur	30	33.20	30	38.80	30	28.00	90	33.33	30	41.67	30	50.17	30	41.53	90	44.46	
Gurdaspur	"	30	50.87	30	38.97	30	38.83	90	42.72	30	50.20	30	47.80	30	52.57	90	50.19	
Batala	"	30	35.93	30	31.87	30	32.37	90	33.39	30	50.07	30	58.90	30	57.63	90	55.83	
Dhanialal	"									30	43.13	30	55.03	30	51.67	90	49.94	
Mukherian	Hoshiarpur	30	36.33	30	49.93	30	41.17	90	42.48	30	28.97	30	33.33	30	33.33	90	31.88	
Hoshiarpur	"	30	40.17	30	36.17	30	33.30	90	36.55	30	33.13	30	36.67	30	31.13	90	33.64	
Gujranwala	Gujranwala	30	27.183	30	30.53	30	30.60	90	29.65	30	23.00	30	26.50	30	27.57	90	25.69	
Jullundur	Jullundur	30	40.57	30	47.03	30	49.53	90	45.71	30	42.23	30	39.90	30	43.27	90	41.80	
		270	35.91	270	37.81	270	34.08	810	35.90	330	38.99	330	43.64	330	41.39	990	41.54	

Signature

Gurdaspur

Punjab

February, 1941										March, 1941								
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Amritsar	Amritsar		30	35.47	30	31.13	30	39.33	90	35.31	15	38.40	15	38.89	15	30.60	45	35.96
Lialkot	Lialkot		30	36.03	30	41.53	30	43.67	90	40.41								
Karawal	.		30	55.47	30	56.63	30	57.40	90	56.50								
Pathankot	Gurdaspur		30	36.60	30	39.27	30	37.93	90	37.93	15	53.00	15	52.13	15	70.40	45	58.51
Gurdaspur	"		30	62.07	30	63.03	30	54.40	90	59.83	24	58.29	24	45.47	24	56.29	72	53.35
Batala	.		30	55.70	30	54.33	30	57.43	90	55.82	21	71.19	21	45.20	21	65.14	63	60.51
Dharawal	.		30	40.73	30	49.70	30	40.50	90	43.44	30	79.57	30	74.17	30	75.53	90	76.42
Mukherian	Hoshkarpur		30	37.50	30	48.27	30	46.10	90	43.96	30	52.07	30	51.30	30	48.27	90	51.21
Hoshkarpur	.		30	38.77	30	38.70	30	39.63	90	38.13	30	35.93	30	38.03	30	38.67	90	37.54
Gujranwala	Gujranwala		30	34.37	30	38.30	30	25.87	90	32.85	3	14.00	3	09.40	3	38.00	9	20.47
Jullundur	Jullundur		30	42.70	30	44.43	30	42.87	90	43.33	24	59.46	24	43.23	24	62.54	72	55.08
			330	43.22	330	45.94	330	43.86	990	44.34	192	51.32	192	44.20	192	53.94	576	49.87

NATIONAL SURVEY OF BOREH PESTS OF SUGAR CANE, 1940-41

Table 62(7) Mean Percentage of Damaged Cane to Total Cane by Localities and Months

Region No. I Name Gurdaspur Province Punjab

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Amritsar	90	27.89	90	23.78	90	35.31	(45) 45	35.96
Bhalkot	90	31.36	90	35.48	90	40.41	n	n
Charnal			90	62.36	90	56.50	n	n
Patah Kot	90	33.33	90	44.46	90	37.93	(45) 45	58.51
Gurdaspur	90	42.72	90	50.19	90	59.83	(70) 72	53.35
Batala	90	33.39	90	55.53	90	55.82	(2) 83	60.51
Dhanial			90	49.94	90	43.64	90	76.42
Mukherian	90	42.48	90	31.88	90	43.96	90	51.21
Hoshiarpur	90	36.55	90	33.64	90	38.13	90	37.54
Gujranwala	90	29.65	90	25.69	90	32.85	(2) 49	20.47
Jalandhar	90	45.71	90	41.80	90	43.33	(72) 72	55.08
Total	810	35.90	990	41.34	990	44.34	576	49.89

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Table A.U. (8). Analysis of Variance

Source of Variation	d.f.	Sum of Squares	Variance	Ratio of Variances
(1)	(2)	(3)	(4)	(5)
Between Months	3	10 88.85	3 62.78	11.70
Between Localities	5	13 65.00	2 75.00	8.80
Months & Localities	15	12 71.64	84.78	2.78
Between Villages (within Months & Localities)	24	7 44.17	31.01	
Total	47	44 69.16		

REGION NO.(2) : MUZAFFARRAGAR (U.P.)

Material

43. All the 11 localities or 110 fields were surveyed in each of the months December 1940 to March 1941. In March 1941 the crop on all 40 fields in 4 localities consisted only of shoots and were omitted as this report is confined only to percentage of canes damaged. We are therefore left with 7 localities or 70 fields for March 1941. Most of the fields were 'planted' with a few either 'ratooned' or 'mixed'.

Damage by Individual Borers

44. The percentage of canes damaged by each of the ten borers is given in the standard form separately by localities and months in Tables M(1.1) - M(1.10). The results for the region as a whole have been gathered together in Table M(2) for comparing the relative incidence of the different borers. In this region 'mixed' fields were covered in the survey only in December whereas 'ratooned' fields were not covered only in March.

45. From Table M(2) we find that Borer No.(1) occurred most frequently in this region; and the damage caused by this borer was 39, 44, 49 and 45 per cent in December 1940, January, February and March 1941 respectively. The difference between December and some of the other months (notably February) are statistically significant.

46. The next important borer is No.(10) with percentage of damage equal to 15, 18, 18 and 13 in the four months December 1940 to March 1941. Borer No.(2) is third in order of intensity of attack, and caused about 3 or 4 per cent damage on an average over the period of 4 months. Borer Nos.(4) and (6) do not occur at all in this region so that Tables M(1.4) and M(1.6) have been omitted.

47. From Tables M(1.1) - M(1.10) it will be seen that there is considerable variation between localities in the proportion of canes damaged by each borer. For the most important borer No.(1) we see from Table M(1.1) that the percentage varied from 18 to 69 per cent in December 1940 (col.11); from 25 to 70 per cent in January 1941 (col.19); from 51 to 67 per cent in February 1941 (col.27); and from 12 to 85 per cent in March 1941 (col.35). For borer No.(10) we see from Table M(1.10) that the percentage varied from 6 to 28 per cent in December 1940; from 6 to 39 per cent in January 1941;

from 6 to 43 per cent in February 1941; and from 5 to 21 per cent in March 1941. The variation from locality to locality is thus not negligible. This has been shown on skeleton maps with the help of contour lines of equal intensity of attack.

Effect of 'Ratooning'

48. Although the number of 'ratoon' and 'mixed' fields are too small for reliable comparisons being made it will be seen that the percentage of canes damaged by borer No.(10) is uniformly greater in 'ratoon' fields as compared to 'planted' fields in every month. For borer No(1) this holds good for only two months out of three. All the fields surveyed in March 1941 were 'planted' so that no comparison is possible in this month between 'planted' and 'ratoon' or between 'planted' and 'mixed'. Comparisons between 'planted' and 'mixed' cropping are available only for December 1940 and we find that the percentage damage is greater in 'planted' fields as compared to that in 'mixed' fields.

Spread of Borers

49. Tables M(3) and M(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. It will be seen from Table M(4) that borer No.(1) was present in every field of every village of each locality surveyed; and borer No.(10) was almost equally widespread having been observed in every village and locality surveyed but not in every field. Borer Nos.(3) and (8) ^{may} be considered as practically absent as they were found respectively only in 1 and 2 canes out of 2892 and 3069 canes examined. Borer Nos.(4) and (6) were completely absent. Tables M(1.4) and M(1.6) have therefore been omitted.

50. Although the percentage of canes damaged by borer No.(2) was much less than those of borer Nos.(1) and (10), borer No.(2) was quite widespread having been found in all the 11 localities in December 1940 and January 1941 and in all but one locality in February and March 1941.

Results by Workers and Localities

51. Table M(5) shows as usual the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table M(6) is derived from Table M(5) by pooling together the figures of the villages and giving consolidated percentages of each locality. In Table M(7) the figures for workers also are combined to give the mean percentage of damaged canes for each locality in each month.

52. Without proper analysis of variance it is difficult to make valid comparisons. But it will be seen that the values given by the three workers for the same month show considerable variations. That a bias possibly exists is indicated by the fact that worker No.3 gave the lowest percentage in every month for the region as a whole. Worker No.2 on the other hand, gave the biggest percentage in three months out of four for the region as a whole. A better method of detecting bias will be to compare the worker-percentages for each village. The matter is worth investigating by a detailed statistical analysis which however has not been attempted in this report for lack of time.

Monthly Fluctuations

53. Table M(7) enables us to study the variation between localities in particular months and between months for particular localities taking all borers into consideration at the same time. The percentage damaged by all borers was the least in December 1940, namely, 49 per cent. After this there was a steady rise to 56 per cent in January 1941 and to 63 per cent in February 1941 followed by a steep fall to 55 per cent in March 1941.

Variations between Localities

54. The variation between Localities was also considerable. The range of variation was from 31 to 81 per cent in December; from 38 per cent to 70 per cent in January; from 48 to 78 per cent in February; and from 20 to 79 per cent in March. The geographical distribution has been shown in the contour maps.

55. The data of Table M(7) excluding that of March have been statistically analysed and the results are given in Table M(8). It will be seen from this Table that although the variation due to interaction between months and localities is probably significant at the 5 per cent level it is much less in magnitude than the variation between months and between localities which are highly significant.

Table M (11)

Mean Percentages with Standard Error of Sample Means to Total Cases.

Sample Size & Field (or "Number of Observations")

Station No. Muzaffarnagar U. P. No (1) Peirphoga Sp.

Locality	Station	Month: December, 1940									Month: January, 1941										
		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)				
Muzaffarnagar	Muzaffarnagar	10	56.30 ± 4.68							10	56.30 ± 4.68	9	67.22 ± 5.70	1	92.00			10	69.70 ± 5.62		
Shamli	"	10	56.50 ± 5.14							10	56.50 ± 5.14	9	55.22 ± 4.88	1	64.00			10	56.10 ± 4.46		
Deoband	Saharanpur	10	39.30 ± 4.08							10	39.30 ± 4.08	10	53.30 ± 4.85					10	53.30 ± 4.85		
Lhaksar	"	10	18.00 ± 2.61							10	18.00 ± 2.61	10	35.00 ± 2.04					10	35.00 ± 2.04		
Dehradun	Dehradun	9	35.67 ± 6.74			1	52.00			10	37.30 ± 6.25	8	43.37 ± 8.44	2	23.00 ± 19.01			10	39.30 ± 7.73		
Doiwala	"	8	34.12 ± 4.83			2	37.00 ± 11.00			10	34.70 ± 4.17	8	38.87 ± 5.16	2	45.00 ± 7.00			10	40.10 ± 4.28		
Bijnor	Bijnor	10	20.10 ± 1.94							10	20.10 ± 1.94	10	30.00 ± 3.65					10	30.00 ± 3.65		
Kashipur	Kairital	9	24.73 ± 2.17				1	22.00		10	24.46 ± 1.98	10	25.30 ± 2.35					10	25.30 ± 2.35		
Bilari	Moradabad	9	29.00 ± 3.09			1	39.00			10	30.00 ± 2.94	10	33.00 ± 3.70					10	33.00 ± 3.70		
Bulandshahr	Bulandshahr	6	41.50 ± 5.22			4	39.00 ± 4.14			10	40.50 ± 3.40	6	49.83 ± 6.46	4	46.00 ± 9.42			10	48.30 ± 5.11		
Begamabad	Meerut	10	68.60 ± 3.37							10	68.60 ± 3.37	10	56.40 ± 3.01					10	56.40 ± 3.01		
		101	38.82 ± 1.99			5	39.00 ± 4.00			4	37.00 ± 12.20	110	38.75 ± 1.85	100	43.89 ± 1.84	10	47.60 ± 7.68			110	44.23 ± 1.84

1/2

Table M(11) Contd. Mean Percentages and Number of Larvae of *Stomoxys calcitrans* L. to Total Counts.

Per 100g Unit of Food (on 20-25°C. temperature)

2 Muzaffarnagar Province U. P. No. 10 *Scirpophaga* Sp.

		February, 1941.							March, 1941.									
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Muzaffarnagar	Muzaffarnagar	10	56.00 ± 4.43						10	62.10 ± 3.68							10	62.10 ± 3.68
Shamli	"	10	67.20 ± 4.18						10	67.20 ± 4.18							10	65.00 ± 6.40
Deoband	Saharanpur	10	51.90 ± 5.71						10	51.90 ± 5.71							10	51.20 ± 7.15
Lhaksar	"	10	44.10 ± 5.37						10	44.10 ± 5.37							10	35.00 ± 2.37
Dehradun	Dehradun	9	51.22 ± 5.70	1	37.00				10	49.80 ± 5.30							10	39.10 ± 5.56
Doiwala	"	9	42.88 ± 3.74	1	48.00				10	43.40 ± 3.38							10	34.40 ± 3.56
Bijnor	Bijnor	10	38.80 ± 5.28						10	38.80 ± 5.28								
Rashipur	Rairital	10	31.40 ± 2.96						10	31.40 ± 2.96							10	12.10 ± 4.91
Bilari	Moradabad	10	41.50 ± 3.53						10	41.50 ± 3.53								
Bulandshahr	Bulandshahr	8	53.62 ± 4.88	2	44.50				10	51.50 ± 4.04								
Begamabad	Meerut	10	64.90 ± 3.29						10	64.90 ± 3.29								
		106	49.36 ± 1.65	4	43.50 ± 2.33				110	49.16 ± 1.60							70	42.70 ± 2.84

comp. no. 1
13/6

Table 4 (12)

Mean Percentage with Standard Error of Estimated Cane to Total Cane.

Cane in Unit Planted (a. P. workers combined)

2. Muzaffarnagar

U. P.

Pest's Name No. (2) *A. Picticarpis* Hampn.

Dist.	Sub Dist.	December, 1940.								January, 1941.										
		(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)			
Muzaffarnagar	Muzaffarnagar	10	7.10 ± 4.54							10	7.10 ± 4.54	9	3.55 ± 3.44	1	4.00			10	3.60 ± 3.08	
Shamli	"	10	3.90 ± 1.92							10	3.90 ± 1.92	9	5.00 ± 1.72	1	0.00			10	4.50 ± 1.62	
Deoband	Saharanpur	10	4.70 ± 1.49							10	4.70 ± 1.49	10	6.90 ± 2.35					10	6.90 ± 2.35	
Lhaksar	"	10	0.90 ± 0.64							10	0.90 ± 0.64	10	7.20 ± 1.56					10	7.20 ± 1.56	
Behradun	Behradun	9	3.00 ± 1.45					1	0.00	10	2.70 ± 1.30	8	1.25 ± 0.82	2	0.00			10	1.00 ± 0.67	
Doiwala	"	8	1.88 ± 1.04					2	0.00	10	1.50 ± 0.82	8	1.87 ± 1.04	2	0.00			10	1.50 ± 0.86	
Bijnor	Bijnor	10	1.30 ± 0.86							10	1.30 ± 0.86	10	7.60 ± 2.39					10	7.60 ± 2.39	
Kashipur	Kaintal	9	0.33 ± 0.33					1	0.00	10	0.30 ± 0.30	10	5.90 ± 1.52					10	5.90 ± 1.52	
Bilari	Moradabad	9	1.67 ± 1.01			1	0.00			10	1.50 ± 0.91	10	3.50 ± 1.23					10	3.50 ± 1.23	
Bulandshahr	Bulandshahr	6	5.17 ± 2.83			4	7.25 ± 0.36			10	6.00 ± 2.80	6	5.16 ± 2.60	4	1.00 ± 0.96			10	3.50 ± 1.69	
Begamabad	Meerut	10	1.70 ± 0.77							10	1.70 ± 0.77	10	1.70 ± 0.73					10	1.70 ± 0.73	
		101	2.84 ± 0.59			5	5.80 ± 0.31		4	0.00	110	2.86 ± 0.56	100	4.61 ± 0.59	10	0.80 ± 0.55			110	4.26 ± 0.58

Table M (1.2) Contd. Mean Percentages with Standard Error of Standard Error of Standard Error of Total Cans.

Serial No. of the Field (as in previous column)

Region No. 2. Name: Muzaffarnagar District: U. P. No. (2) A. Sticticrasis Hampa.

Serial No.	Name	Month: February, 1941.					Month: March, 1941.								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)				
Muzaffarnagar	Muzaffarnagar	10	6.50 ± 2.11				10	6.50 ± 2.11	10	3.20 ± 1.34				10	3.20 ± 1.34
Shamli	"	10	10.10 ± 2.31				10	10.10 ± 2.31	10	7.20 ± 2.74				10	7.20 ± 2.74
Deoband	Sahasraurpur	10	3.00 ± 1.27				10	3.00 ± 1.27	10	4.40 ± 1.63				10	4.40 ± 1.63
Lhaksar	"	10	5.40 ± 1.85				10	5.40 ± 1.85	10	2.10 ± 0.78				10	2.10 ± 0.78
Dehradun	Dehradun	9	1.33 ± 1.33	1	4.00		10	1.60 ± 1.22	10	3.10 ± 1.23				10	3.10 ± 1.23
Doiwala	"	9	0.00	1	0.00		10	0.00	10	0.00				10	0.00
Bijnor	Bijnor	10	2.80 ± 1.31				10	2.80 ± 1.31							
Kashipur	Tainital	10	3.70 ± 1.24				10	3.70 ± 1.24	10	2.10 ± 1.14				10	2.10 ± 1.14
Bilari	Moradabad	10	3.60 ± 1.26				10	3.60 ± 1.26							
Bulandshahr	Bulandshahr	8	5.12 ± 1.83	2	1.50 ± 1.41		10	4.40 ± 1.53							
Begamabad	Meerut	10	2.00 ± 0.71				10	2.00 ± 0.71							
		106	4.00 ± 0.51	4	1.75 ± 1.04		110	3.92 ± 0.49	70	3.15 ± 0.60				70	3.15 ± 0.60

FEDERAL BUREAU OF INVESTIGATION OF THE FBI

U. S. (13)

Area: ...

Date: ...

2 ... Manufacture

U. S.

16. (3) ...

Date:		December, 1940										January, 1941							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
	Manufacture	...	10	0.00					10	0.00	1	0.00	1	0.00				10	0.00
	10	0.00					10	0.00	9	0.00	1	0.00				10	0.00
	10	0.00					10	0.00	10	0.00						10	0.00
	10	0.00					10	0.00	10	0.00						10	0.00
	1	0.00			1	0.00	10	0.00	8	0.00	2	0.00				10	0.00
	8	0.00			2	0.00	10	0.00	8	0.00	2	0.00				10	0.00
	10	0.00					10	0.00	10	0.00						10	0.00
	1	0.00			1	0.00	10	0.00	10	0.00						10	0.00
	1	0.00		1	0.00		10	0.00	10	0.00						10	0.00
	6	0.00	4	0.00			10	0.00	6	0.00	4	0.00				10	0.00
	10	0.00					10	0.00	10	0.00						10	0.00
	10	0.00	5	0.00	4	0.00	10	0.00	10	0.00	10	0.00				10	0.00

Table M (13) Contd. Mean Percentages with Standard Error of Estimated Gens to Total Gens.

Sample Size = Field (or 3 workers combined)

Region No. 2 Name Muzaffarnagar Province U. P. No. (3) *A. tumidicostalis* Hampson.

No.	Locality	District	Month..... February, 1941.....							Month..... March, 1941.....								
			Planted		Grown		Lined		Total		Planted		Grown		Lined		Total	
			N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)		
A	Muzaffarnagar	Muzaffarnagar	10	0.00					10	0.00							10	0.00
B	Shamli	"	10	0.00					10	0.00							10	0.00
C	Deoband	Saharanpur	10	0.00					10	0.00							10	0.00
D	Lhaksar	"	10	0.00					10	0.00							10	0.00
E	Dehradun	Dehradun	9	0.00	1	0.00			10	0.00							10	0.00
F	Doiwala	"	9	0.00	1	0.00			10	0.00							10	0.00
G	Bijnor	Bijnor	10	0.00					10	0.00								
H	Kashipur	Kainital	10	2.40					10	2.40			10	0.00			10	0.00
I	Bilari	Moradabad	10	0.00					10	0.00								
J	Bulandshahr	Bulandshahr	8	0.00	2	0.00			10	0.00								
K	Begunabad	Meerut	10	0.00					10	0.00								
	Total		106	0.23	4	0.00			110	0.23			70	0.00			70	0.00

Copied..... Date 9/1/41..... Checked..... Foll..... Date.....

Table M(15)

Mean Percentages with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 5 workers combined)

Region No. 2 Name. Muzaffarnagar P. Inc. U. P. Date of Cane No. (5) D. Venosata Wk.

No.	Locality	District	Month..... December, 1940.....							Month..... January, 1941.....										
			Planted		Rotten		Lipped		Total		Planted		Rotten		Lipped		Total			
			N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.	N	Mean % S.E.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)		
A	Muzaffarnagar	Muzaffarnagar	10	0.00						10	0.00	9	0.00	1	0.00				10	0.00
B	Shamli	"	10	0.00						10	0.00	9	0.00	1	0.00				10	0.00
C	Deoband	Saharanpur	10	0.00						10	0.00	10	0.00						10	0.00
D	Lhaksar	"	10	0.00						10	0.00	10	3.20						10	3.20
E	Dehradun	Dehradun	9	0.00				1	0.00	10	0.00	8	5.75	2	0.00				10	4.60
F	Doiwala	"	8	0.00				2	0.00	10	0.00	8	0.00	2	0.00				10	0.00
G	Bijnor	Bijnor	10	0.00						10	0.00	10	0.80						10	0.80
H	Kashipur	tainital	9	0.00				1	0.00	10	0.00	10	1.60						10	1.60
I	Balari	Moradabad	9	0.00		1	0.00			10	0.00	10	0.00						10	0.00
J	Bulandshahr	Bulandshahr	6	0.00		4	0.00			10	0.00	6	0.00	4	0.00				10	0.00
K	Begamabad	Meerut	10	0.00						10	0.00	10	0.00						10	0.00
	Total		101	0.00		5	0.00		4	0.00	110	0.00	100	1.02	10	0.00		110	0.93	

Locality..... Date..... Checked..... Roll..... Date.....

REGIONAL SURVEY OF BOREN PESTS OF SUGARCANE, 1941

Table M(1.5) Contd. Mean Percentage with Standard Error of Damaged Cans to Total Cans:

Sampling Unit = Field (or 3 work as combined)

Station No. 2 Name Muzaffarnagar Province U. P. No. (5) D. Venosata Wk.

No.	Locality	District	Month.. February, 1941.								Month.. March, 1941.									
			Planted		Fusion		Mixed		Total		Planted		Fusion		Mixed		Total			
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)		
	Muzaffarnagar	Muzaffarnagar	10	0.00						10	0.00	10	0.00						10	0.00
	Shamli	"	10	0.00						10	0.00	10	0.00						10	0.00
	Deoband	Saharanpur	10	0.00						10	0.00	10	0.00						10	0.00
	Lhaksar	"	10	0.00						10	0.00	10	0.70						10	0.70
	Dehradun	Dehradun	9	5.67	1	0.00				10	5.10	10	7.20						10	7.20
	Doiwala	"	9	0.99	1	4.00				10	1.20	10	0.40						10	0.40
	Bijnor	Bijnor	10	0.00						10	0.00									
	Kashipur	Kairital	10	0.00						10	0.00	10	1.70						10	1.70
	Balari	Moradabad	10	0.00						10	0.00									
	Bulandshahr	Bulandshahr	8	0.00	2	0.00				10	0.00									
	Begamabad	Meerut	10	0.00						10	0.00									
	Total		106	0.56	4	1.00				110	0.57	70	1.42						70	1.42

Completed 12/6

Table M (17)

Mean Percentage with Standard Error of Sampled Cane to Total Cane.

Sampling Unit = Field (or 5 workers combined)

Region No. 2 Name Muzaffarnagar Dist. U. P. No. (1) C. Trypetes Bissel

No.	Locality	District	Month..... December, 1940.....							Month..... January, 1941.....									
			Planted	Pruned	Harvested	Total	Planted	Pruned	Harvested	Total									
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
	Muzaffarnagar	Muzaffarnagar	10	0.00					10	0.00	9	0.00	1	0.00				10	0.00
	Shamli.	"	10	0.00					10	0.00	9	0.00	1	0.00				10	0.00
	Deoband	Sahasraur	10	0.00					10	0.00	10	0.00						10	0.00
	Lhaksar	"	10	0.00					10	0.00	10	0.00						10	0.00
	Dehradun	Dehradun	9	0.00			1	0.00	10	0.00	8	1.12	2	0.00				10	0.90
	Doiwala		8	0.00			2	0.00	10	0.00	8	7.00	2	4.50				10	6.50
	Bijnor	Bijnor	10	0.00					10	0.00	10	0.00						10	0.00
	Kashipur	Kaimital	9	0.00			1	0.00	10	0.00	10	0.00						10	0.00
	Bilari	Moradabad	9	0.00	1	0.00			10	0.00	10	0.00						10	0.00
	Bulandshahr	Bulandshahr	6	0.00	4	0.00			10	0.00	6	0.00	4	0.00				10	0.00
	Begamabad	Meerut	10	0.00					10	0.00	10	0.00						10	0.00
	Total		101	0.00	5	0.00	4	0.00	110	0.00	100	0.65	10	0.90				110	0.67

Table M(1.7) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit - Field (or 5 workers combined)

Region No. 2 Name. Muzaffarnagar P. No. U. P. No. (7) C. Trypetes Bisset.

Locality		District	Month..... <u>February, 1941.</u>						Month..... <u>March, 1941</u>										
			Planted		Patoon		Mixed		Total		Planted		Patoon		Mixed		Total		
No.	Name		N	Mean % D.	N	Mean % D.	N	Mean % D.	N	Mean % D.	N	Mean % D.	N	Mean % D.	N	Mean % D.	N	Mean % D.	
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	
A	Muzaffarnagar	Muzaffarnagar	10	0.00					10	0.00	10	0.00						10	0.00
B	Shamli	"	10	0.00					10	0.00	10	0.00						10	0.00
C	Deoband	Saharanpur	10	0.00					10	0.00	10	0.00						10	0.00
D	Lhaksar	"	10	0.00					10	0.00	10	0.00						10	0.00
E	Dehradun	Dehradun	9	3.00	1	0.00			10	2.70	10	1.50						10	1.50
F	Doiwala	"	9	3.77	1	0.00			10	3.40	10	3.00						10	3.00
G	Bijnor	Bijnor	10	0.00					10	0.00									
H	Kashipur	Kaintal	10	0.00					10	0.00	10	0.00						10	0.00
I	Bilari	Moradabad	10	0.00					10	0.00									
J	Bulandshahr	Bulandshahr	8	0.00	2	0.00			10	0.00									
K	Begamabad	Meerut	10	0.00					10	0.00									
Total			166	0.58	4	0.00			110	0.55	70	0.64						70	0.64

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Table M(18)

Mean Percentage with Standard Error of Emerged Cane to Total Cane.

Sampling Unit = Field (or 5 workers combined)

Region No. 2 Name Muzaffarnagar District U. P. No. (8) R. ablutella Zell

No.	Locality	District	Month..... December, 1940.								Month..... January, 1941.									
			Planted		Harvested		Killed		Total		Planted		Harvested		Killed		Total			
(1)	(2)	(3)	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %		
	Muzaffarnagar	Muzaffarnagar	10	0.00					10	0.00	9	0.00	1	0.00					10	0.00
	Shamli	"	10	0.00					10	0.00	9	0.00	1	0.00					10	0.00
	Deoband	Saharanpur	10	0.00					10	0.00	10	0.00							10	0.00
	Lhaksar	"	10	0.00					10	0.00	10	0.00							10	0.00
	Dehradun	Dehradun	9	0.00			1	0.00	10	0.00	8	0.00	2	0.00					10	0.00
	Doiwala	"	8	0.00			2	0.00	10	0.00	8	0.00	2	0.00					10	0.00
	Bijnor	Bijnor	10	0.00					10	0.00	10	0.40							10	0.40
	Kashipur	Kaintital	9	0.00			1	0.00	10	0.00	10	0.30							10	0.30
	Bilari	Koradabad	9	0.00	1	0.00			10	0.00	10	0.00							10	0.00
	Bulandshahr	Bulandshahr	6	0.00	4	0.00			10	0.00	6	0.00	4	0.00					10	0.00
	Begamabad	Meerut	10	0.00					10	0.00	10	0.00							10	0.00
	Total		101	0.00	5	0.00	4	0.00	110	0.00	100	0.07	10	0.00				110	0.06	

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Table M (18) Contd. Mean Percentage with Standard Error of Separated Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 2 Name Muzaffarnagar Province U. P. No (8) R. ablutella Zell.

No.	Locality	District	Month... February, 1941...								Month... March, 1941...							
			Planted		Rotten		Mined		Total		Planted		Rotten		Mined		Total	
(1)	(2)	(3)	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %
A	Muzaffarnagar	Muzaffarnagar	10	0.00					10	0.00	10	0.00					10	0.00
B	Shamli	"	10	0.00					10	0.00	10	0.00					10	0.00
C	Deoband	Saharanpur	10	0.00					10	0.00	10	0.00					10	0.00
D	Lhaksar	"	10	0.00					10	0.00	10	0.40					10	0.40
E	Dehradun	Dehradun	9	0.00	1	0.00			10	0.00	10	0.00					10	0.00
F	Doiwala	"	9	0.00	1	0.00			10	0.00	10	0.00					10	0.00
G	Bijnor	Bijnor	10	0.00					10	0.00								
H	Kashipur	Kairital	10	0.00					10	0.00	10	0.00					10	0.00
I	Bilari	Moradabad	10	0.00					10	0.00								
J	Bulandshahr	Bulandshahr	8	0.00	2	0.00			10	0.00								
K	Begunabad	Meerut	10	0.00					10	0.00								
	Total		106	0.00	4	0.00			110	0.00	70	0.06					70	0.06

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Roll: 101

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Roll: 101

Title *M (19)*

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Size = Field (or 3 workers combined)

Region No. *2* Name *Muzaffarnagar* Province *U. P.* Season *No. (9)* *Pesania Sp.*

Locality		District	Month... <i>December, 1940</i> ...								Month... <i>January, 1941</i> ...								
No.	Name		Planted		Picked		Died		Total		Planted		Picked		Died		Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
A	<i>Muzaffarnagar</i>	<i>Muzaffarnagar</i>	10	1.60					10	1.60	9	0.44	1	0.00				10	0.40
B	<i>Shamli</i>	"	10	0.00					10	0.00	9	1.11	1	0.00				10	1.00
C	<i>Deoband</i>	<i>Saharanpur</i>	10	1.60					10	1.60	10	0.30						10	0.30
D	<i>Lhaksar</i>	"	10	0.90					10	0.90	10	0.40						10	0.40
E	<i>Dehradun</i>	<i>Dehradun</i>	9	0.89			1	0.00	10	0.80	8	1.00	2	0.00				10	0.80
F	<i>Doirala</i>	"	8	0.50			2	0.00	10	0.40	8	0.00	2	0.00				10	0.00
G	<i>Bijnor</i>	<i>Bijnor</i>	10	3.40					10	3.40	10	1.20						10	1.20
H	<i>Kashipur</i>	<i>Kaimital</i>	9	0.67			1	0.00	10	0.60	10	0.40						10	0.40
I	<i>Bilari</i>	<i>Moradabad</i>	9	1.22		1	0.00		10	1.10	10	0.00						10	0.00
J	<i>Bulandshahr</i>	<i>Bulandshahr</i>	6	2.00		4	0.00		10	1.20	6	0.00	4	0.00				10	0.00
K	<i>Begamabad</i>	<i>Meerut</i>	10	2.30					10	2.30	10	0.00						10	0.00
Total			101	1.32		5	0.00	4	0.00	110	1.20	100	0.45	10	0.00			110	0.41

Copied *16* Roll *1/16* Date *1/16* Method *Roll* Date *1/16*

Table U (19) Contd. Mean Percentage with Standard Error of Damaged Cans to Total Cans.

Sample Size: 100 (of 5 workings combined).

Region No. 2 Name Muzaffarnagar District U. P. No. (9) Sesamia Sp.

Locality	District	Month <u>February, 1941</u>								Month <u>March, 1941</u>								
		Planted		Harvested		Died		Total		Planted		Harvested		Died		Total		
		N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Muzaffarnagar	Muzaffarnagar	10	0.00						10	0.00	10	0.40					10	0.40
Shamli	"	10	0.30						10	0.30	10	1.30					10	1.30
Deoband	Saharanpur	10	0.00						10	0.00	10	0.40					10	0.40
Lhaksar	"	10	0.40						10	0.40	10	0.40					10	0.40
Dehradun	Dehradun	9	3.00	1	0.00				10	2.70	10	0.40					10	0.40
Doirala	"	9	0.00	1	0.00				10	0.00	10	0.00					10	0.00
Bijnor	Bijnor	10	1.30						10	1.30								
Kashipur	Kaintal	10	0.00						10	0.00	10	0.00					10	0.00
Bilari	Moradabad	10	0.00						10	0.00								
Bulandshahr	Bulandshahr	8	0.00	2	0.00				10	0.00								
Regamabad	Meerut	10	0.40						10	0.40								
Total		106	0.51	4	0.00				110	0.49	70	0.42					70	0.42

Copied 46 Total 106 Harvested 4 Died 4 Total 110 Planted 70 Harvested 70 Date 12/6

Table M (1.10)

Mean Percentage with Standard Error of Estimated Cans to Total Cans.

Sampling Unit = Field (ca. 5 workers combined)

Region No. 2 Name Muzaffarnagar Province U. P. Locality No. (10) E. depressella Swinh

No.	Locality	District	Month... <u>December, 1940</u> ...								Month... <u>January, 1941</u> ...								
			Planted		Borer		Lined		Total		Planted		Borer		Lined		Total		
			N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	N	Mean %	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
A	Muzaffarnagar	Muzaffarnagar	10	22.10 ± 4.26					10	22.10 ± 4.26	9	15.22 ± 4.30	1	24.00				10	16.10 ± 3.94
B	Shamli	"	10	17.10 ± 1.88					10	17.10 ± 1.88	9	17.22 ± 2.21	1	54.00				10	20.90 ± 4.18
C	Deoband	Saharanpur	10	12.20 ± 2.97					10	12.20 ± 2.97	10	11.10 ± 1.73						10	11.10 ± 1.73
D	Lhaksar	"	10	14.20 ± 3.04					10	14.20 ± 3.04	10	12.10 ± 1.88						10	12.10 ± 1.88
E	Dehradun	Dehradun	9	7.14 ± 1.57			1	15.00	10	7.90 ± 1.61	8	9.50 ± 2.38	2	12.50 ± 4.47				10	10.10 ± 1.98
F	Doiwala	"	8	5.63 ± 1.71			2	7.00 ± 4.00	10	5.90 ± 1.49	8	6.50 ± 1.99	2	4.50 ± 1.41				10	6.10 ± 1.61
G	Bijnor	Bijnor	10	16.30 ± 1.93					10	16.30 ± 1.93	10	23.60 ± 2.78						10	23.60 ± 2.78
H	Kashipur	Kairital	9	8.78 ± 2.60			1	10.00	10	8.90 ± 2.31	10	7.70 ± 2.14						10	7.70 ± 2.14
I	Bilari	Moradabad	9	15.11 ± 4.18	1	6.00			10	14.20 ± 3.85	10	20.10 ± 3.16						10	20.10 ± 3.16
J	Bulandshahr	Bulandshahr	6	27.59 ± 6.33	4	22.50 ± 6.03			10	25.50 ± 4.33	6	40.16 ± 8.96	4	38.00 ± 6.21				10	39.30 ± 5.58
K	Begamabad	Meerut	10	27.90 ± 2.68					10	27.90 ± 2.68	10	27.30 ± 1.80						10	27.30 ± 1.80
	Total		101	15.71 ± 1.12	5	19.20 ± 1.79	4	9.75 ± 2.50	110	14.53 ± 1.10	100	16.80 ± 1.24	10	26.40 ± 5.92				110	17.67 ± 1.23

Region 2 District Muzaffarnagar Locality No. (10) E. depressella Swinh

Completed
12/6

Table A (1.10) contd. Mean Percentage with Stand of Borer of Total Cane to Total Cane.

Survey Station Field (a. B. number number)

Region No. 2

Name. Muzaffarnagar

Division.

U. P.

Line No. (10) E. depressella Swinh

Locality	District	Month... February, 1941.					Month... March, 1941.											
		N	Mean %	S.E.M.	N	Mean %	S.E.M.	N	Mean %	S.E.M.	N	Mean %	S.E.M.					
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Muzaffarnagar	Muzaffarnagar	10	12.90 ± 2.56						10	12.90 ± 2.56	10	9.80 ± 1.37					10	9.80 ± 1.37
Shamli	"	10	22.30 ± 4.10						10	22.30 ± 4.10	10	21.10 ± 2.03					10	21.10 ± 2.03
Deoband	Saharanpur	10	15.40 ± 3.35						10	15.40 ± 3.35	10	14.70 ± 1.44					10	14.70 ± 1.44
Lhaksar	"	10	19.90 ± 2.90						10	19.90 ± 2.90	10	15.90 ± 1.17					10	15.90 ± 1.17
Dehradun	Dehradun	9	9.22 ± 2.64	1	15.00				10	9.80 ± 2.43	10	16.80 ± 1.18					10	16.80 ± 1.18
Doiwala	"	9	5.67 ± 1.76	1	4.00				10	5.50 ± 1.58	10	9.70 ± 2.99					10	9.70 ± 2.99
Bijnor	Bijnor	10	16.60 ± 3.34						10	16.60 ± 3.34								
Kashipur	Kaimital	10	14.70 ± 3.03						10	14.70 ± 3.03	10	5.30 ± 2.80					10	5.30 ± 2.80
Bilari	Moradabad	10	11.40 ± 2.43						10	11.40 ± 2.43								
Bulandshahr	Bulandshahr	8	42.37 ± 7.17	2	47.50 ± 12.51				10	43.40 ± 7.17								
Begamabad	Meerut	10	29.80 ± 4.17						10	29.80 ± 4.17								
Total		106	17.95 ± 1.36	4	28.50 ± 12.30				110	18.34 ± 1.38	70	13.32 ± 1.22					70	13.32 ± 1.22

Control. 10

Total. 110

1/10/1

North India

Region

Line

10

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table *M* (2)

Mean Percentage with Standard Error of Enumerated Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 2 Name Muzaffarnagar Province U.P.

No.	Borer's Name	Month..... <u>December, 1940</u>								Month..... <u>January, 1941</u>							
		Planted		Mature		Mixed		Total		Planted		Mature		Mixed		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	<i>Scirpophaga</i> Sp.	101	38.82 ± 1.99	5	37.00 ± 4.00	4	37.00 ± 12.20	110	38.75 ± 1.85	100	43.97 ± 1.84	10	47.60 ± 7.68			110	44.23 ± 1.84
2	<i>A. Stictocraspis</i> Hufsch.	101	2.84 ± 0.57	5	5.80 ± 0.31	4	0.00	110	2.86 ± 0.56	100	4.61 ± 0.57	10	0.80 ± 0.55			110	4.26 ± 0.58
3	<i>A. tumidicostalis</i> Hufsch.	101	0.00	5	0.00	4	0.00	110	0.00	100	0.00	10	0.00			110	0.00
4	<i>D. Auricilia</i> Dudgeon	101	0.00	5	0.00	4	0.00	110	0.00	100	0.00	10	0.00			110	0.00
5	<i>D. Venosata</i> Wlk	101	0.00	5	0.00	4	0.00	110	0.00	100	1.02	10	0.00			110	0.93
6	<i>C. Zonellus</i> Swinh.	101	0.00	5	0.00	4	0.00	110	0.00	100	0.00	10	0.00			110	0.00
7	<i>C. byctes</i> Rissel	101	0.00	5	0.00	4	0.00	110	0.00	100	0.65	10	0.90			110	0.67
8	<i>R. Ablutella</i> Zell	101	0.00	5	0.00	4	0.00	110	0.00	100	0.07	10	0.00			110	0.06
9	<i>Sesamia</i> Sp.	101	1.32	5	0.00	4	0.00	110	1.20	100	0.45	10	0.00			110	0.41
10	<i>E. depressella</i> Swinh.	101	15.71 ± 1.12	5	19.20 ± 1.79	4	9.75 ± 2.50	110	14.53 ± 1.10	100	16.80 ± 1.24	10	26.40 ± 5.92			110	17.67 ± 1.23

Prepared..... S.P. Date..... 1/1/41 Checked..... 1/1/41 Date.....

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41.

Table 11(2) (Contd.) - Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 3 work-ups combined)

Region No. 2 Name..... Muzaffarnagar Province..... U.P.

No.	Borer Name	Month..... February, 1941						Month..... March, 1941					
		Planted		Ratoon		Total		Planted		Ratoon		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)
1	<i>Scirpophaga</i> Sp.	106	49.38 ± 1.65	4	43.50 ± 2.33	110	49.16 ± 1.60	70	42.70 ± 2.84			70	42.70 ± 2.84
2	<i>A. sticticrasis</i> Hufn.	106	4.00 ± 0.51	4	1.75 ± 1.04	110	3.92 ± 0.49	70	3.15 ± 0.60			70	3.15 ± 0.60
3	<i>A. tumida catalis</i> Hufn.	106	0.23	4	0.00	110	0.23	70	0.00			70	0.00
4	<i>D. auricilia</i> Dodge	106	0.00	4	0.00	110	0.00	70	0.00			70	0.00
5	<i>D. venosata</i> Wlk	106	0.56	4	1.00	110	0.57	70	1.42			70	1.42
6	<i>C. zonellus</i> Swinh	106	0.00	4	0.00	110	0.00	70	0.00			70	0.00
7	<i>C. trypheta</i> Bisset	106	0.58	4	0.00	110	0.55	70	0.64			70	0.64
8	<i>R. albivittella</i> Zell	106	0.00	4	0.00	110	0.00	70	0.06			70	0.06
9	<i>Sesamia</i> Sp.	106	0.51	4	0.00	110	0.47	70	0.42			70	0.42
10	<i>E. depressella</i> Swinh	106	17.75 ± 1.36	4	28.50 ± 12.30	110	18.34 ± 1.38	70	13.52 ± 1.22			70	13.32 ± 1.22

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continued
13/6

REGIONAL SURVEY OF BORNIAEAE OF SOUTH INDIA, 1950-51

Table M (3) Number of Cane, Stool, Field, Village & Localities affected by different borers.

State No. 2 District Muzaffarnagar U.P.

Borer's Name (1)	December, 1940					January, 1941					February, 1941					March, 1941				
	H ₁ (2)	H ₂ (3)	H ₃ (4)	H ₄ (5)	H ₅ (6)	H ₁ (7)	H ₂ (8)	H ₃ (9)	H ₄ (10)	H ₅ (11)	H ₁ (12)	H ₂ (13)	H ₃ (14)	H ₄ (15)	H ₅ (16)	H ₁ (17)	H ₂ (18)	H ₃ (19)	H ₄ (20)	H ₅ (21)
Belonoloba sp.	1299	626	110	22	11	1578	739	110	22	11	1433	801	110	22	11	772	426	70	13	7
A. sticti. Hamp.	111	90	48	18	11	143	111	65	21	11	129	103	58	19	10	52	42	27	10	6
A. sticti. Hamp.											1	1	1	1	1					
B. auricollis Bagn.																				
C. venosus. Wik.	17	15	15	7	5	23	18	12	5	4	18	15	13	5	3	22	19	13	5	4
C. annellus. Sahl.																				
C. trypoxes. Hirst	8	7	4	3	2	22	19	11	3	2	14	14	12	4	2	13	12	4	4	2
R. albicollis. Gell.						2	2	2	2	2										
Sesona sp.	48	38	32	18	10	12	12	12	9	6	7	6	5	5	5	6	5	4	3	3
S. venosus. Sahl.	506	345	102	22	11	544	391	104	22	11	555	416	104	22	11	233	129	60	13	7
Total Damaged	1772	831	110	22	11	1759	861	110	22	11	1826	878	110	22	11	990	489	70	13	7
Grand Total	3498	990	110	22	11	3069	990	110	22	11	2892	990	110	22	11	1626	630	70	13	7

H₁ = Number of cane affected; H₂ = Number of stools affected; H₃ = Number of fields affected; H₄ = Number of villages affected; H₅ = Number of localities affected.

Controlled by SA Date 10/6/41 Checked by _____

NATIONAL SERVICE OF BOMBSY PESTS ON CIGARS, CIGARETTES

Table *M(4)*. Percentage of Canes, Stools, Fields, Villages & Localities... affected by different borers.

District No. 2

Muzaffarnagar

U.P.

Cigar Name	September, 1940					September, 1941					September, 1942					September, 1943					
	H ₁	H ₂	H ₃	H ₄	H ₅	H ₁	H ₂	H ₃	H ₄	H ₅	H ₁	H ₂	H ₃	H ₄	H ₅	H ₁	H ₂	H ₃	H ₄	H ₅	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
Deliveria	37.1	63.4	100.0	100.0	100.0	51.3	74.6	100.0	100.0	100.0	49.4	80.9	100.0	100.0	100.0	47.5	67.6	100.0	100.0	100.0	100.0
A. of M. (Muz)	3.2	9.1	43.6	81.7	100.0	4.7	11.2	59.1	95.3	100.0	4.4	10.4	52.7	86.3	90.9	3.2	6.7	41.5	76.9	85.7	85.7
A. (Muzaffarnagar)												0.1	0.9	4.5	9.1						
P. (Muzaffarnagar)																					
Composita (Muz)	0.5	1.5	13.6	31.8	45.5	0.8	1.8	10.9	22.7	36.4	0.6	1.5	11.8	22.7	27.3	1.4	3.0	20.0	38.5	57.1	57.1
Localities (Muz)																					
T. (Muzaffarnagar)	0.2	0.7	3.6	13.6	18.2	0.7	1.9	10.0	13.6	18.2	0.5	1.4	10.9	18.2	18.2	0.8	1.9	6.2	30.8	28.6	28.6
M. (Muzaffarnagar)																					
Localities (Muz)	1.4	3.8	29.1	81.7	90.9	0.4	1.2	10.9	40.8	54.5	0.2	0.6	4.6	22.7	45.5	0.4	0.9	6.2	23.1	42.8	42.8
Deliveria (Muz)	14.5	34.9	92.7	100.0	100.0	17.7	39.5	94.5	100.0	100.0	19.2	42.0	94.5	100.0	100.0	14.3	29.8	85.7	100.0	100.0	100.0
	50.7	84.2	100.0	100.0	100.0	57.2	87.0	100.0	100.0	100.0	63.0	88.7	100.0	100.0	100.0	66.9	77.6	100.0	100.0	100.0	100.0

1. Name of Borer

2. Name of Cigar, Cigarette, or other tobacco product

3. Name of Station or Locality

4. Date

5. Name of Investigator

COGNITIVE TESTS OF BOILER WORKERS OF SUGARCANE 1940-41

Table M(5) Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 2 Name Muzaffargarh Province U.P.

Locality No.	Month... December, 1940.								Month... January, 1941								
	Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total		
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	76.53	15	76.53	15	70.60	45	74.55	15	77.80	15	83.33	15	61.99	45	75.04
	2	15	67.40	15	55.07	15	62.27	45	61.58	15	71.13	15	61.20	15	62.66	45	65.80
B	1	15	82.27	15	82.27	15	50.07	45	71.87	15	75.33	15	60.60	15	53.66	45	63.20
	2	15	67.67	15	82.33	15	66.20	45	72.06	15	70.83	15	70.67	15	47.66	45	62.75
C	1	15	46.20	15	54.93	15	33.53	45	44.85	15	65.00	15	69.73	15	69.13	45	67.75
	2	15	37.07	15	75.60	15	48.82	45	53.83	15	72.27	15	66.73	15	42.46	45	60.48
D	1	15	17.00	15	34.37	15	19.67	45	23.85	15	64.40	15	52.80	15	23.86	45	47.02
	2	15	22.40	15	42.13	15	45.33	45	38.62	15	68.53	15	53.47	15	29.26	45	50.42
E	1	15	46.73	15	34.60	15	27.00	45	36.11	15	78.33	15	57.47	15	52.19	45	63.33
	2	15	28.53	15	35.67	15	24.47	45	30.89	15	31.07	15	33.33	15	46.60	45	37.00
F	1	15	40.93	15	33.00	15	34.47	45	35.80	15	66.73	15	55.27	15	38.86	45	58.62
	2	15	42.93	15	37.33	15	29.73	45	36.66	15	41.60	15	41.00	15	28.86	45	37.15
G	1	15	43.00	15	55.07	15	31.47	45	43.18	15	73.93	15	54.27	15	42.26	45	59.15
	2	15	40.07	15	34.67	15	37.87	45	37.52	15	66.53	15	50.40	15	33.66	45	50.20
H	1	15	19.60	15	48.00	15	24.20	45	30.60	15	56.73	15	26.00	15	25.00	45	35.91
	2	15	31.20	15	36.47	15	24.33	45	30.66	15	43.93	15	38.87	15	37.66	45	40.15
I	1	15	27.87	15	46.00	15	40.00	45	37.95	15	64.53	15	62.80	15	29.40	45	52.24
	2	15	46.67	15	54.13	15	31.40	45	44.07	15	71.53	15	21.53	15	46.56	45	46.57
J	1	15	55.20	15	78.40	15	58.01	45	63.87	15	91.73	15	68.00	15	60.89	45	73.44
	2	15	64.73	15	68.60	15	32.01	45	55.11	15	72.13	15	57.67	15	58.33	45	62.71
K	1	15	84.53	15	86.80	15	73.13	45	81.47	15	51.80	15	87.27	15	54.99	45	66.69
	2	15	73.87	15	76.73	15	70.67	45	80.42	15	64.33	15	84.53	15	58.46	45	69.11
Total		330	47.20	330	56.19	330	42.69	990	49.36	330	65.54	330	57.22	330	45.86	990	56.21

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REGISTRATION SURVEY OF BOMBER PESTS OF SUGARCANE 1940-41

Table M(5) Contd. Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 2 Name Muzaffargarh Province U.P.

No. of Stools by	Village No.	Month... February, 1941								Month... March, 1941							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
A	1	15	58.27	15	77.80	15	66.53	45	68.20	15	65.00	15	88.93	15	70.60	45	74.89
	2	15	75.73	15	81.47	15	50.73	45	69.31	15	78.13	15	68.20	15	54.07	45	66.80
B	1	15	88.47	15	76.07	15	59.13	45	74.55	15	49.87	15	77.80	15	80.60	45	69.42
	2	15	82.27	15	84.47	15	80.53	45	82.42	15	83.47	15	86.13	15	97.00	45	89.86
C	1	15	65.40	15	77.67	15	62.27	45	68.44	15	61.13	15	62.80	15	38.93	45	54.29
	2	15	47.80	15	81.13	15	40.60	45	56.51	15	72.27	15	85.47	15	56.73	45	77.49
D	1	15	61.13	15	75.47	15	52.22	45	62.95	15	24.47	15	38.93	15	67.83	45	43.57
	2	15	70.00	15	65.00	15	53.80	45	62.93	15	49.47	15	68.93	15	49.93	45	56.8
E	1	15	51.13	15	76.73	15	68.87	45	65.57	15	58.27	15	83.53	15	68.87	45	70.22
	2	15	47.20	15	65.73	15	61.20	45	58.04	15	48.33	15	44.49	15	42.93	45	45.29
F	1	15	38.33	15	44.40	15	55.07	45	45.93	15	59.53	15	50.53	15	41.07	45	50.37
	2	15	33.33	15	47.80	15	57.73	45	46.28	15	52.80	15	40.00	15	34.33	45	42.37
	1	15	79.00	15	67.33	15	52.20	45	66.51								
	2	15	48.93	15	55.67	15	48.53	45	50.04								
H	1	15	59.20	15	44.33	15	34.67	45	46.06	15	21.07	15	52.20	15	47.80	45	40.88
	2	15	67.33	15	46.60	15	36.53	45	50.16	15	0.03	15	0.00	15	0.00	45	0.00
I	1	15	53.93	15	63.33	15	50.00	45	55.75								
	2	15	54.20	15	55.60	15	44.33	45	51.37								
J	1	15	93.67	15	86.47	15	63.93	45	81.35								
	2	15	69.47	15	76.20	15	48.40	45	64.69								
K	1	15	77.60	15	83.40	15	56.67	45	72.55								
	2	15	74.87	15	85.73	15	73.73	45	78.77								
Total		330	63.51	330	69.10	330	58.46	990	62.87	210	53.58	210	60.56	210	51.27	630	58.83

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M(6)

2

Muzaffarnagar.

U.P.

Month: December 1940

Month: January 1941

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Muzaffarnagar	Muzaffarnagar		30	71.96	30	65.80	30	66.44	90	68.06	30	75.47	30	72.27	30	62.33	90	70.02
Shamli	Do		30	74.94	30	82.80	30	58.14	90	71.97	30	72.93	30	65.63	30	50.66	90	63.07
Deoband	Shaharanpur		30	41.64	30	65.26	30	41.18	90	49.36	30	68.63	30	68.23	30	55.79	90	64.22
Lhaksar	Do		30	19.70	30	41.50	30	32.50	90	31.28	30	66.47	30	53.13	30	26.56	90	48.72
Dehradun	Dehradun		30	37.63	30	35.14	30	27.74	90	33.50	30	54.70	30	46.40	30	49.40	90	50.17
Dowdala	Do		30	41.93	30	35.16	30	32.10	90	36.40	30	54.17	30	48.13	30	33.86	90	45.39
Bijnor	Bijnor		30	41.54	30	44.87	30	34.67	90	40.36	30	70.23	30	52.33	30	41.46	90	54.67
Kashipur	Nainital		30	25.40	30	42.24	30	24.26	90	30.64	30	56.33	30	32.43	30	31.33	90	38.03
Pilani	Alorabad		30	37.27	30	50.06	30	35.70	90	41.02	30	68.13	30	42.17	30	38.03	90	49.41
Bulandshahr	Bulandshahr		30	59.96	30	73.50	30	45.01	90	59.49	30	81.93	30	62.83	30	58.23	90	67.67
Begambad	Meerut		30	89.20	30	81.70	30	71.90	90	80.96	30	58.07	30	85.90	30	56.73	90	66.90
			330	49.20	330	56.19	330	42.69	990	49.36	330	65.54	330	57.22	330	45.86	990	56.21

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Muzaffarnagar

U.P.

February 1941

March 1941

(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
Muzaffarnagar	Muzaffarnagar		30	66.99	30	80.63	30	58.63	90	68.75	30	62.33	30	78.56	30	68.23	90	69.71
Shamli	Do		30	85.36	30	80.26	30	69.83	90	78.48	30	88.79	30	81.96	30	66.66	90	79.14
Deoband	Shaharanpur		30	56.59	30	79.39	30	51.43	90	62.47	30	47.83	30	74.13	30	66.69	90	62.88
Lakhnar	Do		30	65.56	30	70.23	30	54.79	90	63.53	30	58.63	30	53.93	30	39.30	90	49.95
Dehradun	Dehradun		30	49.16	30	71.23	30	65.03	90	61.81	30	55.89	30	63.97	30	53.29	90	57.72
Doiwala	Do		30	35.83	30	46.10	30	56.39	90	48.11	30	37.70	30	45.26	30	56.16	90	46.37
Bijnor	Bijnor		30	63.96	30	61.49	30	48.86	90	58.10								
Kashipur	Nainital		30	63.26	30	45.46	30	35.60	90	48.11	30	23.90	30	26.10	30	10.52	90	20.18
Pilani	Moradabad		30	54.06	30	59.46	30	47.16	90	53.56								
Bulandshahr	Bulandshahr		30	81.57	30	81.33	30	56.16	90	73.02								
Begamabad	Meerut		30	76.23	30	84.56	30	66.11	90	75.66								
			330	63.51	330	69.10	330	55.46	990	62.97	210	53.55	210	60.66	210	51.27	630	55.13

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table *M(7)* Mean Percentage of Damaged Cane to Total Cane
by Localities and Months

Region No. 2 Name Muzaffarnagar Province U.P.

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Muzaffarnagar	90	68.06	90	70.02	90	68.75	90	69.71
B P. amli	90	71.96	90	63.07	90	78.48	90	79.14
C Deoband	90	49.35	90	64.22	90	62.47	90	62.88
D Shamli	90	31.23	90	48.72	90	63.53	90	49.95
E Dehradun	90	33.80	90	50.17	90	61.81	90	57.72
F Doiwala	90	36.80	90	45.39	90	48.11	90	46.37
G Bijnor	90	40.35	90	54.67	90	58.10		
H Kashipur	90	30.63	90	38.03	90	48.11	90	20.18
I Bilari	90	41.02	90	49.41	90	53.56		
J Bulandshar	90	59.49	90	67.67	90	73.02		
K Bagamahal	90	80.95	90	66.90	90	75.66		
Total	990	49.36	990	56.21	990	62.87	630	55.13

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Checked..... *P. P. Gupta* Roll. 120 Date 6/6

Table M(8). Analysis of Variance

Source of Variation (1)	d. f. (2)	Sum of Squares (3)	Variance (4)	Ratio of Variances (5)
Between Months	2	19 44 77	9 72 39	21 94
Between Localities	10	93 11 23	9 31 12	21 01
Months x Localities	20	17 21 96	86 10	1 94
Between Villages (within Months x Localities)	33	14 62 62	44 32	
Total	65	144 40 58		

ml
2016

REGION NO.(3) : GORAKHPUR (U.P.)

Material

56. All the 11 localities or 110 fields were surveyed in each of the months December 1940 to March 1941. But due to the crop in some fields having only shoots and no canes in December and March these fields were omitted from our study of percentages of damaged canes. Most of the fields were 'planted' and the remaining fields were under 'ratoon'.

Damage by Individual Borers

57. Tables GK(1.1) to GK(1.10) give the percentage of canes damaged by each of the ten borers whose Latin names were printed in Form IV (Field Diary). Results for the region as a whole are given as usual in Table GK(2) for purposes of comparison.

58. From Table GK(2) we find that borer No.(10) occurred most frequently in this region; and the rate of attack was 24, 15, 23 and 19 per cent in December 1940, January, February and March 1941 respectively. The difference between January and February is statistically significant.

59. Borer No.(1) was a close second to borer No.(10) with percentage of damage equal to 16, 17, 15 and 11 per cent in the four months December 1940, January, February and March 1941. Borer No.(4) came third in order of intensity of attack causing about 5 per cent damage on an average over the period of 4 months.

60. From Tables GK(1.1) - (1.10) it will be seen that there was considerable variation between localities in the percentage damaged by each borer. For the most important borer No.(10), we see from Table GK(1.10) that the percentage varied from 10 to 42 per cent in December 1940 (col.9); from 9 to 34 per cent in January 1941 (col.15); from 10 to 31 per cent in February 1941 (col.21); and from 5 to 30 per cent in March 1941 (col.27). For borer No.(1) we see from Table GK(1.1) that the percentage varied from 8 to 34 per cent in December 1940; from 9 to 29 per cent in January 1941; from 10 to 31 per cent in February 1941; and from 4 to 17 per cent in March 1941.

Effect of 'ratooning'

61. The comparisons between the extent of damage in 'planted' and 'ratooned' fields gave contradictory results for different borers and months. In some months the percentage was greater for 'ratooned' fields in the case of certain borers, and in other months it was greater for 'planted' fields. Thus, considering only the two most important borers No.(10) and No.(1), we see that in December and January both borers damaged a smaller proportion of canes in 'ratooned' fields than in 'planted' fields. In February on the other hand both borers damaged a higher proportion of canes in 'ratooned' fields than in 'planted' fields. In March borer No.(10) attacked a significantly smaller proportion of canes in 'ratooned' fields as compared to 'planted' fields, whereas borer No.(1) damaged a significantly larger proportion of canes in 'ratooned' fields as compared to 'planted' fields.

Spread of Borers

62. Tables GK(3) and GK(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. It will be seen from Table GK(4) that borer Nos.(10) and (1) were found in every locality and village but not in every field. Thus in December, borer No.(10) was found in 98 per cent of the fields and borer No.(1) in 85 per cent of the fields. In January, borer No.(10) was found in 95 per cent of fields whereas borer No.(1) was even more widespread having been observed in 98 per cent of fields. The third important borer, namely borer No.(4), occurred in all the localities in the months January to March, but only in 7 out of 11 localities in December 1940. Borer No.(2) occurred in more than one-third of the villages. But borer Nos.(3), (5), (6), (7) and (8) were entirely absent in this region. Tables GK(1.3) and GK(1.5) - (1.8) have therefore been omitted.

Results by Workers and Localities

63. Table GK(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers. Table GK(6) as usual gives the consolidated percentages for each locality. In Table GK(7) the figures for workers also are combined to give the mean percentage of damaged canes for each locality in each month. From a cursory glance the bias, if any, does not appear to be high in this region.

Monthly Fluctuations

64. As regards seasonal fluctuations we find from Table GK(7) that the rate of attack by all borers was 38 per cent in December 1940. There was a slight rise to 41 per cent in January followed by a slight fall to 39 per cent in February. After this there was a steep fall to 28 per cent in March 1941.

Variation between Localities

65. The variation between localities was considerable. The intensity of incidence varied from 21 to 61 per cent in December; from 53 per cent to 58 per cent in January; from 28 to 50 per cent in February; and from 8 to 42 per cent in March. The geographical distribution has been shown in the contour maps.

66. The data of Table GK(7) have been statistically analysed and the results are given in Table GK(8). It will be seen from this Table that the interaction between months and localities is not significant and also much less in magnitude than the variation between months and between localities which are highly significant.

Table **CK(1)**

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field, (or 3 workers combined)

Region No. **3** Name **Gorakhpur** Province **U.P.** Locality Name **no(1) Scirpophaga sp.**

No.	Locality Name	District	Month... December 1940						Month... January 1941					
			Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Basti	Basti	9	9.44 ± 4.18	1	4.00	10	8.90 ± 4.15	9	18.00 ± 2.92	1	33.00	10	19.50 ± 3.00
B	Balrampur	Gonda	7	26.00 ± 5.78	3	20.33 ± 8.31	10	24.30 ± 4.13	8	16.75 ± 4.62	2	16.50 ± 8.52	10	16.70 ± 3.87
C	Darshamnagar	Fyzabad	8	15.12 ± 3.87	2	12.00 ± 9.00	10	14.50 ± 3.36	8	14.75 ± 1.58	2	15.50 ± 2.45	10	14.90 ± 1.41
D	Phulpur	Azamgarh	5	8.00 ± 1.67			5	8.00 ± 1.67	10	15.80 ± 3.49			10	15.80 ± 3.49
E	Man	"	8	16.75 ± 3.99	2	7.50 ± 4.69	10	14.90 ± 3.44	8	20.75 ± 2.66	2	12.50 ± 1.58	10	19.10 ± 2.45
F	Ballia	Ballia	5	15.80 ± 1.26	5	8.40 ± 3.46	10	12.10 ± 2.14	10	9.30 ± 2.99			10	9.30 ± 2.99
G	Deoria	Gorakhpur	8	20.50 ± 4.95	2	18.50 ± 1.00	10	20.10 ± 3.92	9	15.33 ± 2.01	1	5.00	10	14.30 ± 2.00
H	Pachraua	"	8	20.62 ± 3.79			8	20.62 ± 3.79	8	29.62 ± 7.14	2	26.00 ± 11.00	10	28.90 ± 5.92
I	Pharanda	"	8	6.50 ± 2.85	2	20.00 ± 12.00	10	9.20 ± 3.40	8	7.88 ± 1.55	2	14.50	10	9.20 ± 1.41
J	Ramgaur	"	10	33.80 ± 7.65			10	33.80 ± 7.65	10	24.90 ± 3.69			10	24.90 ± 3.69
K	Gorakhpur	"	10	16.50 ± 5.17			10	16.50 ± 5.17	9	16.00 ± 4.84	1	11.00	10	15.50 ± 4.36
Total			86	16.44 ± 1.57	17	13.94 ± 2.00	103	15.90 ± 1.36	97	17.13 ± 1.38	13	16.85 ± 2.58	110	17.10 ± 1.00

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Title GK(1)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 3 Name Gorakhpur Province N.P. Name no(1) Scirpophaga sp.

No.	Locality Name	District	Month... <u>February, 1941</u>						Month... <u>March, 1941</u>							
			Planted		Ratoon		Total		Planted		Ratoon		Total			
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)		
A	Basti	Basti	10	15.40 ± 2.53				10	15.40 ± 2.53	10	4.30 ± 1.12				10	4.30 ± 1.12
B	Balrampur	Gonda	8	14.62 ± 3.10	2	21.00 ± 6.04		10	15.90 ± 8.16	3	12.67 ± 6.05	7	13.86 ± 1.73	10	13.50 ± 1.73	
C	Darshannagar	Fyzabad	9	9.44 ± 1.32	1	14.00		10	9.90 ± 1.41	10	9.50 ± 2.74				10	9.50 ± 2.74
D	Phulpur	Azamgarh	10	13.40 ± 1.80				10	13.40 ± 1.80	10	16.50 ± 2.05				10	16.50 ± 2.05
E	Man	"	10	14.10 ± 2.33				10	14.10 ± 2.33	10	9.40 ± 2.08				10	9.40 ± 2.08
F	Balia	Balia	10	13.90 ± 4.86				10	13.90 ± 4.86	5	15.40 ± 2.71				5	15.40 ± 2.71
G	Deoria	Gorakhpur	8	16.38 ± 2.07	2	20.00 ± 13.00		10	17.10 ± 2.45	10	10.60 ± 1.58				10	10.60 ± 1.58
H	Padrauna	"	8	11.75 ± 2.04	2	10.00 ± 2.00		10	11.40 ± 1.73	10	14.20 ± 3.08				10	14.20 ± 3.08
I	Pharsanda	"	9	12.78 ± 3.16	1	12.00		10	12.70 ± 2.83	2	13.00 ± 4.12	3	18.33 ± 3.00	5	16.20 ± 13.74	
J	Ramganj	"	10	31.00 ± 6.27				10	31.00 ± 6.27	10	11.90 ± 1.91				10	11.90 ± 1.91
K	Gorakhpur	"	9	10.67 ± 2.05	1	24.00		10	12.00 ± 2.24	10	8.40 ± 1.67				10	8.40 ± 1.67
	Total		101	14.86 ± 1.06	9	16.89 ± 3.46		110	15.16 ± 1.00	90	10.99 ± 1.02	10	15.20 ± 1.60	100	11.41 ± 0.94	

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Table GA(1-2)

Main Experiment with Standard Error of ~~Planted~~ (one S. Total Area)

Plotting Unit = Field (or 3 workers combined)

Replication No. 3

Name: Gorakhpur

Province: U.P.

Mat: A. Stictocarpus Hampson

No.	Locality Name	District	December, 1940						January, 1941					
			Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Basti	Basti	9	0.06	1	0.00	10	0.00	9	2.88	1	0.00	10	3.50
B	Balarampur	Gonda	7	0.00	3	0.00	10	0.00	8	1.12	2	0.00	10	0.90
C	Darshannagar	Fyzabad	8	0.00	2	0.00	10	0.00	8	0.55	2	0.00	10	0.40
D	Phulpur	Azangach	5	14.20			5	14.20	10	0.00			10	0.90
E	Man	"	8	2.75	2	8.50	10	3.90	8	0.00	2	0.00	10	0.00
F	Ballia	Ballia	5	2.40	5	6.00	10	4.20	10	0.00			10	0.00
G	Deoria	Gorakhpur	8	1.00	2	0.00	10	0.80	9	0.00	1	0.00	10	0.00
H	Padrauna	"	8	0.00			8	0.00	8	0.00	2	0.00	10	0.00
I	Pharanda	"	8	0.00	2	0.00	10	0.00	8	0.88	2	0.00	10	0.70
J	Bansgaon	"	10	2.40			10	2.40	10	1.80			10	1.80
K	Gorakhpur	"	10	1.00			10	1.00	9	0.00	1	0.00	10	0.00
Total			86	1.70	17	2.76	103	1.87	97	0.66	13	0.00	110	0.60

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Station **GK(2) Contd.** Mean Percentage and Standard Error of Mean of Damage to Total Cane.

See line units of loss (see J. column combined)

Range No. **3** Name **Gorakhpur** District **U.P.** Station Name **no(2) A. Stictocraspis Hampson**

No.	Locality Name	District	Month February, 1941					Month March, 1941						
			Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
A	Barki	Barki	10	0.00			10	0.00	10	3.90			10	3.90
B	Balacampur	Gonda	8	0.00	2	0.00	10	0.00	3	2.67	7	0.00	10	0.80
C	Darshanagar	Fyzabad	9	0.44	1	0.00	10	0.40	10	0.00			10	0.00
D	Phulferi	Azamgarh	10	0.00			10	0.00	10	0.00			10	0.00
E	Man	"	10	3.80			10	3.80	10	0.00			10	0.00
F	Ballia	Ballia	10	0.00			10	0.00	5	0.80			5	0.80
G	Deoria	Gorakhpur	8	0.62	2	0.00	10	0.50	10	0.00			10	0.00
H	Padrauna	"	8	0.62	2	0.00	10	0.50	10	0.00			10	0.00
I	Pharanda	"	9	4.89	1	0.00	10	4.40	2	0.00	3	0.00	5	0.00
J	Banogaon	"	10	0.00			10	0.00	10	0.00			10	0.00
K	Gorakhpur	"	9	0.00	1	0.00	10	0.00	10	0.44			10	0.44
	Total		101	0.94	9	0.00	110	0.87	90	0.61	10	0.00	100	0.55

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REGIONAL SURVEY OF LOUSE PESTS OF SUGARCANE, 1940-41

2. GK (14)

Percentage of Standard Error of Mean and Standard Error

Standard Unit = Field (or 3 Standard Saturated)

Station No. 3 Name Gorakhpur Province U.P. District No. (4) D *awicilia* Dugan

No.	Locality Name	District	December, 1940						January, 1941					
			Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Basti	Basti	9	3.67 ± 2.62	1	0.00	10	3.30 ± 2.38	9	4.22 ± 1.55	1	3.00	10	4.10 ± 1.39
B	Balrampur	Gonda	7	17.14 ± 5.11	3	1.33 ± 1.33	10	12.40 ± 4.26	8	19.00 ± 8.54	2	0.00	10	15.20 ± 7.21
C	Darshannagar	Fyzabad	8	3.25 ± 1.22	2	5.00 ± 2.00	10	3.60 ± 1.02	8	6.00 ± 1.90	2	0.00	10	4.80 ± 1.70
D	Phulpur	Azamgarh	5	0.00			5	0.00	10	5.00 ± 1.44			10	5.00 ± 1.44
E	Man	"	8	0.00	2	0.00	10	0.00	8	2.62 ± 1.30	2	8.00 ± 0.00	10	3.70 ± 1.32
F	Balkia	Balkia	5	0.00	5	0.00	10	0.00	10	3.10 ± 0.95			10	3.10 ± 0.95
G	Seoria	Gorakhpur	8	0.00	2	0.00	10	0.00	9	1.78 ± 0.98	1	0.00	10	1.60 ± 0.90
H	Padma	"	8	16.50 ± 4.08			8	16.50 ± 4.08	8	12.88 ± 4.94	2	18.50 ± 0.00	10	14.00 ± 3.97
I	Pharanda	"	8	8.25 ± 3.41	2	6.50 ± 1.41	10	7.90 ± 2.71	8	15.25 ± 10.01	2	2.00 ± 0.00	10	12.60 ± 8.12
J	Bansgaon	"	10	1.40 ± 0.71			10	1.40 ± 0.71	10	4.60 ± 1.45			10	4.60 ± 1.45
K	Gorakhpur	"	10	1.30 ± 1.10			10	1.30 ± 1.10	9	4.11 ± 1.62	1	6.00	10	4.30 ± 1.46
	Total		86	4.70 ± 0.85	17	1.59 ± 0.63	103	4.18 ± 0.80	97	6.85 ± 1.27	13	5.08 ± 1.90	110	6.63 ± 1.00

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Total GK(14)

Mean Percentage with Standard Error of Total of Cane = Total Cane.

Sampling Unit = Field (or 3 workdays combined)

Station No. 3. Name.. Gorakhpur

Province... H.P.

County Name No(4) Dauricilia Dugan.

No.	Locality	District	Month... February, 1941						Month... March, 1941						
			Planted		Ratoon		Total		Planted		Ratoon		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	
A	Barki	Barki	10	2.30 ± 1.00				10	2.30 ± 1.00	10	2.50 ± 1.12			10	2.50 ± 1.12
B	Balarampur	Gonda	8	7.38 ± 1.02	2	2.00 ± 2.00		10	6.30 ± 2.65	3	2.67 ± 1.36	7	1.29 ± 0.85	10	1.70 ± 0.71
C	Darshannagar	Fyzabad	9	4.44 ± 1.56	1	9.00		10	4.90 ± 1.41	10	1.70 ± 0.97			10	1.70 ± 0.97
D	Phulpur	Azamgarh	10	1.60 ± 0.89				10	1.60 ± 0.89	10	12.30 ± 3.11			10	12.30 ± 3.11
E	Man	"	10	0.40 ± 0.40				10	0.40 ± 0.40	10	7.70 ± 2.35			10	7.70 ± 2.35
F	Balia	Balia	10	3.10 ± 0.71				10	3.10 ± 0.71	5	2.80 ± 1.16			5	2.80 ± 1.16
G	Deoria	Gorakhpur	8	2.00 ± 0.32	2	4.00 ± 0.00		10	1.60 ± 0.84	10	6.90 ± 0.94			10	6.90 ± 0.94
H	Pachraua	"	8	11.00 ± 3.08	2	8.00 ± 4.00		10	10.40 ± 2.45	10	11.60 ± 3.55			10	11.60 ± 3.55
I	Pharanda	"	9	6.00 ± 5.51	1	0.00		10	5.80 ± 4.90	2	3.00 ± 3.00	3	0.00	5	1.20 ± 1.00
J	Pansgaon	"	10	3.36 ± 1.22				10	3.36 ± 1.22	10	1.80 ± 1.28			10	1.80 ± 1.28
K	Gorakhpur	"	9	1.44 ± 0.66	1	0.00		10	1.30 ± 0.71	10	4.83 ± 1.01			10	4.83 ± 1.01
Total			101	3.66 ± 0.68	9	3.62 ± 1.45	110	3.69 ± 0.55	90	5.69 ± 0.74	10	0.90 ± 0.64	100	5.21 ± 0.69	

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GK(15)

3

Gorakhpur

G.P

Dr. D. Venkatesh Colk.

			December, 1940						January, 1941.					
			Ratoon						Ratoon					
Name			Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Mean	St. Dev.	Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Basti	Basti	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
	Balrampur	Gonda	7	0.00	3	0.00	10	0.00	8	0.00	2	0.00	10	0.00
	Darshamnagar	Fyzabad	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
	Phulpur	Azamgarh	5	0.00			5	0.00	10	0.00			6	0.00
	Jhan	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
	Balkia	Balkia	5	0.00	5	0.00	10	0.00	6	0.00			10	0.00
	Deoria	Gorakhpur	8	0.00	2	0.00	10	0.00	9	0.00	1	0.00	6	0.00
	Padrauna	"	8	0.00			8	0.00	8	0.00	2	0.00	10	0.00
	Pharanda	"	8	0.00	2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
	Bamangan	"	10	0.00			10	0.00	10	0.00			10	0.00
	Gorakhpur	"	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
			86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00

22

GK(15) Contd.

3

Gorakhpur

Residence H.P

W.S. D. Venkata Lak

Sl. No.	Name	Division	February, 1941						March, 1941					
			Month Planned		Ration		Total		Month Planned		Ration		Total	
			(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Baski	Baski	10	0.00			10	0.00	10	0.00			10	0.00
B	Balrampur	Gonda	8	0.00	2	0.00	10	0.00	3	0.00	7	0.00	10	0.00
C	Darshanagar	Fyzabad	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
D	Phulpur	Azamgarh	10	0.00			10	0.00	10	0.00			10	0.00
E	Man	"	10	0.00			10	0.00	10	0.00			10	0.00
F	Ballia	Ballia	10	0.00			10	0.00	5	0.00			5	0.00
G	Deoria	Gorakhpur	8	0.62	2	0.00	10	0.50	10	0.00			10	0.00
H	Padrauna	"	8	0.00	2	0.00	10	0.00	10	0.00			10	0.00
I	Pravenda	"	9	0.00	1	0.00	10	0.00	2	0.00	3	0.00	5	0.00
J	Bamgaon	"	10	0.00			10	0.00	10	0.00			10	0.00
K	Gorakhpur	"	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
			101	0.62	9	0.00	110	0.04	90	0.00	10	0.00	100	0.00

Sl. No. ... Date ...

GH(19)

3

Gorakhpur

N.P.

No. 19 Sesamia sp.

		December, 1940									January, 1941			
Locality	District	Planted			Ratoon			Planted			Ratoon		Total	
		No.	Area	Yield	No.	Area	Yield	No.	Area	Yield	No.	Area		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Basti	Basti	9	0.00		1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
Balrampur	Gonda	7	0.00		3	0.00	10	0.00	8	0.00	2	0.00	10	0.00
Darshannagar	Fyzabad	8	1.75		2	0.00	10	1.40	8	0.00	2	0.00	10	0.00
Phulpur	Azamgarh	5	0.00				5	0.00	10	0.00			10	0.00
Kan	"	8	0.00		2	0.00	10	0.00	8	2.00	2	0.00	10	0.00
Balia	Balia	5	0.00		5	0.00	10	0.00	10	0.00			10	0.00
Deoria	Gorakhpur	8	0.50		2	0.00	10	0.40	9	0.90	1	0.00	10	0.90
Pachrauna	"	8	1.00				8	1.00	8	0.00	2	0.00	10	0.00
Pharanda	"	8	0.00		2	0.00	10	0.00	8	0.00	2	0.00	10	0.00
Bansgaon	"	10	0.90				10	0.90	10	0.90			10	0.90
Gorakhpur	"	10	0.00				10	0.00	9	0.00	1	0.00	10	0.00
Total		86	0.41		17	0.00	109	0.34	97	0.49	13	0.00	110	0.49

Dist. GK(19)

Comparison with Quarterly Survey of Planned Area

Sampling unit = Field (or 3 workers combined)

Station No. 3. Area Gorakhpur

Province U.P.

No. (9). *Lesamia* Sp.

No.	Locality Name	District	Month Planned February, 1941						Month Actual March, 1941					
			Planned		Ratoon		Planned		Actual		Ratoon		Total	
			Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
U)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
	Basti	Basti	10	0.00			10	0.00	10	0.00			10	0.00
	Balrampur	Gonda	8	0.00	2	0.00	10	0.00	3	0.00	7	0.00	10	0.00
	Darrahamagar	Fyzabad	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Philpue	Azamgarh	10	0.00			10	0.00	10	0.00			10	0.00
	Man	"	10	0.00			10	0.00	10	0.00			10	0.00
	Ballia	Ballia	10	0.00			10	0.00	5	0.00			5	0.00
	Deoria	Gorakhpur	8	0.00	2	0.00	10	0.00	10	0.00			10	0.00
	Pachaura	"	8	1.00	2	0.00	10	0.80	10	0.00			10	0.00
	Pharenda	"	9	0.00	1	0.00	10	0.00	2	0.00	3	0.00	5	0.00
	Bansgaon	"	10	0.00			10	0.00	10	0.60			10	0.60
	Gorakhpur	"	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Total		101	0.08	9	0.00	110	0.07	90	0.07	10	0.00	100	0.06

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Table GK(10)

Mean Percentage with Standard Error of Total of Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 3 Name Gorakhpur Province U.P. Worker's Name No. (10) E. Satyendra Singh

Locality		District	Month... December, 1940						Month... January, 1941					
No.	Name		Planted		Ratoon		Total		Planted		Ratoon		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	Basti	Basti	9	28.56 ± 4.47	1	5.00	10	26.70 ± 4.36	9	30.66 ± 3.03	1	0.00	10	27.60 ± 4.12
E	Balarampur	Gonda	7	15.29 ± 9.27	3	13.70 ± 3.61	10	14.80 ± 6.40	8	11.25 ± 1.73	2	0.00	10	9.00 ± 2.00
C	Darshannagar	Fyzabad	8	22.38 ± 3.87	2	40.50 ± 5.47	10	26.00 ± 4.00	8	24.75 ± 2.86	2	0.00	10	19.80 ± 4.00
D	Phulpara	Azamgarh	5	22.60 ± 6.00			5	22.60 ± 6.00	10	26.50 ± 3.83			10	26.50 ± 3.83
E	Mau	"	8	18.88 ± 2.00	2	23.50 ± 4.47	10	19.80 ± 1.73	8	22.75 ± 3.68	2	0.00	10	18.20 ± 4.24
F	Bakia	Bakia	5	21.40 ± 5.83	5	19.20 ± 4.36	10	20.30 ± 3.46	10	34.10 ± 3.71			10	34.10 ± 3.71
G	Deoria	Gorakhpur	8	34.63 ± 8.54	2	22.00 ± 13.00	10	32.10 ± 7.21	9	20.78 ± 3.66	1	0.00	10	18.70 ± 3.87
H	Pachraua	"	8	42.00 ± 4.90			8	42.00 ± 4.90	8	29.00 ± 3.86	2	0.00	10	23.20 ± 4.90
I	Pharwada	"	8	10.00 ± 4.47	2	15.00 ± 3.00	10	10.00 ± 3.87	8	13.38 ± 1.69	2	0.00	10	10.70 ± 2.24
J	Bamgaon	"	10	35.80 ± 4.58			10	35.80 ± 4.58	10	25.20 ± 3.37			10	25.20 ± 3.37
K	Gorakhpur	"	10	16.10 ± 2.45			10	16.10 ± 2.45	9	11.67 ± 4.71	1	0.00	10	10.50 ± 4.36
Total			86	24.72 ± 1.83	17	21.81 ± 2.45	103	24.03 ± 1.73	97	17.13 ± 1.38	13	0.00	110	15.11 ± 1.41

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Table (11/10)

Mean Percentage with Standard Error of Means of Cane to Total Cane.

Sampling Unit = Field (or 3 nurseries combined)

Region No. 3, Name Gorakhpur, Province W.P., No. of E. *Leptopygus leucostigma*

No.	Locality Name	District	Month..... February 1941						Month..... March 1941					
			Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
A	Basti	Basti	10	22.00 ± 3.56			10	22.00 ± 3.56	10	24.40 ± 2.60			10	24.40 ± 2.60
E	Balarampur	Gonda	8	8.89 ± 0.86	2	15.00 ± 2.00	10	10.10 ± 2.00	3	6.67 ± 2.20	7	3.57 ± 1.73	10	4.50 ± 1.41
C	Sarawanagar	Fyzabad	9	29.22 ± 4.17	1	41.00	10	30.40 ± 3.87	10	15.10 ± 2.47			10	15.10 ± 2.47
D	Phulpur	Azamgarh	10	16.30 ± 2.87			10	16.30 ± 2.87	10	29.90 ± 3.34			10	29.90 ± 3.34
E	Mau	"	10	25.10 ± 7.33			10	25.10 ± 7.33	10	24.80 ± 3.85			10	24.80 ± 3.85
F	Balia	Balia	10	30.50 ± 0.94			10	30.50 ± 0.94	5	15.60 ± 3.04			5	15.60 ± 3.04
G	Deoria	Gorakhpur	8	30.00 ± 6.81	2	24.00 ± 1.00	10	28.80 ± 5.48	10	21.50 ± 4.35			10	21.50 ± 4.35
H	Pachrauna	"	8	22.38 ± 3.31	2	39.50 ± 12.52	10	25.80 ± 4.00	10	19.00 ± 6.73			10	19.00 ± 6.73
I	Pharanda	"	9	22.89 ± 4.63	1	36.00	10	24.20 ± 4.36	2	7.00 ± 7.64	3	7.33 ± 2.83	5	7.20 ± 1.41
J	Bansgarh	"	10	22.80 ± 2.61			10	22.80 ± 2.61	10	23.30 ± 4.24			10	23.30 ± 4.24
K	Gorakhpur	"	9	15.89 ± 3.97	1	12.00	10	15.50 ± 3.61	10	19.44 ± 2.93			10	19.44 ± 2.93
	Total		101	22.24 ± 1.39	9	27.33 ± 4.47	110	22.86 ± 1.41	90	20.74 ± 1.19	10	4.70 ± 1.45	100	19.14 ± 1.18

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41.

Table GK(2)

Mean Percentages with Standard Error of Sampled Cane to Total Cane.

Sample Unit = Fields (or 100 plants combined)

Region No. 3 Name Gorakhpur Province U. P.

No.	Borer Name	Month... December, 1940.....						Month... January, 1941.....					
		Planted		Ratoon		Total		Planted		Ratoon		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Pierisphaga</i> Sp.	86	16.44 ± 1.57	17	13.94 ± 2.00	103	15.90 ± 1.36	97	17.13 ± 1.38	13	16.85 ± 2.58	110	17.10 ± 1.00
2	<i>A. Sticticraspis</i> Hamp.	86	1.70	17	2.76	103	1.87	97	0.66	13	0.60	110	0.60
3	<i>A. tumidicostalis</i> Hamp.	86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00
4	<i>D. aurivillia</i> Dugès	86	4.70 ± 0.85	17	1.59 ± 0.63	103	4.18 ± 0.80	97	6.85 ± 1.27	13	5.08 ± 1.90	110	6.63 ± 1.00
5	<i>D. Venozata</i> Wlk	86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00
6	<i>C. Zonellus</i> Swinh.	86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00
7	<i>C. trypheta</i> Bisset	86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00
8	<i>R. ablutella</i> Zell	86	0.00	17	0.00	103	0.00	97	0.00	13	0.00	110	0.00
9	<i>Pesamia</i> Sp.	86	0.41	17	0.00	103	0.31	97	0.99	13	0.00	110	0.88
10	<i>E. depressella</i> Swinh.	86	24.72 ± 1.83	17	21.81 ± 2.45	103	24.03 ± 1.73	97	17.13 ± 1.38	13	0.00	110	15.11 ± 1.91

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41.

Table GK (2) ^{Loss} Percentages with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 4 quadrats combined)

Region No. 3 Name Gorakhpur Province U. P.

No.	Borer Name	Month: February, 1941						Month: March, 1941					
		Planted		Ratoon		Total		Planted		Ratoon		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1	<i>Pieris nimbifera</i> Sp.	101	14.86 ± 1.06	9	16.89 ± 3.46	110	15.16 ± 1.00	90	10.99 ± 1.02	10	15.20 ± 1.60	100	11.41 ± 0.94
2	<i>A. sticticarpa</i> Hampson	101	0.94 ± 0.35	9	0.00	110	0.87 ± 0.30	90	0.61 ± 0.21	10	0.00	100	0.55 ± 0.19
3	<i>A. tumidicostalis</i> Hampson	101	0.00	9	0.00	110	0.00	90	0.00	10	0.00	100	0.00
4	<i>D. auricilia</i> Dugès	101	3.66 ± 0.68	9	3.67 ± 1.45	110	3.69 ± 0.55	90	5.69 ± 0.74	10	0.90 ± 0.64	100	5.21 ± 0.69
5	<i>D. venosata</i> Wlk	101	0.05 ± 0.05	9	0.00	110	0.04	90	0.00	10	0.00	100	0.00
6	<i>C. zonellus</i> Swinh	101	0.00	9	0.00	110	0.00	90	0.00	10	0.00	100	0.00
7	<i>C. trypetes</i> Bisset	101	0.00	9	0.00	110	0.00	90	0.00	10	0.00	100	0.00
8	<i>R. ablutella</i> Zell	101	0.00	9	0.00	110	0.00	90	0.00	10	0.00	100	0.00
9	<i>Pesamia</i> Sp.	101	0.08 ± 0.07	9	0.00	110	0.07 ± 0.06	90	0.07 ± 0.06	10	0.00	100	0.06 ± 0.05
10	<i>E. depressella</i> Swinh	101	22.24 ± 1.39	9	27.33 ± 4.47	110	22.86 ± 1.41	90	20.74 ± 1.19	10	4.70 ± 1.45	100	19.14 ± 1.18

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table GK(3)) Number of Canes, Stools, fields, villages, and localities affected by different Borer species.....

Region No. 3 Name Gorakhpur District W.P.

Borer's Name (1)	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)
Scirpophaga sp.	378	288	88	21	11	640	404	108	22	11	395	300	104	22	11	250	209	94	20	11
A. sticticalis Hb.	70	58	29	10	7	19	19	13	7	5	24	21	12	7	5	13	11	10	6	5
A. tritici Hb.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D. saccharalis Bg.	106	83	37	13	7	182	143	65	20	11	98	81	49	20	11	176	101	59	19	11
D. saccharalis Wlk.	-	-	-	-	-	5	2	1	1	1	-	-	-	-	-	-	-	-	-	-
C. zonellus Salm.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C. bipetens Biond.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
R. absolutella Zell.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Senecio sp.	8	7	6	5	4	3	3	3	1	1	2	2	2	1	1	1	1	1	1	1
E. depressa Swinh.	595	433	101	21	11	646	513	105	22	11	611	455	109	22	11	427	325	95	20	11
Total Damaged	1056	643	103	21	11	1206	756	110	22	11	1048	660	110	22	11	766	541	100	20	11
Grand Total	2468	925	103	21	11	2904	990	110	22	11	2647	990	110	22	11	2277	900	100	20	11

N₁ = Number of canes affected; N₂ = Number of stools affected; N₃ = Number of fields affected; N₄ = Number of villages affected;N₅ = Number of localities affected.

Collected by H.C. Roll No. 107 Date 11/1/41 Checked by H.P. Roll No. Date

FEDERAL BUREAU OF BOTHER PLANS OF SUGARCANE 1940-41

Table 6K(5). Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 3 Name Gorakhpur Province U. P.

No.	Village	Month... December, 1940.								Month... January, 1941.							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	34.27	15	33.33	15	33.33	45	33.64	15	54.60	15	51.67	15	63.80	45	56.69
	2	15	40.53	15	42.80	15	33.40	45	38.91	15	36.47	15	39.93	15	38.33	45	38.24
B	1	15	33.67	15	25.53	15	27.47	45	28.89	15	47.73	15	37.53	15	46.13	45	43.80
	2	15	19.33	15	24.27	15	20.27	45	21.29	15	28.93	15	21.60	15	23.27	45	24.60
C	1	15	37.00	15	33.80	15	46.00	45	38.93	15	40.60	15	31.07	15	32.13	45	34.60
	2	15	35.60	15	38.33	15	51.87	45	42.60	15	51.53	15	39.33	15	49.87	45	46.91
D	1	15	39.40	15	43.33	15	40.47	45	41.07	15	52.80	15	43.93	15	41.20	45	45.98
	2									15	39.67	15	23.27	15	31.13	45	31.36
E	1	15	30.87	15	28.73	15	39.33	45	32.98	15	31.20	15	39.07	15	32.13	45	34.13
	2	15	40.53	15	36.13	15	23.47	45	33.38	15	44.33	15	36.33	15	18.60	45	33.09
F	1	15	31.40	15	36.13	15	30.67	45	32.73	15	51.00	15	45.47	15	38.27	45	44.91
	2	15	35.00	15	41.07	15	23.80	45	33.29	15	44.93	15	44.07	15	42.67	45	43.89
G	1	15	45.47	15	58.40	15	58.40	45	54.09	15	42.07	15	48.40	15	51.13	45	47.20
	2	15	54.47	15	28.87	15	48.40	45	43.91	15	21.60	15	28.27	15	25.53	45	25.13
H	1	15	63.93	15	64.47	15	82.93	45	70.44	15	48.20	15	51.13	15	62.80	45	54.04
	2	15	26.13	15	27.20	15	23.80	45	25.71	15	67.13	15	64.47	15	52.90	45	61.51
I	1	15	20.53	15	22.87	15	19.60	45	21.00	15	37.73	15	30.27	15	31.07	45	33.02
	2	15	13.93	15	32.20	15	14.40	45	20.18	15	41.67	15	35.53	15	42.13	45	39.78
J	1	15	45.00	15	63.40	15	38.87	45	49.09	15	46.60	15	53.40	15	51.80	45	50.60
	2	15	63.33	15	71.20	15	83.40	45	72.53	15	38.93	15	49.40	15	41.93	45	43.42
K	1	15	32.20	15	30.27	15	33.33	45	31.93	15	30.47	15	30.53	15	29.40	45	30.13
	2	15	20.73	15	38.33	15	31.67	45	30.24	15	45.33	15	27.00	15	33.87	45	35.40
Total		315	36.35	315	39.08	315	38.33	945	37.94	330	42.89	330	39.59	330	40.01	990	40.84

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REGISTRATION OF ROVER PLYS OF SUGARCANE 1940-41

Table 6(5) Contd. Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 3 Name Gorakhpur Province U. P.

Lo- ca- li- ty	Wil- lage	Month.. February, 1941.								Month.. March, 1941.							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)
A	1	15	42.27	15	48.33	15	46.13	45	45.58	15	25.53	15	38.87	15	14.93	45	26.44
	2	15	19.93	15	44.47	15	19.33	45	27.91	15	22.20	15	29.93	15	23.27	45	25.13
	3	15	38.33	15	19.07	15	37.73	45	31.71	15	16.67	15	21.07	15	3.87	45	13.87
	4	15	25.47	15	33.73	15	25.07	45	28.09	15	14.93	15	21.47	15	17.67	45	18.02
	5	15	29.53	15	34.40	15	33.33	45	32.42	15	12.13	15	19.47	15	17.67	45	16.42
	6	15	41.20	15	56.13	15	56.20	45	51.18	15	30.00	15	30.00	15	22.73	45	27.58
	7	15	43.67	15	37.80	15	33.87	45	38.45	15	36.13	15	40.60	15	32.27	45	36.33
	8	15	26.93	15	23.80	15	11.07	45	20.60	15	24.47	15	37.80	15	24.47	45	28.91
	9	15	56.67	15	38.87	15	47.80	45	47.78	15	43.93	15	33.73	15	34.53	45	37.40
	10	15	33.73	15	30.47	15	41.40	45	35.20	15	21.67	15	22.80	15	29.67	45	24.71
	11	15	26.07	15	33.93	15	25.00	45	28.33								
	12	15	54.27	15	47.93	15	57.87	45	53.36	15	35.47	15	27.20	15	37.80	45	33.49
	13	15	42.73	15	52.80	15	55.67	45	50.40	15	55.47	15	39.60	15	43.93	45	46.33
	14	15	38.13	15	33.80	15	27.33	45	33.09	15	33.80	15	23.27	15	26.67	45	27.71
	15	15	38.87	15	66.67	15	49.53	45	51.69	15	23.27	15	28.33	15	49.93	45	33.84
	16	15	35.40	15	58.33	15	24.47	45	39.40	15	59.00	15	44.80	15	47.07	45	50.29
	17	15	36.13	15	45.13	15	39.80	45	40.35								
	18	15	44.47	15	43.27	15	41.67	45	43.14	15	29.47	15	7.20	15	12.20	45	16.29
	19	15	39.47	15	30.00	15	36.13	45	35.20	15	34.33	15	6.67	15	22.73	45	21.24
	20	15	74.47	15	58.87	15	65.53	45	66.29	15	30.00	15	27.20	15	28.33	45	28.51
	21	15	33.73	15	21.07	15	16.13	45	23.64	15	17.20	15	26.13	15	34.80	45	26.64
	22	15	26.07	15	28.87	15	42.27	45	32.40	15	36.60	15	30.00	15	24.40	45	30.33
Total		330	38.22	330	40.25	330	37.88	990	38.92	300	29.38	300	27.68	300	27.11	900	28.44

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REGIONAL SURVEY OF WORM PESTS OF SUGARCANE 1940-41

Form GK(6)

Mean Percentage of Damaged Cane to Total Cane by Localities x Workers x Areas

Sampling with or without

Name

Gorakhpur

U.P.

No.	Locality	Area	Month..... December, 1940.....								Month..... January, 1941.....							
			Worker 1		Worker 2		Worker 3		Worker 4		Worker 1		Worker 2		Worker 3		Worker 4	
			N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Basti	Basti	30	37.40	30	38.07	30	33.37	90	36.28	30	45.53	30	45.50	30	51.07	90	47.37
	Balrampur	Gonda	30	26.50	30	24.90	30	23.87	90	25.09	30	38.33	30	29.57	30	34.70	90	34.20
	Darbhanga	Fyzabad	30	36.30	30	36.07	30	48.93	90	40.43	30	46.07	30	35.20	30	41.00	90	40.76
	Phulpur	Azangarh	15	39.40	15	43.33	15	40.47	45	41.07	30	46.23	30	33.60	30	36.17	90	38.67
	Manu	"	30	35.70	30	32.43	30	31.40	90	33.18	30	37.77	30	37.70	30	28.37	90	33.61
	Ballia	Ballia	30	33.20	30	38.60	30	27.23	90	33.01	30	47.77	30	44.77	30	40.47	90	44.40
	Deoria	Gorakhpur	30	49.97	30	43.63	30	53.40	90	49.00	30	31.83	30	38.33	30	38.33	90	36.16
	Padrauna	"	30	45.03	30	45.83	30	53.37	90	48.08	30	57.67	30	57.80	30	57.87	90	57.78
	Pharanda	"	30	17.23	30	27.53	30	17.00	90	20.59	30	37.70	30	32.90	30	36.60	90	36.40
	Bansgaon	"	30	54.17	30	67.30	30	61.13	90	60.87	30	42.77	30	51.40	30	46.87	90	47.01
	Gorakhpur	"	30	26.47	30	34.30	30	32.50	90	31.09	30	37.90	30	28.77	30	31.63	90	32.77
	Total		315	39.40	315	39.08	315	38.33	945	37.94	330	42.89	330	40.00	330	40.01	990	40.84

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (GK(7)) Mean Percentage of Damaged Cane to Total Cane
by Localities and MonthsRegion No. 3 Name Gorakhpur Province U.P.

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Basti	90	36.28	90	47.37	90	36.74	90	25.79
B Bahrampur	90	25.09	90	34.20	90	29.90	90	15.95
C Barhamnagar	90	40.43	90	40.76	90	41.80	90	22.00
D Phulpur	45	41.07	90	38.67	90	29.52	90	32.62
E Mau	90	33.18	90	33.61	90	41.49	90	31.06
F Ballia	90	33.01	90	44.40	90	40.84	45	38.48
G Deoria	90	49.02	90	36.16	90	41.74	90	37.00
H Padruna	90	48.08	90	57.78	90	45.54	90	42.07
I Phanda	90	20.59	90	36.40	90	41.74	45	8.14
J Bangaon	90	60.87	90	47.01	90	49.63	90	24.88
K Gorakhpur	90	51.09	90	32.77	90	28.02	90	28.19
Total	945	37.92	990	40.82	990	38.92	900	28.44

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Table GK (8). Analysis of variance

Sources of variation	d. f	Sum of squares	Variance	Ratio of variances
(1)	(2)	(3)	(4)	(5)
Between months	3	20 61 13	6 87 04	6 71 **
Between localities	10	35 23 15	3 52 32	3 44 **
Months x localities	30	24 18 39	80 61	0 79
Between villages (within months & localities)	44	45 07 83	1 02 45	
Total	87	12 510 50		

REGION NO.(4) : SEPAWA (BIHAR).

Material

67. All the 11 localities or 110 fields were surveyed in each of the months December 1940 to March 1941. Most of the fields were 'planted' and only a few came under 'ratoon' or 'mixed' cropping. In fact only in February 'ratoon' fields were included in the sample. In all the other months the fields were either 'planted' or 'mixed'.

Damage by Individual Borers

68. Tables S(1.1) to S(1.10) give the percentage of canes damaged by each of the ten borers. The results for the region as a whole are given in the standard form in Table S(2).

69. We notice that borer No.(10) was most frequent in this region with percentages of damage equal to 51, 55, 29 and 58 in December 1940, January, February and March 1941 respectively. The difference between February and March is statistically significant.

70. The next important borer is No.(1) with percentages of damage equal to 24, 22, 25 and 23 in the four months December 1940 to March 1941. Borer No.(4) follows closely as third in order of intensity of attack with percentage damage respectively of 18, 16, 17 and 15 in the months December 1940 to March 1941. Borer No.(2) is fourth in rank with a percentage damage of about 6 per cent on an average over the period of 4 months.

71. From Tables S(1.1) - (1.10) it will be seen that there is considerable variation between localities in the percentage damaged by each borer. Thus taking the most important borer No.(10), we see from Table S(1.10) that the percentage varied from 14 to 44 per cent in December 1940 (col.9); from 19 to 45 per cent in January 1941 (col.15); from 15 to 59 per cent in February 1941 (col.23); and from 27 to 51 per cent in March 1941 (col.31). For borer No.(1) we see from Table S(1.1) that the percentage varied from 12 to 55 per cent in December 1940; from 13 to 29 per cent in January 1941; from 9 to 35 per cent in February 1941; and from 15 to 53 per cent in March 1941.

Effect of 'Ratooning'

72. Although the number of 'mixed' fields is too small for reliable comparisons it will be seen that the percentage of canes damaged by borer No.(10) was uniformly greater in such fields as compared to 'planted' fields in every month. For borer No.(1) the available evidence showed an opposite tendency; and the percentage damage was less in 'mixed' fields than in 'planted' fields in every month. Only in February we had a few 'ratoon' fields; and we find that the percentage damage caused by borer Nos.(1) and (2) were less in such fields as compared to 'planted' fields. Borer No.(4) did not occur at all in the 'ratoon' fields. As none of the results except the last one appears to be statistically significant it is not possible to come to any definite conclusion about the effect of ratooning on the incidence of borers.

Spread of Borers

73. Tables S(3) and S(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. Borer No.(10) was present in every field of every village of each locality surveyed. Borer No.(1) was almost equally widespread; it was absent only in one or two out of the 110 fields surveyed in each month. Borer Nos.(4) and (2), in spite of the wide differences in percentage of canes damaged by each of them, were found in every locality and village, and occurred in an almost equal percentage of fields. Borer Nos.(5), (6), (7) and (8) can be considered to be practically absent in this region; only No.(5) was found on a single cane in one of the months. Tables S(1.6) - (1.8) have therefore been omitted.

Results by Workers and Localities

74. Table S(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table S(6) gives the consolidated percentages for each locality; and Table S(7) the mean percentage of damaged canes for each locality in each month. Without entering into detailed tests for which we have no time we may note that in this region bias among workers, if any, does not appear to be high.

Monthly Fluctuations

75. From Table 8(7) we notice that the percentage damage caused by all borers taken together was more or less stationary. It was 59 per cent in December 1940; after this there was a slight rise to 62 per cent in January 1941, then a slight fall to 60 per cent in February, and then a sudden rise to 66 per cent in March 1941.

Variations between Localities

76. The variation between localities is not negligible. Thus the range of variation was from 48 to 69 per cent in December; from 53 to 78 per cent in January; from 50 to 72 per cent in February; and from 60 to 72 per cent in March.

77. The data of Table 8(7) have been statistically analysed and the results are given in Table 8(8). It will be seen from this Table that the interaction between months and localities is not significant and also much less in magnitude than the variation between months and between localities which are highly significant.

Scale S(1:1)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name. Sepaya Province. Bihar Species Name. No. (1) Schizopraga

No.	Locality Name	District	Month. <u>December</u> ... 1940.						Month. <u>January</u> ... 1941.							
			Planted		Mixed		Total		Planted		Mixed		Total			
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)		
A	<u>Sepaya (hd. or.)</u>	<u>Saran.</u>	10	26.00 ± 2.76				10	26.00 ± 2.76	10	25.80 ± 2.45				10	25.80 ± 2.45
E	<u>Sivan</u>	"	10	33.30 ± 2.17				10	33.30 ± 2.17	10	19.30 ± 2.14				10	19.30 ± 2.14
C	<u>Sidhwatia</u>	"	10	22.70 ± 3.03				10	22.90 ± 3.03	10	22.30 ± 2.39				10	22.30 ± 2.39
L	<u>Marbawahi</u>	"	9	36.56 ± 1.45	1	23.00		10	35.20 ± 1.87	10	26.20 ± 6.39				10	26.20 ± 6.39
E	<u>Sitalpur</u>	"	10	20.80 ± 1.55				10	20.80 ± 1.55	10	20.00 ± 3.10				10	20.00 ± 3.10
F	<u>Harinagar</u>	<u>Champaran</u>	10	24.60 ± 3.85				10	24.60 ± 3.85	10	26.80 ± 4.84				10	26.80 ± 4.84
G	<u>Mohihari</u>	"	9	11.33 ± 5.42	1	16.00		10	11.80 ± 3.10	8	14.75 ± 2.57	2	12.00 ± 2.00		10	14.20 ± 2.10
H	<u>Sagauli</u>	"	10	28.20 ± 3.72				10	28.20 ± 3.72	10	28.60 ± 6.41				10	28.60 ± 6.41
I	<u>Pipra</u>	"	7	20.14 ± 3.34	3	19.00 ± 6.82		10	19.80 ± 2.70	7	14.29 ± 4.55	3	10.00 ± 3.51		10	13.00 ± 3.30
J	<u>Hatipure</u>	<u>Muzaffarpur</u>	9	13.22 ± 7.40	1	20.00		10	13.90 ± 6.65	9	27.89 ± 3.68	1	10.00		10	26.10 ± 3.74
K	<u>Japaha</u>	"	5	24.00 ± 2.53	5	17.00 ± 3.44		10	20.70 ± 2.57	5	23.60 ± 5.35	5	17.40 ± 5.64		10	20.50 ± 3.81
	Total		99	24.92 ± 1.26	11	18.48 ± 2.24		110	24.27 ± 1.12	99	23.00 ± 1.31	11	13.73 ± 8.79		110	22.07 ± 1.24

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Table 5 (1.1) contd. Mean Percentages with Standard Error of Bored Cane to Total Cane.

Sampling Unit = Field (of 5 workers combined)

Region No. 4. Name. *Sepaya*. Province. *Bihar*. District No. (1). *Scirpophaga sp.*

No.	Locality	District	Month..... <i>February</i>1941.....								Month..... <i>March</i>1941.....									
			Planted		Patton		Lixed		Total		Planted		Patton		Lixed		Total			
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)		
	<i>Sepaya (100%)</i>	<i>Sarau</i>	10	26.30 ± 3.18						10	26.30 ± 3.18	10	27.70 ± 2.28						10	27.70 ± 2.28
	<i>Siswa</i>	"	10	31.10 ± 2.49						10	31.10 ± 2.49	10	24.70 ± 4.68						10	24.70 ± 4.68
	<i>Sidhwalia</i>	"	9	10.11 ± 1.60			1	2.75 ± .		10	10.20 ± 1.45	9	27.22 ± 3.73		1	24.00			10	26.90 ± 3.36
	<i>Marhousah</i>	"	10	32.90 ± 5.94						10	32.90 ± 5.94	10	32.80 ± 4.62						10	32.80 ± 4.62
	<i>Sitalpur</i>	"	10	22.80 ± 3.77						10	22.80 ± 3.77	10	16.70 ± 2.68						10	16.90 ± 2.68
	<i>Harinagar</i>	<i>Champaran</i>	10	35.30 ± 4.18						10	35.30 ± 4.18	10	23.40 ± 3.82						10	23.40 ± 3.82
	<i>Motihari</i>	"	8	9.87 ± 1.69			2	2.75 ± 1.45		10	9.00 ± 2.61	9	14.33 ± 2.19		1	20.00			10	14.70 ± 1.87
	<i>Sagauli</i>	"	10	21.70 ± 2.83						10	21.70 ± 2.83	9	22.56 ± 2.05		1	15.00			10	21.80 ± 1.76
	<i>Pipra</i>	"	6	14.83 ± 2.58	4	20.25 ± 2.78				10	17.00 ± 2.00	7	21.71 ± 3.12			3	68.89 ± 7.13		10	23.50 ± 2.94
	<i>Katipuri</i>	<i>Muzaffarpur</i>	9	3.26 ± 2.00			1	24.00		10	31.80 ± 1.64	10	20.40 ± 5.08						10	20.40 ± 5.08
	<i>Tapaha</i>	"	6	18.33 ± 5.31			4	19.25 ± 7.00		10	18.70 ± 3.99	8	19.30 ± 3.30			2	7.50 ± 4.53		10	17.10 ± 3.13
	Total		98	24.12 ± 0.81	4	20.25 ± 2.78	8	15.38 ± 4.90		110	23.34 ± 1.24	102	23.00 ± 1.16			8	19.62 ± 3.95		110	22.75 ± 1.11

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Table S(1.2)

Mean Percentages of Infested and Levels of Losses of Cane to Total Cane.

Sampling Unit = Field (or 3 fields combined)

Region No. 4 Name.. Sepaya District.. Bihar Form No. No. (2) A. *Siticidius aspis* Hampson

No.	Locality Name	District	Month... December 1940						Month... January 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Sepaya (H.O. Br.)	Saranam	10	5.10 ± 1.22			10	5.10 ± 1.22	10	2.90 ± 1.18			10	2.90 ± 1.18
E	Siwan	"	10	9.00 ± 1.58			10	9.00 ± 1.58	10	7.80 ± 1.41			10	7.80 ± 1.41
C	Sidhwalia	"	10	6.80 ± 1.38			10	6.80 ± 1.38	10	7.30 ± 1.90			10	7.30 ± 1.90
D	Marbura	"	9	2.56 ± 3.56	1	3.00	10	9.10 ± 3.21	10	5.20 ± 1.26			10	5.20 ± 1.26
E	Sitalpur	"	10	4.80 ± 1.10			10	4.80 ± 1.10	10	4.90 ± 1.00			10	4.90 ± 1.00
F	Haxinagar	Champaran	10	2.50 ± 0.84			10	2.50 ± 0.84	10	2.60 ± 1.14			10	2.60 ± 1.14
G	Kali-kari	"	9	2.11 ± 0.82	1	5.00	10	2.40 ± 0.84	8	4.50 ± 1.73	2	12.00 ± 2.00	10	4.30 ± 1.38
H	Sagauli	"	10	4.90 ± 1.38			10	4.90 ± 1.38	10	4.00 ± 1.10			10	4.00 ± 1.10
I	Pipra	"	7	6.00 ± 1.25	3	12.33 ± 1.41	10	7.91 ± 1.34	7	5.56 ± 3.02	3	10.00 ± 3.51	10	4.20 ± 2.19
J	Matipura	Muzaffarpur	9	6.22 ± 1.37	1	0.00	10	5.60 ± 1.38	9	12.78 ± 1.92	1	10.00 ±	10	12.20 ± 1.82
K	Japaha	"	5	4.00 ± 1.67	5	6.20 ± 1.95	10	5.10 ± 1.26	5	6.60 ± 2.10	5	17.40 ± 5.64	10	6.90 ± 2.05
	Total		99	5.89 ± 0.48	11	6.91 ± 1.54	110	5.99 ± 0.46	99	5.76 ± 1.67	11	4.82 ± 1.84	110	5.66 ± 0.51

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REGIONAL SURVEY OF MOREN PESTS OF SUGARCANE, 1941

Table 5 (1-2) contd. Mean Percentages with Standard Error of Sampled Cane to Total Cane.

Sampling Unit: Field (or 3 workers combined)

Field No. 4 Name: Sapaya Province: Bihar No. (2) *A. Sticticus* *sp.* *longus*

No.	Locality	District	Month: February, 1941								Month: March, 1941								
			Planted		Ratoon		Lined		Total		Planted		Ratoon		Lined		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	16	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	
A	Sapaya (H.O.)	Saran	10	4.20 ± 1.18					10	4.20 ± 1.18	10	6.30 ± 1.14					10	6.30 ± 1.14	
B	Siwan	"	10	11.50 ± 1.14					10	11.50 ± 1.14	10	3.10 ± 1.14					10	3.10 ± 1.14	
C	Sidhwalia	"	9	3.89 ± 1.10			1	3.00	10	3.80 ± 1.00	9	3.89 ± 1.10		1	11.00		10	4.60 ± 1.22	
D	Harbourah	"	10	12.30 ± 1.38					10	12.30 ± 1.38	10	4.90 ± 2.02					10	4.90 ± 2.02	
E	Sitalpur	"	10	8.20 ± 2.47					10	8.20 ± 2.47	10	6.10 ± 1.95					10	6.10 ± 1.95	
F	Harinagar	Champaran	10	4.70 ± 1.18					10	4.70 ± 1.18	10	7.70 ± 1.00					10	7.70 ± 1.00	
G	Malihari	"	8	2.25 ± 0.73			2	1.50 ± 1.50	10	2.10 ± 0.77	9	7.44 ± 0.66		1	5.00		10	7.20 ± 0.63	
H	Saganli	"	10	5.80 ± 0.63					10	5.80 ± 0.63	9	11.33 ± 2.11		1	5.00		10	10.70 ± 1.97	
I	Pipra	"	6	3.00 ± 1.53	4	5.75 ± 2.40			10	4.10 ± 1.30	7	3.43 ± 1.30		3	10.00 ± 3.79		10	5.40 ± 1.67	
J	Matipura	Muzaffarpur	9	10.44 ± 1.37			1	5.00	10	9.90 ± 1.34	10	13.20 ± 2.61					10	13.20 ± 2.61	
K	Japaha	"	6	5.00 ± 1.22				4	4.75 ± 2.83	10	4.90 ± 1.22	8	5.88 ± 2.47		2	5.50 ± 2.55		10	4.80 ± 2.49
	Total		98	6.76 ± 0.48	4	5.75 ± 2.40	8	3.75 ± 1.41	110	6.50 ± 0.47	102	6.74 ± 0.57		8	7.73 ± 1.62		110	6.82 ± 0.55	

Surveyor: *Seenukumar* Date: 4.4.41. Inspected: 8/6/41. Checked:

Field (13)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined).

Region No. 4 Name *Sepaya* Province *Bihar* No. (3) *A. Tennidicosalis Hampson*

Locality		District	Month... <i>December</i> 1940						Month... <i>January</i> 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	<i>Sepaya (H.B.V.)</i>	<i>Saran</i>	10	2.40			10	2.40	10	0.00			10	0.00
B	<i>Piwan</i>	"	10	0.30			10	0.30	10	0.00			10	0.00
C	<i>Sidhwalia</i>	"	10	0.20			10	0.20	10	0.00			10	0.00
D	<i>Marlowah</i>	"	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
E	<i>Sitalpur.</i>	"	10	0.30			10	0.30	10	0.20			10	0.20
F	<i>Hari nagar</i>	<i>Champaran</i>	10	0.00			10	0.00	10	0.00			10	0.00
G	<i>Makhar</i>	"	9	0.56	1	0.00	10	0.55	8	0.00	2	0.00	10	0.00
H	<i>Sagauli</i>	"	10	0.00			10	0.00	10	4.90			10	4.90
I	<i>Pipra</i>	"	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
J	<i>Makipur.</i>	<i>Muzaffarpur.</i>	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
K	<i>Japaha.</i>	"	5	0.00	5	0.00	10	0.00	5	0.00	5	0.00	10	0.00
Total			99	0.37	11	0.00	110	0.34	99	0.52	11	0.00	110	0.46

Copied *Semenchur* Roll... 44... Date... 8/6/41... Printed *S.K.F.* Roll... to...

Table 5 (1-3) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar District Name No (3) A. *Leucodictya talis* Hamp

No.	Locality	District	Month... February... 1941.....								Month... March... 1941.....								
			Planted		Fatoon		Mixed		Total		Planted		Fatoon		Mixed		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)			
	Sepaya.	Sarau.	10	0.00					10	0.00								10	0.00
	Siwan	"	10	0.00					10	0.00								10	0.00
	Sidhwa	"	9	0.00			1	0.00	10	0.00					1	0.00		10	0.00
	Murbamat	"	10	0.00					10	0.00								10	0.00
	Sitalpur.	"	10	0.00					10	0.00								10	0.00
	Harinaga	Champaran	10	0.00					10	0.00								10	0.00
	Makhar	"	8	0.00			2	0.00	10	0.00				1	0.00			10	0.00
	Saganik	"	10	0.00					10	0.00					1	0.00		10	2.30
	Pipra	"	6	0.00	4	0.00			10	0.00				3	0.00			10	0.00
	Makipur.	Muzaffarpur	9	0.00			1	0.00	10	0.00								10	0.00
	Japala.	"	6	0.00			4	0.00	10	0.00				2	0.00			10	0.00
	Total		98	0.00	4	0.00	8	0.00	110	0.00	102	0.22			8	0.00		110	0.21

Copied *Semurk. Kojin* Roll... 44... Date... 5/6/41... Checked... *S.S.*... Roll... 41... Date... 12/1/41

*copy of
plant
to
K. S. J.*

Table 5 (1-4)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar Report's Name NO(4) D. Anicilia Dugga

No.	Locality	District	Month... <u>December '40</u>						Month... <u>January '41</u>							
			Planted		<u>Mixed</u>		Total		Planted		<u>Mixed</u>		Total			
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)		
A	<u>Sepaya</u>	<u>Saran</u>	10	14.80 ± 3.96				10	14.80 ± 3.96	10	25.40 ± 4.63				10	25.40 ± 4.63
B	<u>Siwan</u>	"	10	18.90 ± 3.45				10	18.90 ± 3.45	10	7.90 ± 2.63				10	7.90 ± 2.63
C	<u>Sidhwalia</u>	"	10	38.30 ± 8.73				10	38.30 ± 8.73	10	37.40 ± 10.05				10	37.40 ± 10.05
D	<u>Marhawal</u>	"	9	12.00 ± 2.83	1	5.00		10	11.30 ± 2.79	10	10.00 ± 1.55				10	10.00 ± 1.55
E	<u>Sitalpur.</u>	"	10	12.20 ± 2.83				10	12.20 ± 2.83	10	13.90 ± 1.70				10	13.90 ± 1.70
F	<u>Harinagar</u>	<u>Champaran</u>	10	17.80 ± 4.28				10	17.80 ± 4.28	10	17.00 ± 4.45				10	17.00 ± 4.45
G	<u>Hatchari</u>	"	9	31.67 ± 4.56	1	32.00		10	31.70 ± 4.07	8	28.50 ± 7.15	2	2.00 ± 2.00		10	23.20 ± 6.66
H	<u>Sagauli</u>	"	10	28.70 ± 4.68				10	28.70 ± 4.68	10	24.10 ± 7.00				10	24.10 ± 7.00
I	<u>Pipra</u>	"	7	15.14 ± 1.51	3	2.33 ± 1.15		10	11.30 ± 2.24	7	16.14 ± 7.45	3	3.00 ± 1.73		10	12.20 ± 5.49
J	<u>Malipur</u>	<u>Muzaffarpur</u>	9	7.78 ± 2.36	1	0.00		10	7.00 ± 2.26	9	4.33 ± 1.20	1	0.00		10	3.90 ± 1.14
K	<u>Japaha</u>	"	5	2.60 ± 1.00	5	3.20 ± 1.53		10	2.90 ± 0.84	5	3.80 ± 1.55	5	1.80 ± 0.81		10	2.80 ± 0.89
	Total		99	17.48 ± 1.64	11	5.45 ± 2.78		110	17.72 ± 1.55	99	17.93 ± 1.94	11	2.00 ± 0.65		110	16.34 ± 1.80

Copied S. S. S. S. S. S. Roll 44 Date 8/6/41Checked S. S. S. S. S. S. Roll 44 Date 8/6/41

Completed
 plan
 signed

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table 5 (1.4) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Pichay Borer's Name No. (4)² *Avicilia* Suda

No.	Locality	District	Month..... February..... 1941.....								Month..... March..... 1941.....							
			Planted		Patcon		Mixed		Total		Planted		Patcon		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
A	Sepaya	Saran	10	23.00 ± 4.87					10	23.00 ± 4.87	10	24.20 ± 4.48					10	24.20 ± 4.48
B	Siwau	"	10	20.90 ± 3.15					10	20.90 ± 3.15	10	21.60 ± 4.95					10	21.60 ± 4.95
C	Sidharia	"	9	32.00 ± 9.41			1	0.00	10	28.80 ± 9.00	9	24.78 ± 7.50		1	5.00		10	22.80 ± 6.88
D	Marbousah	"	10	14.10 ± 6.15					10	14.10 ± 6.15	10	25.40 ± 5.82					10	25.40 ± 5.82
E	Sitalpur	"	10	14.30 ± 3.58					10	14.30 ± 3.58	10	11.40 ± 2.50					10	11.40 ± 2.50
F	Harinaga	Champaran	10	8.00 ± 3.24					10	8.00 ± 3.24	10	13.30 ± 2.74					10	13.30 ± 2.74
G	Makihari	"	8	38.50 ± 10.28			2	9.00 ± 6.00	10	32.60 ± 9.05	9	19.56 ± 3.89		1	5.00		10	18.10 ± 3.74
H	Sagauli	"	10	29.00 ± 6.46					10	29.00 ± 6.46	9	12.33 ± 7.09		1	3.00		10	11.40 ± 6.32
I	Pipra	"	6	21.33 ± 5.08	4	0.00			10	12.80 ± 4.58	7	19.86 ± 6.57		3	3.00 ± 1.00		10	14.20 ± 5.29
J	Makipur	Muzaffarpur	9	1.89 ± 1.20			1	2.00	10	1.90 ± 1.00	10	4.90 ± 1.32					10	4.90 ± 1.32
K	Jafala	"	6	1.33 ± 0.57			4	2.75 ± 1.22	10	1.90 ± 0.20	8	2.12 ± 0.77		2	0.00		10	1.70 ± 0.28
	Total		98	18.80 ± 1.98	4	0.00	8	3.88 ± 1.73	40	17.03 ± 1.84	102	16.41 ± 1.54		8	2.00 ± 0.77	10	15.36 ± 1.48	

Copied. *S. S. Saha* Roll. 44 Date. 8/6/41 Checked. Roll. Date.

REGIONAL SURVEY OF BORN PLANTS OF SUGARCANE, 1940-41

Table (15)

Mean percentage with Standard Error of Mean of Cane to Total Cane.

Sampling Unit = Field (or 2 workers combined)

Region No. 4 Name Sepaya Province Bihar Surveyor's Name No (5) D. Venkataiah

No.	Locality Name	District	Month... December, 1940						Month... January, 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)			
A	Sepaya	Saran	10	0.00			10	0.00	10	0.00			10	0.00
E	Piwan	do	10	0.00			10	0.00	10	0.00			10	0.00
C	Sidhwalia	do	10	0.00			10	0.00	10	0.00			10	0.00
D	Marboursah	do	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
E	Sitalpur.	do	10	0.00			10	0.00	10	0.00			10	0.00
F	Harinagar	Champaran	10	0.00			10	0.00	10	0.00			10	0.00
G	Matihari	do	9	0.00	1	0.00	10	0.00	8	0.38	2	0.00	10	0.30
H	Pagauti	do	10	0.00			10	0.00	10	0.00			10	0.00
I	Pipra	do	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
J	Matipur.	Muzaffarpur	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
K	Japaha	do	5	0.00	5	0.00	10	0.00	5	0.00	5	0.00	10	0.00
	Total		99	0.00	11	0.00	110	0.00	99	0.03	11	0.00	110	0.03

Surveyor's Name Sewankhyu Roll 44 Date 8/6/41

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table S(1.5), Contd. - Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar Farmer's Name 10(5) S. Vanosata wck

Locality	District	Month February 1941										Month March 1941							
		Hatched		Patron		Mixed		Total		Hatched		Patron		Mixed		Total			
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	
A	Sepaya	Saran	10	0.00					10	0.00	10	0.00						10	0.00
B	Siwan	do	10	0.20					10	0.20	10	0.00						10	0.00
C	Sidhwaia	do	9	0.00			1	0.00	10	0.00	9	0.00			1	0.00		10	0.00
D	Marboush	do	10	0.00					10	0.00	10	0.00						10	0.00
E	Litalpur	do	10	0.20					10	0.20	10	0.00						10	0.00
F	Harinagar	Champaran	10	0.00					10	0.00	10	0.00						10	0.00
G	Makhari	do	8	0.00			2	0.00	10	0.00	9	0.00			1	0.00		10	0.00
H	Sangaoli	do	10	0.00					10	0.00	9	0.00			1	0.00		10	0.00
I	Pepra	do	6	0.00	4	0.00			10	0.00	7	0.00			3	0.00		10	0.00
J	Makipuri	Muzaffarpur	9	0.00			1	0.00	10	0.00	10	0.00						10	0.00
K	Japaha	do	6	0.00			4	0.00	10	0.00	8	0.88			2	0.00		10	0.70
			98	0.04	4	0.00	8	0.00	110	0.04	102	0.07			8	0.00		110	0.06

Suppl. Semuakhp Roll 44 Date 8/6/41 Checked S.O.F. Roll 141 Date 13/6

REGIONAL SURVEY OF FOREN PESTS OF SUGARCANE, 1940-41.

Job No. _____
Job _____

Table (S (1-9))

Mean Percentage with Standard Error of Unpaired Game to Total Game.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar Report No. (9) Sesamia sp.

No.	Locality Name	District	Month... <u>December, 1940</u>						Month... <u>January, 1941</u>					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Sepaya	Saran	10	0.30			10	0.30	10	0.30			10	0.30
E	Siwan	"	10	0.00			10	0.00	10	0.00			10	0.00
C	Sidhwalia	"	10	0.00			10	0.00	10	0.00			10	0.00
D	Mardouah	"	9	0.67	1	0.00	10	0.60	10	0.30			10	0.30
E	Sitalpur	"	10	0.40			10	0.40	10	0.30			10	0.30
F	Harinagar	Champaran	10	0.00			10	0.00	10	0.00			10	0.00
G	Matihari	"	9	0.44	1	0.00	10	0.40	8	0.00	2	0.00	10	0.00
H	Sagauli	"	10	0.00			10	0.00	10	2.30			10	2.30
I	Pipra	"	7	0.00	3	0.00	10	0.00	7	0.71	3	0.00	10	0.71
J	Matipur	Muzaffarpur	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
K	Japaha	"	5	0.00	5	0.00	10	0.00	5	0.00	5	0.00	10	0.00
	Total		99	0.17	11	0.00	110	0.15	99	0.37	11	0.00	110	0.33

Copies SD Roll _____ Date 12/5/41 Check SD Date 1/4/41 Date 13/6/41

Table 5 (1-10)

Hour Percentages with Standard Error of Ranked Cane

Sampling Unit: 5 Field (or 3 workers combined)

Region No. 4 Name Sefaya Province Bihar Survey No. 10 E. depressella Swink

Locality		District	Month: December, 1940						Month: January, 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	(4)	Mean ± S.E.	(6)	Mean ± S.E.	(8)	Mean ± S.E.	(10)	Mean ± S.E.	(12)	Mean ± S.E.	(14)	Mean ± S.E.
A	Sefaya (H.Q.)	Saran	10	30.80 ± 3.23			10	30.80 ± 3.23	10	29.30 ± 4.63			10	29.30 ± 4.63
E	Siwan	"	10	31.20 ± 2.45			10	31.20 ± 2.45	10	37.30 ± 3.68			10	37.30 ± 3.68
C	Sidhwalia	"	70	32.10 ± 3.86			10	32.10 ± 3.86	10	32.10 ± 3.62			10	32.10 ± 3.62
D	Marbousah	"	9	28.22 ± 1.67	1	23.00	10	27.70 ± 1.58	10	29.20 ± 2.30			10	29.20 ± 2.30
E	Sitalpur	"	10	33.10 ± 4.09			10	33.10 ± 4.09	10	40.60 ± 4.88			10	40.60 ± 4.88
F	Harinagar	Champaran	10	33.60 ± 2.70			10	33.60 ± 2.70	10	32.22 ± 3.89			10	32.22 ± 3.89
G	Malikari	"	9	29.00 ± 3.51	1	11.00	10	27.20 ± 3.62	8	25.12 ± 4.42	2	12.00 ± 9.00	10	22.50 ± 4.32
H	Sagauli	"	10	14.10 ± 3.05			10	14.10 ± 3.05	10	18.50 ± 3.29			10	18.50 ± 3.29
I	Pipra	"	7	28.53 ± 5.52	3	27.67 ± 1.73	10	28.20 ± 3.79	7	31.86 ± 2.67	3	30.00 ± 1.53	10	31.30 ± 2.02
J	Matipur	Muzaffarpur	9	36.22 ± 6.56	1	31.00	10	35.70 ± 5.89	9	43.22 ± 4.63	1	60.00	10	44.90 ± 4.46
K	Jafaha	"	5	38.60 ± 4.60	5	49.60 ± 8.42	10	44.10 ± 4.89	5	36.00 ± 3.29	5	47.00 ± 5.32	10	41.50 ± 3.32
Total			99	30.67 ± 1.11	11	36.18 ± 5.48	110	31.22 ± 3.00	97	32.37 ± 1.36	11	37.18 ± 5.37	110	32.95 ± 1.34

Copied *SD* Roll Date *9/6/41* Checked *S.P. 8 P. Sen* Roll *141.49* Date *12/6*

REGIONAL SURVEY OF BOREN PESTS OF SUGARCANE, 1940-41

Table S(1.10) contd. Mean Percentages with Standard Error of Planted Cane to Total Cane.

Sampling Unit = Field (a. 3 workers combined)

Region No. 4 Name Sefaya Province Bihar District name 10 E. depressella Swinh

Locality		District	Month..... February, 1941.....							Month..... March, 1941.....								
			Planted		Patton		Mixed		Total		Planted		Patton		Mixed		Total	
No.	Name		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
A	Sefaya	Saran	10	31.80 ± 6.74					10	31.80 ± 6.74	10	31.90 ± 2.66					10	31.90 ± 2.66
B	Siwan	"	10	32.40 ± 1.79					10	32.40 ± 1.79	10	41.30 ± 4.59					10	41.30 ± 4.59
C	Sidhwalia	"	9	27.56 ± 3.28			1	27.00	10	27.50 ± 3.00	9	37.67 ± 2.28			1	18.00	10	35.70 ± 2.83
D	Marbousah	"	10	27.30 ± 2.26					10	27.30 ± 2.26	10	27.40 ± 3.99					10	27.40 ± 3.99
E	Sitalpur	"	10	35.60 ± 3.79					10	35.60 ± 3.79	10	51.10 ± 6.07					10	51.10 ± 6.07
F	Harinagar	Champaran	10	32.40 ± 3.35					10	32.40 ± 3.35	10	44.20 ± 8.29					10	44.20 ± 8.29
G	Matihari	"	8	20.12 ± 2.06			2	16.00 ± 4.00	10	17.30 ± 1.73	9	40.22 ± 3.23			1	37.00	10	40.10 ± 2.83
H	Sagauli	"	10	14.15 ± 3.02					10	14.50 ± 3.02	9	36.89 ± 2.33			1	23.00	10	35.50 ± 2.45
I	Pipra	"	6	28.00 ± 3.21	4	29.50 ± 2.65			10	28.60 ± 2.00	7	34.43 ± 4.46			3	44.50 ± 2.83	10	37.50 ± 3.46
J	Matipur	Muzaffarpur	9	38.77 ± 4.59			1	43.00	10	37.20 ± 4.12	10	34.70 ± 5.27					10	34.70 ± 5.27
K	Jafaha	"	6	26.33 ± 3.56			4	48.25 ± 7.50	10	35.20 ± 5.00	8	35.38 ± 7.20			2	58.00 ± 16.00	10	37.90 ± 6.86
	Total		98	29.00 ± 1.28	4	29.50 ± 2.65	8	37.12 ± 0.50	110	29.40 ± 1.27	102	37.87 ± 1.56			8	41.15 ± 4.29	110	38.12 ± 1.81

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REGIONAL SURVEY OF COREE PESTS OF SUGARCANE, 1940-41.

Table 5(2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar

No.	Borer Name	Month..... <u>December, 1940</u>						Month..... <u>January, 1941</u>					
		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> Sp.	99	24.72 ± 1.26	11	18.45 ± 2.24	110	24.27 ± 1.12	99	23.00 ± 1.31	11	13.73 ± 8.79	110	22.07 ± 1.24
2	<i>A. stictocraspis</i> Hmp.	99	5.87 ± 0.48	11	6.91 ± 1.54	110	5.99 ± 0.46	99	5.76 ± 1.67	11	4.82 ± 1.84	110	5.66 ± 0.51
3	<i>A. tumidicostalis</i> Hmp.	99	0.37 ± 0.12	11	0.00	110	0.34 ± 0.11	99	0.52 ± 0.17	11	0.00	110	0.46 ± 0.15
4	<i>D. auricilia</i> Dudge.	99	19.08 ± 1.64	11	5.45 ± 2.78	110	17.72 ± 1.55	99	17.93 ± 1.94	11	2.00 ± 0.65	110	16.34 ± 1.89
5	<i>D. venosata</i> Wlk.	99	0.00	11	0.00	110	0.00	99	0.03	11	0.00	110	0.03
6	<i>C. zonellus</i> Swinh.	99	0.00	11	0.00	110	0.00	99	0.00	11	0.00	110	0.00
7	<i>C. trypheta</i> Bisset	99	0.00	11	0.00	110	0.00	99	0.00	11	0.00	110	0.00
8	<i>A. ablutella</i> Zell.	99	0.00	11	0.00	110	0.00	99	0.00	11	0.00	110	0.00
9	<i>Sesamia</i> Sp.	99	0.17	11	0.00	110	0.15	99	0.37	11	0.00	110	0.33
10	<i>E. depressella</i> Swinh.	99	30.67 ± 1.11	11	36.18 ± 5.48	110	31.22 ± 3.00	99	32.37 ± 1.36	11	37.18 ± 5.37	110	32.85 ± 1.34

 Investigated..... DA Roll..... Date..... 9/1 Checked S.S. Roll..... 14 Date..... 13/1

S.S.

Table 8 (2) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 4 Name Sepaya Province Bihar

No.	Borer Name	Month February '41								Month March '41					
		Planted		Patton		Mixed		Total		Planted		Mixed		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	<i>Scirpophaga</i> sp.	98	24.12 ± 0.81	4	28.25 ± 2.78	8	15.38 ± 4.90	110	23.34 ± 1.24	102	23.00 ± 1.16	8	17.62 ± 3.95	110	22.75 ± 1.11
2	<i>A. Stictocraspis</i> Hufn.	98	6.76 ± 0.48	4	5.75 ± 2.40	8	3.75 ± 1.41	110	6.50 ± 0.49	102	6.74 ± 0.57	8	7.75 ± 1.62	110	6.82 ± 0.55
3	<i>A. tumidicostalis</i> Hufn.	98	0.00	4	0.00	8	0.00	110	0.00	102	0.22	8	0.00	110	0.21
4	<i>D. Auricilia</i> Dudgeon	98	18.80	4	0.00	8	3.88	110	17.03	102	16.41	8	2.00	110	15.36
5	<i>D. Venosata</i> Wlk	98	0.04	4	0.00	8	0.00	110	0.04	102	0.07	8	0.00	110	0.06
6	<i>C. Zorellus</i> Swinh	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00	8	0.00	110	0.00
7	<i>C. trypheta</i> Bisset	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00	8	0.00	110	0.00
8	<i>H. Ablutella</i> Zell	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00	8	0.00	110	0.00
9	<i>Sesamia</i> sp.	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00	8	0.00	110	0.00
10	<i>E. depressella</i> Swinh	98	29.00 ± 1.28	4	29.50 ± 2.65	8	37.12 ± 0.50	110	29.44 ± 1.27	102	37.87 ± 1.56	8	41.25 ± 4.29	110	38.12 ± 1.57
Total															

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (5 (3)) Number of Canes, Stools, Fields, Villages & Localities affected by different Borers

Region No. 4 Name Sepaya Province Bihar

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Scirpophaga sp.	984	576	108	22	11	915	527	109	22	11	867	549	110	22	11	828	557	108	22	11
A. stricti. Hmps.	213	188	94	22	11	234	195	94	22	11	257	210	91	22	11	243	208	90	22	11
A. tumidi. Hmps.	5	4	3	3	3	1	1	1	1	1										
D. auricilia Drgr.	746	397	102	22	11	742	366	96	22	11	651	347	88	22	11	598	353	96	22	11
D. venosata Wlk.						1	1	1	1	1										
C. zonellus Swinh.																				
C. trypetes Biss.																				
R. ablutella Zell.																				
Sesamia sp.	6	5	5	4	4	1	1	1	1	1	6	5	3	3	3	2	1	1	1	1
E. depress. Swinh.	1217	681	110	22	11	1377	723	110	22	11	1113	628	110	22	11	1390	765	110	22	11
Total Damaged	2341	889	110	22	11	2549	912	110	22	11	2324	899	110	22	11	2319	937	110	22	11
Grand Total	3858	988	110	22	11	4154	970	110	22	11	3687	989	110	22	11	3621	988	110	22	11

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (5(4)). Percentage of Canes, Stools, Fields, Villages & Localities affected by different borers

Region No. 4 Name Sepaya Province Bihar

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Scirpophaga sp.	25.5	60.5	78.2	100.0	100.0	22.1	53.4	99.1	100.0	100.0	23.5	55.4	100.0	100.0	100.0	22.9	56.4	98.2	100.0	100.0
A. sticti. Hmps.	5.5	19.1	85.5	100.0	100.0	5.6	19.8	85.5	100.0	100.0	7.0	21.2	82.7	100.0	100.0	6.7	22.1	81.8	100.0	100.0
A. tumidi. Hmps.	0.7	0.4	2.7	13.6	27.3	0.0	0.1	0.9	4.5	9.1										
D. auricilia Drgr.	19.3	40.3	92.7	100.0	100.0	17.9	37.1	87.3	100.0	100.0	17.6	35.0	80.0	100.0	100.0	16.5	35.7	87.3	100.0	100.0
D. venosata Wlk.						0.0	0.1	0.9	4.5	9.1										
C. zonellus Swinh.																				
C. trypetes Blaset.																				
R. ablutella Zell.																				
Secania sp.	0.2	0.5	4.5	18.2	36.4	0.0	0.1	0.9	4.5	9.1	0.2	0.5	2.7	13.6	27.3	0.1	0.1	0.9	4.5	9.1
E. depress. Swinh.	31.5	69.1	100.0	100.0	100.0	33.2	73.3	100.0	100.0	100.0	30.2	63.4	100.0	100.0	100.0	38.4	77.4	100.0	100.0	100.0
Total Damaged	60.6	90.2	100.0	100.0	100.0	61.4	92.5	100.0	100.0	100.0	63.0	90.8	100.0	100.0	100.0	64.0	94.8	100.0	100.0	100.0

N₁ = Number of canes affected; N₂ = Number of stools affected; N₃ = Number of fields affected; N₄ = Number of villages affected;N₅ = Number of localities affected.

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Completed by J. S. 28/6/41

GIVE THE PERCENTAGE OF DAMAGED CANE TO TOTAL CANE

Table 5(5). Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 4 Name Sepaya Province Bihar

No. of Stools	Worker No.	Month, <u>December, 1940</u>								Month, <u>January, 1941</u>							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
		15	56.87	15	63.13	15	50.60	45	56.87	14	73.29	15	65.93	15	84.40	44	74.57
		15	60.27	15	67.20	15	57.60	45	61.69	14	56.43	15	59.47	15	61.00	44	59.03
		15	73.07	15	66.40	15	66.80	45	68.76	15	75.40	15	69.93	15	65.80	45	70.38
		15	58.73	15	64.73	15	73.93	45	65.80	15	47.13	15	68.27	15	67.20	45	60.87
		15	67.93	15	85.60	15	65.33	45	73.62	15	72.40	15	87.27	15	84.27	45	81.31
		15	57.13	15	68.47	15	67.47	45	64.36	15	71.13	15	71.87	15	70.80	45	71.27
	1	15	55.40	15	50.20	15	47.87	45	51.16	15	63.07	15	52.00	15	45.20	45	53.42
	2	15	61.80	15	55.27	15	56.07	45	57.71	15	54.93	15	66.13	15	48.40	45	56.49
		15	64.00	15	52.26	15	45.27	45	53.84	15	59.07	15	60.47	15	63.47	45	61.00
	2	15	55.53	15	47.80	15	62.47	45	55.27	15	60.07	15	53.47	15	59.47	45	57.67
	1	15	70.07	15	71.33	15	60.27	45	67.22	14	67.86	14	52.29	14	62.64	42	60.93
	2	14	87.14	15	60.40	15	67.27	44	71.25	15	67.27	14	62.64	14	76.43	43	72.67
	1	15	59.33	15	50.73	15	39.87	45	49.98	15	43.07	15	48.40	15	31.87	45	41.11
	2	15	65.53	15	52.20	15	61.73	45	59.82	15	65.00	15	65.87	15	61.87	45	64.25
	1	15	57.07	15	50.73	15	64.24	45	57.33	15	58.80	15	49.60	15	47.93	45	52.11
	2	15	68.67	15	72.33	15	48.60	45	63.20	15	70.73	15	64.67	15	64.67	45	66.69
	1	15	58.87	15	52.73	15	26.93	45	46.18	15	64.53	15	62.20	14	47.50	44	58.31
	2	15	50.87	14	45.21	15	52.67	44	49.68	15	48.60	15	59.20	15	37.80	45	48.53
	1	15	67.40	15	65.93	15	48.67	45	60.67	15	67.33	15	43.60	15	64.27	45	58.40
	2	15	51.47	15	53.33	15	39.53	45	48.11	15	78.60	15	53.73	15	64.40	45	65.58
	1	15	57.67	15	48.13	15	76.60	45	60.80	13	63.23	13	51.31	11	63.27	37	59.05
	2	15	55.60	15	53.40	15	60.53	45	56.51	13	83.30	14	54.21	14	74.14	41	70.24
Total		329	61.85	329	59.02	330	56.38	988	59.08	323	64.11	325	59.62	322	61.14	970	61.63

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1/1/1

REGULAR SURVEY OF BOILER PLANTS OF SUGARCANE 1940-41

Table 5 (2) Cont. Between Percentage of Emerged Gase to Total Gase.

Sampling Unit = Stool

Region No. 4 Name Sepaya Province Bihar

No.	Plot	Month.. February, 1941								Month.. March, 1941							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
		(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	34
A	1	15	71.27	15	63.76	15	68.27	45	67.77	15	53.13	15	68.73	15	69.53	45	63.86
	2	15	56.66	15	68.27	15	74.93	45	66.62	15	66.47	15	75.40	15	69.60	45	70.49
B	1	15	64.47	15	62.07	15	69.33	45	65.29	15	78.60	15	66.87	15	69.67	45	71.71
	2	15	72.60	15	74.93	15	87.13	45	78.89	15	54.47	15	75.93	15	68.87	45	66.42
C	1	15	53.00	15	46.60	15	56.73	45	52.11	15	68.27	15	67.00	15	78.33	45	71.20
	2	15	54.80	15	63.76	15	51.33	45	56.63	15	54.47	15	65.67	15	69.33	45	63.16
D	1	15	65.80	15	50.20	15	75.53	45	63.84	15	71.33	15	76.07	15	55.40	45	67.60
	2	15	66.93	15	65.87	15	75.07	45	69.29	15	56.93	15	72.53	15	71.53	45	67.00
E	1	15	64.73	15	52.13	15	74.07	45	63.64	15	81.00	15	73.53	15	72.47	45	75.67
	2	15	54.67	15	59.40	15	59.47	45	57.85	15	59.00	15	51.47	15	60.07	45	56.85
F	1	15	79.20	15	63.53	15	58.80	45	67.18	15	59.27	15	52.53	15	77.47	45	63.09
	2	15	59.80	15	47.13	15	52.87	45	53.27	15	60.40	15	66.53	15	77.60	45	68.18
G	1	15	46.53	14	43.36	15	52.53	44	47.57	15	69.53	15	48.67	15	60.60	45	59.60
	2	15	62.53	15	52.87	15	53.60	45	56.33	15	76.13	15	70.47	15	63.13	45	67.91
H	1	15	55.33	15	43.13	15	44.73	45	47.73	15	63.00	15	62.53	15	67.40	45	64.31
	2	15	65.87	15	64.47	15	74.47	45	68.27	14	67.14	15	50.47	14	66.71	43	61.17
I	1	15	50.27	15	64.33	15	42.33	45	52.31	15	69.27	15	67.13	15	57.93	45	64.78
	2	15	44.60	15	42.53	15	59.93	45	49.02	15	54.80	15	68.13	15	69.07	45	64.00
J	1	15	67.33	15	57.00	15	63.93	45	62.75	15	77.40	15	59.60	15	60.13	45	66.38
	2	15	68.93	15	66.80	15	64.60	45	66.51	15	58.47	15	53.80	15	49.13	45	53.80
K	1	15	49.80	15	59.73	15	53.67	45	54.40	15	51.33	15	59.40	15	63.40	45	58.04
	2	15	40.87	15	46.80	15	46.60	45	44.76	15	36.13	15	46.26	15	53.47	45	45.29
Total		330	59.82	329	57.31	330	61.82	989	59.65	329	68.57	330	63.59	329	65.75	988	66.03

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Completed by *[Signature]* 16/4/41

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41.

Table 5 (6)

Mean Percentage of Damaged Cane to Total Cane : By Localities x Workers x Months

Sampling Unit = Stool

Region No. 4

Name Sepaya

Province Bihar

Locality		District	Month..... December, 1940.....								Month..... January, 1941.....							
No.	Name	(3)	Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
			N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
A	Sepaya	Saran	30	58.57	30	65.17	30	54.10	90	59.28	28	64.86	30	62.70	30	72.70	88	66.80
B	Siwan	"	30	65.88	30	65.57	30	70.37	90	67.27	30	61.27	30	66.10	30	66.50	90	64.62
C	Sidhwalia	"	30	63.53	30	77.03	30	66.40	90	68.99	30	71.77	30	79.57	30	77.53	90	76.29
D	Harbarnah	"	30	58.60	30	52.73	30	51.97	90	54.43	30	57.00	30	59.07	30	46.80	90	54.96
E	Sitalpur	"	30	59.77	30	50.03	30	53.87	90	54.56	30	57.57	30	56.97	30	61.47	90	57.34
F	Harinzar	Champaran	29	78.31	30	65.87	30	63.77	89	69.22	29	68.59	28	57.46	28	69.61	85	65.26
G	Matihari	"	30	62.43	30	51.47	30	50.80	90	54.90	30	54.03	30	57.13	30	46.87	90	52.68
H	Saganli	"	30	62.87	30	61.53	30	56.40	90	60.27	30	64.77	30	57.13	30	56.30	90	59.40
I	Pipra	"	30	54.87	29	47.10	30	39.80	89	47.91	30	56.57	30	60.70	29	42.48	89	53.37
J	Matipur	Muzaffarpur	30	59.43	30	59.63	30	44.10	90	54.39	30	72.97	30	48.67	30	64.33	90	61.99
K	Jafaha	"	30	56.63	30	50.77	30	68.57	90	58.66	26	73.27	27	52.81	25	69.36	78	64.93
Total			329	61.85	329	59.02	330	56.38	988	59.08	323	64.11	325	59.62	322	61.14	970	61.63

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Champaran

P. S. 12/1/41

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Table

Mean Percentage of Damaged Cane to Total Cane : By Localities x Workers x Months

Sampling Unit = Stool

Region No. 4Name SefayaProvince Bihar

Locality	District	Month..... <u>February, 1941</u>								Month..... <u>March, 1941</u>								
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total		
No.	Name	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
A	Sefaya	Saran	30	63.97	30	66.00	30	71.60	90	67.19	30	59.80	30	72.17	30	69.57	90	67.18
B	Siwan	"	30	68.53	30	69.50	30	78.23	90	72.09	30	66.53	30	71.40	30	69.27	90	69.07
C	Siddharia	"	30	53.90	30	55.17	30	54.03	90	54.37	30	61.37	30	66.30	30	73.83	90	67.18
D	Marbouah	"	30	66.37	30	58.03	30	75.29	90	66.56	30	64.13	30	74.30	30	63.47	90	67.30
E	Sitalpur	"	30	59.70	30	55.77	30	66.77	90	60.75	30	70.00	30	62.50	30	66.27	90	66.26
F	Harinagar	Champaran	30	69.50	30	53.33	30	55.83	90	60.22	30	59.83	30	59.53	30	77.53	90	65.63
G	Matihari	"	30	54.53	29	48.28	30	53.07	89	52.00	30	72.83	30	59.57	30	61.97	90	64.76
H	Sagauli	"	30	60.60	30	53.18	30	59.60	90	57.77	29	65.00	30	56.50	29	67.06	88	60.78
I	Pipra	"	30	47.43	30	53.43	30	51.13	90	50.66	30	62.03	30	67.63	30	63.50	90	64.39
J	Matipur	Muzaffarpur	30	68.13	30	61.50	30	64.27	90	64.63	30	68.93	30	56.70	30	54.63	90	60.09
K	Jafaha	"	30	45.33	30	53.27	30	50.13	90	49.58	30	42.73	30	52.83	30	58.43	90	71.66
	Total		330	59.82	329	57.31	330	61.82	989	59.65	329	68.57	330	63.59	329	65.95	988	66.03

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REGIONAL SURVEY OF BOREA PESTS OF SUGARCANE, 1940-41

Table 5 (7) Mean Percentage of Damaged Cane to Total Cane
by Localities and Months

Region No. 4 Name Sepaya Province Bihar

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Sepaya	90	59.28	88	66.80	90	67.19	90	67.18
B Siwan	90	67.27	90	64.62	90	72.09	90	69.07
C Sidhwalia	90	68.99	90	76.29	90	54.37	90	67.18
D Marboush	90	54.43	90	54.96	90	66.56	90	67.30
E Sitalpur	90	54.56	90	59.34	90	60.75	90	66.26
F Harinagar	89	69.22	85	65.26	90	60.22	90	65.63
G Matihari	90	54.90	90	52.68	89	52.00	90	64.76
H Sagauli	90	60.27	90	59.40	90	57.79	88	60.78
I Pipra	89	47.91	89	53.37	90	50.66	90	64.39
J Matipur	90	54.39	90	61.99	90	64.63	90	60.09
K Bahaba	90	58.66	78	64.93	90	49.58	90	71.66
Total	988	59.08	970	61.63	989	59.65	988	66.03

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Table 5(8). Analysis of variance

Source of variation	d.f	Sum of Squares	Variance	Ratio of variances
(1)	(2)	(3)	(4)	(5)
Between months	3	3 64.86	1 21.62	2.58
Between Localities	10	17 79.88	1 77.99	3.78**
months x Localities	30	17 44.25	58.14	1.23
Between villages (within months & localities)	44	20 72.30	47.10	
Total	87	59 61.29		

REGION NO.(5) : PUSA (BIHAR)

Material

78. All the 11 localities or 110 fields were surveyed in each of the months December 1940 to March 1941. Most of the fields were 'planted' and only a few came under 'mixed' cropping. There were no fields completely under 'ratooning'.

Damage by Individual Borers

79. Tables PU(1.1) to PU(1.10) give the percentage of canes damaged by each of the ten borers. Results for the region as a whole are given as usual in Table PU(2) for purposes of comparison. From this Table we find that borer No.(1) occurred most frequently in this region, and the rate of attack from this borer was 15, 17, 15 and 15 per cent in December 1940, January, February and March 1941 respectively. The differences between January and the two succeeding months, February and March, were probably statistically significant.

80. The next important borer was No.(10) with percentages of damage equal to 11, 11, 9 and 14 per cent in the four months December 1940 - March 1941. Borer Nos.(3) and (4) came next in order of intensity of attack each causing about 2 per cent damage on an average over the period of 4 months.

81. From Tables PU(1.1) - (1.10) it will be seen that there was considerable variation between localities in the percentage damaged by the important borers. For the most important borer No.(1), we notice from Table PU(1.1), that the percentage varied from 5 to 22 per cent in December 1940 (col.9); from 7 to 42 per cent in January 1941 (col.15); from 8 to 20 per cent/ⁱⁿ February 1941 (col.21); and from 9 to 16 per cent in March 1941 (col.27). For borer No.(10) we see from Table PU(1.10) that the percentage varied from 3 to 19 per cent in February 1941; and from 7 to 20 per cent in March 1941. In this region also the variation from locality to locality was not negligible.

Effect of 'Ratooning'

82. The effect of ratooning on the incidence of borer pests is not clear. The percentage damage by borer No.(1) was less in 'mixed' fields than in 'planted' fields in three out of four months, whereas in the case of borer No.(10) the percentage damage was less in 'mixed' fields than in 'planted'

fields in two out of four months. None of the observed differences is statistically significant. Even if there is any real effect of re-tooning, it may have been masked by the non-orthogonal nature of the material with respect to other rather unclassified but known factors such as varieties, manures, etc.

Spread of Borers

83. Tables PU(3) and PU(4) show the extent of spread of each borer among canes, stools, fields, villages and localities in this region. Borer No.(1) was present in every locality and village but not in every field. Borer No.(10) was present in every locality but not in all villages in each month. Borer No.(4) was much more widespread than borer No.(5) although the percentage of canes damaged by each was practically the same. Borer Nos.(6), (7) and (8) were totally absent in this region. Tables PU(1.6) - (1.8) have therefore been omitted.

Results by Workers and Localities

84. Table PU(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month; and Table PU(6) the consolidated percentages for each locality. In Table PU(7) the figures for workers also are combined to give the mean percentage of damaged canes for each locality in each month.

Personal Bias

85. The question of personal bias among workers was investigated in detail in this region to serve as a model for similar work for other regions. The percentage canes damaged by all-borers was calculated for each stool and an analysis of variance was carried out for each village in accordance with the following scheme :-

	d.f.
Between Workers	2
Between Fields	4
Worker x Field	8
Residual	50

The ratio of variances of the first three items to the residual variance was calculated in each case; and the number of significant ratios out of a total of 22 is shown in Table PU(A). It will be seen that 'workers' are responsible

for the greatest number of significant values revealing the existence of personal bias.

Table PU(A). Number of Ratio of Variances Significant at 5 per cent level out of 22 Ratios.

Source of Variation (1)	December 1940 (2)	January 1941 (3)	February 1941 (4)	March 1941 (5)	Total (6)
Between Workers	6	8	-	1	15
Between Fields	2	5	2	-	9
Worker x Field	-	3	1	2	6

86. It is of interest to enquire whether such personal bias was steady for each worker in every village and locality. This information is given in Tables PU(5) and PU(6). The appropriate analysis of variance is given in Table PU(B). In this Table, col.(1) gives the source of variation, col.(2) the degrees of freedom. The variances and ratio of variances for December 1940 are given in cols.(3) and (4); for January 1941 in cols.(5) and (6); for February 1941 in cols.(7) and (8); and for March 1941 in cols.(9) and (10).

Table PU(B). Analysis of Variance by Months

Source of Variation (1)	d.f. (2)	December, 1941		January, 1941	
		Variance (3)	Ratio (4)	Variance (5)	Ratio (6)
Between Workers	2	281.63	5.15**	171.27	3.58**
Between Localities	10	248.45	4.54**	564.97	11.81**
Between Villages (within Localities)	11	102.25	1.87	181.03	3.78**
Residual	42	54.67		47.85	
Total	65	99.51		153.75	

Source of Variation (1)	d.f. (2)	February, 1941		March, 1941	
		Variance (7)	Ratio (8)	Variance (9)	Ratio (10)
Between Workers	2	114.74	6.05**	53.60	1.86
Between Localities	10	145.80	7.58**	67.89	2.56**
Between Villages (within Localities)	11	62.04	3.27**	23.04	0.80
Residual	42	18.97		28.78	
Total	65	48.41		34.59	

87. It will be seen that the variation between workers was highly significant in December 1940, and January and February 1941. Thus in December 1940 worker No.(1) gave the highest percentage of damage, namely 28.61 per cent whereas the other two workers gave almost equal estimates, namely 23.22 and 22.11 per cent. Similarly in January and February, worker No.(1) gave appreciably higher values than the other two workers. In March the disagreement was less marked. Apparently as the workers became more and more experienced the bias steadily decreased. This can be easily seen from the following table in which W_1 gives the percentages of damaged reported by worker No.(1), and $(W_2 + W_3)/2$ the average of the percentages recorded by the other two workers.

	W_1	$(W_2 + W_3)/2$	Difference
December 1940	28.61	22.67	5.94
January 1941	33.05	28.20	4.85
February 1941	24.90	21.37	3.53
March 1941	28.64	25.10	1.54

Worker No.(1) had more experience of entomological work than the other two. It is not surprising, therefore, that he reported a much larger number of damaged cones in the beginning. The above figures show, however, that the gap between him and the other two workers was steadily decreasing.

Local Variations

88. From Table PU(B) it can be also seen that there were significant local variations in every month. The two villages within each locality did not show significant differences in December 1940 and March 1941; but in January and February differences were statistically significant.

Monthly Fluctuations

89. As regards seasonal fluctuations we find from Table PU(7) that the intensity of attack by all borers was 25 per cent in December 1940 and rose to 30 per cent in January 1941. After this there was a fall to 25 per cent in February and then a slight rise to 25 per cent in March 1941.

Variation between Localities

90. The variation between localities was also considerable. The range of variation was from 16 to 36 per cent in December; from 18 to 51 per cent in January; from 16 to 30 per cent in February; and from 19 to 29 per cent in March.

91. The data of Table PU(7) have been statistically analysed and the results are given in Table PU(8). It will be seen from this Table that although the variation due to interaction between months and localities is statistically significant it is much less in magnitude than the variation between months and between localities which are highly significant.

Serial No. 5 Name Pusa

Bihar

No. Scirpophaga Sp.

No.	Locality	District	Month December, 1940.						Month January, 1941						
			Planted	Mixed		Total	Planted	Mixed		Total					
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
	Pusa	Darbhanga	7	15.29 ± 1.08	3	11.00 ± 3.51	10	14.00 ± 3.01			10	14.50 ± 2.42	10	14.50 ± 2.42	
	Sakri	"	9	21.89 ± 0.64	1	19.00		10	21.60 ± 4.72	9	45.00 ± 5.36	1	18.00	10	42.30 ± 5.50
	Khajantli	"	10	20.10 ± 3.37				10	20.10 ± 3.37	10	19.00 ± 2.69			10	19.00 ± 2.69
	Hasanpur	"	7	16.00 ± 2.89	3	11.00 ± 0.04	10	14.50 ± 3.54	8	12.75 ± 1.56	2	10.50 ± 2.47	10	12.30 ± 1.32	
	Pupri	Muzaffarpur	10	10.20 ± 0.90				10	10.20 ± 0.96	10	14.40 ± 1.49			10	14.40 ± 1.49
	Riga	"	10	9.50 ± 2.03				10	9.50 ± 2.03	9	13.44 ± 1.66	1	12.00	10	13.30 ± 1.52
	Mansi	Monghyr	6	5.67 ± 2.14	4	12.75 ± 1.39	10	8.50 ± 4.95	8	21.00 ± 2.90	2	16.50 ± 4.53	10	20.10 ± 2.48	
	Begusarai	"	8	5.13 ± 1.74	2	5.00 ± 5.00	10	5.10 ± 1.58	9	9.00 ± 1.09	1	8.00	10	8.90 ± 0.98	
	Bachuarai	"	6	9.50 ± 1.02	4	15.75 ± 0.09	10	12.00 ± 5.87	7	8.43 ± 1.99	3	23.67 ± 6.97	10	13.00 ± 3.24	
	Araria	Purnia	10	19.40 ± 1.91				10	19.40 ± 1.91	10	18.20 ± 2.69			10	18.20 ± 2.69
	Semapur	"	5	13.00 ± 3.29	5	10.20 ± 2.79	10	11.60 ± 5.14	5	6.00 ± 2.45	5	7.40 ± 2.56	10	6.70 ± 1.69	
	Total		88	13.69 ± 0.85	22	11.82 ± 1.47	110	13.32 ± 1.41	85	17.43 ± 1.40	25	13.80 ± 1.63	110	16.61 ± 1.15	

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Part (1) Contd. Mean Percentage with Standard Error of Mean of the ...

Sampling Unit - Field (3 ... combined)

Region No. 5 Name: Pusa Province: Bihar Variety Name: No. 1 Scirpophaga Sp.

No.	Locality	District	Month: February - 1941						Month: March - 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Pusa.	Dharbhanga	7	19.57 ± 3.13	3	16.00 ± 2.08	10	18.50 ± 2.27	7	18.00 ± 2.46	3	11.00 ± 2.08	10	15.90 ± 2.06
B	Zakri.	"	9	21.00 ± 2.61	1	6.00	10	19.50 ± 2.78	9	13.11 ± 1.91	1	12.00	10	13.00 ± 1.71
C	Khajani.	"	7	13.14 ± 1.13	3	15.00 ± 2.08	10	13.70 ± 0.98	9	13.89 ± 1.57	1	8.00	10	13.30 ± 1.52
D	Hasanpur.	"	9	8.78 ± 2.22	1	6.00	10	8.50 ± 2.00	10	14.40 ± 1.64			10	14.40 ± 1.64
E	Pabri.	Muzaffarnagar	9	9.44 ± 1.44	1	8.00	10	9.30 ± 1.29	10	11.60 ± 1.34			10	11.60 ± 1.34
F	Riga.	"	9	21.89 ± 3.38	1	6.00	10	20.30 ± 3.41	7	9.57 ± 2.01	3	8.00 ± 2.00	10	9.10 ± 1.49
G	Mansi.	Monghyr.	10	11.10 ± 1.38			10	11.10 ± 1.38	9	11.78 ± 1.78	1	24.00	10	13.00 ± 2.01
H	Begusarai	"	10	17.90 ± 1.80			10	17.90 ± 1.80	10	11.80 ± 2.15			10	11.80 ± 2.15
I	Bachman.	"	10	10.80 ± 1.73			10	10.80 ± 1.73	10	11.80 ± 2.22			10	11.80 ± 2.22
J	Araria.	Purnia	9	7.56 ± 1.41	1	16.00	10	8.40 ± 1.52	10	15.10 ± 1.50			10	15.10 ± 1.50
K	Semarpur.	"	9	8.33 ± 1.17	1	5.00	10	8.00 ± 1.10	8	11.75 ± 2.36	2	29.00 ± 21.01	10	15.20 ± 4.31
	Total		98	13.47 ± 0.79	12	11.67 ± 1.55	110	13.27 ± 0.72	99	12.96 ± 0.58	11	14.45 ± 3.88	110	13.11 ± 0.64

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Tab. Pk(1.2)

Mean Percentage with Spiders, based on number of Total Cane.

Sampling Unit = Field (or 3 workers considered)

Region No. 5 Name Pusa Province Bihar. No(2) *A. Sticticraspis Hampson.*

No.	Locality Name	District	Month December - 1940						Month January - 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Pusa	Darbhanga	7	0.43	3	0.00	10	0.43			10	0.00	10	0.00
B	Sakri	"	9	0.22	1	0.00	10	0.22	9	0.00	1	0.00	10	0.00
C	Khajanti	"	10	0.30			10	0.30	10	0.00			10	0.00
D	Hasanpur	"	7	0.00	3	0.00	10	0.00	8	0.63	2	0.00	10	0.50
E	Pupri	Muzaffarpur	10	0.00			10	0.00	10	0.20			10	0.20
F	Riga	"	10	0.30			10	0.30	9	0.22	1	0.00	10	0.20
G	Mansi	Monghyr	6	0.00	4	0.00	10	0.00	8	0.00	2	0.00	10	0.00
H	Begusarai	"	8	0.00	2	0.00	10	0.00	9	0.00	1	0.00	10	0.00
I	Bachauri	"	6	0.00	4	0.00	10	0.00	7	0.00	3	0.00	10	0.00
J	Araria	Purnia	10	0.40			10	0.40	10	0.00			10	0.00
K	Semarpur	"	5	1.60	5	1.40	10	1.50	5	0.00	5	0.00	10	0.00
	Total		88	0.26	22	0.32	110	0.27	85	0.11	25	0.00	110	0.09

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Part IV (1.2) Contd. Mean Percentage with Standard Error of Damaged Cane in Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 5 Name Pusa Province Bihar Worker's Name No. 2 A. Sticticraspis Hampson.

No.	Locality Name	District	Month February-1941						Month March-1941										
			Planted			Mixed			Total			Planted			Mixed			Total	
			N	Mean	S.E.	N	Mean	S.E.	N	Mean	S.E.	N	Mean	S.E.	N	Mean	S.E.		
(1)	(2)	(3)	(6)	(7)	(8)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	
F	Pusa	Barabhangha	7	0.00		3	0.00		10	0.00		7	0.00		3	0.00		10	0.00
B	Sakri	"	9	0.00		1	0.00		10	0.00		9	0.00		1	0.00		10	0.00
C	Khajantli	"	7	0.00		3	0.00		10	0.00		9	0.00		1	0.00		10	0.00
D	Hasanpur	"	9	0.78		1	0.00		10	0.70		10	0.20					10	0.20
E	Purvi	Muzaffarpur	9	0.00		1	0.00		10	0.00		10	0.00					10	0.00
F	Riga	"	9	0.00		1	0.00		10	0.00		7	0.00		3	0.00		10	0.00
G	Mausi	Monghyr	10	0.00					10	0.00		9	0.33		1	0.00		10	0.30
H	Begusarai	"	10	0.00					10	0.00		10	0.00					10	0.00
I	Bachwari	"	10	0.30					10	0.30		10	0.00					10	0.00
J	Arancia	Purnia	9	0.00		1	0.00		10	0.00		10	0.00					10	0.00
K	Semaipur	"	9	0.00		1	0.00		10	0.00		8	0.00		2	0.00		10	0.00
	Total		98	0.10		12	0.00		110	0.09		99	0.05		11	0.00		110	0.05

Center Ud. Roll 224 Date 9.6.1941 Inspector B.S.H. Dist. P/b

No. (14.3)

Mean Percentage with Standard Error of Mean of Cows in Total Cows.

Sampling Unit = Field (or 3 patches combined)

Station No. 5. Name.

Pusa.

Province.

Bihar.

Station No. (14.3) A. *Tumidicostalis* Hampson.

No.	Locality Name	District	Month December - 1940						Month January - 1941.						
			Planted		Mixed		Total		Planted		Mixed		Total		
			N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
10	Pusa.	Darbhanga	7	0.00	3	0.00	10	0.00				10	0.00	10	0.00
	Sakri.	"	9	0.00	1	0.00	10	0.00	9	0.00		1	0.00	10	0.00
	Khajauli	"	10	1.00			10	1.00	10	0.40				10	0.40
	Hassanfow.	"	7	2.71	3	3.33	10	2.90	8	0.63		2	0.00	10	0.50
	Purri.	Muzaffarpore	10	0.00			10	0.00	10	0.00				10	0.00
	Riga.	"	10	0.00			10	0.00	9	0.00		1	0.00	10	0.00
	Mansi.	Monghyr.	6	0.00	4	0.50	10	0.20	8	0.00		2	0.00	10	0.00
	Begusarai	"	8	0.00	2	0.00	10	0.00	9	0.33		1	0.00	10	0.30
	Bachman.	"	6	0.00	4	0.00	10	0.00	7	0.00		3	0.00	10	0.00
	Araria.	Purnia	10	8.30			10	8.30	10	6.10				10	0.00
	Semafow.	"	5	19.20	5	16.20	10	17.70	5	29.40		5	16.20	10	22.80
	Total		88	2.05	22	4.23	110	2.74	85	2.20		25	3.24	110	2.88

Cows 132 2.24 9.6

SA 155

Soil 13/16

Table (Part 3) Contd. Mean Percentage with Standard Error of Damaged Lane in Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. **5** Name **Pusa** Province **Bihar** No. **(3) A. Tumidicostalis Impson.**

No.	Locality	District	Month February 1941						Month March 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
	Pusa.	Darbhanga	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
	Sakri.	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
	Khajanchi	"	7	0.00	3	0.00	10	0.00	9	0.00	1	0.00	10	0.00
	Hasanpore.	"	9	0.00	1	0.00	10	0.00	10	2.30			10	2.30
	Pupri.	Buzaffpore	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Riga.	"	9	0.00	1	0.00	10	0.00	7	0.00	3	0.00	10	0.00
	Mansi.	Bonghyr.	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
	Begusarai.	"	10	3.20			10	3.20	10	0.00			10	0.00
	Bachhari.	"	10	5.00			10	5.00	10	0.00			10	0.00
	Araria.	Purnia	9	0.00	1	0.00	10	0.00	10	3.70			10	3.70
	Semarpore.	"	9	0.00	1	0.00	10	0.00	8	9.13	2	16.00	10	10.50
	Total		98	0.87	12	0.00	110	0.75	99	1.34	11	2.91	110	1.50

Roll **224** Date **9.6.**

Roll **455** Date **13/6**

Pu(1.4)

Mean Percentage with Standard Error of Paired Cane vs Total Cane.

Surplus Dept - Field (or 2 workers combined)

Station No. 5

Name

Pusa

Bihar

Reporter's Name (No 4) D. Anicilia Indgo.

No.	Locality	District	Month December - 1940						Month January - 1941						
			Planted		Fixed		Total		Planted		Fixed		Total		
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	
	Pusa.	Darbhanga	7	4.57		3	0.00	10	3.20			10	2.20	10	2.20
	Sakri.	"	9	0.78		1	3.00	10	1.00	9	1.67	1	12.00	10	2.70
	Khajani	"	10	12.60				10	12.60	10	7.50			10	7.50
	Hasanpur.	"	7	4.14		3	5.00	10	4.40	8	3.88	2	0.00	10	3.10
	Pupri.	Muzaffarpur.	10	0.10				10	0.10	10	2.00			10	2.00
	Piga.	"	10	0.10				10	0.10	9	0.89	1	3.00	10	1.10
	Mansi.	Monghyr.	6	1.83		4	3.00	10	2.30	8	6.25	2	0.00	10	5.00
	Begusarai	"	8	0.63		2	0.00	10	0.50	9	2.78	1	0.00	10	2.50
	Bachauri.	"	6	6.67		4	0.50	10	0.60	7	1.71	3	0.00	10	1.20
	Araria.	Purnia	10	0.30				10	0.30	10	0.30			10	0.30
	Semarpour	"	5	1.00		5	0.00	10	0.50	5	0.00	5	0.00	10	0.00
	Total		88	2.61		22	1.45	110	2.38	85	2.58	25	1.48	110	2.56

Copied by WS. Roll 224. Date 9.6.

Checked

SA. 186

Roll

Date

12/6

Tab. (1.4) ; Contd. Mean Percentages with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 5 Name Pusa Province Bihar Survey No. (No. 4) D. auricilia Dodge

No.	Locality	District	Month <u>February - 1941</u>						Month <u>March - 1941</u>					
			Planted		Mixed		Total		Planted		Mixed		Total	
	Name		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Pusa	Darbhanga	7	2.14	3	1.67	10	2.00	7	3.71	3	0.00	10	2.60
	Sakri	"	9	1.78	1	14.00	10	6.00	9	0.67	1	0.00	10	0.60
	Khajanchi	"	7	5.11	3	3.33	10	3.20	9	0.33	1	5.00	10	0.80
	Hasanpore	"	9	3.14	1	3.00	10	1.20	10	0.00			10	0.00
	Pipri	Bongaypore	9	2.56	1	3.00	10	2.60	10	3.70			10	3.70
	Piga	"	9	1.78	1	6.00	10	2.20	7	10.00	3	0.00	10	7.00
	Bansi	Bonghyr	10	0.30			10	0.30	10	3.70			10	3.70
	Begusarai	"	10	0.00			10	0.00	10	0.00			10	0.00
	Bachmaria	"	10	0.00			10	0.00	10	0.00			10	0.00
	Araria	Purnia	9	0.00	1	0.00	10	0.00	10	0.00			10	0.00
	Semapore	"	9	0.00	1	0.00	10	0.00	8	0.00	2	0.00	10	0.00
	Total		98	1.37	12	3.42	110	1.57	99	1.48	11	0.45	110	1.38

Copy W3 Roll 2291 Date 9.6 Checked JA+S Roll 13/6 Date 13/6

Pat 15 (15)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 5 Name. Pusa Province. Bihar No. (5) D. Venkath Wlk.

Locality		District	Month... December, 1940						Month... January, 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Pusa (H.A.S.)	Darbhanga	7	0.00	3	0.00	10	0.00			10	0.00	10	0.00
E	Sabri	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
C	Khajauli	"	10	0.00			10	0.00	10	0.00			10	0.00
E	Haranpur	"	7	0.00	3	0.00	10	0.00	8	0.00	2	0.00	10	0.00
E	Pethi	Muzaffarpur	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
E	Riga	"	10	0.00			10	0.00	10	0.00			10	0.00
G	Mami	Munghyr	6	0.00	4	0.00	10	0.00	8	0.00	2	0.00	10	0.00
E	Begunwari	"	8	0.00	2	0.00	10	0.00	9	0.33	1	0.00	10	0.30
I	Bachwari	"	6	0.00	4	0.00	10	0.00	7	0.00	3	0.00	10	0.00
J	Araria	Purnia	10	0.00			10	0.00	10	0.00			10	0.00
K	Semapur	"	5	0.00	5	0.00	10	0.00	5	0.00	5	0.00	10	0.00
	Total		88	0.00	22	0.00	110	0.00	85	0.03	25	0.00	110	0.03

Copied 11 Roll 116 Date 11/6/41 Checked SD + SS Total to 13/6

Table (P-1) Mean Percentage with Standard Error of Deviation of Damage to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 5 Name Pusa Province Bihar Locality Name No. (9) Serania Sp.

Locality		District	Month... December, 1940						Month... January, 1941					
No.	Name		Planted		Total		Planted		Total					
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Pusa	Darbhanga	7	0.86	3	0.00	10	0.60			10	0.00	10	0.00
B	Sabri	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
C	Khaijani	"	10	0.00			10	0.00	10	0.00			10	0.00
D	Hasanpur	"	7	0.00	3	0.00	10	0.00	8	0.00	2	0.00	10	0.00
E	Pupri	Muzaffarpur	10	0.00			10	0.00	10	0.00			10	0.00
F	Riga	"	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
G	Manri	Monghyr	6	0.00	4	0.50	10	0.20	8	0.00	2	0.00	10	0.00
H	Begusarai	"	8	0.25	2	0.00	10	0.20	9	0.00	1	0.00	10	0.00
I	Bachhari	"	6	0.00	4	0.00	10	0.00	7	0.00	3	0.00	10	0.00
J	Arari	Pirovia	10	0.00			10	0.00	10	0.00			10	0.00
K	Serapur	"	5	0.00	5	0.00	10	0.00	5	0.00	5	0.00	10	0.00
	Total		88	0.09	22	0.09	110	0.09	85	0.00	25	0.00	110	0.00

Copies 116 Date 11/6/41 Checked J.D.S.S. Date 13/6

Tab. PL(19) Contd Mean Percentage with Standard Error of Sampling Units to Total Cane.

Sampling Unit = Field (or 3 bushes combined)

Region No. 5 Name Pusa Province Bihar Local Name (No. 9) Sesamia sp.

No.	Locality Name	District	Month... February - 1941						Month... March - 1941				
			Planted	Mixed		Total		Planted	Mixed		Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
			Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.	Mean ± S.E.
A	Pusa.	Darbhanga	7 0.00	3 0.00	10 0.00	7 0.00	3 0.00	10 0.00	7 0.00	3 0.00	10 0.00	7 0.00	3 0.00
B	Sakri.	"	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00
C	Khajanchi	"	7 0.71	3 0.00	10 0.50	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00
D	Hasanfawa.	"	9 0.67	1 0.00	10 0.60	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00	
E	Purri.	Bhagalpur	9 0.00	1 0.00	10 0.00	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00	
F	Riga.	"	9 0.00	1 0.00	10 0.00	7 0.00	3 0.00	10 0.00	7 0.00	3 0.00	10 0.00	7 0.00	3 0.00
G	Mansi.	Bonghyr.	10 0.00		10 0.00	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00	10 0.00	9 0.00	1 0.00
H	Begusarai.	"	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00	
I	Bachhari.	"	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00		10 0.00	10 0.00	
J	Araria.	Purnia	9 0.00	1 0.00	10 0.00	10 0.60		10 0.60	10 0.60		10 0.60	10 0.60	
K	Semafawa.	"	9 0.67	1 0.00	10 0.60	8 0.00	2 0.00	10 0.00	8 0.00	2 0.00	10 0.00	8 0.00	2 0.00
	Total		98 0.17	12 0.00	110 0.14	99 0.06	11 0.00	110 0.05	99 0.06	11 0.00	110 0.05	99 0.06	11 0.00

Copied 1/2 Roll 224 Date 7.6 Checked JA 185 Roll 136

Fr. RU(1.10)

Mean Percentages with Standard Errors of Mean Relating to Total Cane.

Sampling Unit = Field (or 3 farmers combined.)

Order No. 5 Name Pusa Province Bihar Station Name (No. 10) E. depressella Smith.

No.	Locality Name	District	Month... December - 1940...						Month... January - 1941.					
			Planted		Fixed		Total		Planted		Fixed		Total	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Pusa	Darbhanga	7	12.14 ± 1.77	3	8.00 ± 2.08	10	10.90 ± 1.47			10	10.00 ± 1.54	10	10.00 ± 1.54
	Sakri.	"	9	12.33 ± 1.27	1	14.00	10	12.50 ± 1.14	9	11.78 ± 2.04	1	0.00	10	10.60 ± 2.02
	Khajani	"	10	2.50 ± 1.57			10	2.50 ± 1.57	10	5.50 ± 1.16			10	5.50 ± 1.16
	Hasanjoni.	"	7	10.00 ± 1.93	3	15.67 ± 7.36	10	11.70 ± 1.58	8	7.63 ± 2.28	2	11.50 ± 5.31	10	8.40 ± 2.11
	Pupri.	Muzaffarpur.	10	9.40 ± 1.23			10	9.40 ± 1.23	10	10.30 ± 1.44			10	10.30 ± 1.44
	Riga.	"	10	12.60 ± 2.09			10	12.60 ± 2.09	9	9.89 ± 0.75	1	5.00	10	9.40 ± 0.73
	Mansi.	Monghyr.	6	20.17 ± 1.77	4	17.75 ± 0.35	10	19.20 ± 1.73	8	1.50 ± 0.27	2	26.00 ± 5.72	10	6.40 ± 2.67
	Begusarai.	"	8	12.88 ± 2.12	2	18.50 ± 2.55	10	14.00 ± 1.87	9	8.44 ± 1.69	1	16.00	10	9.20 ± 1.69
	Bachhari.	"	6	12.00 ± 2.52	4	15.75 ± 1.39	10	13.50 ± 1.66	7	17.14 ± 4.57	3	38.33 ± 8.33	10	23.50 ± 4.99
	Arari.	Purnia	10	6.90 ± 0.74			10	6.90 ± 0.74	10	10.50 ± 1.64			10	10.50 ± 1.64
	Semarpur.	"	5	2.40 ± 0.80	5	8.40 ± 2.80	10	5.40 ± 1.70	5	3.60 ± 1.12	5	6.60 ± 1.95	10	5.10 ± 1.17
	Total		88	10.09 ± 0.69	22	13.55 ± 1.28	110	10.78 ± 0.62	85	10.65 ± 0.80	25	13.76 ± 2.48	110	11.35 ± 0.87

Order 11 Date 22.1.41 Page 7.6 Station S/D 456

Table (1.10) Contd. Mean Percentages with Standard Errors of Means of Cane to Total Cane.

Sampling Unit = Field (or 3 fields combined)

Region No. 5. Name: Pusa Province: Bihar. District: (No. 10) E. depressoella Swinh.

No.	Locality	District	Month..... February - 1941						Month..... March - 1941					
			Planted		Mixed.		Total		Planted		Mixed.		Total	
	Name		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
P	Pusa	Darbhanga	7	10.57 ± 1.90	3	4.33 ± 2.33	10	8.70 ± 1.72	7	14.14 ± 2.91	3	12.00 ± 4.58	10	13.50 ± 2.34
E	Sakri.	"	9	3.56 ± 0.71	1	3.00	10	3.50 ± 0.60	9	14.44 ± 3.11	1	19.00	10	14.90 ± 2.81
C	Khajanchi	"	7	5.43 ± 1.57	3	4.33 ± 1.35	10	5.10 ± 1.14	9	6.89 ± 1.14	1	8.00	10	7.00 ± 1.02
D	Hatanjore	"	9	19.56 ± 4.36	1	18.00	10	19.40 ± 3.90	10	11.00 ± 1.47			10	11.00 ± 1.47
E	Purori.	Muzaffarpur.	9	10.44 ± 2.05	1	8.00	10	10.20 ± 1.53	10	9.10 ± 1.53			10	9.10 ± 1.53
F	Rigra	"	9	5.22 ± 1.27	1	0.00	10	4.70 ± 1.14	7	17.71 ± 3.11	3	17.67 ± 0.91	10	17.70 ± 2.14
G	Mansi.	Monghyr.	10	6.30 ± 1.63			10	6.30 ± 1.63	9	18.67 ± 3.39	1	3.00	10	17.10 ± 3.24
H	Begusarai.	"	10	5.40 ± 2.86			10	5.40 ± 2.86	10	15.70 ± 1.89			10	15.70 ± 1.89
I	Boachari.	"	10	1.60 ± 0.54			10	1.60 ± 0.54	10	20.00 ± 2.74			10	20.00 ± 2.74
J	Arari.	Purnia	9	14.22 ± 1.39	1	10.00	10	13.80 ± 1.32	10	11.70 ± 1.58			10	11.70 ± 1.58
K	Semajore.	"	9	13.11 ± 1.30	1	11.00	10	12.90 ± 1.18	8	12.25 ± 1.68	2	10.00 ± 1.63	10	11.80 ± 1.40
	Total		98	8.57 ± 0.79	12	6.33 ± 1.52	110	8.60 ± 0.69	99	13.70 ± 0.77	11	12.64 ± 1.87	110	13.59 ± 0.71

Copy: 12 Roll: 224 Date: 9.2.41

REGIONAL SURVEY OF COREA PESTS OF SUGARCANE, 1940

Table (2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = 500 (or 3 workers combined)

Region No. 5 Name Pusa Province Bihar

No.	Borer Name	Month: December, 1940.						Month: January, 1941.					
		Planted		Fixed		Total		Planted		Fixed		Total	
(1)	(2)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
		(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> Sp.	88	13.69 ± 0.85	22	11.82 ± 1.47	110	13.32 ± 1.41	85	17.43 ± 1.40	25	13.80 ± 1.63	110	16.61 ± 1.15
2	<i>A. sticticraspis</i> Hamp.	88	0.26	22	0.32	110	0.27	85	0.11	25	0.00	110	0.09
3	<i>A. tumidicostalis</i> Hamp.	88	2.05	22	4.23	110	2.74	85	2.20	25	3.24	110	2.18
4	<i>D. arvicilia</i> Dudge.	88	2.61	22	1.45	110	2.38	85	2.58	25	1.48	110	2.56
5	<i>D. venosata</i> Wlk.	88	0.00	22	0.00	110	0.00	85	0.03	25	0.00	110	0.05
6	<i>C. zonellus</i> Swinh.	88	0.00	22	0.00	110	0.00	85	0.00	25	0.00	110	0.00
7	<i>C. tryphetus</i> Bisset.	88	0.00	22	0.00	110	0.00	85	0.00	25	0.00	110	0.00
8	<i>R. ablutella</i> Zell.	88	0.00	22	0.00	110	0.00	85	0.00	25	0.00	110	0.00
9	<i>Sesamia</i> Sp.	88	0.09	22	0.09	110	0.09	85	0.00	25	0.00	110	0.00
10	<i>E. depressella</i> Swinh.	88	10.09 ± 0.69	22	13.55 ± 1.28	110	10.78 ± 0.62	85	10.65 ± 0.80	25	13.76 ± 2.48	110	11.35 ± 0.87

Copied 42 Roll 2241 Date 10.6 Checked J.A.D.M. Roll 13/6 Date 13/6

Tab. PA (2) Contd. Mean Percentages with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 2 workern combined)

Region No. 5 Name Pusa Province Bihar

No.	Borer Name	Month..... <u>February - 1941..</u>						Month..... <u>March - 1941..</u>					
		Planted		Mixed.		Total		Planted		Mixed.		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	<i>Scirpophaga</i> Sp.	98	13.47 ± 0.79	12	11.67 ± 1.55	110	13.27 ± 0.72	99	12.96 ± 0.58	11	14.45 ± 3.88	110	13.11 ± 0.64
2	<i>A. sticticraspis</i> Hamp.	98	0.10	12	0.00	110	0.09	99	0.05	11	0.00	110	0.05
3	<i>A. tumidicostalis</i> Hamp.	98	0.87	12	0.00	110	0.75	99	1.34	11	2.91	110	1.50
4	<i>D. aurivillia</i> Budgn.	98	1.37	12	0.42	110	1.59	99	1.48	11	0.45	110	1.38
5	<i>D. venosata</i> Wlk.	98	0.00	12	0.00	110	0.00	99	0.00	11	0.00	110	0.00
6	<i>C. zonellus</i> Swinh.	98	0.00	12	0.00	110	0.00	99	0.00	11	0.00	110	0.00
7	<i>C. trypetus</i> Bisset.	98	0.00	12	0.00	110	0.00	99	0.00	11	0.00	110	0.00
8	<i>R. ablutella</i> Zell.	98	0.00	12	0.00	110	0.00	99	0.00	11	0.00	110	0.00
9	<i>Sesamia</i> Sp.	98	0.17	12	0.00	110	0.14	99	0.06	11	0.00	110	0.05
10	<i>E. depressoella</i> Swinh.	98	8.57 ± 0.79	12	6.33 ± 1.52	110	8.60 ± 0.69	99	13.70 ± 0.77	11	12.64 ± 1.87	110	13.59 ± 0.71

Copied..... W..... Roll..... 224..... Date..... 10.6..... Checked..... SD + BN..... Roll..... Date..... 13/6

REGIONAL SURVEY OF BOREN PESTS OF SUGARCANE, 1940-41

Table No. (3)) Number of Cane, Stalk, Fields, Villages and Localities affected by different Pests.

Region No. 5 District Pusa Province Bihar

Pests Name (1)	December, 1940					January, 1941					February, 1941					March, 1941					
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)	
Chirped sp.	561	495	103	22	11	649	508	108	22	11	450	404	108	22	11	522	439	109	22	11	
A. sticticus	6	6	6	5	5	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2
A. turci	98	83	21	2	5	109	74	22	10	5	26	17	15	16	3	58	44	17	6	3	
P. auricilla	117	90	43	15	11	92	84	42	20	10	55	54	34	14	7	65	53	23	12	6	
D. variator						1	1	1	1	1											
C. conchalis																					
C. tritaceae																					
R. ablutella																					
Sesona sp.	2	2	2	2	2						5	5	5	4	3	9	3	3	2	1	
B. depressa	463	369	106	22	11	428	361	105	22	11	285	263	93	22	11	526	490	100	20	11	
Total Damaged	1054	734	110	22	11	1168	744	108	22	11	792	639	108	22	11	1053	707	109	22	11	
Grand Total	4197	990	110	22	11	3942	990	110	22	11	3436	990	110	22	11	4026	990	110	22	11	

N₁ = $\frac{\text{Percentage}}{\text{Number of canes affected}}$; N₂ = $\frac{\text{Percentage}}{\text{Number of stalks affected}}$; N₃ = $\frac{\text{Percentage}}{\text{Number of fields affected}}$; N₄ = $\frac{\text{Percentage}}{\text{Number of villages affected}}$; N₅ = $\frac{\text{Percentage}}{\text{Number of localities affected}}$.

Counted by HC Date 11/2/41 Checked by SD Date 15/2
 14-1-41

NATIONAL SURVEY OF FOREP PESTS OF SPINNING, 1940-41

Tr. Pu (3) Ganta.

Parish No. 5

Pusa

Bihar

Genetic Name (1)	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)
Spinach	561	495	103	22	11	649	508	108	22	11	450	404	108	22	11	522	439	109	22	11
Spinach	6	6	6	5	5	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2
Spinach	98	83	21	8	5	109	74	22	10	5	26	17	15	16	3	58	44	17	6	3
Spinach	117	90	43	15	11	92	84	42	20	10	55	54	34	14	7	65	53	23	12	6
Spinach						1	1	1	1	1										
Spinach																				
Spinach																				
Spinach																				
Spinach	2	2	2	2	2						5	5	5	4	3	3	3	3	2	1
Spinach	463	369	106	22	11	428	361	105	22	11	285	263	93	22	11	526	490	100	20	11
Total damaged	1054	734	110	22	11	1168	744	108	22	11	792	639	108	22	11	1053	707	109	22	11
Grand total	4137	990	110	22	11	3942	990	110	22	11	3436	990	110	22	11	4026	990	110	22	11

Percentage

affected

Percentage

Percentage

Percentage

Percentage

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table *Pu(47)* Percentage of Cane, Hoops, Fields, Villages, & Localities affected by different Borers.
 Region No. *5* District *Pusa* Province *Patna*

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
<i>Scirpophaga</i> sp.	13.6	50.0	92.6	100.0	100.0	16.5	51.3	98.2	100.0	100.0	13.1	40.8	98.2	100.0	100.0	12.9	44.3	99.1	100.0	100.0
<i>A. ticti</i> Hamp.	0.2	0.6	5.5	22.7	45.5	0.1	0.2	0.9	4.5	9.1	0.1	0.2	1.8	9.1	18.2	0.0	0.2	1.8	9.1	18.2
<i>A. turticollis</i> Hamp.	2.4	8.4	19.1	36.4	45.5	2.8	7.5	20.0	45.5	45.5	0.8	1.7	13.6	72.7	27.3	1.4	4.4	15.5	27.3	27.3
<i>P. auricollis</i> Burd.	2.8	9.1	39.1	68.2	100.0	2.3	8.5	38.2	90.9	90.9	1.6	5.4	30.9	63.6	63.6	1.6	5.4	20.9	54.5	54.5
<i>M. venosus</i> Wlk.						0.0	0.1	1.9	4.6	9.1										
<i>Chorillus</i> Swinh.										1										
<i>A. strigatus</i> Bizet																				
<i>Phabutella</i> Zell.																				
<i>Spodis</i> sp.	0.1	0.2	1.8	9.1	18.2						0.1	0.5	4.5	18.2	27.3	0.1	0.3	2.7	9.1	9.1
<i>Democossus</i> Swinh.	11.2	37.3	96.4	100.0	100.0	10.9	36.5	95.5	100.0	100.0	8.3	26.6	84.5	100.0	100.0	13.0	49.5	90.9	90.9	100.0
Total Damaged	25.5	74.1	100.0	100.0	100.0	26.4	75.1	98.2	100.0	100.0	23.0	64.5	98.2	100.0	100.0	26.1	71.4	99.1	100.0	100.0

N₁ = Percentage of canes affected; N₂ = Percentage of hoops affected; N₃ = Percentage of fields affected; N₄ = Percentage of villages affected; N₅ = Percentage of localities affected.

Collected *1/1* Roll *1/1* Date *11/1/41* Checked *D* Roll *13/6* Rte. *13/6*

FIELD SURVEY OF BOHRER PLOTS OF SUGARCANE 1940-41

Tab. (5).

Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit - Stool

Region No. 5 Name Pusa Province Bihar

No.	Village	Month. December - 1940.								Month. January - 1941.							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	22.67	15	17.73	15	14.33	45	18.24	15	30.20	15	13.67	15	22.67	45	22.18
	2	15	30.60	15	27.53	15	14.33	45	24.12	15	42.47	15	30.13	15	18.33	45	30.31
B	1	15	52.60	15	36.53	15	31.53	45	40.22	15	59.00	15	51.67	15	59.73	45	56.80
	2	15	20.33	15	23.53	15	17.00	45	20.29	15	45.07	15	53.80	15	35.00	45	44.62
C	1	15	47.87	15	25.40	15	27.73	45	33.67	15	35.53	15	19.07	15	15.53	45	23.38
	2	15	57.57	15	30.87	15	26.00	45	38.14	15	26.20	15	18.07	15	32.33	45	25.53
D	1	15	23.73	15	29.93	15	25.80	45	26.49	15	30.87	15	25.27	15	18.67	45	24.94
	2	15	34.20	15	33.80	15	18.27	45	28.76	15	25.33	15	24.27	15	28.33	45	25.98
E	1	15	19.87	15	15.13	15	25.13	45	20.04	15	20.67	15	27.93	15	19.87	45	22.82
	2	15	9.33	15	10.00	15	25.53	45	14.89	15	22.53	15	24.40	15	20.80	45	22.58
F	1	15	10.33	15	12.00	15	11.33	45	11.22	15	25.67	15	27.13	15	15.00	45	22.60
	2	15	16.33	15	21.33	15	22.53	45	20.06	15	27.93	15	19.27	15	18.93	45	22.04
G	1	15	42.73	15	14.93	15	14.33	45	23.96	15	41.67	15	43.33	15	45.40	45	43.47
	2	15	28.47	15	25.27	15	25.67	45	26.30	15	43.73	15	34.80	15	49.20	45	42.58
H	1	15	25.40	15	22.60	15	16.87	45	21.62	15	20.40	15	11.33	15	13.00	45	17.51
	2	15	8.20	15	22.07	15	18.53	45	16.27	15	23.53	15	17.33	15	20.80	45	20.55
I	1	15	17.27	15	17.33	15	26.73	45	20.44	15	22.60	15	11.00	15	28.87	45	18.16
	2	15	26.27	15	16.73	15	22.67	45	21.89	15	42.60	15	37.93	15	53.93	45	44.82
J	1	15	41.07	15	28.53	15	23.33	45	30.98	15	42.80	15	30.80	15	53.33	45	42.31
	2	15	22.87	15	20.80	15	20.13	45	21.27	15	22.80	15	30.20	15	17.80	45	23.60
K	1	15	35.93	15	35.93	15	35.87	45	35.91	15	38.80	15	39.60	15	11.87	45	30.09
	2	15	37.47	15	24.27	15	23.33	45	28.35	15	36.80	15	45.80	15	18.60	45	33.73
Total		330	28.61	330	23.22	330	22.11	990	24.67	330	33.05	330	28.94	330	27.45	990	29.91

Copies..... 11 Roll. 2211 Date. 10.6

Checked..... SA Roll. Date. 13.6

FEDERAL SURVEY OF BOMBER PESTS OF SUGARCANE 1940-41

Table (5) *Contd* Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 5 Name Pusa Province Bihar

No.	Village	Month. <u>February - 1941</u>								Month. <u>March - 1941</u>							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
A	1	15	26.80	15	24.47	15	22.93	45	24.73	15	17.27	15	24.33	15	19.07	45	20.22
B	2	15	32.67	15	32.13	15	22.47	45	29.09	15	32.13	15	26.00	15	23.33	45	27.15
	-	15	29.47	15	41.73	15	27.00	45	32.73	15	33.93	15	29.07	15	14.40	45	25.80
	2	15	26.93	15	23.73	15	26.53	45	25.73	15	23.80	15	22.87	15	28.27	45	24.98
C	1	15	28.53	15	21.53	15	17.67	45	22.58	15	24.87	15	16.87	15	19.47	45	20.40
	2	15	25.73	15	16.07	15	13.80	45	18.53	15	18.47	15	25.60	15	17.13	45	20.40
D	-	15	35.40	15	33.73	15	36.67	45	35.27	15	32.53	15	28.33	15	24.67	45	28.51
	2	15	28.67	15	18.13	15	24.87	45	23.89	15	40.00	15	24.27	15	26.87	45	30.38
E	1	15	20.27	15	16.20	15	13.47	45	16.65	15	18.27	15	22.00	15	18.47	45	19.58
	-	15	17.07	15	12.53	15	21.93	45	17.18	15	22.93	15	19.33	15	15.00	45	19.09
F	1	15	34.40	15	21.60	15	32.93	45	29.64	15	18.47	15	20.47	15	24.87	45	21.27
	2	15	23.73	15	20.53	15	20.40	45	21.55	15	30.27	15	19.53	15	22.20	45	24.00
G	1	15	24.67	15	18.47	15	18.20	45	20.45	15	29.00	15	24.40	15	28.93	45	27.44
	2	15	16.33	15	12.13	15	15.47	45	14.64	15	21.40	15	20.20	15	27.60	45	23.07
H	1	15	27.73	15	35.07	15	22.93	45	28.58	15	26.00	15	24.33	15	21.47	45	28.05
	2	15	19.73	15	16.87	15	19.33	45	18.64	15	24.20	15	29.07	15	29.07	45	27.45
I	1	15	28.27	15	16.53	15	11.60	45	18.80	15	40.67	15	21.93	15	30.80	45	31.13
	2	15	22.67	15	7.20	15	7.73	45	12.53	15	21.20	15	31.40	15	27.33	45	26.64
J	1	15	26.93	15	21.53	15	24.80	45	24.42	15	25.00	15	23.07	15	20.20	45	22.76
	2	15	18.13	15	25.60	15	24.20	45	22.64	15	23.27	15	34.47	15	23.80	45	27.18
K	1	15	19.27	15	17.60	15	21.53	45	19.47	15	37.28	15	21.00	15	19.87	45	26.05
	2	15	22.67	15	15.53	15	22.67	45	20.29	15	25.13	15	36.40	15	35.07	45	32.20
Total		330	24.90	330	21.34	330	21.39	990	22.60	330	26.64	330	24.83	330	25.36	990	25.00

Copied 41 Roll 224 Date 10.6
 Checked SP Roll 1011 Date 10/10

Dist. PU (6)

Reporting Unit: District

District No.

5

Name

Pusa

Province Bihar

No.	Name	District	Month December - 1940								Month January - 1941							
			(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
	Pusa	Darbhanga	30	26.63	30	22.63	30	14.33	90	21.20	30	36.33	30	21.90	30	20.50	90	26.24
	Sakri	"	30	36.47	30	30.03	30	24.27	90	30.26	30	52.03	30	52.73	30	47.37	90	50.71
	Khajanchi	"	30	52.67	30	28.13	30	26.87	90	35.89	30	30.87	30	18.57	30	23.93	90	24.46
	Hassanpore	"	30	28.97	30	31.87	30	22.03	90	27.62	30	28.10	30	24.77	30	23.50	90	25.46
	Pupri	Muzaffarpur	30	14.60	30	12.57	30	25.33	90	17.50	30	21.60	30	26.17	30	20.33	90	22.70
	Riga	"	30	13.33	30	16.67	30	16.93	90	15.64	30	26.80	30	23.20	30	16.97	90	22.32
	Mansi	Monghyr	30	35.60	30	20.10	30	19.67	90	25.12	30	42.70	30	39.07	30	47.30	90	43.02
	Begusarai	"	30	16.80	30	21.67	30	17.70	90	18.72	30	21.97	30	14.33	30	16.90	90	17.73
	Bachwarra	"	30	21.77	30	17.03	30	24.70	90	21.17	30	32.60	30	24.47	30	37.40	90	31.49
	Araria	Prinia	30	31.97	30	24.67	30	21.73	90	26.12	30	32.80	30	30.50	30	35.57	90	32.96
	Semarpore	"	30	36.70	30	30.10	30	29.60	90	32.13	30	37.80	30	42.70	30	15.23	90	31.91
	Total		330	28.61	330	23.22	330	22.11	990	24.67	330	33.05	330	28.94	330	27.45	990	29.91

Copied... 11... 224... 4.6... 13/6

NATIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Form (5) Contd.

Mean Abundance of Damage Done to Total Cane by Localities x Workers x Months

Sampling Unit = Stool

Region No. 5

Name Pusa

Province

Bihar

Locality		Classification	Month..... February - 1941.....								Month..... March - 1941.....							
No.	Name	(3)	Marker 1		Marker 2		Marker 3		Total		Marker 1		Marker 2		Marker 3		Total	
			N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
	Pusa	Darbhanga	30	29.73	30	28.30	30	28.39	90	27.14	30	24.70	30	25.17	30	21.20	90	25.69
	Saxvi	"	30	28.20	30	32.70	30	26.77	90	29.22	30	28.87	30	25.97	30	21.33	90	25.39
	Khajanchi	"	30	27.13	30	18.80	30	15.73	90	20.55	30	21.67	30	21.91	30	18.30	90	20.62
	Hasanpur	"	30	32.03	30	25.93	30	30.77	90	29.58	30	36.27	30	26.30	30	25.77	90	29.45
	Pipri	Muzaffarpur	30	18.67	30	14.37	30	17.70	90	16.91	30	20.60	30	20.67	30	16.73	90	19.33
	Riga	"	30	29.07	30	21.07	30	26.67	90	25.60	30	24.37	30	20.00	30	23.53	90	22.63
G	Hawsia	Monghyr	30	18.40	30	15.30	30	16.83	90	16.84	30	25.20	30	22.30	30	28.27	90	25.26
H	Begusarai	"	30	23.73	30	25.97	30	21.13	90	23.61	30	25.10	30	26.70	30	25.27	90	25.69
I	Bachwara	"	30	25.47	30	11.87	30	9.67	90	15.67	30	30.90	30	26.67	30	29.07	90	28.89
J	Araria	Purnia	30	22.53	30	23.57	30	24.50	90	23.53	30	24.13	30	28.77	30	22.00	90	24.97
K	Semarpur	"	30	20.97	30	16.90	30	22.10	90	19.99	30	31.17	30	28.70	30	27.47	90	29.11
Total			330	24.90	330	21.34	330	21.39	990	22.60	330	26.64	330	24.83	330	25.36	990	25.00

Copied..... 1/1 Roll..... 24 Date..... 12.6 Checked..... J.A. Roll..... Date..... 13/6

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (7)) Mean Percentage of Damaged Cane to Total Cane
by Localities and Months

Region No. 5 Name Pusa Province Bihar

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Pusa	90	21.20	90	26.24	90	27.14	90	23.69
B Sakri	90	30.26	90	50.71	90	29.22	90	25.39
C Khajanti	90	35.89	90	24.46	90	20.55	90	20.62
D Hasanpur	90	27.62	90	25.46	90	29.58	90	29.45
E Puri	90	17.50	90	22.70	90	16.94	90	19.33
F Riga	90	15.64	90	22.32	90	25.60	90	22.63
G Bansi	90	25.12	90	43.02	90	16.84	90	25.26
H Begusarai	90	18.72	90	17.73	90	23.61	90	25.69
I Bachhara	90	21.17	90	31.49	90	15.67	90	28.89
J Araria	90	26.12	90	32.96	90	23.53	90	24.97
K Samarpur	90	32.13	90	31.91	90	19.99	90	29.11
Total	990	24.67	990	29.91	990	22.60	990	25.00

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Table PL(8) Analysis of Variance

Source of Variation (1)	df. (2)	Sum of Squares (3)	Variance (4)	Ratio of Variance (5)
Between Months	3	627.90	209.30	6.82**
Between Localities	10	1330.70	133.07	4.33**
Month & Localities	30	2086.06	69.54	2.27**
Between Villages (within Month & Locality)	44	1350.64	30.70	
Total	87	5395.30		

REGION NO.(6) : DACCA (BENGAL)

Material

92. In December 1940 only 6 localities were surveyed in which 56 fields were examined. In January 1941 all 11 localities were surveyed, but records of only 9 localities with 50 fields altogether were received by us; the other fields visited had been already harvested. In February 1941 no field work was done owing to lack of funds for travelling allowance. As for March 1941, field records for only one locality were received in the Statistical Laboratory; but the crop in the sample fields consisted only of shoots. The present report is therefore based on results obtained for 56 fields surveyed in December 1940 and 50 fields surveyed in January 1941. Most of the fields were 'planted' and the rest had 'mixed' cropping.

Damage by Individual Borers

93. Tables D(1.1) - D(1.10) give the percentage of canes damaged by each of the ten borers in December and January. The results for the region as a whole are given in the standard form in Table D(2).

94. We notice that borer No.(1) occurred most frequently in this region with percentage of damage equal to 17 and 25 per cent in December 1940 and January 1941 respectively. The difference between the two months is not statistically significant.

95. The next important borer was No.(5) with a rate of attack equal to 8 per cent and 13 per cent in December and January respectively. Borer No.(2) follows as third in order of intensity of attack with a percentage damage of about 5 per cent on an average over the period of 2 months.

96. From Tables D(1.1) - D(1.10) it will be seen that there is considerable variation between localities in the percentage damaged by each borer. Thus taking the most important borer No.(1), we see from Table D(1.1) that the percentage varied from 7 to 25 per cent in December 1940 (col.9), and from 7 to 32 per cent in January 1941 (col.15). For borer No.(5) we see from Table D(1.5) that the percentage varied from 5 to 15 per cent in December 1940; and from 2 to 28 per cent in January 1941.

Effect of 'Ratooning'

97. In the case of borer Nos.(1) and (5) the percentage of attack was less in 'mixed' fields than in 'planted' fields in both the months. In case of borer No.(2) the position was just the reverse. None of the differences is, however, statistically significant; so that it is not possible to come to any definite conclusion about the effect of ratooning on the incidence of borers.

Spread of Borers

98. Tables D(5) and D(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. Borer Nos.(1) and (5) were present in every locality and village in December 1940. In January 1941 each of these borers was absent from only one village, while borer No.(5) was absent from only one locality. Borer Nos.(2) and (10) were also widespread among localities in December although the percentage of canes damaged by each of them was comparatively small. Borer Nos.(5) - (9) were totally absent. Tables D(1.5) - D(1.9) have therefore been omitted.

Results by Workers and Localities

99. Table D(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table D(6) gives the consolidated percentages for each locality; and Table D(7) the mean percentage of damaged canes for each locality in each month. There was considerable variation between the estimates derived by the three workers; worker No.(5) gave much lower percentages than the other two in both the months.

Monthly Fluctuations

100. From Table D(7) we notice that the percentage damage caused by all borers taken together was 25 per cent in December 1940 compared to 58 per cent in January 1941.

Variation between Localities

101. The variation between localities was not negligible. The intensity of attack varied from 14 to 29 per cent in December; and from 24 to 52 per cent in January.

102. Owing to the non-orthogonal nature of the data in Table D(7) a statistical analysis of the material could not be carried out for want of time for using appropriate but laborious methods.

D (14)

Mean Percentage with Standard Error of Difference of Damaged Cane to Total Cane.

Sampling Unit = Field (or 8 workable sub-units)

Reason No. 6 Name Dacca

Province Bengal

Cane's Name No. (1) Scirpophaga sp.

Locality		District	Month December, 1940						Month January, 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)			
	Dacca	Dacca	2	18.00 ± 4.00	8	17.25 ± 1.00	10	17.40 ± 1.00			1	22.00 ±	1	22.00
	Munshiganj													
	Prodyotnagar	Mymensingh	8	19.50 ± 1.46	2	25.00 ± 2.00	10	20.60 ± 1.38	6	15.50 ± 1.78	1	52.00	7	20.71 ± 5.43
	Sitalganj	Dinajpur							5	32.40 ± 3.60			5	32.40 ± 3.60
	Dinajpur	"							4	19.75 ± 9.87	3	13.33 ± 4.40	7	17.00 ± 2.65
	Gopalfur	Rajshahi							8	28.38 ± 3.82			8	28.38 ± 3.82
	Pabna	Pabna	10	16.10 ± 1.92			10	16.10 ± 1.92	9	32.44 ± 2.45	1	25.00	10	31.70 ± 2.32
	Berhampur	Murshidabad							1	30.00	1	17.00	2	23.50 ± 6.52
	Rangpur	Rangpur	3	9.67 ± 4.62	6	5.00 ± 2.38	9	6.56 ± 2.16	4	6.00 ± 3.67	3	12.67 ± 1.82	7	17.43 ± 3.21
	Darsana	Kadia	2	30.00 ± 2.00	6	23.00 ± 2.74	8	24.75 ± 2.35						
	Muslandpur	24-Barganas	9	14.22 ± 1.70			9	14.22 ± 1.70	3	19.00 ± 2.00			3	19.00 ± 2.00
Total			34	16.76 ± 1.14	22	16.18 ± 1.89	56	16.54 ± 1.01	40	24.10 ± 1.78	10	19.40 ± 4.07	50	23.16 ± 3.70

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D(12)

Mean Percentages with Standard Error of Difference of Damage to Total Cane

Sampling Unit = Field (or 3 workers combined)

Region No. 6 Name Dacca Province Bengal Cane's Name 10(2) *Asiaticraspis* Hampson (2)

No.	Locality Name	District	Month... December..... 1940.....						Month... January..... 1941.....					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Dacca	Dacca	2	0.00	8	0.00	10	0.00			1	0.00	1	0.00
E	Munshigonj	Dacca												
C	Prodyatnagar	Mymensingh	8	2.12 ± 0.71	2	0.00	10	1.70 ± 0.63	6	8.50 ± 3.61	1	3.00	7	7.71 ± 2.62
U	Sitalgonj	Dinajpur							5	0.60 ± 0.60			5	0.60 ± 0.60
E	Dinajpur	Dinajpur							4	1.00 ± 1.00	3	12.67 ± 6.38	7	6.00 ± 3.40
F	Gobalpur	Rajshahi							8	2.38 ± 0.50			8	2.38 ± 0.50
G	Pabna	Pabna	10	0.80 ± 0.32			10	0.80 ± 0.32	9	2.22 ± 1.00	1	7.00	10	2.70 ± 1.00
H	Berhampur	Murshidabad							1	0.00	1	9.00	2	4.50 ± 4.30
I	Rangpur	Rangpur	3	7.67 ± 6.27	6	8.67 ± 3.87	9	8.33 ± 3.50	4	18.75 ± 7.23	3	0.00	7	10.71 ± 1.58
J	Garessua	Nachua	2	0.00	6	0.33 ± 0.21	8	0.25 ± 0.18						
K	Munshandpur	24 Parganas	9	1.33 ± 0.47			9	1.33 ± 0.47	3	2.00 ± 1.00			3	2.00 ± 1.00
	Total		34	1.76 ± 0.69	22	2.45 ± 1.69	56	2.04 ± 0.66	40	4.45 ± 1.18	10	5.70 ± 2.45	50	4.70 ± 1.06

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Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 6 Name Dacca

Province Bengal

Genetic Name No. (3) *A. tumidicostalis* Hampen.

Locality		District	Month December, 1940						Month January, 1941					
No.	Name		Planted		Mixed		Total	Planted		Mixed		Total		
			Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Dacca	Dacca	2	9.00 ± 2.00	8	0.00	10	7.90 ± 1.48			1	4.00	1	4.00
	Munshiganj	"												
	Prodyotnagar	Mymensingh	8	8.12 ± 1.94	2	0.00	10	7.40 ± 1.61	6	4.17 ± 0.71	1	0.00	7	3.57 ± 0.84
	Sitalganj	Dinajpur							5	27.80 ± 6.45			5	27.80 ± 6.45
	Dinajpur	"							4	16.26 ± 2.40	3	7.33 ± 7.33	7	12.43 ± 3.55
	Gopalpur	Rajshahi							8	13.25 ± 2.18			8	13.25 ± 2.18
	Pabna	Pabna	10	12.50 ± 1.73			10	12.50 ± 1.73	9	18.56 ± 2.11	1	15.00 ±	10	18.20 ± 1.92
	Berhampur	Murshidabad							1	4.00	1	0.00	2	2.00 ± 2.00
I	Rangpur	Rangpur	3	5.67 ± 3.83	6	8.67 ± 3.87	9	10.78 ± 1.37	4	5.25 ± 3.50	3	21.33 ± 7.21	7	12.15 ± 4.66
J	Darsana	Kadia	2	3.00 ± 2.12	6	0.33 ± 0.21	8	5.62 ± 1.17						
K	Mulardpur	24-Parganas	9	3.00 ± 0.94			9	3.00 ± 0.94	3	5.33 ± 1.41			3	5.33 ± 1.41
	Total		34	7.59 ± 0.98	22	2.45 ± 1.69	56	7.62 ± 0.75	40	13.58 ± 1.61	10	10.50 ± 3.79	50	12.96 ± 1.49

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Table (14) Mean Percentages with Standard Errors of Percent of Damage to Total Cause.

Sampling Unit = Field (of 2 farmers combined)

Acres No. 6 Name Dacca Province Bengal Female Name 10(4) Dauricilia Dutta (4)

Locality		District	Month... December 1940						Month... January 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Jacca	Dacca	2	0.00	8	0.00					1	0.00	1	0.00
E	Munshiganj	Dacca												
C	Prodyatnagar	Myhansingh	8	0.00	2	0.00		10 0.00	6	0.00	1	0.00	7	0.00
E	Sitalganj	Dinajpur							5	0.00			5	0.00
E	Dinajpur	Dinajpur							4	0.00	3	0.00	7	0.00
F	Gopalpur	Rajshahi							8	0.00			8	0.00
G	Palona	Palona	10	0.00				10 0.00	9	0.00	1	0.00	10	0.00
H	Berhampur	Murshidabad							1	0.00	1	0.00	2	0.00
I	Rangpur	Rangpur	3	0.00	6	0.00		9 0.00	4	0.00	3	0.00	7	0.00
J	Darsua	Nadia	2	0.00	6	0.00		8 0.00						
K	Muslandpur	24 Parganas	9	0.00				9 0.00	3	0.50			3	0.50
	Total		34	0.00	22	0.00		56 0.00	40	0.01	10	0.00	50	0.00

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Table (110)

Mean Percentage with Standard Error of Mean of Time to Total Cane.

Sampling Unit = Field (3 workers combined)

Region No. 6 Name: Dacca Province: Bengal Locality Name: 10(10) E depressella Swinh (10)

No.	Locality Name	District	Month... December... 1940...						Month... January... 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Dacca	Dacca	2	0.00	8	0.00	10	0.00			1	0.00	1	0.00
E	Munshiganj	Dacca												
C	Prodyotnagar	Mymensingh	8	0.37 ± 0.35	2	0.00	10	0.30 ± 0.30	6	3.67 ± 2.12	1	0.00	7	3.14 ± 1.85
E	Sitalganj	Dinajpur							5	0.00			5	0.00
E	Dinajpur	Dinajpur							4	0.00	3	0.00	7	0.00
F	Gopalpur	Rajshahi							8	0.00			8	0.00
G	Pabna	Pabna	10	0.40 ± 0.32			10	0.40 ± 0.32	9	0.33 ± 0.33	1	0.40	10	0.34 ± 0.32
H	Berhampur	Murshidabad							1	0.00	1	0.00	2	0.00
I	Rangpur	Rangpur	3	0.43 ± 0.37	6	0.67 ± 0.41	9	0.54 ± 0.28	4	7.50 ± 3.87	3	0.00	7	4.28 ± 2.51
J	Darazasa	Nadia	2	0.67 ± 0.57	6	1.00 ± 0.41	8	0.89 ± 0.33						
K	Mustafapur	24- Parganas	9	0.44 ± 0.33			9	0.44 ± 0.33	3	1.00 ± 1.00			3	1.00 ± 1.00
	Total		34	0.47 ± 0.17	22	0.45 ± 0.06	56	0.46 ± 0.14	40	1.45 ± 0.59	16	0.44 ± 0.44	56	1.20 ± 0.48

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Table (2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or workers combined)

Region No. 6 Name Dacca Province Bengal

No.	Borer Name	Month December 1940						Month January 1941					
		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> sp.	34	16.76 ± 1.14	22	16.18 ± 1.89	56	16.54 ± 1.01	40	24.10 ± 1.78	10	19.40 ± 4.07	50	23.16 ± 3.70
2	<i>A. sticticraspis</i> Hmps.	34	1.76 ± 0.69	22	2.45 ± 1.69	56	2.04 ± 0.66	40	4.45 ± 1.18	10	5.70 ± 2.45	50	4.70 ± 1.06
3	<i>A. tumidicostalis</i> Hmps.	34	7.59 ± 0.98	22	2.45 ± 1.69	56	7.62 ± 0.75	40	13.58 ± 1.61	10	10.50 ± 3.79	50	12.96 ± 1.49
4	<i>D. annicilia</i> Dudgeon	34	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
5	<i>D. venosata</i> Wlk.	34	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
6	<i>C. zonellus</i> Swinh.	34	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
7	<i>C. tryphates</i> Bisset	24	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
8	<i>R. albivittella</i> Zoll.	34	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
9	<i>Sesamia</i> sp.	34	0.00	22	0.00	56	0.00	40	0.00	10	0.00	50	0.00
10	<i>E. depressella</i> Swinh.	34	0.47 ± 0.17	22	0.45 ± 0.06	56	0.46 ± 0.14	40	1.45 ± 0.59	10	0.96 ± 0.49	50	1.20 ± 0.45

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REGIONAL SERVICE OF BOREM PESTS OF INDIA

Table D 3) Number of Canes, Stools, Fields, Villages, & Localities affected by different Borers.

Form No. 6 Dacca Bengal

Borer's Name (1)	December 1940					Jan., 1941					February, 1941					March, 1941				
	H ₁ (2)	H ₂ (3)	H ₃ (4)	H ₄ (5)	H ₅ (6)	H ₁ (7)	H ₂ (8)	H ₃ (9)	H ₄ (10)	H ₅ (11)	H ₁ (12)	H ₂ (13)	H ₃ (14)	H ₄ (15)	H ₅ (16)	H ₁ (17)	H ₂ (18)	H ₃ (19)	H ₄ (20)	H ₅ (21)
Salpophaga sp.	457	327	53	12	6	455	303	47	15	9										
M. rotundifolia	50	47	19	8	5	64	57	23	10	7										
Choristolepta	222	181	48	12	6	290	200	46	15	8										
P. auricollis						1	1	1	1	1										
D. variabilis																				
C. variabilis																				
C. variabilis																				
R. variabilis																				
Sesamia																				
E. depressa Swinn.	12	12	12	5	5	3	3	3	2	2										
Total damaged	688	417	56	12	6	723	394	50	16	9										
Grand Total	2724	503	56	12	6	1905	450	50	16	9										

H₁ = Number of canes, stools, fields, villages, & localities affected; H₂ = Number of fields affected; H₃ = Number of villages affected; H₄ = Number of localities affected; H₅ = Number of fields affected.

Collected by: *Shobha Roy* Date: 10/10/62 263 Int: 28-41

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REGIONAL SURVEY OF BOREM PESTS OF SUGARCANE, 1940-41

Table (D) (4). Percentage of Canes, Stalks, Fields, Villages & localities, affected by different Borers

Station No. 6 Date Dacca Province Bengal

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Scirpophaga sp.	16.8	65.0	94.6	100.0	100.0	23.9	67.5	94.0	93.8	100.0										
A. ruficollis Hamp.	1.8	9.3	33.9	66.7	83.3	3.4	12.7	46.0	62.5	77.8										
A. turid. Hamp.	8.1	36.0	85.7	100.0	100.0	15.2	44.5	92.0	93.8	88.9										
D. auricilia Digt.						0.0	0.2	2.0	6.3	11.1										
D. venosus Mik.																				
C. zonellus Sindh.																				
C. thripetes Hiest.																				
R. ablutella Zell.																				
Secunia sp.																				
H. depress. Sindh.	0.4	2.4	21.4	41.7	83.3	0.2	0.7	6.0	12.5	22.2										
Total damaged	25.2	82.9	100.0	100.0	100.0	38.0	87.7	100.0	100.0	100.0										

N₁ = number of canes affected; N₂ = number of stalks affected; N₃ = number of fields affected; N₄ = number of villages affected; N₅ = number of localities affected.

Collected by P. Chatterjee Date 11/6/41 Checked by Shalbyer Date 12/22/41

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REGIONAL SURVEY OF BOMER PESTS OF SUGARCANE 1940-41

Table (5)

Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 6 Name Dacca Province Bengal

Locality	Village No	Month. <u>December, 1940</u>								Month. <u>January, 1941</u>							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	31.80	15	22.13	15	20.93	45	24.95	3	22.00	3	52.67	3	19.33	9	31.33
	2	15	27.47	15	22.00	15	20.67	45	23.38								
B	1																
C	1	15	33.00	15	27.80	15	24.80	45	28.53	9	20.00	9	37.00	9	9.60	27	19.91
	2	15	28.33	15	32.80	15	26.87	45	29.33	12	44.00	12	46.50	12	28.67	36	39.72
D	1									3	72.67	3	75.67	3	17.67	9	55.34
	2									12	74.75	12	46.83	12	30.67	36	50.75
E	1									15	23.33	15	39.93	15	22.07	45	28.44
	2									6	37.17	6	39.17	6	19.33	18	31.89
F	1									15	31.67	15	66.47	15	35.87	45	44.67
	2									9	28.22	9	47.78	9	18.78	27	31.59
G	1	15	22.67	15	37.47	15	18.13	45	26.09	15	50.07	15	43.20	15	43.80	45	45.69
	2	15	24.27	15	26.73	15	15.47	45	22.16	15	46.27	15	42.73	15	50.40	45	46.47
H	1									6	37.17	6	26.83	6	20.50	18	28.17
	2																
I	1	15	21.60	15	21.13	15	26.13	45	22.95	12	35.92	12	31.17	12	22.25	36	29.78
	2	12	27.75	12	28.83	12	18.00	36	24.85	9	24.89	9	77.78	9	29.56	27	44.08
J	1	9	31.22	9	26.44	9	13.56	27	23.74								
	2	15	49.67	15	29.20	14	17.21	44	32.03								
K	1	12	24.08	12	19.83	12	13.07	36	18.54	3	24.33	3	17.67	3	17.67	9	19.89
	2	15	17.60	15	15.73	15	14.00	45	15.78	6	60.33	6	25.83	6	25.00	18	37.00
Total		168	28.76	168	25.88	167	19.29	503	24.73	150	40.45	150	45.54	150	28.16	450	37.91

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Checked: Shankar B. K. S. S. Roll: 260-163 Date: 2.8.41

Table (6) — Mean Percentage of Damaged Cane to Total Cane : by Localities x Workers x Months

Region No. ... 6

Name ... Dacca

Bengal

Sampling Unit = Stool

No.	Name	District	Month... <u>December</u> ... 1940.								Month... <u>January</u> ... 1941.							
			Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
			N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
A	Dacca	Dacca	20	29.63	30	22.07	30	20.80	90	24.17	3	22.00	3	52.67	3	19.33	9	31.23
B	Munshiganj	Dacca																
C	Prodyothagar	Mymensingh	30	30.67	30	30.30	30	25.83	90	28.93	21	34.40	21	42.42	21	18.07	63	30.29
D	Sitalganj	Dinajpur									15	74.33	15	52.60	15	28.07	45	51.67
E	Dinajpur	Dinajpur									21	27.71	21	39.71	21	21.29	63	29.57
F	Gopalpur	Rajshahi									24	30.78	24	59.46	24	29.46	72	39.90
G	Palna	Palna	30	23.47	30	32.10	30	16.80	90	24.12	30	48.17	30	42.97	30	13.79	90	34.27
H	Berhampur	Mirshidabas									6	52.13	6	26.83	6	20.50	18	33.28
I	Rangpur	Rangpur	27	27.41	27	24.56	27	22.52	81	24.83	21	31.19	21	51.14	21	25.38	63	23.90
J	Bansura	Nadia	24	42.75	24	28.17	23	15.78	71	29.08								
K	Muladpur	24 Sarganas	27	10.48	27	17.56	27	13.53	81	13.84	9	35.89	9	23.11	9	22.56	27	27.19
Total			168	28.76	168	25.88	167	19.29	503	24.73	150	40.47	150	45.54	150	28.16	450	37.91

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (7) Mean Percentage of Damaged Cane to Total Cane by Localities and Months

Region No. 6 Name Dacca Province Bengal

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dacca	90	24.17	91	31.33				
Munshiganj								
Prodyotnagar	90	28.93	63	30.39				
Sikalganj			45	51.67				
Dinajpur			63	29.57				
Gopalpur			72	39.90				
Pabna	90	24.12	90	46.97 28.17 23.28				
Berhampur			18	33.28				
Rangpur	81	24.83	63	23.90				
Marsaya	71	29.08						
Munsampur	81	13.84	27	27.19				
Total	503	24.73	450	37.91				

Collected by S. K. Dutt Date 2.1.6 Date 9.7.41.
 Checked by S. K. Dutt Date 2.8.41 Date 2.8.41.

cont. page 13/6

REGION NO.(7) : CUTTACK (ORISSA)

Material

103. All the 11 localities or 110 fields were surveyed in each of the months December 1940 to March 1941. Most of the fields were 'planted' and only a few came under 'mixed' cropping. There were no fields completely under 'ratoons'.

Damage by Individual Borers

104. Tables C(1.1) - C(1.10) give the percentage of canes damaged by each of the borers. Results for the region as a whole are given as usual in Table C(2) for purposes of comparisons.

105. From Table C(2) we find that borer No.(2) occurred most frequently in this region with a rate of attack equal to 6, 15, 11 and 12 per cent in December 1940, January, February and March 1941 respectively. The differences 'between months' are statistically significant. The next important borer was No.(1) with percentages of damage equal to 5, 6, 5 and 1 per cent in the four months December 1940 to March 1941. Borer No.(5) was third in order of intensity taking the period of four months as a whole; in January however it caused a much higher percentage of damage than borer No.(1). The actual damage due to borer No.(5) in the four months December 1940 to March 1941 was 5, 10, 5 and 2 per cent respectively.

106. From Tables C(1.1) - (1.10) it will be seen that there is a good deal of variation between localities in the damage caused by some of the borers. Thus taking the most important borer No.(2), we see from Table C(1.2) that the percentage varied from 0 to 25 per cent in December 1940 (col.9); from 0 to 31 per cent in January 1941 (col.15); from 0 to 28 per cent in February 1941 (col.21); and from 0 to 25 per cent in March 1941 (col.27). The variation from locality to locality was thus not negligible.

Effect of 'Ratooning'

107. The percentage of canes damaged by borer No.(2) was greater in 'planted' fields than in 'mixed' fields in three out of four months, whereas in the case of borer No.(1) the percentage of canes damaged was greater in 'mixed' fields than in 'planted' fields in three out of four months. As none of the differences is statistically significant no definite conclusions can be reached about the effect of ratooning on the incidence of particular borer pests.

Spread of Borers

108. Tables C(3) and C(4) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. It will be seen that none of the borers was present in all the localities every month. Even the most important borer No.(2) was found in all localities only in one month, namely, March 1941. In December 1940 each of the three important borer Nos.(2), (1) and (5) occurred in the same number of localities, namely, ten; but borer No.(1) was more widespread than borer No.(2) among fields and villages. The incidence of borer Nos.(5) and (9) was almost negligible, and borer Nos.(7), (8) and (10) were totally absent in this region. Tables C(1.7), C(1.8) and C(1.10) therefore have been therefore omitted.

Results by Workers and Localities

109. In Table C(5) we have given the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table C(6) as usual gives the consolidated percentages for each locality. In Table C(7) the figures for workers also are combined to give the mean percentage of damaged canes for each locality in each month. From a cursory glance the bias, if any, does not appear to be high in this region.

Monthly Fluctuations

110. As regards seasonal fluctuations we find from Table C(7) that the percentage damaged by all borers was least in December 1940, namely, 14 per cent. After this there was a steep rise to 23 per cent in January followed by a sudden fall to 16 per cent in February with a more or less stationary condition in March.

Variation between Localities

111. The variation between localities was considerable. The intensity of incidence fluctuated from 0 to 27 per cent in December; from 12 to 53 per cent in January; from 0 to 33 per cent in February; and from 5 to 50 per cent in March. The geographical distribution has been shown in the contour maps.

112. The data of Table C(7) have been statistically analysed and the results are given in Table C(8). It will be seen from this Table that although the variation due to interaction between months and localities is statistically significant it is much less in magnitude than the variation between months and between localities which are highly significant.

(11)

Mean Percentage with Standard Error of Damaged Cane to Total Cane

Sampling Unit = Field (or 8 workers combined)

Station No. 7 Name Cuttack Province Orissa Locality Name No. (1) Scirpophaga sp.

No.	Locality Name	District	Month... December, 1940						Month... January, 1941					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayaghada	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	1.00 ± 1.00	10	0.40 ± 0.39
E	Askar	Ganjam	10	1.30 ± 0.87			10	1.30 ± 0.87	10	8.60 ± 2.14			10	8.60 ± 2.14
C	Hingili	"	10	1.20 ± 0.63			10	1.20 ± 0.63	10	3.00 ± 1.06			10	3.00 ± 1.06
D	Balugon	Puri	6	10.50 ± 2.66	4	14.75 ± 1.80	10	12.20 ± 1.81	6	3.67 ± 1.38	4	12.75 ± 6.56	10	7.30 ± 2.91
E	Khurda	"	7	3.14 ± 2.04	3	1.67 ± 1.67	10	2.70 ± 1.48	7	8.14 ± 2.50	3	6.33 ± 1.86	10	7.60 ± 1.80
F	Bhubaneswar	"	10	7.00 ± 1.76			10	7.00 ± 1.76	10	8.40 ± 2.33			10	8.40 ± 2.33
G	Ranti	Cuttack	10	7.50 ± 2.34			10	7.50 ± 2.34	10	5.20 ± 1.77			10	5.20 ± 1.77
H	Cuttack	"	10	4.00 ± 0.99			10	4.00 ± 0.99	10	7.60 ± 1.63			10	7.60 ± 1.63
I	Garki Radhupur	"	9	3.22 ± 0.78	1	25.00	10	5.40 ± 2.29	9	8.00 ± 1.41	1	22.00	10	9.40 ± 1.88
J	Jenapur	"	10	7.00 ± 1.58			10	7.00 ± 1.58	10	7.40 ± 2.00			10	7.40 ± 2.00
K	Angul	Angul	10	8.70 ± 2.26			10	8.70 ± 2.26	9	6.00 ± 1.89	1	5.00	10	6.00 ± 1.69
	Total		99	4.85 ± 0.56	11	8.09 ± 0.28	110	5.18 ± 0.58	97	6.26 ± 0.58	13	7.46 ± 2.63	110	6.40 ± 0.60

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Table (1) Contd. Mean Percentages with Standard Error of Difference due to Total Cane.

Sampling Unit = Field (or 3 earliers combined)

Region No. 7 Name Cuttack Province Orissa Locality Name No. (1) Scirpophaga sp.

No.	Locality Name	District	Month..... <u>February, 1941</u>						Month..... <u>March, 1941</u>					
			Planted		Mixed		Total		Planted		Mixed		Total	
			N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
A	Rayaghada	Koraput	6	0.00	4	0.00	10	0.00	1	0.00	9	0.44 \pm 0.39	10	0.40 \pm 0.39
E	Askar	Ganjam	8	5.62 \pm 2.64	2	0.00	10	4.50 \pm 2.15	4	4.50 \pm 2.75	6	1.83 \pm 1.73	10	2.90 \pm 1.55
C	Hingili	"	10	4.70 \pm 1.84			10	4.70 \pm 1.84	9	1.33 \pm 0.90	1	0.00	10	1.20 \pm 0.82
F	Balugon	Puri	6	4.50 \pm 0.73	4	7.00 \pm 1.91	10	5.50 \pm 1.89			10	0.60 \pm 0.60	10	0.60 \pm 0.60
H	Khurda	"	5	0.00	5	0.00	10	0.00	6	0.00	4	4.00 \pm 3.08	10	1.60 \pm 1.30
H	Bhubaneswar	"	10	3.50 \pm 2.55			10	3.50 \pm 2.55	10	0.00			10	0.00
G	Barki	Cuttack	10	10.80 \pm 3.02			10	10.80 \pm 3.02	10	0.00			10	0.00
H	Cuttack	"	10	10.10 \pm 2.01			10	10.10 \pm 2.01	10	0.00			10	0.00
I	Garh Khudpur	"	9	7.67 \pm 1.99	1	4.00	10	7.30 \pm 1.82	8	3.75 \pm 1.26	2	3.00 \pm 3.00	10	3.60 \pm 1.10
J	Jenapur	"	10	3.90 \pm 0.47			10	3.90 \pm 0.47	10	2.30 \pm 0.96			10	2.30 \pm 0.96
K	Angul	Angul	2	0.00	8	0.00	10	0.00	4	0.00	6	1.67 \pm 1.66	10	1.00 \pm 1.00
	Total		86	5.48 \pm 0.70	24	1.33 \pm 0.62	110	4.57 \pm 0.59	72	1.15 \pm 0.36	38	1.39 \pm 0.54	110	1.24 \pm 0.27

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Topic **C(17)**

Mean Percentage with Standard Error of Mean of Case to Total Case.

Sampling Unit = Field (one or two workers combined)

Region No. **7** Name **Cuttack** Province **Orissa** No. (2) **A. Sticticrapis** Hampson

Locality		District	Month... December, 1940						Month... January, 1941					
No.	Name		Planted	Mixed		Total	Planted	Mixed		Total				
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayaghada	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	1.00	10	0.40
B	Askar	Ganjam	10	1.30 ± 1.30			10	1.30 ± 1.30	10	11.80 ± 3.50			10	11.80 ± 3.50
C	Hingili	"	10	22.60 ± 6.50			10	22.60 ± 6.50	10	30.70 ± 3.34			10	30.70 ± 3.34
D	Balugon	Puri	6	6.67 ± 2.73	4	3.00 ± 1.73	10	5.20 ± 1.81	6	7.83 ± 2.55	4	17.25 ± 3.86	10	11.60 ± 2.55
E	Khurda	"	7	0.71 ± 0.71	3	0.00	10	0.50 ± 0.49	7	20.71 ± 2.68	3	15.33 ± 2.55	10	19.10 ± 2.17
F	Bhubaneswar	"	10	10.40 ± 1.26			10	10.40 ± 1.26	10	23.40 ± 2.62			10	23.40 ± 2.62
G	Banki	Cuttack	10	7.10 ± 2.59			10	7.10 ± 2.59	10	15.00 ± 2.62			10	15.00 ± 2.62
H	Cuttack	"	10	2.90 ± 1.39			10	2.90 ± 1.39	10	10.60 ± 2.17			10	10.60 ± 2.17
I	Garh Madhupur	"	9	5.89 ± 2.36	1	5.00	10	5.80 ± 2.34	9	19.67 ± 3.40	1	22.00	10	19.90 ± 3.05
J	Jenapur	"	10	11.50 ± 3.42			10	11.50 ± 3.42	10	19.10 ± 3.11			10	19.10 ± 3.11
K	Angul	Angul	10	1.00 ± 0.67			10	1.00 ± 0.67	9	7.78 ± 1.66	1	10.00	10	8.00 ± 1.50
Total			99	6.71 ± 1.06	11	1.55 ± 0.81	110	6.19 ± 0.97	97	15.93 ± 1.15	13	11.31 ± 0.60	110	15.38 ± 1.02

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Form (1.2) Contd. Mean Percentage with Standard Error of Mean of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province Orissa Variety No. (2) A. Sticticarpis Ampson

No.	Locality Name	District	Month... <u>February, 1941</u> ...						Month... <u>March, 1941</u> ...					
			Planted		<u>Mixed</u>		Total		Planted		<u>Mixed</u>		Total	
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(6)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Rayaghadia	Koraput	6	0.00	4	0.00	10	0.00	1	0.00	9	3.00 ± 2.08	10	2.70 ± 1.89
E	Askar.	Ganjam	8	33.13 ± 2.61	2	8.00 ± 8.00	10	28.10 ± 4.11	4	11.00 ± 7.14	6	17.17 ± 4.95	10	14.70 ± 4.00
C	Hinguli	"	10	22.80 ± 3.84			10	22.80 ± 3.84	9	26.89 ± 3.02	1	8.00	10	25.00 ± 3.29
D	Balugaon.	Puri.	6	13.83 ± 2.33	4	23.75 ± 3.45	10	11.80 ± 2.45			10	19.00 ± 3.36	10	19.00 ± 3.36
E	Khurda.	"	5	0.00	5	0.00	10	0.00	6	3.17 ± 0.47	4	8.25 ± 3.09	10	5.20 ± 1.53
F	Bhubaneswar.	"	10	8.30 ± 2.16			10	8.30 ± 2.16	10	5.30 ± 2.11			10	5.30 ± 2.11
G	Bansis.	Cuttack	10	18.80 ± 3.48			10	18.80 ± 3.48	10	15.10 ± 4.59			10	15.10 ± 4.59
H	Cuttack.	"	10	7.90 ± 2.06			10	7.90 ± 2.06	10	0.40 ± 0.39			10	0.40 ± 0.39
I	Ganesh Madhupuri	"	9	9.89 ± 1.74	1	7.00	10	9.60 ± 1.76	8	23.00 ± 3.78	2	23.50 ± 1.41	10	23.10 ± 2.99
J	Jenapuri.	"	10	7.60 ± 1.92			10	7.60 ± 1.92	10	9.50 ± 2.17			10	9.50 ± 2.17
K	Angul.	Angul	2	0.00	8	1.63 ± 0.80	10	1.30 ± 0.67	4	5.25 ± 3.20	6	14.67 ± 3.22	10	10.90 ± 2.68
	Total		86	72.69 ± 1.28	24	5.46 ± 1.92	110	11.11 ± 1.12	72	11.43 ± 1.44	38	12.84 ± 1.70	110	11.92 ± 1.10

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Tab. (1.3)

Mean Percentages with Standard Error of Sampled Cane to Total Cane.

Sampling Unit = Field (or 3 plantings combined)

Region No. 7 Name Cuttack Province Orissa Locality Name (No. 3) *A. tumidicostalis* Hampson

No.	Locality	District	Month..... December, 1940.....						Month..... January, 1941.....					
			Planted		Mixed		Total		Planted		Mixed		Total	
	Name		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayaghadra	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Askan.	Ganjam	10	0.00			10	0.00	10	0.00			10	0.00
C	Hingili	"	10	0.00			10	0.00	10	0.00			10	0.00
E	Bahgan.	Puri	6	0.00	4	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Khureda.	"	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
F	Bhubaneswar	"	10	0.00			10	0.00	10	0.00			10	0.00
G	Bawri.	Cuttack	10	0.40			10	0.40	10	0.00			10	0.00
H	Cuttack	"	10	0.00			10	0.00	10	0.00			10	0.00
I	Ganesh Madhupur	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
J	Jenapara	"	10	0.00			10	0.00	10	0.00			10	0.00
K	Angul.	Angul	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
	Total		99	0.04	11	0.00	110	0.04	97	0.00	13	0.00	110	0.00

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Table 13 (Cont.) Mean Percentage with Standard Error of Mean of Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province Orissa Inspector's Name

Locality		District	Month: <u>Feb</u>						Month: <u>March</u>					
No.	Name		Planted		Total		Planted		Total		Planted		Total	
(1)	(2)	(3)	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A			6	0.00	4	0.00	10	0.00	1	0.00	9	0.00	10	0.00
B			8	0.00	2	0.00	10	0.00	4	0.00	6	0.00	10	0.00
C			10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
D			6	0.00	4	0.00	10	0.00			10	0.00	10	0.00
E			5	0.00	5	0.00	10	0.00	6	0.00	4	0.00	10	0.00
F			10	0.00			10	0.00	10	0.00			10	0.00
G			10	0.00			10	0.00	10	0.00			10	0.00
H			10	0.00			10	0.00	10	0.00			10	0.00
I			9	0.00	1	0.00	10	0.00	8	0.00	2	0.00	10	0.00
J			10	0.00			10	0.00	10	0.00			10	0.00
K			2	0.00	8	0.00	10	0.00	4	0.00	6	0.00	10	0.00
Total			86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00

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No. (1.4)

Mean Percentage with Standard Error of Mean of Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province Orissa Sample Name No. (H) D. Auricilia Indgn.

Locality		District	Month..... December - 1940.....						Month..... January - 1941.....					
No.	Name		Planted		Mixed.		Total		Planted		Mixed.		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayaghadra	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	0.00	10	0.00
B	Askara.	Ganjam	10	0.00			10	0.00	10	0.00			10	0.00
C	Hingili	"	10	0.50			10	0.50	10	0.00			10	0.00
D	Bahugaon.	Puri	6	0.00	4	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Khwada.	"	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
F	Bhambaneswar.	"	10	0.00			10	0.00	10	0.00			10	0.00
G	Banki.	Cuttack	10	1.20			10	1.20	10	0.40			10	0.40
H	Cuttack	"	10	0.00			10	0.00	10	0.00			10	0.00
I	Garkh. Madhupur	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
J	Jenapura.	"	10	0.00			10	0.00	10	0.40			10	0.40
K	Angul.	Angul.	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
	Total		99	0.15	11	0.00	110	0.14	97	0.08	13	0.00	110	0.07

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No. C(1-4) Contd Mean Percentages with Standard Error of Mean of Same or Same to Total Same.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province

Locality		District	Month..... <u>July</u>						Month..... <u>March</u>					
No.	Name		Planted		Total		Planted		Total					
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A			6	0.00	4	0.00	10	0.00	1	0.00	9	0.00	10	0.00
B			8	0.00	2	0.00	10	0.00	4	0.00	6	0.00	10	0.00
C			10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
D			6	0.00	4	0.00	10	0.00			10	0.00	10	0.00
E			5	0.00	5	0.00	10	0.00	6	0.00	4	0.00	10	0.00
F			10	0.00			10	0.00	10	0.00			10	0.00
G			10	0.00			10	0.00	10	0.00			10	0.00
H			10	0.00			10	0.00	10	0.00			10	0.00
I			9	0.00	1	0.00	10	0.00	8	0.00	2	0.00	10	0.00
J			10	0.00			10	0.00	10	0.00			10	0.00
K			2	0.00	8	0.00	10	0.00	4	0.00	6	0.00	10	0.00
Total			86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00

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Pa. C (15)

Mean Percentages with Standard Error of Difference Due to Total Cause

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province Orissa Sample No. (5) D. Venosata, wlk.

No.	Locality	District	Month... <u>December - 1940</u> ...						Month... <u>January - 1941</u> ...					
			Planted		<u>Mixed</u>		Total		Planted		<u>Mixed</u>		Total	
	Name		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayghada	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Askara	Garjam	10	8.10 ± 2.57			10	8.10 ± 2.57	10	12.60 ± 2.60			10	12.60 ± 2.60
C	Hingili	"	10	7.40 ± 4.00			10	7.40 ± 4.00	10	7.40 ± 1.47			10	7.40 ± 1.47
D	Balugaon	Puri	6	1.33 ± 1.33	4	7.25 ± 2.02	10	3.70 ± 1.44	6	13.67 ± 4.74	4	21.25 ± 3.99	10	16.70 ± 3.34
E	Khurda	"	7	2.29 ± 1.61	3	1.67 ± 1.68	10	2.10 ± 1.19	7	8.00 ± 1.89	3	12.00 ± 4.95	10	9.20 ± 2.30
F	Bhambaneswar	"	10	1.00 ± 1.00			10	1.00 ± 1.00	10	10.70 ± 2.55			10	10.70 ± 2.55
G	Banki	Cuttack	10	2.00 ± 0.79			10	2.00 ± 0.79	10	8.10 ± 1.55			10	8.10 ± 1.55
H	Cuttack	"	10	0.80 ± 0.54			10	0.80 ± 0.54	10	11.20 ± 2.22			10	11.20 ± 2.22
I	Gach Madhupur	"	9	0.44 ± 0.44	1	0.00	10	0.43 ± 0.43	9	12.44 ± 2.50	1	11.00	10	12.30 ± 2.24
J	Jenapora	"	10	9.10 ± 3.15			10	9.10 ± 3.15	10	14.90 ± 1.84			10	14.90 ± 1.84
K	Angul	Angul	10	0.50 ± 0.49			10	0.50 ± 0.49	9	11.78 ± 2.61	1	5.00	10	11.10 ± 2.43
	Total		97	3.20 ± 0.68	11	3.09 ± 1.49	110	3.19 ± 0.63	97	10.36 ± 1.00	13	10.54 ± 3.02	110	10.47 ± 0.94

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Table (16)

Mean Percentages with Standard Error of Percent of Cane to Total Cane.

Sampling Unit = Field (or 3 stalks combined)

Region No. 7 Name: Cuttack Province: Orissa Locality: Kallac zonellus Swinh

No.	Locality Name	District	Month... December... 1940.			Month... January... 1941.								
			Planted	Mixed		Total	Planted	Mixed		Total				
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Rayagada	Koraput	7	0.00	3	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Askan	Ganjam	10	1.20			10	1.20	10	0.00			10	0.00
C	Hingili	"	10	0.00			10	0.00	10	0.00			10	0.00
D	Bahugon	Puri	6	0.00	4	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E	Khurda	"	7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
F	Bhubaneswar	"	10	0.00			10	0.00	10	0.00			10	0.00
G	Banki	Cuttack	10	0.20			10	0.20	10	0.00			10	0.00
H	Cuttack	"	10	0.00			10	0.00	10	0.00			10	0.00
I	Jarsh Mahupin	"	9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
J	Jenapur	"	10	0.00			10	0.00	10	0.00			10	0.00
K	Angul	Straul	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
	Total		99	0.15	11	0.00	110	0.14	97	0.00	13	0.00	110	0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41.

Job No.

Read (16) Contd. Mean Percentages with Standard Error of Difference due to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name Cutlass Province Worker's Name

Locality		District	Month..... <i>Jan</i>						Month..... <i>March</i>					
No.	Name		Planted		Total		Planted		Total					
(1)	(2)	(3)	(4)	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A			6	0.00	4	0.00	10	0.00	1	0.00	9	0.00	10	0.00
B			8	0.00	2	0.00	10	0.00	4	0.00	6	0.00	10	0.00
C			10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
D			6	0.00	4	0.00	10	0.00			10	0.00	10	0.00
E			5	0.00	5	0.00	10	0.00	6	0.00	4	0.00	10	0.00
F			10	0.00			10	0.00	10	0.00			10	0.00
G			10	0.00			10	0.00	10	0.00			10	0.00
H			10	0.00			10	0.00	10	0.00			10	0.00
I			9	0.00	1	0.00	10	0.00	8	0.00	2	0.00	10	0.00
J			10	0.00			10	0.00	10	0.00			10	0.00
K			2	0.00	8	0.00	10	0.00	4	0.00	6	0.00	10	0.00
Total			86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00

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Table (19)

Mean Percentages with Standard Error of Difference Due to Total Cane.

Sampling Unit = Field (or 3 workers combined).

Region No. 7 Name Culebra Province Pinar del Rio

Locality		District	Month <i>Dec</i>						Month <i>Jan</i>					
No.	Name		Planted		Total		Planted		Total		Planted		Total	
(1)	(2)	(3)	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A			7	0.00	3	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E			10	0.00			10	0.00	10	0.00			10	0.00
C			10	0.00			10	0.00	10	0.00			10	0.00
D			6	0.00	4	0.00	10	0.00	6	0.00	4	0.00	10	0.00
E			7	0.00	3	0.00	10	0.00	7	0.00	3	0.00	10	0.00
F			10	0.00			10	0.00	10	0.00			10	0.00
G			10	0.00			10	0.00	10	0.00			10	0.00
H			10	0.00			10	0.00	10	0.00			10	0.00
I			9	0.00	1	0.00	10	0.00	9	0.00	1	0.00	10	0.00
J			10	0.00			10	0.00	10	0.00			10	0.00
K			10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
Total			99	0.00	11	0.00	110	0.00	97	0.00	13	0.00	110	0.00

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Table (19) ~~Contd.~~, Mean Percentage with Standard Error of Lamer of Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 7 Name. Cuttack Province. Orissa Lorer's Name *N. Sesamia* sp. (9)

Locality		District	Month... February... 1941						Month... March... 1941					
No.	Name		Planted		Mixed		Total		Planted		Mixed		Total	
(1)	(2)	(3)	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Rayagada	Koraput	6	0.00	4	0.00	10	0.00	1	0.00	9	0.00	10	0.00
B	Haskar	Ganjam	8	0.00	2	0.00	10	0.00	4	0.00	6	0.00	10	0.00
C	Hingili	"	10	0.00			10	0.00	9	0.00	1	0.00	10	0.00
D	Balugan	Puri	6	0.00	4	0.00	10	0.00			10	0.00	10	0.00
E	Khurda	"	5	0.00	5	0.00	10	0.00	6	0.00	4	0.00	10	0.00
F	Bhubaneswar	"	10	0.00			10	0.00	10	0.00			10	0.00
G	Banki	Cuttack	10	0.00			10	0.00	10	0.00			10	0.00
H	Cuttack	"	10	0.00			10	0.00	10	0.70			10	0.70
I	Gan Madhupur	"	9	0.00	1	0.00	10	0.00	8	0.00	2	0.00	10	0.00
J	Jenapur	"	10	0.00			10	0.00	10	0.00			10	0.00
K	Angul	Angul	2	0.00	8	0.00	10	0.00	4	2.00	6	2.83	10	2.49
	Total		86	0.00	24	0.00	110	0.00	72	0.12	38	0.45	110	0.29

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REGIONAL SURVEY OF Borer PESTS OF SUGARCANE, 1940-41.

Table (2)

Mean Percentage with Standard Error of Lumped Data to Total Cane.

Sample Unit = Field (or 3 workmen combined)

 Region No. 7 Name Cuttack Province Orissa

No.	Borer Name	Month..... <u>December - 1940.</u>						Month..... <u>January - 1941.</u>					
		Planted		Mixed.		Total		Planted		Mixed.		Total	
(1)	(2)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> Sp.	99	4.85 ± 0.56	11	8.09 ± 0.28	110	5.18 ± 0.58	97	6.26 ± 0.58	13	7.46 ± 2.63	110	6.40 ± 0.60
2	<i>A. Sticticraspis</i> Hamp.	99	6.71 ± 1.06	11	1.55 ± 0.81	110	6.19 ± 0.97	97	15.93 ± 1.15	13	11.31 ± 0.60	110	15.38 ± 1.02
3	<i>A. tumidicostalis</i> Hamp.	99	0.04	11	0.00	110	0.04	97	0.00	13	0.00	110	0.00
4	<i>D. auricilia</i> Dudge	99	0.15	11	0.00	110	0.14	97	0.08	13	0.00	110	0.07
5	<i>D. venosata</i> Wlk.	99	3.20 ± 0.68	11	3.09 ± 1.49	110	3.19 ± 0.63	97	10.36 ± 1.00	13	10.54 ± 3.02	110	10.47 ± 0.94
6	<i>C. zonellus</i> Swinh	99	0.15	11	0.00	110	0.14	97	0.00	13	0.00	110	0.00
7	<i>C. trypeta</i> Bisset	99	0.00	11	0.00	110	0.00	97	0.00	13	0.00	110	0.00
8	<i>P. abditella</i> Zell	99	0.00	11	0.00	110	0.00	97	0.00	13	0.00	110	0.00
9	<i>Sesamia</i> Sp.	99	0.00	11	0.00	110	0.00	97	0.00	13	0.00	110	0.00
10	<i>E. depressella</i> Swinh	99	0.00	11	0.00	110	0.00	97	0.00	13	0.00	110	0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-71

Table (2) Contd. Mean Percentage with Standard Error of Damage Done to Total Cane.

Sample Unit = Field (or 3 workers combined)

Region No. 7 Name Cuttack Province Orissa

No.	Borer Name	Month..... <u>February-1941</u>						Month..... <u>March-1941</u>					
		Planted		<u>Fixed</u>		Total		Planted		<u>Fixed</u>		Total	
		N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(5)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	<i>Scirpophaga</i> Sp.	86	5.48 ± 0.70	24	1.33 ± 0.62	110	4.57 ± 0.59	72	1.15 ± 0.30	38	1.39 ± 0.54	110	1.24 ± 0.27
2	<i>A. Sticticraspis</i> Impson	86	12.69 ± 1.28	24	5.46 ± 1.92	110	11.11 ± 1.12	72	11.43 ± 1.44	38	12.84 ± 1.70	110	11.92 ± 1.10
3	<i>A. tumidicostalis</i> Impson	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00
4	<i>D. Awicilia</i> Indgyn	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00
5	<i>D. Venosata</i> Wlk.	86	3.28 ± 0.46	24	1.46 ± 0.33	110	2.88 ± 0.09	72	1.49 ± 0.56	38	1.81 ± 0.78	110	1.60 ± 0.45
6	<i>C. Zonellus</i> Swinh	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00
7	<i>C. trypheta</i> Bissel	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00
8	<i>R. obtellata</i> Zell.	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00
9	<i>Sesamia</i> Sp.	86	0.00	24	0.00	110	0.00	72	0.11	38	0.45	110	0.29
10	<i>E. depressella</i> Swinh	86	0.00	24	0.00	110	0.00	72	0.00	38	0.00	110	0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table C (3) ... Number of Cane, Stalks, Fields, Villages & Localities affected by different borers:
 Region No. 7 ... State ... Cuttack ... Province ... Orissa

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Scirpoborus sp.	133	114	66	20	10	165	134	78	20	10	104	86	57	16	8	26	24	21	11	8
A. sticti. Hagen	154	123	54	18	10	414	292	96	20	10	305	217	72	18	9	253	224	76	21	11
A. tur. Hagen	2	2	2	1	7															
D. variabilis Duf.	7	3	3	3	2	2	2	2	2	2										
D. venosata Wlk.	80	64	37	16	10	267	212	91	20	10	65	55	83	13	8	33	31	19	8	5
G. zonellus Schiff.	2	2	2	2	1															
O. tripotes Hagen																				
R. ablutella Zell.																				
Sesania sp.																5	5	4	2	1
H. depressa Swinh.																				
Total Damaged	332	267	87	20	10	646	442	100	20	10	428	286	80	18	9	331	274	80	21	11
Grand Total	2720	990	110	22	11	2708	990	110	22	11	2679	990	110	22	11	2181	990	110	22	9

N₁ = Number of canes affected; N₂ = Number of stalks affected; N₃ = Number of fields affected; N₄ = Number of villages affected; N₅ = Number of localities affected.

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (4) Percentage of Cane, Stools, Fields, Villages and Localities affected.....

Region No. 7 Name Cuttack District Orissa

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Scirpophaga sp.	4.9	11.5	60.0	90.9	90.9	6.1	13.5	70.9	90.9	90.9	3.9	8.7	53.6	72.7	72.7	1.2	2.4	17.1	50.0	72.7
A. stricta Hamp.	5.7	12.4	49.1	81.8	90.9	15.3	29.5	87.3	90.9	90.9	11.4	21.9	65.5	81.8	81.8	11.6	22.6	67.1	95.5	100.0
A. turidella Hamp.	0.1	0.2	1.8	4.5	9.1															
D. auricilia Briff.	0.3	0.3	2.7	13.6	18.2	0.1	0.2	1.8	9.1	18.2										
E. venosata Wlk.	2.9	3.7	33.6	72.7	90.9	9.9	21.4	82.7	90.9	90.9	2.4	5.6	30.0	57.1	72.7	1.5	3.1	17.3	36.4	48.5
E. zonellus Guen.	0.1	0.2	1.8	9.1	9.1															
E. tripetala Hirst																				
R. ebulifera Zell.																				
Secoria sp.																0.2	0.5	0.4	9.0	9.1
E. degeerella Guen.																				
Total Damaged	12.2	27.0	80.9	90.9	90.9	23.9	44.6	90.9	90.9	90.9	16.0	28.9	72.7	81.8	81.8	15.2	27.7	72.7	95.5	100.0

Percentage of canes affected; N₂ = Percentage of stools affected; N₃ = Percentage of fields affected; N₄ = Percentage of villages affected; N₅ = Percentage of localities affected.

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MONTHLY STATEMENT OF WORKERS' EARNINGS OF SUGARCANE 1940-41

Dist: C(5)

Local Name of the place where the work is done.

Employment Unit Name

Season No. 7 Name: Cuttack Province: Orissa

No. of Co- li- ty No.	No.	Month: December 1940.								Month: January 1941.							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	0.00	15	0.00	15	0.00	45	0.00	15	0.00	15	0.00	15	0.00	45	0.00
	2	15	0.00	15	0.00	15	0.00	45	0.00	15	0.00	15	0.00	15	0.00	45	0.00
	3	15	13.33	15	6.67	15	10.00	45	10.00	15	35.15	15	14.34	15	13.81	45	21.10
	4	15	20.00	15	20.53	15	4.14	45	14.99	15	37.69	15	25.48	15	15.54	45	26.24
	5	15	33.47	15	42.67	15	35.53	45	37.22	15	26.21	15	36.89	15	41.62	45	34.91
	6	15	15.53	15	16.00	15	20.00	45	17.18	15	38.42	15	21.61	15	24.88	45	28.30
	7	15	14.40	15	13.33	15	20.20	45	15.98	15	45.49	15	18.94	15	22.21	45	28.88
	8	15	12.20	15	10.53	15	21.13	45	14.62	15	47.82	15	17.74	15	10.01	45	25.19
	9	15	0.00	15	5.53	15	7.73	45	4.42	15	35.68	15	22.21	15	16.68	45	24.86
	10	15	8.93	15	2.00	15	0.00	45	3.64	15	36.69	15	16.61	15	6.67	45	19.99
	11	15	30.00	15	19.93	15	21.67	45	23.87	15	34.48	15	24.41	15	35.62	45	31.50
	12	15	15.53	15	24.40	15	12.20	45	17.38	15	26.68	15	35.02	15	11.67	45	24.46
	13	15	10.40	15	24.00	15	21.87	45	18.76	15	35.02	15	16.01	15	16.07	45	22.37
	14	15	17.87	15	25.00	15	23.47	45	22.11	15	22.81	15	17.74	15	16.07	45	18.87
	15	15	11.07	15	0.00	15	16.67	45	9.24	15	21.08	15	18.34	15	31.68	45	23.70
	16	15	7.80	15	6.67	15	17.80	45	10.72	15	14.94	15	31.08	15	10.54	45	18.85
	17	15	11.07	15	18.93	15	16.07	45	15.36	15	36.67	15	33.42	15	27.68	45	32.59
	18	15	9.40	15	20.53	15	9.33	45	13.09	15	15.47	15	36.69	15	18.74	45	23.63
	19	15	31.00	15	25.60	15	12.00	45	22.87	15	36.67	15	32.02	15	37.95	45	35.57
	20	15	32.07	15	12.80	15	18.27	45	21.05	15	21.88	15	25.55	15	25.55	45	24.33
	21	15	6.20	15	5.73	15	3.87	45	5.27	15	23.95	15	30.95	15	11.07	45	21.99
	22	15	16.13	15	26.67	15	7.73	45	16.84	15	10.01	15	17.68	15	13.27	45	13.65
	TOTAL	330	14.38	330	14.90	330	13.63	990	14.30	330	27.36	330	22.37	330	18.48	990	22.73

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REGULAR SURVEY OF WORKER PIECES OF SUGARCANE 1940-41

Table C (5) ~~Contd.~~ Mean Percentage of Damaged Cane to total cane.

Sampling Unit = 3000.

Region no. 7 Name Cuttack Province Orissa

Locality No.	Month. <u>February 1941</u>								Month. <u>March 1941</u>							
	Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1	15	0.00	15	0.00	15	0.00	45	0.00	15	0.00	15	0.93	15	0.00	45	0.31
2	15	0.00	15	0.00	15	0.00	45	0.00	15	9.14	15	5.54	15	0.00	45	4.89
3	15	32.20	15	19.93	15	38.93	45	30.35	15	29.08	15	37.82	15	46.89	45	37.93
4	15	38.87	15	22.33	15	46.87	45	36.02	15	11.94	15	21.08	15	12.87	45	15.30
5	15	17.27	15	13.27	15	48.40	45	26.31	15	22.74	15	28.01	15	21.41	45	24.05
6	15	31.13	15	14.40	15	42.27	45	29.27	15	53.36	15	22.21	15	33.35	45	36.31
7	15	26.67	15	20.13	15	31.73	45	26.18	15	25.08	15	14.41	15	24.08	45	21.19
8	15	17.80	15	21.00	15	30.67	45	23.16	15	28.61	15	34.48	15	22.14	45	28.41
9	15	0.00	15	0.00	15	0.00	45	0.00	15	6.67	15	8.74	15	3.34	45	6.25
10	15	0.00	15	0.00	15	0.00	45	0.00	15	7.87	15	10.01	15	13.34	45	10.41
11	15	5.47	15	3.87	15	13.33	45	7.56	15	6.67	15	6.67	15	6.67	45	6.67
12	15	14.40	15	23.33	15	7.20	45	14.98	15	2.20	15	3.34	15	15.54	45	7.03
13	15	37.80	15	35.60	15	10.00	45	27.80	15	10.01	15	3.34	15	16.68	45	10.01
14	15	27.80	15	35.60	15	33.33	45	32.24	15	23.35	15	26.68	15	16.68	45	22.24
15	15	29.88	15	13.33	15	8.33	45	17.18	15	0.00	15	2.20	15	10.01	45	4.07
16	15	37.20	15	13.33	15	34.47	45	28.33	15	0.00	15	0.00	15	23.35	45	7.78
17	15	14.93	15	16.60	15	23.33	45	18.29	15	43.36	15	19.41	15	43.42	45	35.40
18	15	17.73	15	13.13	15	9.53	45	13.46	15	22.68	15	18.08	15	21.14	45	20.63
19	15	13.20	15	5.53	15	6.00	45	8.24	15	17.78	15	14.41	15	20.01	45	17.40
20	15	15.87	15	7.87	15	8.67	45	10.80	15	30.55	15	8.87	15	3.87	45	14.43
21	15	0.00	15	0.00	15	3.33	45	1.11	15	10.21	15	15.94	15	14.41	45	13.52
22	15	8.00	15	0.00	15	0.00	45	2.67	15	26.61	15	11.07	15	0.00	45	12.56
Total	330	17.85	330	12.67	330	18.02	990	16.18	330	17.60	330	13.93	330	16.80	990	16.11

Inspected RP Roll Date 13/6

Inspected Singh Roll Date

~~Special Survey of Mosquito Pests of Sugarcane 1940-41~~

Table (6)

Mean Percentage of Damaged Cane to Total Cane : By Localities x Workers x Months

Sampling Unit = Stool

Region No. 7

Name Cuttack

Province Orissa

Locality		District	Month..... <u>December, 1940.</u>								Month..... <u>January, 1941.</u>							
			Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
No.	Name		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
A	Rayaghada	Koraput	30	00.00	30	00.00	30	00.00	90	00.00	30	00.00	30	19.88	30	14.65	90	11.51
B	Askare	Garjam	30	16.67	30	13.60	30	7.20	90	12.49	30	36.36	30	29.20	30	33.20	90	32.92
C	Hingili	"	30	24.50	30	29.33	30	27.77	90	27.20	30	32.27	30	18.32	30	16.08	90	22.22
D	Bahugaon	Puri	30	13.30	30	11.93	30	20.67	90	15.30	30	46.59	30	19.38	30	11.66	90	25.88
E	Khurda	"	30	4.47	30	3.87	30	3.87	90	4.07	30	36.13	30	00.00	30	00.00	90	12.04
F	Bahameswar	"	30	22.77	30	22.17	30	16.93	90	20.62	30	30.54	30	29.67	30	23.61	90	27.94
G	Banki	Cuttack	30	14.13	30	24.50	30	22.67	90	20.43	30	28.87	30	16.85	30	16.02	90	20.58
H	Cuttack	"	30	9.43	30	3.33	30	17.23	90	10.00	30	17.98	30	24.68	30	21.08	90	21.25
I	Gandhadapur	"	30	10.23	30	19.73	30	12.70	90	14.22	30	26.04	30	35.00	30	23.18	90	28.07
J	Jaypur	"	30	31.53	30	19.20	30	15.13	90	21.95	30	29.27	30	28.74	30	31.70	90	29.90
K	Angul	Angul	30	11.17	30	16.20	30	5.80	90	11.06	30	16.95	30	24.28	30	12.15	90	17.79
Total			330	14.38	330	14.90	330	13.63	990	14.30	330	27.36	330	22.37	330	18.48	990	22.73

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EXTENSIVE SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Table (6) ~~Contd.~~ Mean Percentage of Damaged Cane to Total Cane : By Localities x Workers x Months

Sampling Unit = Stool

Region No. 7

Name Cuttack

Province Orissa

Locality		District	Month <u>February, 1941</u>								Month <u>March, 1941</u>							
			Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
No.	Name		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
A	Rayaghada	Koraput	30	00.00	30	00.00	30	00.00	90	00.00	30	4.56	30	3.23	30	00.00	90	2.60
B	Askare	Ganjam	30	35.53	30	21.13	30	42.90	90	33.19	30	20.48	30	29.40	30	29.84	90	26.57
C	Hingih	"	30	24.20	30	13.83	30	45.33	90	27.79	30	38.00	30	25.07	30	27.84	90	30.30
D	Balugaon	Puri	30	22.23	30	20.57	30	31.20	90	24.67	30	26.81	30	24.41	30	23.08	90	24.77
E	Khurda	"	30	00.00	30	00.00	30	00.00	90	00.00	30	7.26	30	9.36	30	8.33	90	8.32
F	Bhubaneswar	"	30	9.93	30	13.63	30	10.27	90	11.27	30	4.43	30	5.00	30	11.09	90	6.84
G	Banki	Cuttack	30	32.80	30	35.60	30	21.67	90	30.02	30	16.65	30	14.99	30	16.65	90	16.10
H	Cuttack	"	30	33.53	30	13.33	30	21.40	90	22.75	30	00.00	30	1.10	30	16.65	90	5.92
I	Ganb. Madhup	"	30	16.33	30	14.57	30	16.43	90	15.78	30	32.97	30	15.52	30	32.23	90	26.91
J	Jenapure	"	30	17.87	30	6.70	30	7.33	90	10.63	30	24.11	30	11.62	30	11.92	90	15.88
K	Angul	Angul	30	4.00	30	00.00	30	1.67	90	1.89	30	18.38	30	13.49	30	7.19	90	13.02
Total			330	17.85	330	12.67	330	18.02	990	16.18	330	17.60	330	13.93	330	16.80	990	16.11

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Table (7) Mean Percentage of Damaged Cane to Total Cane by Localities and Months

Region No. 7 Name Cuttack Province Orissa

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Rayaghada	90	0.50	90	11.51	90	0.00	90	2.60
B Arkar	90	12.49	90	32.92	90	33.19	90	26.57
C Hinguli	90	27.20	90	22.22	90	27.79	90	30.30
D Bahugaon	90	15.30	90	25.88	90	24.67	90	24.77
E Khurda	90	4.07	90	12.04	90	0.00	90	8.32
F Abhananagar	90	20.62	90	27.94	90	11.27	90	6.84
G Ranki	90	20.43	90	20.58	90	30.02	90	16.10
H Cuttack	90	10.00	90	21.25	90	23.75	90	5.92
I Bank Machhipur	90	14.22	90	28.07	90	15.78	90	26.91
J Denapur	90	21.95	90	29.90	90	10.63	90	15.88
K Angul	90	11.06	90	17.79	90	1.89	90	13.02
Total	990	14.30	990	22.73	990	16.18	990	16.11

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Table C(8). Analysis of Variance

Source of variation (1)	df. (2)	Sum of Squares (3)	Variance (4)	Ratio of Variances (5)
Between Months	3	923.85	307.95	10.82 **
Between localities	10	5264.58	526.46	18.51 **
Months & localities	30	2547.25	84.91	2.98 **
Between villages (within months & localities)	44	1251.76	28.45	
Total	87	9987.44		

91

113

REGION NO.(8) : GUDIYATTAM (MADRAS)

Material

115. In December 1940 only 8 localities were surveyed and 78 fields were actually examined. In January and February 1941 all the 11 localities were surveyed although the total number of fields covered was not 110 in each month. In March 1941 only 9 localities were surveyed and records for only 44 fields were received. Other fields were already harvested. All the fields were 'planted'.

Damage b Individual Borers

114. Tables GD(1.1) - GD(1.10) give the percentage of canes damaged by each of the ten borers. The results for the region as a whole are given in the standard form in Table GD(2).

115. We notice that this region is comparatively free from borer attack. Borer Nos.(1) and (5) were most frequent in this region. The intensity of attack by borer No.(1) was 8, 6, 4 and 4 per cent in December 1940, January, February and March 1941 respectively, whereas the percentage of damage by borer No.(5) was 6, 4, 6 and 5 per cent for the corresponding months. Borer No.(2) came third in the order of importance with a percentage of damage of about 2.5 per cent on an average over the period of 4 months.

116. From Tables GD(1.1) - GD(1.10) it will be seen that there was considerable variation between localities in the percentage damage caused by each borer. For the most important borer No.(1), we see from Table GD(1.1) that the rate of attack varied from 1 to 17 per cent in December 1940 (col.5); from 2 to 20 per cent in January 1941 (col.11); from 1 to 18 per cent in February 1941 (col.17); and from 2 to 7 per cent in March 1941 (col.23).

Spread of Borers

117. Tables GD(3) and GD(5) give us information about the extent of spread of each borer among canes, stools, fields, villages and localities in this region. Borer Nos.(1) and (5) were present in every locality and village in all the months except February 1941, in which month, borer No.(1) was absent in two villages and borer No.(5) in one village. Borer No.(2) was also fairly widespread. Borer Nos.(3), (4), (6), (7), (8) and (10) were totally absent in this region; and borer No.(9) was found only in 1 out of 5540 canes examined. Tables GD(1.3), (1.4), (1.6), (1.7), (1.8) and (1.10) are therefore omitted from this report.

Results of Workers and Localities

118. Table GD(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and month. Table GD(6) gives the consolidated percentages for each locality; and Table GD(7)¹ the mean percentage of damaged canes for each locality in each month. Without entering into detailed tests for which we have no time we may note that in this region bias among workers, if any, does not appear to be high.

Monthly Fluctuations

119. From Table GD(7) we notice that the percentage damage caused by all borers taken together was highest in December 1940, namely, 16 per cent. After this there was a slight fall to 13 per cent in January 1941, then a slight increase to 15 per cent in February 1941 followed by a fall to 10 per cent in March 1941.

Variation between Localities

120. The variation between localities was not negligible. The rate of incidence varied from 8 to 35 per cent in December; from 7 to 40 per cent in January; from 2 to 37 per cent in February; and from 7 to 14 per cent in March.

121. The data of Table GD(7) have been statistically analysed and the results are given in Table GD(8). It will be seen from this Table that the interaction between months and localities is not significant and also much less in magnitude than the variation between months and between localities which are highly significant.

67(11)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Station No. 8 Name Indiyattam Province Madras Locality Name No. (1) Scirhophaga sp.

Locality		District	Month... December, 1940					Month... January, 1941						
No.	Name		Planted		Total			Planted		Total				
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Palamuru	Chittoor	10	16.90 ± 2.94			10	16.90 ± 2.94	10	19.80 ± 3.26			10	19.80 ± 3.26
E	Chittoor	"	10	5.90 ± 1.84			10	5.90 ± 1.84	8	2.50 ± 1.32			8	2.50 ± 1.32
F	Indiyattam	N. Arcot	10	9.10 ± 2.70			10	9.10 ± 2.70	10	4.70 ± 2.86			10	4.70 ± 2.86
D	Kavangoor	"	10	6.00 ± 1.76			10	6.00 ± 1.76	10	5.80 ± 1.95			10	5.80 ± 1.95
E	Wallajah	"	5	2.20 ± 1.34			5	2.20 ± 1.34	10	4.30 ± 1.73			10	4.30 ± 1.73
F	Vellore	"	10	1.20 ± 0.24			10	1.20 ± 0.24	10	2.20 ± 0.71			10	2.20 ± 0.71
G	Strambot	"	8	2.87 ± 0.93			8	2.87 ± 0.93	9	3.67 ± 1.37			9	3.67 ± 1.37
E	Jirupathoor	"	10	12.70 ± 3.72			10	12.70 ± 3.72	10	7.50 ± 3.13			10	7.50 ± 3.13
I	Polur	"							10	3.10 ± 1.01			10	3.10 ± 1.01
J	Puvvuramamaki	"							10	3.50 ± 0.77			10	3.50 ± 0.77
K	Puvvuramamaki	S. Arcot							10	3.40 ± 1.84			10	3.40 ± 1.84
Total			73	7.56 ± 1.14			73	7.56 ± 1.14	107	5.57 ± 0.20			107	5.57 ± 0.20

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Table (11) Contd. Mean Percentage with Standard Error of Mean of Damage Done to Total Cane.

Sampling Unit = Field (or 8 stalks combined).

Station No. 8 Name: Gudiyattam Province: Madras Collector's Name: No. 1) Scitophaga Sp.

No.	Locality Name	District	Month... February, 1941.						Month... March, 1941.							
			Planted			Total			Planted			Total				
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)			
A	Palamuru	Chittoor	10	17.80 ± 2.19					10	17.80 ± 2.19	2	2.00 ± 2.00			2	2.00 ± 2.00
E	Chittoor		7	2.56 ± 1.56					7	2.56 ± 1.56	3	4.00 ± 2.08			3	4.00 ± 2.08
C	Gudiyattam	North Arcot	10	4.80 ± 2.10					10	4.80 ± 2.10	7	5.14 ± 2.88			7	5.14 ± 2.88
D	Kanconoor	"	8	3.75 ± 2.94					8	3.75 ± 2.94						
E	Wallaiah	"	8	2.25 ± 1.12					8	2.25 ± 1.12	5	5.40 ± 1.41			5	5.40 ± 1.41
F	Vellore	"	10	0.60 ± 0.60					10	0.60 ± 0.60	9	2.44 ± 1.10			9	2.44 ± 1.10
G	Strambot	"	8	2.62 ± 1.37					8	2.62 ± 1.37	6	3.50 ± 0.91			6	3.50 ± 0.91
H	Gudiyattam	"	6	5.56 ± 3.19					6	5.56 ± 3.19	3	7.33 ± 4.32			3	7.33 ± 4.32
I	Pala-	"	9	1.78 ± 1.10					9	1.78 ± 1.10						
J	Tiruvannamalai	"	8	2.50 ± 1.17					8	2.50 ± 1.17	5	2.00 ± 0.63			5	2.00 ± 0.63
K	Tirukoyilur	South Arcot	9	2.78 ± 1.57					9	2.78 ± 1.57	4	2.75 ± 1.73			4	2.75 ± 1.73
	Total		93	4.44 ± 2.37					93	4.44 ± 2.37	44	3.52 ± 0.67			44	3.52 ± 0.67

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Tab. (FD-2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. 8 Name Gudiyaattam Province Madras Forer's Name A. Sticticrapis Hampson (2)

No.	Locality Name	District	Month..... December, 1940						Month..... January, 1941.					
			Planted			Total			Planted			Total		
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Palamuru.	Chittoor	10	1.70 ± 0.71			10	1.70 ± 0.71	10	7.80 ± 2.45			10	7.80 ± 2.45
B	Chittoor.	"	10	3.10 ± 1.22			10	3.10 ± 1.22	8	2.62 ± 1.41			8	2.62 ± 1.41
C	Gudiyaattam.	N. Arcat	10	6.30 ± 1.41			10	6.30 ± 1.41	10	3.00 ± 1.41			10	3.00 ± 1.41
D	Karavoor.	"	10	1.90 ± 1.05			10	1.90 ± 1.05	10	0.60 ± 0.20			10	0.60 ± 0.20
E	Wallajah.	"	5	3.40 ± 2.05			5	3.40 ± 2.05	10	2.30 ± 1.00			10	2.30 ± 1.00
F	Vellore.	"	10	2.00 ± 1.30			10	2.00 ± 1.30	10	2.50 ± 0.20			10	2.50 ± 0.20
G	Ithambak	"	8	1.38 ± 0.79			8	1.38 ± 0.79	9	0.00 ± 0.00			9	0.00 ± 0.00
H	Gumpathur	"	10	0.50 ± 0.32			10	0.50 ± 0.32	10	0.60 ± 0.14			10	0.60 ± 0.14
I	Pohru.	"	-	-			-	-	10	3.90 ± 1.00			10	3.90 ± 1.00
J	Tiruvannamalai	"	-	-			-	-	10	1.80 ± 1.00			10	1.80 ± 1.00
K	Tirukkoyilur	S. Arcat.	-	-			-	-	10	3.20 ± 0.22			10	3.20 ± 0.22
Total			73	2.51 ± 0.67			73	2.51 ± 0.67	107	2.60 ± 0.10			107	2.60 ± 0.10

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Table (12)

Mean Percentage with Standard Error of Band of Cane to Total Cane.

Sampling Unit ~~Field~~ (or 8 workers combined)

Region No. 8 Name Andiyattam Province Madras No. (2) A. Stictocarpus Hampson

No.	Locality Name	District	Month <u>February 1941</u>						Month <u>March 1941</u>									
			Planted			Total			Planted			Total						
			N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.		N	Mean ± S.E.					
(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)							
A	Palamur	Chittoor	10	4.70 ± 2.24				10	4.70 ± 2.24				2	0.00			2	0.00
B	Chittoor		7	6.56 ± 2.83				7	6.56 ± 2.83				3	3.33 ± 3.32			3	3.33 ± 3.32
C	Andiyattam	N. Arcot	10	3.90 ± 1.00				10	3.90 ± 1.00				7	0.00			7	0.00
D	Kavangoor		8	3.62 ± 1.00				8	3.62 ± 1.00									
E	Wakkajah	"	8	1.50 ± 1.00				8	1.50 ± 1.00			5	3.60 ± 2.24				5	3.60 ± 2.24
F	Vellore	"	10	1.60 ± 0.20				10	1.60 ± 0.20			9	3.00 ± 1.41				9	3.00 ± 1.41
G	Stramboot	"	8	2.50 ± 1.00				8	2.50 ± 1.00			6	2.33 ± 1.41				6	2.33 ± 1.41
H	Jenupathur	"	6	4.67 ± 1.41				6	4.67 ± 1.41			3	0.00				3	0.00
I	Polur	"	9	7.56 ± 3.00				9	7.56 ± 3.00									
J	Tiruvannamalai		8	1.88 ± 1.00				8	1.88 ± 1.00			5	2.60 ± 1.41				5	2.60 ± 1.41
K	Tirukkoyilur	S. Arcot	9	1.24 ± 1.00				9	1.24 ± 1.00			4	1.25 ± 1.25				4	1.25 ± 1.25
	Total		93	3.56 ± 0.17				93	3.56 ± 0.17			44	1.98 ± 0.17				44	1.98 ± 0.17

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Table 64D(15)

Mean Percentages with Standard Error of Difference Due to Total Cane.

Sampling Unit = Field (of 3 workers combined)

Station No. 8 Name Gudiyattam Province Madras Surveyor's Name No. (5) D. Venasata. wtk

No.	Locality Name	District	Month..... December, 1940						Month..... January, 1941					
			Planted			Total			Planted			Total		
			N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Palamur	Chittoor	10	16.30 \pm 3.84			10	16.30 \pm 3.84	10	12.00 \pm 3.27			10	12.00 \pm 3.27
B	Chittoor	"	10	2.20 \pm 1.00			10	2.20 \pm 1.00	8	4.25 \pm 1.41			8	4.25 \pm 1.41
C	Gudiyattam	N. Arcot	10	6.50 \pm 1.79			10	6.50 \pm 1.79	10	5.00 \pm 1.55			10	5.00 \pm 1.55
D	Kavanoor	"	10	8.50 \pm 2.53			10	8.50 \pm 2.53	10	7.40 \pm 2.57			10	7.40 \pm 2.57
E	Wallajah	"	5	3.60 \pm 2.08			5	3.60 \pm 2.08	10	2.70 \pm 0.77			10	2.70 \pm 0.77
F	Vellore	"	10	2.30 \pm 1.14			10	2.30 \pm 1.14	10	3.10 \pm 1.41			10	3.10 \pm 1.41
G	Ithambaot	"	8	4.75 \pm 2.95			8	4.75 \pm 2.95	9	3.67 \pm 1.56			9	3.67 \pm 1.56
H	Jurupathur	"	10	2.80 \pm 1.45			10	2.80 \pm 1.45	10	3.10 \pm 1.14			10	3.10 \pm 1.14
I	Palur	"							10	2.10 \pm 0.63			10	2.10 \pm 0.63
J	Tiruvannamalai	"							10	0.90 \pm 0.77			10	0.90 \pm 0.77
K	Tirukkalalur	S. Arcot							10	4.40 \pm 1.22			10	4.40 \pm 1.22
	Total		73	6.03 \pm 0.92			73	6.03 \pm 0.92	107	4.43 \pm 0.17			107	4.43 \pm 0.17

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Sampling Unit = Field (or 3 workers combined)

Region No. 8 Name Gudiyattam Province Madras District Name No(5) D. Venkata wkt

Locality		District	Month February, 1941						Month March, 1941					
No.	Name		Planted		Total		Planted		Total					
(1)	(2)	(3)	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(16)	(17)	(18)	(17)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)			
A	Palamner	Chittoor	10	16.10 ± 2.00			10	16.10 ± 2.00	2	13.00 ± 4.00			2	13.00 ± 4.00
E	Chittoor	"	7	7.00 ± 1.41			7	7.00 ± 1.41	3	4.00 ± 2.08			3	4.00 ± 2.08
C	Gudiyattam	N. Arcat	10	6.10 ± 2.00			10	6.10 ± 2.00	7	2.56 ± 1.51			7	2.56 ± 1.51
D	Kavaroor	"	8	9.50 ± 3.00			8	9.50 ± 3.00						
E	Wallajah	"	8	5.25 ± 1.87			8	5.25 ± 1.87	5	9.20 ± 1.67			5	9.20 ± 1.67
F	Vellore	"	10	0.40 ± 0.40			10	0.40 ± 0.40	9	3.78 ± 0.75			9	3.78 ± 0.75
G	Sthamboot	"	8	7.38 ± 1.94			8	7.38 ± 1.94	6	2.33 ± 1.35			6	2.33 ± 1.35
H	Jirupathur	"	6	5.50 ± 0.91			6	5.50 ± 0.91	3	3.67 ± 2.00			3	3.67 ± 2.00
I	Polur	"	9	2.44 ± 1.91			9	2.44 ± 1.91						
J	Tiruvarnamalai	"	8	2.75 ± 1.12			8	2.75 ± 1.12	5	3.80 ± 2.05			5	3.80 ± 2.05
K	Tirukoyilur	S. Arcat	9	4.00 ± 1.20			9	4.00 ± 1.20	4	7.00 ± 0.87			4	7.00 ± 0.87
Total			93	6.08 ± 0.66			93	6.08 ± 0.66	44	4.95 ± 0.60			44	4.95 ± 0.60

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Mean Percentage with Standard Error of (unbiased) estimate of Total Cane.

Sampling Unit = Field (or 100 bushes per field)

Station No. 8 Name Andiyattam Province Madras District's Name Desamia sp. (?)

No.	Locality Name	District	Month: December - 1940					Month: January - 1941						
			Planted		Total			Planted		Total				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
	Salamner	Chittoor	10	0.00			10	0.00	10	0.00			10	0.00
	Chittoor	"	10	0.00			10	0.00	8	0.00			8	0.00
	Andiyattam	N. Arcal	10	0.00			10	0.00	10	0.00			10	0.00
	Kavanoor	"	10	0.00			10	0.00	10	0.00			10	0.00
	Wallejah	"	5	0.00			5	0.00	10	0.20			10	0.20
	Vellore	"	10	0.00			10	0.00	10	0.00			10	0.00
	Ithambol	"	8	0.00			8	0.00	9	0.00			9	0.00
	Jirupattur	"	10	0.00			10	0.00	10	0.00			10	0.00
	Polur	"							10	0.00			10	0.00
	Tiruvannamalai	"							10	0.00			10	0.00
	Tirukkoyilur	S. Arcal							10	0.00			10	0.00
	Total		73	0.00			73	0.00	107	0.02			107	0.02

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Sankar

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

G.D. (19) Cont Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit Field (or 3 workers combined)

Region No. S Name Jindiyatham Province Madras Borer's name Sesunia Sp.

No.	Locality Name	District	Month... February 1941.....								Month... March 1941.....							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)		
A	Ralamuru	Chittoor	10	0.00					10	0.00	2	0.00					2	0.00
B	Chittoor	"	7	0.00					7	0.00	2	0.00					2	0.00
C	Jindiyatham	N. Arcot	10	0.00					10	0.00	7	0.00					7	0.00
D	Karaimond	"	8	0.00					8	0.00								
E	Hullajah	"	8	0.00					8	0.00	5	0.00					5	0.00
F	Vellore	"	10	0.00					10	0.00	9	0.00					9	0.00
G	Stamboul	"	8	0.00					8	0.00	6	0.00					6	0.00
H	Jirupathur	"	6	0.00					6	0.00	3	0.00					3	0.00
I	Palur	"	9	0.00					9	0.00								
J	Kiruvanamudi	"	8	0.00					8	0.00	5	0.00					5	0.00
K	Kirukkolur	S. Arcot	9	0.00					9	0.00	4	0.00					4	0.00
	Total		13	0.00					93	0.00	44	0.00					44	0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Fig. (2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 3 workers combined)

Region No. 8

Name. Gudiyattam

Province. Madras

No.	Borer Name	Month. December, 1940						Month. January, 1941					
		Planted				Total		Planted				Total	
		N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	<i>Scirpophaga</i> sp.	73	7.56 ± 1.14			73	7.56 ± 1.14	107	5.57 ± 0.20			107	5.57 ± 0.20
2	<i>A. sticticrasis</i> Hamp.	73	2.51 ± 0.67			73	2.51 ± 0.67	107	2.60 ± 0.10			107	2.60 ± 0.10
3	<i>A. timidicatalis</i> Hamp.	73	0.00			73	0.00	107	0.00			107	0.00
4	<i>D. auricilia</i> Dudge.	73	0.00 ± 0.00			73	0.00 ± 0.00	107	0.00 ± 0.00			107	0.00 ± 0.00
5	<i>D. venosata</i> Wlk.	73	6.03 ± 0.92			73	6.03 ± 0.92	107	4.43 ± 0.17			107	4.43 ± 0.17
6	<i>C. zonellus</i> Swinh.	73	0.00			73	0.00	107	0.00			107	0.00
7	<i>C. trypheta</i> Bisset	73	0.00			73	0.00	107	0.00			107	0.00
8	<i>R. ablutella</i> Zell.	73	0.00			73	0.00	107	0.00			107	0.00
9	<i>Sesamia</i> sp.	73	0.00			73	0.00	107	0.02 ± 0.00			107	0.02 ± 0.00
10	<i>E. depressella</i> Swinh.	73	0.00 ± 0.00			73	0.00 ± 0.00	107	0.00 ± 0.00			107	0.00 ± 0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1941-42.

Table (2) Contd Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 3 workers combined)

Region No. 8. Name. Gudiyattam. Province. Madras.

Borer		Month. February. 1941.						Month. March. 1941.					
		Planted				Total		Planted				Total	
No.	Name	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
(1)	(2)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	<i>Scirpophaga</i> sp.	93	4.44 ± 2.37			93	4.44 ± 2.37	44	3.52 ± 0.67			44	3.52 ± 0.67
2	<i>A. Stictocraspis</i> Hufn	93	3.56 ± 0.17			93	3.56 ± 0.17	44	1.98 ± 0.17			44	1.98 ± 0.17
3	<i>A. Tumidicostalis</i> Hufn	93	0.00			93	0.00	44	0.00			44	0.00
4	<i>D. Auricilia</i> Dudgeon	93	0.00			93	0.00	44	0.00			44	0.00
5	<i>D. Venosata</i> Wlk	93	6.08 ± 0.66			93	6.08 ± 0.66	44	4.95 ± 0.60			44	4.95 ± 0.60
6	<i>C. Zonellus</i> Guenée	93	0.00			93	0.00	44	0.00			44	0.00
7	<i>C. Trypetes</i> Bissch	93	0.00			93	0.00	44	0.00			44	0.00
8	<i>R. Aboluta</i> Zell	93	0.00			93	0.00	44	0.00			44	0.00
9	<i>Sesamia</i> sp.	93	0.00			93	0.00	44	0.00			44	0.00
10	<i>E. Depressella</i> Guenée	93	0.00			93	0.00	44	0.00			44	0.00

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REGIONAL SURVEY OF BORER PESTS OF BUREAU OF AP, 1940-41

The (GX 3) Number of Cans, Stools, Fields, Villages & Localities affected by different Borer.

Region No. 8

Name Gudiyattam

District

Borer's Name (1)	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)
Spirpodon	172	131	47	16	8	178	135	63	22	11	125	97	42	20	11	49	39	24	12	9
A. asiaticus Hagen	71	55	31	13	8	91	78	49	20	10	111	90	55	21	11	32	28	20	8	6
A. turidid. Hampson																				
D. auricilia Dyar																				
D. venosus Wlk.	142	116	49	15	8	144	118	68	22	11	172	140	64	21	11	65	52	36	12	9
C. zonellus Swinh.																				
C. trypetes Eschsch.																				
R. ablutella Zell.																				
Sesaria sp.								1	1	1	1									
E. depress. Swinh.																				
Total Damaged	385	241	68	16	8	411	301	98	22	11	415	280	77	22	11	148	109	43	12	9
Grand Total	2542	661	73	16	8	3540	945	107	22	11	3075	821	93	22	11	1481	389	44	12	9

N_1 = $\frac{\text{Percentage}}{\text{Number of cans affected}}$; N_2 = $\frac{\text{Percentage}}{\text{Number of stools affected}}$; N_3 = $\frac{\text{Percentage}}{\text{Number of fields affected}}$; N_4 = $\frac{\text{Percentage}}{\text{Number of villages affected}}$; N_5 = $\frac{\text{Percentage}}{\text{Number of localities affected}}$.

Collected (10) Roll 13:6 Date 13:6 Checked Roll Date

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-1

Table 60 (4)

Percentage of larvae, Stalks in fields, villages, etc. and localities affected by different Borer

8

Borer's Name	December, 1940					January, 1941					February, 1941					March, 1941					
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1. Stripopopage sp.	6.8	19.9	63.5	100.0	100.0	5.0	14.4	58.9	100.0	100.0	4.1	11.8	45.2	90.9	100.0	3.3	10.0	54.5	100.0	100.0	100.0
2. A. striatellus	2.8	8.3	41.9	86.7	100.0	2.6	8.3	45.8	90.9	90.9	3.6	11.0	59.1	95.5	100.0	2.2	7.2	45.5	66.7	66.7	66.7
3. A. bambusae																					
4. P. aurivillii																					
5. S. venosus	5.6	17.6	66.2	100.0	100.0	4.1	12.5	63.5	100.0	100.0	5.6	17.1	68.8	95.5	100.0	4.4	13.3	81.8	100.0	100.0	100.0
6. P. zonellus																					
7. S. imitator																					
8. R. albicollis																					
9. S. ...						0.0	0.1	0.9	4.5	9.1											
10. B. ...																					
Total Damaged	15.1	36.6	91.9	100.0	100.0	11.6	32.0	91.6	100.0	100.0	13.5	34.1	82.8	100.0	100.0	10.0	27.9	97.7	100.0	100.0	100.0

Percentage

Percentage

Percentage

Percentage

N₁ = No. of stalks in fields; N₂ = No. of stalks in villages, etc.; N₃ = No. of stalks in fields, villages, etc. and localities affected; N₄ = No. of stalks in fields, villages, etc. and localities affected; N₅ = Number of stalks in fields, villages, etc. and localities affected.

Collected by.....

Checked by.....

Checked by.....

Field.....

Date.....

REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Table (5)

Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Bunch

Region No. 8 Name Gudiyattam Province Madras

Locality	Village No.	Month... December, 1940								Month... January, 1941							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
A	1	15	30.33	15	19.73	15	19.93	45	23.33	12	37.50	15	19.67	15	29.20	42	0.28
	2	15	39.53	15	37.07	15	61.67	45	46.09	15	42.20	15	47.80	15	62.20	45	5.07
B	1	15	11.73	15	8.47	15	14.33	45	11.51	9	11.56	9	15.00	9	15.56	27	14.04
	2	15	13.53	15	13.00	15	10.20	45	12.24	15	2.20	15	4.67	15	10.00	45	5.62
C	1	15	22.87	15	9.33	15	32.47	45	21.56	15	16.67	15	5.20	15	8.00	45	9.96
	2	15	21.07	15	9.60	15	18.07	45	16.25	15	17.67	15	14.80	15	4.47	45	12.31
D	1	15	30.00	15	15.40	15	7.20	45	20.20	15	15.47	15	5.00	-	30	10.24	
	2	15	22.47	15	25.67	14	41.93	44	29.75	15	8.87	15	8.73	15	35.53	45	17.71
E	1	14	50.71	15	7.40	15	11.00	44	22.41	15	15.07	15	17.87	15	8.20	45	13.71
	2									15	0.00	15	18.87	15	8.20	45	9.02
F	1	14	59.29	15	5.47	15	8.87	44	23.75	15	10.60	15	14.73	15	6.46	45	10.60
	2	15	0.00	13	2.57	15	10.53	43	4.44	15	5.07	15	10.00	15	5.20	45	6.76
G	1	15	8.33	15	5.60	15	5.60	45	6.51	15	14.67	15	11.33	15	6.00	45	10.67
	2	12	20.83	12	9.75	12	14.58	36	15.05	12	0.00	12	9.33	12	4.83	36	4.72
H	1	15	21.87	15	15.80	15	15.13	45	17.60	15	11.33	15	11.33	15	6.33	45	9.66
	2	15	17.07	15	12.07	15	28.67	45	19.27	15	18.00	15	10.20	15	3.33	45	10.51
I	1									15	1.07	15	19.13	15	7.20	45	9.13
	2									15	6.00	15	11.67	15	15.00	45	10.87
J	1									15	6.67	15	5.27	15	9.47	45	7.14
	2									15	0.80	15	11.47	15	8.13	45	6.80
K	1									15	16.13	15	7.87	15	18.20	45	14.73
	2									15	14.07	15	8.33	15	10.92	45	11.11
Total		220	15.40	220	13.27	221	19.99	661	16.23	318	12.24	321	13.20	306	13.53	945	12.98

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-42

Table (G7)(5) Contd. Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 8 Name *Gudiyattam* Province *Madras*

Loc- No.	Village	Month. <i>February, 1941</i>								Month. <i>March, 1941</i>							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
A	1	15	43.87	15	23.00	15	33.13	45	33.33	6	8.33	6	8.33	6	23.67	18	13.44
	2	15	64.46	15	39.87	15	37.67	45	47.33								
B	1	9	26.89	9	0.97	9	6.44	27	11.43								
	2	12	26.42	12	11.08	12	27.75	36	21.75	9	11.11	9	2.78	9	27.78	27	13.89
C	1	14	13.00	15	6.53	15	85.07	44	35.02	6	11.00	6	12.50	6	15.33	18	13.94
	2	15	36.80	15	20.00	15	9.67	45	22.16	9	0.00	15	16.60	15	9.73	39	10.13
D	1	15	6.27	15	13.33	15	19.80	45	13.13								
	2	9	13.89	9	26.56	9	3.57	27	14.66								
E	1	9	3.67	9	7.00	9	4.56	27	5.08								
	2	15	3.33	15	14.93	15	8.87	45	9.04	15	10.53	15	13.87	15	14.87	45	12.09
F	1	15	1.33	-	-	15	46.00	30	23.67	12	2.25	12	16.42	12	5.83	36	8.17
	2	15	0.00	15	3.33	15	10.67	45	4.67	15	7.13	15	8.42	15	10.47	45	8.67
G	1	15	10.87	15	8.06	15	12.27	45	10.40	9	4.33	9	10.56	9	7.78	27	7.56
	2	9	0.00	9	22.56	9	13.81	27	12.12	9	8.11	9	7.56	9	4.78	27	6.82
H	1	6	17.83	6	9.67	6	8.83	18	12.11								
	2	12	27.08	12	12.67	12	65.83	36	35.19	9	18.44	9	12.89	9	2.78	27	11.37
I	1	15	0.00	15	1.60	15	9.40	45	3.67								
	2	12	21.50	12	15.17	12	25.83	36	20.83								
J	1	15	7.60	15	15.00	15	10.67	45	11.09	14	6.94	15	12.13	15	4.67	44	7.93
	2	9	5.56	9	7.78	9	1.11	27	4.82								
K	1	15	10.53	12	4.33	15	57.33	42	25.47								
	2	12	0.00	15	12.47	12	75.83	39	28.13	12	8.75	12	17.33	12	3.75	36	9.94
Total		278	15.88	260	13.62	279	14.93	821	14.83	125	7.90	132	12.11	132	10.26	389	10.13

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NATIONAL SURVEY OF FLYER PESTS OF SUGARCANE 1940-41

(G-D) (6)

Main Part of the report should be typed on one side by localities & Months & Months

Reporting District

Region No. 8

Name Gudiyattam

Province Madras

No.	Locality	District	Month: December, 1940								Month: January, 1941									
			Worker 1		Worker 2		Worker 3		Worker 4		Worker 1		Worker 2		Worker 3		Worker 4			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Palamner	Chittoor	30	34.93	30	8.90	30	40.80	90	34.88	27	40.03	30	33.73	30	45.70	87	39.82		
	Chittoor	"	30	12.63	30	10.73	30	12.27	90	12.04	24	5.71	24	8.54	24	12.50	72	8.92		
	Gudiyattam	North Arcot	30	21.97	30	9.47	30	25.27	90	18.90	30	17.17	30	10.00	30	6.23	90	11.13		
	Kavaracon	"	30	13.80	30	20.53	29	23.97	89	19.38	30	12.17	30	6.87	15	35.53	75	14.72		
	Wallajah	"	14	50.71	15	7.40	15	11.00	44	22.41	30	7.53	30	18.37	30	8.20	90	11.37		
	Vellore	"	29	8.62	28	4.10	30	9.70	87	19.20	30	7.83	30	12.37	30	5.83	90	8.68		
	Thambot	"	27	5.56	27	7.44	27	9.59	81	7.53	27	8.15	27	10.44	27	5.48	81	8.02		
	Jirupathur	"	30	19.47	30	3.93	30	21.90	90	18.43	30	14.67	30	10.77	30	4.83	90	10.09		
	Polur	"									30	3.53	30	15.40	30	11.10	90	10.01		
	Tiruvannamalai	"									30	3.73	30	8.37	30	8.80	90	6.97		
	Tirukkoyilur	South Arcot									30	15.10	30	9.10	30	14.57	90	12.92		
		"	220	19.05	220	9.23	221	19.99	661	16.23	318	12.24	321	13.20	306	13.53	945	12.98		

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NATIONAL SURVEY OF HONEY BEES OF SUGARCANE 1940-41

Table G.1 (6) ~~Continued~~ Mean Percentage of Honey Capped to Total Honey in Localities in Workers & Mentos

Sampling Unit - Stocks

Region No. 8

Name Gudiyattam

Province Madras

Locality		District		Month... February, 1941,						Month... March, 1941,									
				Worker 1		Worker 2		Worker 3		Worker 4		Worker 5		Worker 6		Total			
No.	Name			H	Mean	H	Mean	H	Mean	H	Mean	H	Mean	H	Mean	H	Mean		
(1)	(2)	(3)		(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)
	Balamner	Chitton		30	54.17	30	21.43	30	35.40	90	37.00	6	8.33	6	8.33	6	23.67	18	13.44
	Chitton	"		21	26.62	21	10.48	21	18.62	63	18.57	9	11.11	9	2.78	9	27.78	27	13.89
	Gudiyattam	North Arcat		29	25.31	30	12.77	30	14.63	89	17.48	15	4.40	21	15.43	21	12.33	57	11.39
	Karanoor	"		24	9.12	24	18.29	24	15.66	72	14.35								
	Hallajah	"		24	3.46	24	11.96	24	12.62	72	9.35	15	10.53	15	10.38	15	14.87	45	11.93
	Vellore	"		30	0.67	15	3.30	30	2.41	75	4.90	27	4.96	27	11.96	27	8.41	81	8.44
	Uthambot	"		24	6.79	24	13.50	24	17.79	72	12.69	18	6.22	18	9.06	18	6.23	54	7.17
	Girupathkur	"		18	24.00	18	11.67	18	13.83	54	16.50	9	18.44	9	12.89	9	2.78	27	11.37
	Polur	"		27	9.56	27	7.63	27	75.33	81	30.84								
	Kiruvannavala	"		24	6.83	24	12.29	24	5.61	72	8.24	14	6.93	15	12.13	15	4.70	44	7.94
	Bruckhoyilur	South Arcat		27	5.85	27	8.85	27	11.60	81	8.77	12	8.75	12	17.33	12	3.75	36	9.94
				278	15.88	264	13.62	279	14.93	821	14.83	125	7.90	132	12.11	132	10.26	389	10.13

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-11

Table (A) (7) Mean Percentage of Damaged Cane to Total Cane by Localities and Months

Region No. 8 Name Gudiyattam Province Madras

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Palamuru	90	34.88	87	39.82	90	37.00	18	13.44
Chittoor	90	12.04	72	8.92	63	18.57	27	13.89
Gudiyattam	90	18.90	90	11.13	89	17.48	57	11.39
Kavaraoo	89	19.38	75	14.72	72	14.35	-	-
Wallajah	44	22.41	90	11.37	72	9.35	45	11.95
Vellore	87	14.20	90	8.68	75	1.90	81	8.44
Itanboot	81	7.53	81	8.02	72	12.69	54	7.17
Gudiyattam Palur	90	18.43	90	10.09	54	16.50	27	11.37
Palur	-	-	90	10.01	81	30.84	-	-
Tiruvannamalai	-	-	90	6.97	72	8.24	44	7.94
Tiruchigalur	-	-	90	12.92	81	8.77	36	9.94
Total	661	16.23	945	12.98	821	14.83	389	10.13

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Table G.D (8) Analysis of variance

Source of variation	d.f	Sum of squares	variance	Ratio of variances
(1)	(2)	(3)	(4)	(5)
Between months	2	11 61.76	5 80.88	9.17 **
Between localities	6	10 47.71	1 74.62	2.76 **
* months & localities	12	12 47.18	1 03.93	1.64
Between villages (within months & localities)	21	13 29.71	63.32	
	41	47 86.36		

Results by Workers and Localities

128. Table PD(5) gives the percentage of canes damaged by all borers as recorded by each of the three workers for each village and months. Table PD(6) gives the consolidated percentages for each locality, and Table PD(7) the mean percentage of damaged canes for each locality in each month. Without entering into detailed tests for which we have no time we may note that there was apparently a good deal of bias among workers. Thus worker No.(2) always gave a higher percentage of damage than the other two workers.

Monthly Fluctuations

129. From Table PD(7) we notice that the percentage damaged by all borers taken together was 5 per cent in January, followed by a slight fall to 1 per cent in February, and a steep rise to 8 per cent in March.

Variation between Localities

130. The variation between localities is not negligible. The range of variation was from 0 to 15 per cent in January; from 0 to 5 per cent in February; and from 0 to 18 per cent in March.

131. Owing to the non-orthogonal nature of the data in Table PD(7), no statistical analysis has been attempted as there was no time for using appropriate but laborious methods.

Table (1.2)

Mean Percentage with Standard Error of Mean of Loss of Cane to Total Cane.

Sampling Unit = Field (or 3 workers' equivalent)

Region No. 9 Name Padegaon Province Bombay District Name Maharashtra (2)

Locality		District	Month... December, 1940						Month... January, 1941					
No.	Name		Planted		Ratoon		Total		Planted		Ratoon		Total	
			N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
A	Karad	Satara												
E	Kale	'												
C	Padegaon	'							2	0.00			2	0.00
D	Phaltan	'							8	3.25 \pm 1.24			8	3.25 \pm 1.24
E	Kimbit	Poona							5	0.00			5	0.00
F	Vadgaon	"							5	0.00			5	0.00
G	Baramati	'							5	4.60 \pm 1.88			5	4.60 \pm 1.88
H	Kalamb	'							1	12.00			1	12.00
I	Belwandi	Ahmadnagar												
J	Belapur	'												
K	Kopergaon	'												
	Total								26	2.35 \pm 0.73			26	2.35 \pm 0.73

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GR(2) Contd. Mean Percentage with Sturled Lines of Leaf of same as Total Area.

Sampling Unit = 100 ft² (or 1 acre if available)

Form No. 9. Name: Padegaon. Location: Bombay. No(2)A. Sticticraspis Hampen

Locality	District	Month: February, 1941				Month: March, 1941							
		Planted		Ratoon		Planted		Ratoon					
(1)	(2)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Karad	Satara							10	15.40 ± 1.30			10	15.40 ± 1.30
Kale	"							10	17.60 ± 1.64			10	17.60 ± 1.64
Padegaon	"	1	0.00	1	0.00	2	0.00						
Phaltan	"	5	0.00			5	0.00	4	2.75 ± 1.58			4	2.75 ± 1.58
Kimbut	Poona	3	2.00 ± 2.00			3	2.00 ± 2.00	8	0.00			8	0.00
Vadgaon	"	3	0.00			3	0.00	3	1.67 ± 1.63			3	1.67 ± 1.63
Baramati	"	5	3.40 ± 1.40			5	3.40 ± 1.40	5	5.20 ± 3.32			5	5.20 ± 3.32
Kalamb	"	2	0.00			2	0.00	2	0.00			2	0.00
Belwandi	Ahmadnagar							5	0.00			5	0.00
Belapur	"							5	0.00			5	0.00
Kopergaon	"												
Total		19	1.28 ± 0.55	1	0.00	20	1.15 ± 0.56	52	7.15 ± 3.72			52	7.15 ± 3.72

To 62(13)

Mean Percentage with Standard Error of Mean of Game to Total Game.

Sampling Unit = Field (or 3 hectares combined)

Station No. 9 Name Padegaon Province Bombay Locality Name *A. tumidicostalis* Hufsch

No.	Locality Name	District	Month.....				Month.....							
			Planted		Total		Planted		Total					
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.		
(1)	(2)	(3)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	Karad	Satara												
B	Kale	"												
C	Padegaon	"							2	0.00			2	0.00
D	Phaltan	"							8	0.00			8	0.00
E	Kambhat	Poona							5	0.00			5	0.00
F	Vedgaon	"							5	0.00			5	0.00
G	Karamati	"							5	0.00			5	0.00
H	Kalamub	"							1	0.00			1	0.00
I	Belwandi	Ahmadnagar												
J	Belapur	"												
K	Kopergaon	"												
	Total								26	0.00			26	0.00

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Table **GP(2)**

Mean Percentages with Error of Standard Error to Total Cane

Sample No. 9

Serial No. 9

9

Name

Padegaon

Province

Bombay

No.	Name	December, 1940.					January, 1941						
		Plant		Ratoon			Plant		Ratoon				
		Mean %	S.E.	Mean %	S.E.	Mean %	S.E.	Mean %	S.E.	Mean %	S.E.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
	<i>Scirpophaga</i> Sp.							26	0.00			26	0.00
	<i>A. Stictinaspis</i> Hagen							26	2.35 ± 0.73			26	2.35 ± 0.73
	<i>A. Imidicostalis</i> Hagen							26	0.00			26	0.00
	<i>D. auricilia</i> Dudgeon							26	0.00 †			26	0.00
	<i>D. Venosata</i> Wlk							26	0.00			26	0.00
	<i>C. Zonellus</i> Swinh							26	0.00			26	0.00
	<i>C. Trypetes</i> Bisset							26	0.00			26	0.00
	<i>R. ablutella</i> Zell							26	0.00			26	0.00
	<i>Sesamia</i> Sp.							26	0.00			26	0.00
	<i>E. depressella</i> Swinh							26	0.00			26	0.00

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Table (2) Contd. Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sample Unit = Field (or 4 workers combined)

Region No. 9 Name Padegaon Province Bombay ..

No.	Pest	Month..... February, 1941						Month..... March, 1941					
		Planted		Ratoon		Total		Planted		Ratoon		Total	
		N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
(1)	(2)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
1	<i>Scirpophaga</i> sp.	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
2	<i>A. Sclitocraspis</i> Hufn.	19	1.21 ± 0.55	1	0.00	20	1.15 ± 0.53	52	7.15 ± 3.72			52	7.15 ± 3.72
3	<i>A. Imidicostalis</i> Hufn.	19	0.00	1	0.00	20	0.00	52	0.21 ± 0.15			52	0.21 ± 0.15
4	<i>D. Auricilia</i> Dodge	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
5	<i>D. Venosata</i> Wlk.	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
6	<i>C. Zonellus</i> Swinh	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
7	<i>C. Frypetis</i> Bisset	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
8	<i>R. Abutiliella</i> Zed	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
9	<i>Sesamia</i> sp.	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00
10	<i>E. Depressella</i> Guen	19	0.00	1	0.00	20	0.00	52	0.00			52	0.00

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (4) Percentage of Cane, Stools, Fields, Villages and Localities affected by Borer

Region No. 9 Name Padegaoon Province Bombay

Borer's Name (1)	December, 1940					January, 1941					February, 1941					March, 1941					
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)	
Scirpophage sp.																					
A. stricti. Hampn.						4.3	5.9	48.0	66.7	83.3	1.9	3.1	25.0	30.0	50.0	8.7	15.8	48.1	43.8	53.6	
A. tumidi. Hampn.																0.3	0.5	1.9	6.3	11.1	
D. auricilia Dg.																					
D. varicosa Wlk.																					
C. zonellus Swinh.																					
C. trypetes Bl.																					
R. ablutella Zell.																					
Secania sp.																					
E. depress. Swinh.																					
Total Damaged						4.3	5.9	48.0	66.7	83.3	1.9	3.1	25.0	30.0	50.0	8.7	16.3	50.0	50.0	66.7	

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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FEDERAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Table (5 contd. Mean Percentage of Damaged Cane to Total Cane.

Sampling Unit = Stool

Region No. 9 . Name Padegaon . Province Bombay

Locality	Village No	Month... <u>February, 1941</u>								Month... <u>March, 1941</u>							
		Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
A	1									15	3.33	15	15.53	15	22.20	45	13.67
	2									15	9.93	15	26.67	15	14.40	45	17.00
B	1									15	17.73	15	16.67	15	11.07	45	15.16
	2									15	22.20	15	18.33	15	24.40	45	19.98
C	1	3	0.00	6	0.00	3	0.00	12	0.00	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	1	6	0.00	5	0.00	5	0.00	16	0.00	6	0.00	6	0.00	5	0.00	17	0.00
	2	9	0.00	8	0.00	7	0.00	24	0.00	15	5.53	6	0.00	6	0.00	27	0.00
E	1	3	0.00	2	0.00	3	0.00	8	0.00	12	0.00	4	0.00	2	0.00	18	0.00
	2	6	0.00	1	0.00	6	0.00	13	0.00	6	0.00	7	4.71	6	0.00	19	1.74
F	1	6	0.00	5	0.00	4	0.00	15	0.00	3	0.00	3	0.00	3	0.00	9	0.00
	2	3	0.00	3	0.00	2	0.00	8	0.00	5	0.00	6	8.33	5	0.00	16	3.12
G	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	15	0.00	6	19.33	15	0.00	36	3.22	15	4.40	15	7.20	15	0.00	45	3.87
H	1	3	0.00	3	0.00	3	0.00	9	0.00	3	0.00	3	0.00	3	0.00	9	0.00
	2	3	0.00	3	0.00	3	0.00	9	0.00	3	0.00	1	0.00	3	0.00	7	0.00
I	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	14	0.00	11	0.00	8	0.00	33	0.00
J	1	-	-	-	-	-	-	-	-	6	0.00	4	0.00	6	0.00	16	0.00
	2	-	-	-	-	-	-	-	-	8	0.00	6	0.00	8	0.00	22	0.00
K	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		57	0.00	42	5.14	51	0.00	150	1.44	156	6.06	132	9.65	130	7.68	418	8.23

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

Table D (6)

Mean Percentage of Damaged Cane to Total Cane : by Localities x Workers x Months

Sampling Unit : Stool

Region No. 9

Name Padegaon

Province Bombay

Locality		District	Month... December, 1940.....								Month... January, 1941.....							
			Worker 1		Worker 2		Worker 3		Total		Worker 1		Worker 2		Worker 3		Total	
No.	Name		N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
A	Karad	Satara																
B	Kale	"																
C	Padegaon	"									6	0.00	6	0.00	4	0.00	16	0.00
D	Phaltan	"									24	0.00	23	12.00	24	0.00	71	3.89
E	Timbut	Poona									8	0.00	13	15.38	11	0.00	32	6.25
F	Vadgaon	"									11	0.00	15	0.00	18	0.00	44	0.00
G	Baramati	"									15	0.00	15	5.53	15	0.00	45	1.84
H	Kalamb	"											3	13.33			3	13.33
I	Belwandi	Ahmadnagar																
J	Belapur	"																
K	Kopergaon	"																
Total											64	0.00	75	7.98	72	0.00	211	2.95

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Form G.D.(6) Contd.

Major Entomologist, Entomology Department, Government of India

Director, Agricultural Entomology, Bombay

Reporting Unit Name

Station No. 9

Padegaon

Bombay

Locality	Dist. Code	Month..... February, 1941.....									Month..... March, 1941.....						Total	
		(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)		
Karad	Satara	-		-		-		-		30	6.63	30	21.10	30	18.30	90	15.34	
Kale	"	-		-		-		-		30	19.73	30	15.00	30	17.73	90	17.55	
Padegaon	"	3	0.00	6	0.00	3	0.00	12	0.00									
Phaltan	"	15	0.00	13	0.00	12	0.00	40	0.00	21	3.95	12	0.00	11	0.00	44	1.89	
Nimbut	Poona	9	0.00	3	16.67	9	0.00	21	2.38	18	0.00	11	3.00	8	0.00	37	0.89	
Vadgaon	"	9	0.00	8	6.25	6	0.00	23	2.17	8	0.00	9	5.56	8	0.00	25	2.00	
Baramati	"	15	0.00	6	19.33	15	0.00	36	3.22	15	4.40	15	7.20	15	0.00	45	3.87	
Kalamb	"	6	0.00	6	0.00	6	0.00	18	0.00	6	0.00	4	0.00	6	0.00	16	0.00	
Belwandi	Ahmadnagar	-		-		-		-		14	0.00	11	0.00	8	0.00	33	0.00	
Belapur	"	-		-		-		-		14	0.00	10	0.00	14	0.00	38	0.00	
Kopergaon	"	-		-		-		-		-		-		-		-		
		57	0.00	42	5.14	51	0.00	150	1.44	156	6.06	132	9.65	130	7.68	418	8.23	

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table 6D(7) Mean Percentage of Damaged Cane to Total Cane
by Localities and Months

Region No. 9 Name Padegaon Province Bombay

Name of Locality	December, 1940		January, 1941		February, 1941		March, 1941	
	N	Mean	N	Mean	N	Mean	N	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A Karad	-		-				90	15.34
B Kote	-		-				90	17.55
C Padegaon	-		16	0.00	12	0.00	-	
D Phaltan	-		71	3.89	40	0.00	44	1.89
E Nembur	-		32	6.25	21	2.38	37	0.89
F Vadgaon	-		44	0.00	23	2.17	25	2.00
G Baramati	-		45	1.84	36	3.22	45	3.87
H Kalamb	-		3	13.33	18	0.00	16	0.00
I Belwandi	-		-		-		33	0.00
J Belapur	-		-		-		38	0.00
K Kohurgaon	-		-		-		-	
Total	-		211	2.95	150	1.44	418	8.23

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CHAPTER 5. DISCUSSION OF RESULTS FOR INDIVIDUAL BORERS

Consolidated Tables for all Regions

132. For convenience of inter-regional comparisons results for the different regions have been brought together in the form of a series of consolidated All-Region Tables.

Damage by Individual Borers : Tables IND(1) - (2)

133. Tables IND(1.1) - IND(1.10) give for each of the borer Nos.(1) - (10) the mean percentage of damage in each region and month in 'planted', 'ratoon', 'mixed' and 'total' fields. In These Tables col.(1) gives the serial number and col.(2) the name of the region, and col.(3) the name of the province. Cols.(4) - (11) relate to December 1940; cols.(4), (6), (8) and (10) give the number of 'planted', 'ratoon', 'mixed' and 'total' fields for each region; and cols.(5), (7), (9) and (11) give the mean with standard error of the percentage of canes damaged by the borer in question in 'planted', 'ratoon', 'mixed' and 'total' fields respectively. In the same way cols.(12) - (19) give similar information for January 1941; cols.(20) - (27) for February 1941; and cols.(28) - (35) for March 1941. The bottom row of each Table gives relevant information for All-Regions, being the average over all the nine regions. These have been gathered together in Table IND(2).

Spread of Individual Borers : Tables IND(3) - (5).

134. Table IND(3) gives the total number of canes, stools, fields, villages and localities surveyed in each region in each of the months December 1940 to March 1941. In this Table col.(1) shows the name of the region; and cols. (2) - (6) give respectively the number of canes, stools, fields, villages and localities surveyed in each region in December 1940. Cols (7) - (11) give similar information for January 1941; cols.(12) - (16) for February 1941; and cols.(17) - (21) for March 1941.

135. Tables IND(4.1) - IND(4.10) and Table IND(4.0) give information about the extent of spread of borer Nos.(1) - (10) and of all borers respectively among the canes, stools, fields, villages and localities of each region. In each of these Tables, col.(1) gives the name of region; and cols.(2) - (6) give respectively the percentages of canes, stools, fields, villages and localities affected by an particular borer or all borers in December 1940.

Similar information for January 1941 is given in cols.(7) - (11); for February in cols.(12) - (16); and for March in cols.(17) - (21). The bottom row of each of these Tables has been gathered together in Table IND(5) which shows the extent of spread of each borer and all borers for all-regions as a whole.

All Borers : Table IND(7)

156. Table IND(7) gives the percentage damaged by all borers for each region and month. Here col.(1) gives the serial number and col.(2) the name of the region, col.(5) the number of stools examined and col.(4) the mean percentage of canes damaged by all borers in each region in December 1940; cols.(5) - (6) give similar information for January 1941; cols.(7) - (8) for February 1941; and cols.(9) - (10) for March 1941.

Borer No.(1) : Scirpophaga sp.

157. From Table IND(1.1) we notice that this borer occurred most frequently in Region (2) : Muzaffarnagar with a percentage damage of 59, 44, 49 and 45 per cent in December 1940, January, February and March 1941 respectively. The region with the second highest attack was Region (1) : Gurdaspur with percentage damage of 25, 32, 34 and 32 per cent respectively in the four months December 1940 to March 1941. On the other hand Region (9) : Padegaon was completely free from attack by this borer.

158. From Table IND(4.1) we find that this borer was quite widespread in all the regions except in Padegaon where it did not occur. It was found in every village in Regions (1) - (6) (Gurdaspur, Muzaffarnagar, Gorakhpur, Sepaya, Pusa and Bengal) and in Region (8) : Gudiyattam; and occurred in every field in Regions (1) : Gurdaspur and (2) : Muzaffarnagar.

159. From Table IND(5) it will be noticed that this borer had the highest intensity of incidence over all India and was also the most widespread.

140. Taking all regions together we find from Table IND(2) that the percentage damage was greater in 'ratoon' fields than in 'planted' fields during three months out of four, whereas the percentage damage in 'mixed' fields was less than in 'planted' fields in all the four months. Some of the differences are statistically significant.

Borer No.(4) ; Diatraea auricilia Pudgn.

147. From Table IND(1.4) we notice that this borer occurred most frequently in Region (4) ; Sepaya with a high rate of attack of 18, 16, 17 and 15 per cent in December 1940, January, February and March 1941 respectively. The region next in importance was Region (5) ; Gorakhpur with percentage damage of 4, 7, 4 and 5 per cent in the corresponding months. We also notice that certain regions were completely free from attack by this borer.

148. From Table IND(4.4) we find that this borer was most widespread in region (4) ; Sepaya where its intensity of incidence among canes was also the highest. From Table IND(5) we see that although the intensity of incidence among canes in all regions was almost the same for borer No.(4) and borer No.(2) the former was much less widespread than the latter.

149. There is not enough material for comparing the influence of ratooning on the incidence of borers.

Borer No.(5) ; D. venosta Wlk.

150. From Table IND (1.5) we find that this borer was most frequent in Region (8) ; Gudiyattam with a percentage damage of 6, 4, 6 and 5 per cent in December 1940, January, February and March 1941 respectively. The next important region was Region (7) ; Cuttack, with a percentage damage of 5, 10, 5 and 2 per cent in the corresponding months. In the other regions the attack from this borer was negligible.

151. From Table IND(4.5) we find that this borer was quite widespread in Region (8) ; Gudiyattam in every month and only a little less so in Region (7) ; Cuttack in December and January. From Table IND(5) we notice that this borer was much more widespread than borer No.(7) which had a higher intensity of incidence among canes.

152. No comparison of the percentage damage of 'planted', 'ratoon' and 'mixed' fields is possible as the damage done was small.

Borer No.(6). C. zenellus Swinh.

153. From Table IND(1.6) we notice that this borer was absent from almost all the regions except Region (1) ; Gurdaspur where its rate of attack was about 0.5 per cent of canes. But as can be seen from Table IND(4.6) it was observed in 44 per cent of localities in December 1940, 27 per cent of localities in January 1941, 9 per cent of localities in February and 22 per cent of localities in March 1941 in Region (1).

Borer No.(4) ; Diatraea auricilia Judgn.

147. From Table IND(1.4) we notice that this borer occurred most frequently in Region (4) : Sepaya with a high rate of attack of 18, 16, 17 and 15 per cent in December 1940, January, February and March 1941 respectively. The region next in importance was Region (5) : Gorakhpur with percentage damage of 4, 7, 4 and 5 per cent in the corresponding months. We also notice that certain regions were completely free from attack by this borer.

148. From Table IND(4.4) we find that this borer was most widespread in region (4) : Sepaya where its intensity of incidence among canes was also the highest. From Table IND(5) we see that although the intensity of incidence among canes in all regions was almost the same for borer No.(4) and borer No.(2) the former was much less widespread than the latter.

149. There is not enough material for comparing the influence of ratooning on the incidence of borers.

Borer No.(5) ; D. venosta Wlk.

150. From Table IND (1.5) we find that this borer was most frequent in Region (8) : Gudiyattam with a percentage damage of 6, 4, 6 and 8 per cent in December 1940, January, February and March 1941 respectively. The next important region was Region (7) : Cuttack, with a percentage damage of 5, 10, 5 and 2 per cent in the corresponding months. In the other regions the attack from this borer was negligible.

151. From Table IND(4.5) we find that this borer was quite widespread in Region (8) : Gudiyattam in every month and only a little less so in Region (7) : Cuttack in December and January. From Table IND(5) we notice that this borer was much more widespread than borer No.(7) which had a higher intensity of incidence among canes.

152. No comparison of the percentage damage of 'planted', 'ratoon' and 'mixed' fields is possible as the damage done was small.

Borer No.(6). C. senellus Swinh.

153. From Table IND(1.6) we notice that this borer was absent from almost all the regions except Region (1) : Gurdaspur where its rate of attack was about 0.5 per cent of canes. But as can be seen from Table IND(4.6) it was observed in 44 per cent of localities in December 1940, 27 per cent of localities in January 1941, 9 per cent of localities in February and 22 per cent of localities in March 1941 in Region (1).

154. The damage done was too small to allow comparisons between 'planted', 'ratoon' and 'mixed' fields.

Borer No.(7) : G. trypetes Bisset.

155. From Table IND(1.7) we find that this borer occurred most frequently in Region (1) : Gurdaspur with quite a high rate of attack equal to 10, 8, 11 and 16 per cent in December 1940, January, February and March 1941. respectively. All the other regions were free from attack from this borer except Region (2) : Muzaffarnagar where it caused a comparatively small damage of about 0.6 per cent.

156. No comparison between 'planted', 'ratoon' and 'mixed' fields is possible.

Borer No.(8) : R. ablutell Zell.

157. From Table IND(1.8) we find that this borer was found only in Regions (1) : Gurdaspur and (2) : Muzaffarnagar; and it was responsible for a negligible percentage of damage less than 0.1 per cent.

158. Like borer No.(7) this borer occurred only in Regions (1) : Gurdaspur and (2) : Muzaffarnagar but with much less intensity. It was also less widespread as can be easily seen from Tables IND(4.8) and IND(5).

159. It is not possible to compare the percentage damage in 'planted', 'ratoon' and 'mixed' fields.

Borer No.(9) : Sesamia sp.

160. From Table IND(1.9) we see that Regions (6) - (9) (Dacca, Cuttack, Gudiattam and Padegaon) were comparatively free from this borer. Even in Regions (1) - (5) (Gurdaspur, Muzaffarnagar, Gorakhpur, Sepaya, and Pusa) the rate of attack was less than 1 per cent.

161. From Table IND(4.9) we find that the intensity of incidence among canes as well as the extent of spread among localities and villages of this borer was highest in Region (2) : Muzaffarnagar. From Table IND(5) we notice, however, that borer No.(9) was more widespread than Borer Nos.(6), (7) or (8).

162. The damage done was too small to allow comparisons between 'planted', 'ratoon' and 'mixed' fields.

167. From Table IND(4.0) we find that not a single field in region Nos.(1) - (4) and (6) (Gurdaspur, Muzaffarnagar, Gorakhpur, Sepaya and Dacca) was free from borer attack. In Region No.(5) : Pusa all villages and almost all fields had borers. In Region (8) : Gudiyattam every village had at least one field with borers. In Region (7) : Cuttack, on the other hand, some of the localities did not have any borer attack in certain months. In Region (9) : Padegaon there were localities without borers in every month.

168. As regards monthly fluctuations, we notice from Table IND(7) that the mean percentage damage by all borers for all regions was lowest in December 1940, namely 30 per cent. After this the rate of attack rose steeply to 37 per cent in January 1941, remained more or less stationary in February, and then decreased to 34 per cent in March 1941.

Table (IND) (12)

Mean Per ~~centage~~ with Standard Error of Damaged Cans to Total Cans.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Honey's Name *Ind(12) A. Sticticus sp. Anjan*

No.	Region District	Province District	Month..... <i>December, 1940. etc.</i>				Month..... <i>January, 1941. Jan.</i>											
			Planted		Patron		Mixed		Total		Planted		Patron		Mixed		Total	
			N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.	N	Mean \pm S.E.
1	Gwalalpur	Punjab	88	3.23 \pm 0.53			2	3.00 \pm 1.00	90	3.22 \pm 0.53	102	1.72 \pm 0.36			8	0.00	110	1.59 \pm 0.34
2	Muzaffarnagar	U.P.	101	2.84 \pm 0.59	5	5.80 \pm 0.31	4	0.00	110	2.86 \pm 0.56	100	4.61 \pm 0.59	10	0.80 \pm 0.53			110	4.26 \pm 0.58
3	Gorakhpur	"	86	1.70	17	2.76			103	1.87	97	0.66	13	0.00			110	0.60
4	Sahaya	Bihar	99	5.89 \pm 0.48			11	6.91 \pm 1.54	110	5.99 \pm 0.46	99	5.76 \pm 1.67			11	4.82 \pm 1.84	110	5.66 \pm 0.51
5	Pusa	"	88	0.26			22	0.32	110	0.27	85	0.11	25	0.00			110	0.09
6	Dacca	Bangal	34	1.76 \pm 0.69			22	2.45 \pm 1.69	56	2.04 \pm 0.66	40	4.45 \pm 1.18	10	5.70 \pm 2.45	50	4.70 \pm 1.06		
7	Cuttack	Orissa	99	6.71 \pm 1.06			11	1.55 \pm 0.81	110	6.19 \pm 0.97	97	15.93 \pm 1.15			13	11.31 \pm 0.60	110	15.36 \pm 1.02
8	Gudiyatham	Madras	73	2.51					73	2.51	107	2.60					107	2.60
9	Padiganon	Bombay?									26	2.35 \pm 0.73					26	2.35 \pm 0.73
	Total		668	3.34 \pm 0.21	22	3.45 \pm 0.21	72	2.22 \pm 0.59	762	3.23 \pm 0.19	753	4.44 \pm 0.29	23	0.35 \pm 0.24	67	3.84 \pm 0.48	843	4.27 \pm 0.18

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Title (IND(3)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Contd. Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Forest Name No(3) A. tumidicastris Hampen... (?)

No.	Region Localities	Province District	Month..... February, 1941.....								Month..... March, 1941.....							
			Planted		Patron		Mixed		Total		Planted		Patron		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gwalaspur	Punjab	102	0.00			8	0.00	110	0.00	58	0.00			6	0.00	64	0.00
2	Muzaffarnagar	U.P.	106	0.23	4	0.00			110	0.22	70	0.00					70	0.00
3	Gorakhpur	"	101	0.00	9	0.00			110	0.00	90	0.00	10	0.00			100	0.00
4	Sahaya	Bihar	98	0.00	4	0.00		8	0.00	110	0.00	102	0.22		8	0.00	110	0.21
5	Paasa	"	98	0.87			12	0.00	110	0.75	99	1.34		11	2.91		110	1.50
6	Sheea	Bengal																
7	Cuttack	Orissa	86	0.02			24	0.00	110	0.00	72	0.00		38	0.00		110	0.00
8	Gundigallam	Madras	93	0.00					93	0.00	44	0.00					44	0.00
9	Podegann	Bombay	19	0.00	1	0.00			20	0.00	52	0.21					52	0.21
T																		
f																		
	Total		703	0.16	18	0.00	52	0.00	773	0.13	587	0.28	10	0.00	63	0.51	660	0.30

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE 1940-41

TSEIe (IND(14)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name. Province. Borer's Name No. (4) *S. aurivillia* (14)

No.	Region locality	Province	Month..... <i>December, 1940</i>				Month..... <i>January, 1941</i>											
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
1	Gwadaspur	Punjab	88	0.00			2	0.00	90	0.00	102	0.00			8	0.00	110	0.00
2	Muzaffarnagar	U.P.	101	0.00	5	0.00	4	0.00	110	0.00	100	0.00	10	0.00			110	0.00
3	Gorakhpur		86	4.70 ± 0.85	17	1.59 ± 0.63			103	4.18 ± 0.80	97	6.85 ± 1.27	13	5.08 ± 1.90			110	6.63 ± 1.00
4	Safaya	Bihar	99	19.08 ± 1.64			11	5.45 ± 2.78	110	17.72 ± 1.55	99	17.93 ± 1.94			11	2.00 ± 0.65	110	16.34 ± 1.84
5	Pausa		88	2.61			22	1.45	110	2.38	85	2.58			25	1.48	110	2.56
6	Sacca	Bengal	34	0.00			22	0.00	56	0.00	40	0.01			10	0.00	50	0.01
7	Cuttack	Orissa	99	0.15			11	0.00	110	0.14	97	0.08			13	0.00	110	0.07
8	Gandiyatman	Madras	73	0.00					73	0.00	107	0.03					107	0.03
9	Padegon	Bombay									26	0.00					26	0.00
J																		
X																		
	Total		668	3.80	22	1.23	72	1.28	762	3.149	753	3.55	23	2.87	67	0.88	843	3.35

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND(5))

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined).

Region No..... Name..... Province..... Borer's Name *10(5) S. ventral N. W.*

No.	Region Locality	Province District	Month..... <i>December, 1940..... etc.</i>				Month..... <i>January, 1941..... Jan.</i>											
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gwalahpur	Punjab	88	0.01			2	0.00	90	0.01	102	0.00			8	0.00	110	0.00
2	Muzaffargarh	H.P.	101	0.00	5	0.00	4	0.00	110	0.00	100	1.02	10	0.00			110	0.93
3	Gorakhpur	H.P.	86	0.00	17	0.00			103	0.00	97	0.00	13	0.00			110	0.00
4	Sehays	Bihar	99	0.00			11	0.00	110	0.00	99	0.03			11	0.00	110	0.03
5	Prasa		88	0.00			22	0.00	110	0.00	85	0.03			25	0.00	110	0.03
6	Sacca	Bengal	34	0.00			22	0.00	56	0.00	40	0.00			10	0.00	50	0.00
7	Cuttack	Orissa	99	3.20			11	3.09	110	3.19	97	10.36			13	10.54	110	10.47
8	Gndiyatham	Madras	73	6.03					73	6.03	107	4.93					107	4.43
9	Pachegam	Bombay?									26	0.00					26	0.00
J																		
K																		
Total			668	1.13	22	0.00	72	0.47	762	0.89	753	2.11	23	0.00	67	2.05	843	2.05

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND(5)) Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Contd.

Sampling Unit = Field (or 3 workers combined)

Region No. Name. Province. Borer's Name *No. (5) S. Venkata W.K.*

No.	Region Locality	Province District	Month..... <i>February, 1941</i>				Month..... <i>March, 1941</i>											
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gundlupet	Punjab	102	0.00			8	0.00	110	0.00	58	0.00			6	0.00	64	0.00
2	Muzaffarnagar	U.P.	106	0.56	4	1.00			110	0.57	70	1.42					70	1.42
3	Gorakhpur	"	101	0.05	9	0.00			110	0.04	90	0.00	10	0.00			100	0.00
4	Lepaya	Poikar	98	0.04	4	0.00	8	0.00	110	0.00	102	0.07			8	0.00	110	0.06
5	Prasa	"	98	0.00			12	0.00	110	0.00	99	0.00			11	0.00	110	0.00
6	Sacca	Bengal																
7	Cuttack	Orissa	86	3.28			24	0.35	110	2.88	72	1.49			38	1.81	110	1.60
8	Gudigattam	Madras	93	6.08					93	6.08	44	4.95					44	4.95
9	Pudigam	Bombay	19	0.00	1	0.00			20	0.00	52	0.00					52	0.00
J																		
K																		
Total			703	1.30	18	0.22	52	0.16	773	1.28	587	0.74	10	0.00	63	1.09	660	0.76

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Table (IND(6))

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Borer's Name *No. (6) C. Zonellus Swinh.*

No.	Region Locality	Province District	Month..... <i>December, 1940</i>								Month..... <i>January, 1941</i>							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.	N	Mean + S.E.
1	Gwedakhu	Punjab	88	0.65			2	0.00	90	0.63	102	0.17			8	0.75	110	0.00
2	Muzaffargarh	N.P.	101	0.00	5	0.00	4	0.00	110	0.00	100	0.00	10	0.00			110	0.00
3	Groakhpur		86	0.00	17	0.00			103	0.00	97	0.00	13	0.00			110	0.00
4	Sapaya	Bihar	99	0.00			11	0.00	110	0.00	99	0.00			11	0.00	110	0.00
5	Pusa		88	0.00			21	0.00	110	0.00	85	0.00			25	0.00	110	0.00
6	Dacca	Bengal	34	0.00			22	0.00	56	0.00	40	0.00			10	0.00	50	0.00
7	Cuttack	Orissa	99	0.15			11	0.00	110	0.13	97	0.00			13	0.00	110	0.00
8	Gudiyatan	Madras	73	0.00					73	0.00	107	0.00					107	0.00
9	Padegam	Bombay									26	0.00					26	0.00
10																		
11																		
	Total		668	0.11	21	0.00	72	0.00	762	0.09	753	0.04	23	0.00	67	0.14	843	0.03

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND)(6)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Contd

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Borer's Name *Ma(b) C. Zonellus Smith*

No.	Region Locality	Province District	Month..... <i>February, 1941</i>								Month..... <i>March, 1941</i>							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
4	Gurdaspur	Punjab	102	0.17			8	0.00	110	0.15	58	0.07			6	0.00	64	0.06
2	Muzaffargarh	S.P.	106	0.00	4	0.00			110	0.00	70	0.10					70	0.10
3	Gorakhpur	"	101	0.00	9	0.00			110	0.00	90	0.00	10	0.00			100	0.00
4	Lahaya	Bihar	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00			8	0.00	110	0.00
5	Pusa	"	98	0.00			12	0.00	110	0.00	99	0.00			11	0.00	110	0.00
6	Dacca	Bengal																
7	Cuttack	Orissa	86	0.00			24	0.00	110	0.00	72	0.00			38	0.00	110	0.00
8	Gudiyatan	Madras	93	0.00					93	0.00	44	0.00					44	0.00
9	Padegaon	Bombay	19	0.00	1	0.00			20	0.00	52	0.00					52	0.00
J																		
K																		
Total			703	0.02	18	0.00	52	0.00	773	0.02	587	0.02	10	0.00	63	0.00	660	0.02

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND) (17)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Borer's Name No. (1) *C. trypeta* *Bombyx*

No.	Regions Locality	Province District	Month..... <i>December, 1940</i>				Month..... <i>January, 1941</i>											
			-Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gurdaspur	Bengal	88	7.66			2	4.50	90	9.54	102	7.62			8	14.25	110	8.10
2	Muzaffarpur	B.P.	101	0.00			4	0.00	110	0.00	100	0.65	10	0.09			110	0.60
3	Gorakhpur	"	86	0.00	5	0.00			103	0.00	97	0.00	13	0.00			110	0.00
4	Sahaya	Pithur	99	0.00	17	0.00	11	0.00	110	0.00	99	0.00			11	0.00	80	0.00
5	Prasa	"	88	0.00			22	0.00	110	0.00	85	0.00			25	0.00	110	0.00
6	Bacca	Bengal	34	0.00			22	0.00	56	0.00	40	0.00			10	0.00	50	0.00
7	Cuttack	Orissa	99	0.00			11	0.00	110	0.00	99	0.00			13	0.00	110	0.00
8	Gudiyatham	Madras	73	0.00					73	0.00	107	0.00					107	0.00
9	Padgaon	Prombay									26	0.00					26	0.00
J																		
K																		
	Total		668	1.27	22	0.00	72	0.12	762	1.13	753	1.12	23	0.04	67	1.70	843	1.14

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND(8))

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Borer's Name *No. 8 R. ablutella*

No.	Region Locality	Province District	Month..... <i>December, 1940</i>				Month..... <i>January, 1941</i>											
			Planted		Patton		Mixed		Total		Planted		Patton		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gurdaspur	Punjab	88	0.09			2	0.00	90	0.00	102	0.04			8	0.00	110	0.04
2	Muzaffargarh	A.P.	101	0.00	5	0.00	4	0.00	110	0.00	100	0.07	10	0.00			110	0.06
3	Gorakhpur		86	0.00	17	0.00			103	0.00	97	0.00	13	0.00			110	0.00
4	Lahore	Bihar	99	0.00			11	0.00	110	0.00	99	0.00			11	0.00	110	0.00
5	Pinna		88	0.00			22	0.00	110	0.00	85	0.00			25	0.00	110	0.00
6	Dacca	Bengal	34	0.00			21	0.00	56	0.00	40	0.00			10	0.00	50	0.00
7	Cuttack	Orissa	99	0.00			11	0.00	110	0.00	97	0.00			13	0.00	110	0.00
8	Gudiyatham	Madras	73	0.00					73	0.00	107	0.00					107	0.00
9	Kadegan	Bombay									26	0.00					26	0.00
	Total		668	0.01	23	0.00	72	0.00	762	0.01	753	0.02	23	0.00	67	0.00	843	0.01

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND(18) Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Contd. Sampling Unit = Field ~~area~~ 3 workers combined)

Region No. Name Province Borer's Name No. 8. *R. albistrigatus*

No.	Region Locality	Province District	Month.....February, 1941.....				Month.....March, 1941.....											
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gondalpur	Kinjab	102	0.03			8	0.00	110	0.00	58	0.12			6	0.00	64	0.11
2	Muzaffarpur	H.P.	106	0.00	4	0.00			110	0.00	70	0.06					70	0.06
3	Gorakhpur	"	101	0.00	9	0.00			110	0.00	90	0.00	10	0.00			100	0.00
4	Sahayga	Patna	98	0.00	4	0.00	8	0.00	110	0.00	102	0.00			8	0.00	110	0.00
5	Pusa	"	98	0.00			12	0.00	110	0.00	99	0.00			11	0.00	110	0.00
6	Dacca	Bengal					24	0.00	110	0.00	72	0.00			38	0.00	110	0.00
7	Cuttack	Orissa	96	0.00					93	0.00	44	0.00					44	0.00
8	Gudigatla	Madras	93	0.00					20	0.00	51	0.00					51	0.00
9	Padigan	Bombay	19	0.00	1	0.00												
10																		
	Total		703	0.00	18	0.00	52	0.00	773	0.00	587	0.02	10	0.00	63	0.00	660	0.02

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (Ind. 19)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Morar's Name *M. G. Searia, Jr.*

No.	Regions Localities	Province District	Month..... <i>February, 1941</i>				Month..... <i>March, 1941</i>											
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gundasapur	Punjab	102	0.01			8	0.00	110	0.01	58	0.01			6	0.00	64	0.01
2	Muzaffargarh	H.P.	106	0.51	4	0.00			110	0.49	70	0.42					70	0.42
3	Gorakhpur	H.P.	101	0.08	9	0.00			110	0.07	90	0.07	10	0.00			100	0.06
4	Sepaya	Punjab	98	0.00	4	0.00	8	0.75	110	0.05	102	0.00			8	0.00	110	0.00
5	Pusa		98	0.17			12	0.00	110	0.14	99	0.06			11	0.00	110	0.05
6	Bacca	Bengal																
7	Cuttack	Orissa	86	0.00			24	0.00	110	0.00	72	0.11			38	0.45	110	0.29
8	Gudiyatham	Madras	93	0.00					93	0.00	44	0.00					44	0.00
9	Padegaon	Bombay	19	0.00	1	0.00			20	0.00	52	0.00					52	0.00
10																		
	Total		703	0.11	18	0.00	52	0.00	713	0.11	587	0.09	10	0.00	63	0.27	660	0.10

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REGIONAL SURVEY OF BORER PESTS ON SUGARCANE 1950-51

Table (IND 14)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No..... Name..... Province..... Borer's Name: *No. (10). E. distansella Swinh.*

No.	Regions Localities	Province District	Month..... <i>December... 1950..</i>								Month..... <i>January, 1951.....</i>							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	Gundarpur	Pingree	88	0.49 ± 0.38			2	2.02 ± 0.02	90	0.52 ± 0.37	102	0.05 ± 0.03			8	0.00	110	0.05 ± 0.02
2	Muzaffargarh	W.P.	101	15.71 ± 1.12	5	19.20 ± 1.79	4	9.75 ± 2.50	110	14.53 ± 1.16	100	16.80 ± 1.24	10	26.40 ± 5.92			110	17.67 ± 1.23
3	Gorakhpur	"	86	24.72 ± 1.83	17	21.81 ± 2.45			103	24.03 ± 1.73	97	17.13 ± 1.38	13	0.00			110	15.11 ± 1.40
4	Behaya	Bihar	99	30.67 ± 1.11			11	36.18 ± 5.48	110	31.22 ± 3.00	99	32.37 ± 1.36			11	37.18 ± 5.37	110	32.85 ± 1.34
5	Pusa	"	88	10.09 ± 0.69			22	13.55 ± 1.28	110	10.78 ± 0.62	85	10.65 ± 0.80			25	13.76 ± 2.48	110	11.35 ± 0.87
6	Dacca	Bengal	34	0.47 ± 0.17	1		22	0.45 ± 0.02	56	0.46 ± 0.14	40	1.45 ± 0.59			10	0.44 ± 0.44	50	1.02 ± 0.48
7	Cuttack	Orissa	99	0.00			11	0.00	110	0.00	97	0.00			13	0.00	110	0.00
8	Gudiyatham	Madras	73	0.00					73	0.00	107	0.00					107	0.00
9	Puduchery	Bombay									26	0.00					26	0.00
	Total		668	11.52 ± 0.35	22	21.22 ± 1.96	72	10.40 ± 0.93	762	11.50 ± 0.53	753	9.98 ± 0.32	23	11.48 ± 2.56	67	11.30 ± 1.29	843	10.14 ± 0.32

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Table (Ind 110)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Conto

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province Worker's Name ^{No. 10} E. deprevela Bunch

No	Regions Localities	Province District	Month.....February, 1941.....								Month.....March, 1941.....							
			Planted		Patoon		Mixed		Total		Planted		Patoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
A	Gundacapus	Pinjah	102	0.30 ± 0.008			8	0.00	110	0.30 ± 0.008	58	0.00			6	0.00	64	0.00
B	Muzaffarngas	h.P	106	17.95 ± 1.36	4	28.50 ± 12.30			110	18.34 ± 1.38	70	13.32 ± 1.22					70	13.32 ± 1.22
C	Gorakshpur	"	101	22.24 ± 1.39	9	27.35 ± 4.47			110	22.86 ± 1.41	90	20.74 ± 1.19	10	4.70 ± 1.45			100	19.14 ± 1.19
D	Sepaya	Pohjan	98	29.00 ± 1.28	4	29.50 ± 2.65	8	37.12 ± 0.50	110	29.46 ± 1.27	102	37.87 ± 1.50			8	41.25 ± 4.29	110	38.12 ± 1.51
E	Pusa	"	98	8.57 ± 0.79			12	6.33 ± 1.52	110	8.60 ± 0.69	99	13.70 ± 0.77			4	12.64 ± 1.87	110	13.59 ± 0.77
F	Saca	Bergal																
G	Cultack	Orissa	86	0.00			24	0.00	110	0.00	72	0.00			38	0.00	110	0.00
H	Gandigan	Madras	93	0.00					93	0.00	44	0.00					44	0.00
I	Padegaon	Bombay	19	0.00	1	0.00			20	0.00	52	0.00					52	0.00
J																		
K																		
Total			703	11.18 ± 0.26	18	26.55 ± 3.64	52	7.17 ± 0.26	733	11.32 ± 0.25	587	13.66 ± 0.38	10	4.70 ± 1.45	63	7.45 ± 0.62	660	12.93 ± 0.36

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND 2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Sampling Unit = Field (or 3 workers combined)

Region No. Name Province District Name

No.	Locality Borer.	Disturbat	Month.....December, 1940.....								Month.....January, 1941.....							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	<i>Scirpophaga</i> sp		668	18.85 ± 0.49	22	19.64 ± 1.80	72	15.55 ± 1.04	762	18.56 ± 0.47	753	20.13 ± 0.44	23	30.22 ± 3.62	67	16.19 ± 1.82	843	20.09 ± 0.46
2	<i>A. Stictocranus</i> Haydon		668	3.34 ± 0.21	22	3.45 ± 0.21	72	2.22 ± 0.59	762	3.23 ± 0.19	753	4.44 ± 0.29	23	0.35 ± 0.24	67	3.84 ± 0.48	843	4.27 ± 0.18
3	<i>A. turidicincta</i> Haydon		668	0.73	22	0.00	72	2.04	762	1.03	753	1.06	23	0.00	67	2.18	843	1.19
4	<i>A. australis</i> Andgrn		668	3.80	22	1.23	72	1.28	762	3.49	753	3.55	23	2.87	67	0.88	843	3.25
5	<i>A. Vongsak</i> WVK		668	1.3	22	0.00	72	0.47	762	1.23	753	2.11	23	0.00	67	2.05	843	1.94
6	<i>C. zonellus</i> Swinh		668	0.11	22	0.00	72	0.00	762	0.09	753	0.04	23	0.00	67	0.14	843	0.03
7	<i>C. trypales</i> Parset		668	1.27	22	0.00	72	0.12	762	1.13	753	1.12	23	0.04	67	1.70	843	1.14
8	<i>R. salubris</i> Zeh		668	0.01	22	0.00	72	0.00	762	0.01	753	0.02	23	0.00	67	0.00	843	0.01
9	<i>Sesamia</i> sp.		668	0.33	22	0.00	72	0.03	762	0.29	753	0.13	23	0.00	67	0.00	843	0.12
10	<i>E. debressella</i> Swinh		668	11.52 ± 0.35	22	21.22 ± 1.96	72	10.40 ± 0.93	762	11.50 ± 0.53	753	9.98 ± 0.32	23	11.48 ± 2.56	67	11.30 ± 1.23	843	10.11 ± 0.32
X			6															
	Total																	

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REGIONAL SURVEY OF BORER PESTS OF SUGARCANE, 1940-41

Table (IND 2)

Mean Percentage with Standard Error of Damaged Cane to Total Cane.

Cont.

Sampling Unit = Field (or 3 workers combined)

Region No. Name. Province. Borer's Name.

No.	Locality Procc.	District	Month..... February 1941.....								Month..... March 1941.....							
			Planted		Ratoon		Mixed		Total		Planted		Ratoon		Mixed		Total	
			N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.	N	Mean ± S.E.
1	<i>Leucophaea</i> sp.		703	20.57 ± 0.49	18	22.61 ± 1.193	52	10.90 ± 0.97	773	20.34 ± 0.17	587	16.54 ± 0.46	10	15.20 ± 1.16	63	9.11 ± 1.10	660	15.18 ± 0.4
2	<i>A. Stictocarpis</i> Hampson		703	4.41 ± 0.23	18	1.67 ± 0.18	52	3.35 ± 0.95	773	4.28 ± 0.22	587	4.09 ± 0.46	10	0.00	63	8.90 ± 1.06	660	4.49 ± 0.30
3	<i>A. trandicatalis</i> Hampson		703	0.16	18	0.00	52	0.00	773	0.13	587	0.28	10	0.00	63	0.51	660	0.30
4	<i>D. asiaticus</i> Endg.		703	3.36	18	1.84	52	0.60	773	3.13	587	3.97	10	0.90	63	0.33	660	3.58
5	<i>D. Venosaria</i> Wlk.		703	1.30	18	0.22	52	0.78	773	1.28	587	0.74	10	0.00	63	1.09	660	0.76
6	<i>C. zonellus</i> Swinh		703	0.02	18	0.00	52	0.00	773	0.02	587	0.02	10	0.00	63	0.00	660	0.02
7	<i>C. trypetes</i> Prisset		703	1.56	18	0.00	52	4.04	773	1.69	587	2.02	10	0.00	63	2.29	660	1.66
8	<i>P. albivittata</i> Zell		703	0.00	18	0.00	52	0.00	773	0.00	587	0.02	10	0.00	63	0.00	660	0.02
9	<i>Lesania</i> St.		703	0.11	18	0.00	52	0.12	773	0.11	587	0.09	10	0.00	63	0.27	660	0.10
10	<i>E. delphacella</i> Swinh		703	11.18 ± 0.36	18	26.85 ± 3.864	52	7.17 ± 0.36	773	11.92 ± 0.35	587	13.66 ± 0.39	10	4.70 ± 1.45	63	7.45 ± 0.62	660	12.93 ± 0.3
11																		
Total																		

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Table IND.(3) *Number of canes, stools, fields, villages & localities surveyed.....*

region	December, 1940					January, 1941					February, 1941					March, 1941																			
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅															
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)															
(1) Gurdaspur	61	62	8	10	90	18	9	70	95	9	90	1	10	22	11	70	64	9	90	1	10	22	11	38	23	5	76	64	16	9					
(2) Mizaffarnagar	34	98	9	90	1	10	22	11	30	69	9	90	1	10	22	11	28	92	9	90	1	10	22	11	16	26	6	30	70	13	7				
(3) Gorakhpur	24	68	9	45	1	03	21	11	29	04	9	90	1	10	22	11	26	47	9	90	1	10	22	11	22	77	9	00	1	00	20	11			
(4) Sepaya	38	58	9	88	1	10	22	11	41	54	9	70	1	10	22	11	36	87	9	89	1	10	22	11	36	21	9	88	1	10	22	11			
(5) Pusa	41	37	9	90	1	10	22	11	39	42	9	90	1	10	22	11	34	36	9	90	1	10	22	11	40	26	9	90	1	10	22	11			
(6) Dacca	27	24	5	03	56	12	6	19	05	4	50	50	16	9																					
(7) Cuttack	27	20	9	90	1	10	22	11	27	08	9	90	1	10	22	11	26	79	9	90	1	10	22	11	21	81	9	90	1	10	22	11			
(8) Gudiyattam	25	42	6	61	73	16	8	35	40	9	45	1	07	22	11	30	75	8	21	93	92	11	14	81	3	89	44	12	9						
(9) Padegaon								3	05	2	11	26	9	6	2	64	1	50	20	10	6	7	51	4	18	52	16	9							
All regions	28	149	68	77	7	62	1	55	78	29	622	75	26	8	43	179	92	25	744	69	10	7	73	1	64	83	19	786	58	81	6	60	1	40	78

N₁ = Number of canes Surveyed = Number of stools Surveyed. Number of fields Surveyed. N₄ = Number of villages Surveyed.

N₅ = Number of localities Surveyed.

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Table IND (40). ...Percentage of Cans, Stools, Fields, Villages & Localities affected by all Brosses.....

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	35.2	97.9	100.0	100.0	100.0	40.7	97.2	100.0	100.0	100.0	43.6	98.9	100.0	100.0	100.0	53.9	98.4	100.0	100.0	100.0
(2) Muzaffarnagar	50.7	84.2	100.0	100.0	100.0	57.2	87.0	100.0	100.0	100.0	63.0	88.7	100.0	100.0	100.0	60.9	77.6	100.0	100.0	100.0
(3) Gorakhpur	42.8	69.4	100.0	100.0	100.0	41.5	76.7	100.0	100.0	100.0	39.5	66.7	100.0	100.0	100.0	38.6	61.1	100.0	100.0	100.0
(4) Sepaya	60.6	90.2	100.0	100.0	100.0	61.4	92.5	100.0	100.0	100.0	63.0	90.8	100.0	100.0	100.0	64.0	94.8	100.0	100.0	100.0
(5) Pusa	25.5	74.1	100.0	100.0	100.0	26.4	75.1	98.2	100.0	100.0	23.0	64.5	98.2	100.0	100.0	26.1	71.4	99.1	100.0	100.0
(6) Dacca	25.2	82.9	100.0	100.0	100.0	38.0	87.7	100.0	100.0	100.0										
(7) Cuttack	12.2	27.0	80.9	90.9	90.9	23.9	44.6	90.9	90.9	90.9	16.0	28.9	72.7	81.8	81.8	15.2	27.7	72.7	95.5	100.0
(8) Gudivattam	15.1	36.6	91.9	100.0	100.0	11.6	32.0	91.6	100.0	100.0	13.5	34.1	82.8	100.0	100.0	10.0	27.9	97.7	100.0	100.0
(9) Padegaon						4.3	5.9	48.0	66.7	83.3	1.9	3.1	25.0	30.0	50.0	8.9	16.3	50.0	50.0	66.7
All Regions	35.6	70.0	97.0	99.0	99.0	38.0	72.0	96.0	97.0	98.0	38.5	66.9	91.8	93.3	93.9	39.0	63.0	91.0	94.0	96.1

N₁ = ^{Percentage} Number of cans affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected;
 N₅ = ^{Percentage} Number of localities affected.

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Table (IND 4.1) ... Percentage of Cane, Stools, Fields, Villages & Localities affected by Brown Rot

Part I

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	21.7	78.9	100.0	100.0	100.0	34.1	92.5	100.0	100.0	100.0	31.1	92.8	100.0	100.0	100.0	31.9	88.9	100.0	100.0	100.0
(2) Muzaffarnagar	37.1	63.4	100.0	100.0	100.0	51.3	74.6	100.0	100.0	100.0	49.4	80.9	100.0	100.0	100.0	47.5	67.6	100.0	100.0	100.0
(3) Gorakhpur	15.3	31.1	85.4	100.0	100.0	22.0	41.0	98.2	100.0	100.0	14.9	30.3	94.5	100.0	100.0	11.0	23.6	94.0	100.0	100.0
(4) Sepaya	25.5	60.5	98.2	100.0	100.0	22.1	53.4	99.1	100.0	100.0	23.5	55.4	100.0	100.0	100.0	22.9	56.4	98.2	100.0	100.0
(5) Pusa	13.6	50.0	93.6	100.0	100.0	16.5	51.3	98.2	100.0	100.0	13.1	40.8	98.2	100.0	100.0	12.9	44.3	99.1	100.0	100.0
(6) Dacca	16.8	45.0	94.6	100.0	100.0	23.9	67.5	94.0	93.8	100.0										
(7) Cuttack	4.9	11.5	60.0	90.9	90.9	6.1	13.5	70.9	90.9	90.9	3.9	8.7	53.6	72.7	72.7	1.2	2.4	19.1	50.0	72.7
(8) Gudiyattam	6.8	19.9	63.5	100.0	100.0	5.0	14.4	58.9	100.0	100.0	4.1	11.8	45.2	90.9	100.0	3.3	10.0	54.5	100.0	100.0
(9) Padegaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND(42) ...Percentage...of Cane...Stalk...Fields...Villages & Localities affected...by Borer No.2

region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	315	172	672	944	1000	15	68	309	500	545	37	145	518	812	909	22	116	516	812	229
(2) Muzaffarnagar	32	91	436	817	1000	46	112	591	953	1000	44	104	527	862	909	32	67	415	763	257
(3) Gorakhpur	28	63	282	476	636	06	19	118	318	455	09	21	109	318	455	06	12	100	300	455
(4) Sepaya	55	191	254	1000	1000	56	198	255	1000	1000	70	212	227	1000	1000	67	221	818	1000	1000
(5) Fusa	02	06	55	227	455	01	02	09	45	91	01	02	18	91	182	00	02	18	91	182
(6) Dacca	18	93	339	667	833	34	127	460	625	778										
(7) Cuttack	57	124	491	818	909	153	295	273	909	909	114	219	655	818	818	116	226	691	955	1000
(8) Gudiyattam	28	83	419	867	1000	26	83	458	909	909	36	110	591	955	1000	22	72	455	667	667
(9) Padegaon						43	59	480	667	833	19	31	250	300	500	87	158	481	438	556
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stalks affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND (4-3)

Percentage of Cane, Stools, Fields, Villages & Localities affected by Borer No. (3)...

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	0.0	0.2	2.2	11.1	22.2	0.0	0.1	0.9	4.5	9.1										
(2) Muzaffarnagar											0.0	0.1	0.9	4.5	9.1					
(3) Gorakhpur																				
(4) Sepaya	0.2	0.4	2.7	13.6	27.3	0.0	0.1	0.9	4.5	9.1										
(5) Pusa	2.4	8.4	19.1	36.4	45.5	2.8	7.5	20.0	45.5	45.5	0.8	1.7	13.6	92.7	27.3	1.4	4.4	15.5	27.3	20.3
(6) Dacca	8.1	36.0	85.7	100.0	100.0	15.2	44.5	92.0	93.8	88.9										
(7) Cuttack	0.1	0.2	1.8	4.5																
(8) Gudiyattam																				
(9) Padegaon																				
All regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND (4/4)

Percentage of Cane, Stools, Fields, Villages & Localities affected by *Bois* No. (4)

Region	December, 1940					January, 1941					February, 1941					March, 1941					
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
(1) Gurdaspur																					
(2) Muzaffarnagar																					
(3) Gorakhpur	43	90	359	619	636	63	145	591	908	1000	37	82	445	908	1000	51	114	590	950	1000	
(4) Sepaya	193	403	927	1000	1000	179	371	873	1000	1000	176	350	800	1000	1000	165	357	873	1000	1000	
(5) Pusa	28	91	391	682	1000	23	85	382	909	909	16	54	309	636	636	16	54	209	545	545	
(6) Dacca						00	02	20	63	111											
(7) Cuttack	03	03		136	182	01	02	18	91	182											
(8) Guñiyattam																					
(9) Padergon																					
All Regions																					

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected;
 N₅ = ^{Percentage} Number of localities affected.

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Table IND (4-5) ... Percentage of Cane, Stools, Fields, Villages & Localities affected by Brown No. 5 ...

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	0.0	0.1	1.1	5.6	11.1															
(2) Muzaffarnagar	0.0	1.5	13.6	31.8	45.5	0.8	1.8	10.9	22.7	36.4	0.6	1.5	11.8	22.7	27.3	1.4	3.0	20.0	38.5	57.1
(3) Gorakhpur																				
(4) Sepaya						0.0	0.1	0.9	4.5	9.1										
(5) Pusa						0.0	0.1	0.9	4.6	9.1										
(6) Dacca																				
(7) Cuttack	2.9	3.7	33.6	72.7	90.9	9.9	21.4	82.7	90.9	90.9	2.4	5.6	30.0	59.1	72.7	1.5	3.1	17.3	36.4	45.5
(8) Guhlyattam	5.6	17.6	66.2	100.0	100.0	4.1	12.5	63.5	100.0	100.0	5.6	17.1	68.8	95.5	100.0	4.4	13.3	81.8	100.0	100.0
(9) Padergaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND(4-6)

Percentage of Cane, Stools, Fields, Villages & Localities affected by *Planor* No. (6)....

region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	0.7	3.3	21.1	44.4	44.4	0.2	0.7	6.4	18.2	27.3	0.1	0.5	3.6	9.1	9.1	0.1	0.5	4.7	12.5	22.2
(2) Mizaffarnagar																				
(3) Gorakhpur																				
(4) Sepaya																				
(5) Pusa																				
(6) Dacca																				
(7) Cuttack	0.1	0.2	1.8	9.1	9.1															
(8) Gudivattam																				
(9) Padegaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND (4.7)

Percentage... of Cans... Stalks... Fields... Villages & localities affected by Borer No. 7

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	9.7	36.8	54.4	55.6	55.6	7.9	30.9	55.4	68.2	72.7	10.1	38.6	60.0	63.6	63.6	19.5	57.1	76.6	81.2	77.8
(2) Muzaffarnagar	0.2	0.7	3.6	13.6	18.2	0.7	1.9	10.0	13.6	18.2	0.5	1.4	10.9	18.2	18.2	0.8	1.9	6.1	30.8	28.6
(3) Gorakhpur																				
(4) Sepaya																				
(5) Pusa																				
(6) Dacca																				
(7) Cuttack																				
(8) Gudiattam																				
(9) Palegaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stalks affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected;
 N₅ = ^{Percentage} Number of localities affected.

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Table IND (4-8)

Percentage of Cane, Stalk, Fields, Villages, & Localities affected by Brown Ho. (?)

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	0.1	7.5	3.3	16.7	33.3	0.1	0.4	1.8	9.1	18.2	0.0	0.1	0.9	4.5	4.5	0.1	0.5	1.6	6.2	11.1
(2) Muzaffarnagar						0.1	0.2	1.8	9.1	18.2										
(3) Gorakhpur																				
(4) Sepaya																				
(5) Pusa																				
(6) Decca																				
(7) Cuttack																				
(8) Gudiyattam																				
(9) Padegaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stalks affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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Table IND (4-9)

Percentage of Cane, Stools, Fields, Villages, localities affected by *Bombyx mori*.

Region	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1) Gurdaspur	0.3	2.6	14.4	50.0	66.7	0.1	0.9	8.2	27.3	36.4	0.0	0.1	0.9	4.5	4.5	0.0	0.2	1.6	6.2	11.1
(2) Muzaffarnagar	1.4	3.8	29.1	81.7	90.9	0.4	1.2	10.9	40.8	54.5	0.2	0.6	4.6	22.7	45.5	0.4	0.9	6.2	23.1	42.8
(3) Gorakhpur	0.3	0.8	5.8	23.8	36.4	0.1	0.3	2.7	9.1	18.2	0.1	0.2	1.8	4.5	9.1	0.0	0.1	1.0	5.0	9.1
(4) Sepaya	0.2	0.5	4.5	18.2	36.4	0.0	0.1	0.9	4.5	9.1	0.2	0.5	2.7	13.6	27.3	0.1	0.1	0.9	4.5	9.1
(5) Pusa	0.1	0.2	1.8	9.1	18.2						0.1	0.5	4.5	18.2	27.3	0.1	0.3	2.7	9.1	9.1
(6) Dacca																				
(7) Cuttack																0.2	0.5	0.4	9.0	9.1
(8) Gudiattam						0.0	0.1	0.9	4.5	9.1										
(9) Padegaon																				
All Regions																				

N₁ = ^{Percentage} Number of canes affected; N₂ = ^{Percentage} Number of stools affected; N₃ = ^{Percentage} Number of fields affected; N₄ = ^{Percentage} Number of villages affected; N₅ = ^{Percentage} Number of localities affected.

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REGIONAL SURVEY OF LARVAE PESTS OF SUGARCANE, 1940-41

Table IND (4-10) *Percentage of Cane, Stalk, Fields, Villages & Localities affected by Borer No. (10)*

region.	December, 1940					January, 1941					February, 1941					March, 1941					
	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	N ₁	N ₂	N ₃	N ₄	N ₅	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	
(1) Gurdaspur	0.7	4.6	24.4	66.7	88.9	0.0	0.3	2.7	9.1	18.2	0.3	1.8	12.7	27.3	27.3						
(2) Muzaffarnagar	14.5	35.0	92.7	100.0	100.0	17.7	39.5	94.5	100.0	100.0	19.2	42.0	84.5	100.0	100.0	14.3	29.8	85.7	100.0	100.0	
(3) Gorakhpur	24.1	46.8	98.0	100.0	100.0	22.2	52.0	95.4	100.0	100.0	23.0	46.0	99.1	100.0	100.0	18.8	36.7	95.0	100.0	100.0	
(4) Sepaya	31.5	69.1	100.0	100.0	100.0	33.2	73.3	100.0	100.0	100.0	20.2	63.4	100.0	100.0	100.0	38.4	77.4	100.0	100.0	100.0	
(5) Pusa	11.2	37.3	96.4	100.0	100.0	10.9	36.5	95.5	100.0	100.0	8.3	26.6	84.5	100.0	100.0	13.0	49.5	90.9	90.9	100.0	
(6) Dacca	0.4	2.4	21.4	41.7	83.3	0.2	0.7	6.0	12.5	22.2											
(7) Cuttack																					
(8) Gudiattam																					
(9) Padergaon																					
All regions																					

N₁ = ^{Percentage} ~~Number~~ of canes affected; N₂ = ^{Percentage} ~~Number~~ of stalks affected; N₃ = ^{Percentage} ~~Number~~ of fields affected; N₄ = ^{Percentage} ~~Number~~ of villages affected; N₅ = ^{Percentage} ~~Number~~ of localities affected.

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REGIONAL SURVEY OF BORER-PESTS OF SUGARCANE, 1940-41

Table (IND 5) Percentage of Cane Steels, Fields, Villages & Localities affected by Different Borers.

Station No. Name Province

Borer's Name (1)	December, 1940					January, 1941					February, 1941					March, 1941				
	N ₁ (2)	N ₂ (3)	N ₃ (4)	N ₄ (5)	N ₅ (6)	N ₁ (7)	N ₂ (8)	N ₃ (9)	N ₄ (10)	N ₅ (11)	N ₁ (12)	N ₂ (13)	N ₃ (14)	N ₄ (15)	N ₅ (16)	N ₁ (17)	N ₂ (18)	N ₃ (19)	N ₄ (20)	N ₅ (21)
<i>Scirponnaga</i> sp.	19.0	47.0	87.0	99.0	99.0	24.0	48.0	87.0	93.0	92.0	21.6	45.7	83.2	89.0	89.2	18.5	37.0	74.4	84.0	84.6
<i>A. sticti</i> Hampn.	3.0	10.0	45.0	72.0	85.0	3.0	11.0	46.0	66.0	72.0	4.3	11.5	45.5	68.3	75.7	3.8	11.0	43.0	62.0	67.2
<i>A. tumidi</i> Hampn.	1.0	4.0	10.0	17.0	23.0	1.0	4.0	8.0	15.0	16.0	0.1	0.3	2.1	10.4	4.8	0.3	1.0	3.0	5.0	5.1
<i>D. auricilla</i> Dign.	3.0	8.0	24.0	34.0	40.0	3.0	8.0	24.0	36.0	38.0	3.1	7.0	22.1	34.1	34.9	3.9	9.0	27.0	37.0	35.8
<i>E. venosata</i> Wlk.	1.0	3.0	13.0	25.0	31.0	1.0	5.0	21.0	28.0	30.0	1.0	3.0	14.2	20.8	26.5	0.6	2.0	10.0	17.0	23.0
<i>G. zonellus</i> Swinh.	0.0	0.0	3.0	6.0	6.0	0.0	0.0	1.0	2.0	3.0	0.0	0.1	0.5	1.2	1.2	0.0	0.0	0.0	1.0	2.5
<i>G. trimetis</i> Hlasi.	2.0	4.0	7.0	8.0	9.0	2.0	4.0	9.0	10.0	11.0	2.8	5.7	10.1	11.0	10.8	3.8	6.0	8.0	12.0	11.5
<i>R. ablutella</i> Zell.	0.0	0.0	0.0	2.0	4.0	0.0	0.0	0.0	2.0	4.0	0.0	0.0	0.1	0.6	1.2	0.0	0.0	0.0	1.0	1.2
<i>Secania</i> sp.	0.0	1.0	8.0	25.0	33.0	0.0	0.0	3.0	10.0	14.0	0.1	0.3	2.1	8.5	15.7	0.0	0.0	2.0	7.0	10.2
<i>E. depressa</i> Swinh.	10.0	27.0	59.0	67.0	73.0	10.0	26.0	51.0	51.0	52.0	10.0	25.2	55.6	57.3	56.6	13.0	30.0	55.0	52.0	51.2
<i>M. Panzer</i>	35.0	70.0	97.0	99.0	99.0	38.0	72.0	96.0	97.0	98.0	38.5	66.9	91.8	93.3	93.9	39.0	63.0	91.0	94.0	96.1

N₁ = Number of canes affected; N₂ = Number of Steels affected; N₃ = Number of fields affected; N₄ = Number of villages affected
 N₅ = Number of localities affected.

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Regional Survey of Borer Pests of Sugarcane, 1940-41.

Table (IND.7). Mean percentage of damaged canes to total cane by Regions in months.

Name of Region	December 1940		January 1941		February 1941		March 1941	
	No. of stools	Mean	No. of stools	Mean	No. of stools	Mean	No. of stools	Mean
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Burundaspur	810	29.45	990	41.34	990	44.33	576	40.76
Mugaifarm	990	49.36	990	56.21	990	62.87	630	55.13
Coranpur	945	37.92	990	40.83	990	38.81	900	28.04
Sejaya	988	59.08	970	61.63	989	59.65	988	66.03
Pusa	990	24.67	990	29.91	990	22.60	990	25.00
Badar	503	24.73	450	37.91				
Kuttak	990	14.30	990	22.73	990	16.18	990	16.11
Gandiyatam	6851	16.23	945	12.98	821	14.83	389	10.13
Padegam			211	2.95	150	1.44	418	8.23
Total	68774	30.34	7526	37.05	6910	36.81	5881	23.74

CHAPTER 4. CONTOUR MAPS OF RATE OF ATTACK

Introduction

169. The variation from locality to locality within each region was considerable. A geographical study of the magnitude of the variations between localities and between months has been made with the help of skeleton maps of each region specially prepared for this purpose in the Statistical Laboratory. The eleven localities of each region are marked A, B, C, J, K on the map. The mean percentage of canes damaged by all borers and by one or more important borers individually were then entered at each locality-point, and contour lines were drawn showing zones of varying intensities of borer attack. These charts do not supply any additional information over and above that given in the statistical tables. They are however convenient in giving a general or bird's eye view of the position as a whole.

170. In each chart the region of highest incidence has been shown by contour lines drawn in red pencil. Regions of lowest incidence by borers have been indicated, on the other hand, with blue pencil. Zones of intermediate intensity of attack have been shown in ordinary black pencil. The percentage damage has been shown in figures for each contour line.

171. Skeleton maps of India also were prepared showing the position of the nine regions and the approximate position of the 11 localities within each region covered in the present survey. The percentage of canes damaged by all borers and by each individual borer in each region was marked on this map for studying the geographical distribution of the intensity of attack in each month, and also the shifts in this distribution from month to month. These contour maps give in a concrete form a picture of the incidence of the borer pests of sugarcane on all-region basis.

REGIONAL MAPS

172. We shall first consider the rate of attack by regions.

NO.(1) : GURDASPUR (PUNJAB)

173. Borer No.(1) : The distribution is given in chart Nos.GU(1.1) - (1.4). The geographical distribution was not quite steady, but on the whole the damage was higher in the south-east in most of the months. The incidence of attack increased in January 1941 as compared to December 1940 while conditions were on the whole much the same in February and March.

174. Borer No.(7) : The geographical distribution, shown in chart Nos.GU(7.1) - (7.4), was more or less consistent. The incidence was greater in the centre and in the north than in the south; this can be easily seen from the fairly steady position of the lowest contour line of 10 per cent damage. The attack decreased to some extent in January 1941 as compared to December 1940 but became greater in February followed by a further rise in March.

175. All Borers : The geographical distribution of damage, given in chart Nos.GU(0.1) - (0.4), is fairly steady when all borers are taken into consideration. The damage was greatest in the centre and in the north while the area in the south-west was least affected by borers. The intensity of attack increased in January 1941 over the greater part of the region as compared to December 1940. This was followed by a further rise in February while conditions in March were on the whole still worse.

NO.(2) : MUZAFFARNAGAR (U.P.)

176. Borer No.(1) : The position of contour lines in chart Nos.M(1.1) - (1.4) show that the geographical distribution was quite steady in all the months. The localities in west suffered most from an attack by this borer while the area in the north-east had a much lower percentage of damage. The intensity of attack increased somewhat in January and was more or less stationary in February. This was followed by a general decrease over the whole region in March. The actual level of attack was very high and reached 60 or 70 per cent in many places.

177. Borer No.(10) : The contour lines for the distribution of borer No.(10) is shown in chart Nos. M(10.1) - (10.4). For this borer also the geographical distribution was on the whole fairly consistent. The area which suffered most was usually in the south-west while the incidence of attack was lowest in the north-east generally. The extent of damage increased in January 1941 as compared to December 1940 with a further small rise in February; this was followed by a decrease in some of the localities in March.

178. All Borers : When we take all borers into consideration the geographical distribution, shown in chart Nos.M(0.1) - (0.4), is fairly characteristic. The damage done was greatest in the west and south-west and lowest in the north-east in all the months. The intensity increased to some extent in many of the localities in January 1941 as compared to December 1940; there was a further rise in February, but the damage done decreased to some extent in March. The total damage was very high and reached 70 or 80 per cent in some of the localities; and, except in one locality in March, the intensity of attack remained consistently above 50 or 40 per cent in all the months.

NO.(3) : GORAKHPUR (U.P.)

179. Borer No.(1) : The distribution is shown in chart Nos.GK(1.1) - (1.4). From the position of the red contour line of 50 per cent rate of attack in December 1940 and February 1941, and the 20 per cent contour line in January 1941 we notice that a central area a little to the east is more affected than other localities. The fluctuation from month to month was also characteristic. Although the rate of attack was high (50 per cent) in one locality in December the incidence was equally great or slightly greater in January 1941 on the whole. There was no appreciable change in February on an average, but the intensity fall off to some extent in March.

180. Borer No.(10) : The geographical distribution, shown in chart Nos.GK(10.1) - (10.4), is somewhat blurred by monthly changes. On the whole the area in the north and north-west suffered less from damage by

this borer. The intensity of attack was quite high and usually between 20 and 40 per cent in December 1940. It decreased somewhat in January 1941, and remained more or less steady in February; this was followed by a decrease in most of the localities in March.

181. All Borers : The contour lines, shown in chart Nos.GK(0.1) - (0.4), indicate that the damage caused by all borers was highest in some of the central and eastern localities while the incidence was lowest in the north and the west. The incidence was very high in December and fluctuated between 50 and 60 per cent in most of the localities. There was no substantial change on the whole in January or February, but there was a general decrease in the rate of attack in March.

NO.(4) : SEKAYA (BIHAR)

182. Borer No.(1) : The contour maps in chart Nos.S(1.1) - (1.4) show that the area in the west was most susceptible to attack by this borer for all the four months while the area in the north-east and in the centre sustained less damage. As compared to December 1940 the incidence was less in January 1941 but increased again in February in many localities followed by a slight fall in March.

183. Borer No.(10) : The geographical distribution, given in chart Nos.S(10.1) - (10.4), show that the area in the south and in the east was most susceptible to damage by this borer. The general level was high in all the months. The intensity increased somewhat in January 1941 as compared to December 1940 but decreased slightly in February with another rise in March.

184. All Borers : The distribution is given in chart Nos.S(0.1) - (0.4). The damage caused by all borers was throughout very high in this region and fluctuated usually between 50 and 70 per cent. The localities in the west were more susceptible as compared to those in the east. The intensity increased to some extent in January 1941 as compared to December 1940 but remained more or less stationary in February. Conditions were very uniform all over the region in March with an intensity of attack in the neighbourhood of 65 per cent.

NO.(5) : PUSA (BIHAR)

185. Borer No.(1) : The monthly maps for borer No.(1) in Pusa region are shown in charts PU(1.1) - (1.4). The contour lines on the maps show a geographical distribution of incidence which was to a great extent steady from month to month. For example, the incidence is usually high in the central and north-western areas, while localities lying generally in the south and south-west in the neighbourhood of the blue contour lines had lower attacks by this borer.

186. In December the percentage attack fluctuated between 10 and 20 per cent on the whole. It increased steeply in locality (B) in January 1941, but again decreased in February followed by a further fall in March. Monthly changes on the whole were moderate or small but probably not negligible.

187. Borer No.(10) : Contour lines are shown in chart Nos.PU(10.1) - (10.4). The geographical distribution in this case was rather irregular. Localities in the north and the east had slightly lower intensities of attack; otherwise the distribution was more or less random. Monthly changes were also on the whole small.

188. All Borers : The distribution is shown in chart Nos.PU(0.1) - (0.4). The incidence of all borers taken together was usually of the order of 20 per cent or more in all four months. The percentage damage was of the order of 50 per cent over a wide area in December 1940. There was a considerable increase in January 1941 followed by a fall in February; and a further decrease in March in which month the rate of attack fluctuated between 19 and 29 per cent from one locality to another.

189. The geographical distribution, although not highly contrasted, showed certain characteristic features; localities in the south and the west on the whole had lower intensities of attack by borers. Monthly changes were quite well marked but the general pattern of geographical distribution was preserved to a considerable extent.

NO.(6) : DACCA (BENGAL)

190. Borer No.(1) : The distribution of borer No.(1) is shown in chart Nos.D(1.1) - (1.2) for the two months December 1940 and January 1941. The comparison between months is rather difficult owing to records being not available for all localities in both months. For localities for which

records are available there was on the whole a general increase in the rate of attack in January 1941 as compared to December 1940.

191. Borer No.(5) : The distribution of damage by borer No.(5) is shown in chart No.(5.1) - (5.2). On the whole the incidence of attack increased in January and the geographical distribution was fairly steady.

192. All Borers : The distribution is given in chart Nos.D(0.1) - (0.2). If we consider the incidence of all borers taken together it will be noticed that there was a general increase in January 1941 as compared to December 1940. It is difficult to say anything regarding the geographical distribution as many of the localities were surveyed only in one month.

NO.(7) : CUTTACK (ORISSA)

195. Borer No.(1) : The distribution is shown in chart Nos.C(1.1) - (1.4). The damage caused by borer No.(1) was small and of the order of 10 per cent or less on the whole. The incidence of attack fluctuated between 5 and 12 per cent in most of the localities. The change from one month to another was quite marked. The rate of attack decreased generally in January 1941 as compared to December 1940. A peculiar feature was a more intense attack in the north and the west in December 1940 followed by an increased attack in the south and the east in January suggesting a kind of wave-like advance from the north-west to the south-east. In February there was a slight increase in the north-east; but in March the incidence decreased generally all over the area.

194. Borer No.(2) : The distribution is shown in chart Nos.C(2.1) - (2.4). The incidence of attack by borer No.(2) in this region shows quite a consistent geographical distribution. On the whole localities in the north and the west had lower attacks than localities in the south-east as can be clearly seen in the maps from the position of the red and blue contour lines. There were also considerable monthly fluctuations. The percentage damage increased in January but decreased again in February and was probably more or less stationary in March.

195. All Borers : The distribution is shown in chart Nos.C(0.1) - (0.4). The contour lines of damage caused by all borers show consistent features from month to month. The incidence of attack was on the whole greater in the east and the south while the damage done in the north and the west was inva-

invariably small. As regards the monthly fluctuations we notice a general increase in January 1941 as compared to December 1940 followed by a decrease in February and a further fall in March 1941.

NO.(8) : GUDIYATTAM (MADRAS)

196. Borer No.(1) : The geographical distribution of attack, shown in chart Nos.GD(1.1) - (1.4), was fairly steady. On the whole the region in the north-west had a larger incidence of borer No.(1) in practically every month. The damage caused by this borer increased generally in January 1941 as compared to December 1940, but decreased a little in February, and still further in March in which month all the localities had a rate of attack equal to or less than 7 per cent.

197. Borer No.(5) : The position in regard to borer No.(5) in Gudiyattam is very similar to borer No.(1) as can be easily seen from chart Nos.GD(5.1) - (5.4). The area in north-east sustained greater damage in practically every month. In most of the localities the damage was less than 10 per cent; and monthly changes were on the whole small.

198. All Borers : The contour lines for all borers are shown in chart Nos.GD(0.1) - (0.4). As in the case of individual borers the area in the north-west sustained greater damage from borers in every month. The over-all incidence was moderately high in the first three months December 1940, January and February 1941; but there was an appreciable decrease in March.

NO.(9) : PADEGAON (BOMBAY)

199. Borer No.(2) : In this region no records are available for December 1940. The contour maps for borer No.(2) are shown in chart Nos.PD(2.2) - (2.4). The incidence of attack apparently decreased in February as compared to January. It is difficult to say anything about the position in March as we have comparatively high incidence at 2 localities (A) and (B) for which records are not available for previous months. In the other localities also there was probably a slight increase in March as compared to February.

200. All Borers : The position regarding damage caused by all borers as shown in chart Nos.PD(0.2) - (0.4), was more or less similar. There was a general decrease in February as compared to January with possibly a slight rise in March.

CONTOUR MAPS FOR INDIVIDUAL BORERS

201. We shall now consider the results for each individual ^{borer} for all regions.

Borer No.(1) : Scirpophaga sp.

202. The all-India distribution of borer No.(1) is shown for the different months in charts Nos.IND(1.1) - (1.4). A comparison of these charts for all four months leaves no doubt regarding the differential distribution in different parts of India. The highest incidence of the order of 50 or 40 per cent occurred in region No.(2) Misaffarnagar in every month. Damage of the order of 20 or 30 per cent occurred in two other regions, in Gurdaspur in the Punjab and in Pusa in Bihar. Gorakhpur in east U.P., Sepaya in Bihar, and Bengal lie in a belt with an incidence varying between 10 per cent and 20 per cent. Cuttack (Orissa), Gudiyattam (Madras) and Padegaon (Bombay) on the other hand have less than 10 per cent of attacks. The kink in the 20 per cent contour line separating Sepaya from the two adjoining regions is well marked and steady in all months.

203. Considering the region as a whole, monthly fluctuations in the contour lines are not very marked. There was a slight increase in the damage caused by borers in January 1941 as compared to December 1940, and a further small rise in west United Provinces and in the Punjab in February 1941. In March conditions remained more or less stationary in north India with possibly a slight decrease in South India.

Borer No.(2) : A. sticticraspis Hamp.

204. The regional incidence of borer No.(2) is shown in chart Nos. ^{IND.}(2.1) - (2.4). The distribution is quite characteristic. The incidence is highest in Cuttack (Orissa) while the next highest rate of attack occurred invariably in Sepaya. One striking feature was the complete immunity in every month of Pusa in the immediate neighbourhood of Sepaya.

205. Monthly fluctuations were appreciable. In Padegaon the incidence was comparatively slight up to February but rose to 7 per cent in March. In Gudiyattam (Madras), on the other hand, the percentage attack was more stable and varied between 2 and 4 per cent in different months. In Bengal the attack increased from 2 per cent in December to 5 per cent in January while records were not available for other months. Pusa as already noted,

was free from attack in every month. Sepaya on the other hand showed an incidence of 6 or 7 per cent all through. Gorakhpur had a comparatively small incidence of 1 per cent in practically every month excepting December when it was only slightly higher and 2 per cent. Musaffarnagar in the United Provinces had a slightly higher rate of attack of 3 or 4 per cent in different months.

Borer No.(3) : A. tumidicostalis Hamp.

206. The contour lines for the damage caused by borer No.(3) is shown in chart Nos. IND(3.1) - (3.4). The rate of attack by this borer was on the whole small. Dacca (Bengal) was the region most affected with an average intensity of incidence of 8 per cent in December and 15 per cent in January. Unfortunately records are not available for the other two months. Besides Bengal this borer caused damage only in the adjoining region Pusa, where the extent of damage was about 4 per cent in December and January and 1 or 2 per cent in the later months. All the other 7 regions appeared to be free from this borer.

Borer No.(4) : Diatraea auricillia Dudgm.

207. The contour lines for the distribution of borer No.(4) is shown in chart Nos. IND(4.1) - (4.4). The regional distribution is strikingly characteristic. The highest value varying from 18 per cent in December to 15 per cent in March was shown consistently by the same region Sepaya. The two adjoining regions Gorakhpur and Pusa were affected to a much less extent. The damage done in Gorakhpur fluctuated from 4 to 7 per cent in the different months while the intensity of attack was even less and varied from 1 to 3 per cent in Pusa. All the other regions were practically free from this borer.

Borer No.(5) : D. venosata Wlk.

208. The contour lines for the distribution of borer No.(5) is shown in chart Nos. IND(5.1) - (5.4). The regional distribution shows a good deal of consistency. This borer did not cause any damage in north India excepting in one region Musaffarnagar where also the rate of attack was only 1 per cent in January, February and March. In December 1940 and January 1941 Cuttack (Orissa) was the part worst affected with percentage damage of 5 per cent and 10 per cent respectively. The damage in Gudiyattam (Madras) was much

less and 1 per cent and 4 per cent in the first two months. The position was however quite different in February and March during which Gudiyattan (Madras) suffered most from this borer with a percentage attack of 6 and 5 per cent. In February there was no attack in Orissa, but in March about 2 per cent of the canes were damaged in Orissa by this borer.

Borer No.(6) : C. scapallus Swinh.

209. The contour lines for the distribution of borer No.(6) is shown in chart Nos. IND(6.1) - (6.4). During the four months under review only about 1 per cent damage was caused by this borer in one single region, namely, Gurdaspur in December 1940. This region was however free from attack in the other three months while all the other regions were immune throughout the period under review.

Borer No.(7) : C. trypetes Bisset.

210. The contour lines for the distribution of borer No.(7) is shown in chart Nos. IND(7.1) - (7.4). This borer was a serious pest only in the Punjab. The incidence was fairly high and 10 per cent on an average in December 1940. It decreased somewhat to 8 per cent in January 1941; but again increased steeply to 18 per cent in February followed by a slight fall to 16 per cent in March. The only other area affected was in the neighbourhood of the Punjab, namely, Musaffarnagar in west U.P. The percentage attack was however very small and only about 1 per cent on an average in the three months January, February and March 1941.

Borer No.(8) : R. ablutella Zell.

211. The contour lines for the distribution of borer No.(8) is shown in chart Nos. IND(8.1) - (8.4). This borer apparently did not cause any damage in any region during the four months under review.

Borer No.(9) : Sesaxia sp.

212. The contour lines for the distribution of borer No.(9) is shown in chart Nos.IND(9.1) - (9.4). This borer caused an average damage of 1 per cent in Gurdaspur in December 1940; otherwise it was quite harmless throughout the survey.

Borer No.(10) : E. depressella Swinh.

213. The contour lines for the distribution of borer No.(10) is shown in chart Nos. ^{IND.}(10.1) - (10.4). This is a pest which was of importance practically only in the United Provinces and Bihar. The part worst affected was Sepaya with an average intensity of attack of about 50 per cent in December 1940, January and February 1941, and 58 per cent in March 1941. The next worst area was invariably the adjoining region of Gorakhpur with a percentage attack of 24, 15, 25 and 19 per cent in the four months under review. The third region in order of damage was Musaffarnagar in which the percentage attack varied from 15 to 18 per cent in the different months. The damage done in Pusa came next with an intensity of attack fluctuating between 9 and 14 per cent in the four months. One peculiarity may be noted here. Pusa, although adjoining the worst affected area Sepaya, had a much lower incidence of this pest than Musaffarnagar which is situated much further away.

214. This borer caused very little damage in the Punjab or in Bengal; the intensity was only about 1 per cent in one month in each of these provinces. Apparently this borer was of no importance in the south where all the three regions were completely immune throughout the period covered by the present survey.

All Borers

215. The contour maps for all borers taken together are shown in chart Nos. IND(0.1) - (0.4) for the four months under review.

216. Sepaya on the whole was the worst affected region with a percentage attack fluctuating between 59 and 66 per cent in the different months. Musaffarnagar came next with an average intensity of attack varying between 49 and 63 per cent in the period under survey. Gurdaspur in the Punjab was third in the list with a percentage attack of 29 in December 1940, and a little over 40 per cent in the succeeding months.

217. Curiously enough Gorakhpur, which is practically adjoining Sepaya, had an appreciably lower incidence of borer attack; the rate of attack was on the whole just below 40 per cent in the first three months and 28 per cent in March. To the east of Sepaya we find Pusa with a still lower intensity of attack fluctuating between 25 and 30 per cent during the four months under review.

218. Dacca in Bengal had on the whole about the same or a slightly higher intensity of attack than the adjoining region of Pusa; the actual damage done was 25 and 30 per cent in December 1940 and January 1941 respectively.

219. The Cuttack region in Orissa had an appreciably lower intensity of attack fluctuating between 14 and 23 per cent. Gudiyattam in Madras on the whole had a still lower proportion of damage from all borers of about 15 per cent in the first three months and 10 per cent in March.

220. Padegaon had the lowest incidence of borers in all the three months January to March 1941 for which records were available. The actual values were comparatively small, 5 per cent and one per cent in January and February, but appreciably higher (8 per cent) in March 1941.

CHAPTER 5. GENERAL REVIEW OF RESULTS

221. I shall conclude this Report with a brief review of the results obtained so far in the present survey. Two important principles were introduced in the revised plan. Arrangements were made for recording the incidence of borers in a number of localities, villages, fields and stools within each region; and secondly, for all sample-units being located at random. This has made it possible to build up on an objective basis a broad general picture of the relative frequency of attack by sugarcane borers in different regions during the four months (December 1940 to March 1941) under observation.

222. The reliability of the primary material was studied by a full analysis in the case of one region, namely, Pusa in Bihar. Similar analysis is proceeding for other regions; and although it has not been possible to complete the work for lack of time, and I am not able to give full details in this Report, the general position may be tentatively indicated. As may be easily expected, in recording the damage done by borers, the workers differed among themselves owing no doubt to personal bias. Sometimes these differences were small and sometimes quite appreciable. There is definite evidence, however, of the differences getting smaller and smaller as the workers got more experienced.

Regional Features

223. Naturally there were also differences between fields within the same village, and between villages in the same locality. But compared to such differences there were usually wider differences between localities. And yet each region as a whole was an integral unit with its own special features.

224. North India was far more seriously affected by borers than South India. The worst regions were Sepaya (Bihar) and Muzaffarnagar (U.P.) with rates of attack in excess of 50 or 60 per cent, closely followed by Gurdaspur (Punjab) and Gorakhpur (U.P.) with an incidence of the order of 30 or 40 per cent. A peculiar feature was the comparatively lower incidence of about 25 or 30 per cent in Pusa in Bihar immediately adjoining the worst infested region Sepaya. Dacca (Bengal) to the east of Pusa region had about the same

intensity of attack. Cuttack (Orissa) occupied an intermediate position with a rate of attack of the order of 15 or 20 per cent, while Gudiyattan (Madras) had a still lower incidence of 10 or 15 per cent. Padegaon (Bombay) suffered least from borers the incidence being so low as 1 or 3 per cent in some months.

Borer Characteristics

225. This so far as the damage done by all borers is concerned. Even if we consider individual borers we find striking peculiarities and regional differences. For example, borer No.(1) had its highest incidence in Musaffarnagar and generally in North India although the amount of damage done in Orissa, Madras and Bombay was quite considerable.

226. Borer No.(2) had its highest rate of attack invariably in Cuttack and Sepaya; a peculiar feature being the complete immunity of Pusa in the immediate neighbourhood of Sepaya. Borer No.(3) was a serious pest in Bengal and did a certain amount of damage in the adjoining region Pusa; but was absent from practically all the other seven regions.

227. Borer No.(4) had its highest incidence invariably in the same region Sepaya with a much lower rate of attack in the two adjoining regions Gorakhpur and Pusa; while all the other six regions were practically free from attack. Borer No.(5) on the other hand was practically absent in North India but did a good deal of damage in Orissa and Madras.

228. Borer No.(7) was a serious pest in the Punjab where it did a considerable amount of damage; it affected only one other region Musaffarnagar, but the rate of attack was very small. Borer Nos.(6) and (9) occurred only in the Punjab in December 1940; and the average intensity of attack was only about 1 per cent. Borer No.(8) caused very little damage, less than 0.1 per cent, and was found in the Punjab and West U.P.

229. Borer No.(10) had a high rate of attack in the United Provinces and Bihar, but caused little damage in the Punjab or in Bengal while it was practically absent from the regions in the south.

Spread of Borers

230. Considering all nine regions we find that borer No.(1) was easily the worst pest. It had not only the highest frequency of attack of about 19 per cent but was most widespread of all borers among fields, villages,

and localities with an incidence rate of about 90 per cent. Borer No.(10) had the next highest rate of attack of about 11 per cent and infested nearly 60 per cent of localities and villages. Borer No.(2) had a much lower frequency of incidence of about 4 per cent but occurred in 75 per cent of localities and 67 per cent of villages and was thus more widespread than borer No.(10). Borer No.(4) had an over-all frequency of about 5 per cent which was only slightly less than that of borer No.(2); but the distribution of borer No.(2) was much more restricted as it occurred in only about 36 per cent of localities or villages. A similar contrast is shown by borer Nos.(7) and (5) both of which had a frequency of attack of a little over 1 per cent; borer No.(5), however, occurred in about one-fourth of the localities and villages while borer No.(7) was found in only one-tenth of the localities and villages.

251. A distinction must be made, therefore, between the extent of damage done by a borer and its spread or distribution. Some of the borers did less damage but were more widespread than others. In devising methods of control it is necessary to keep this in mind.

The Effect of 'Ratooning'

252. The material for studying the influence of 'ratooning' on the rate of attack was meagre and not quite consistent. The damage done was greater in 'ratooned' fields than in 'planted' fields in the case of borer Nos.(1) and (10) but less in the case of borer No.(2) in three months out of four. The rate of attack in 'planted' fields was however greater than that in 'mixed' fields for all three borers in most months. These results suggest that 'mixed' fields were best in the sense of having the lowest rate of attack from borers, and 'planted' fields were on the whole better than 'ratooned' fields.

253. A great deal of caution is, however, necessary in accepting these results. There were many factors such as variety, manure, methods of cultivation, and weather conditions which were not taken into account. It is difficult indeed to eliminate the influence of such factors in an extensive survey of the present kind. Unless a very large number of samples can be provided the cost of which would be prohibitive, it would appear advisable to study such special questions as the influence of 'ratooning' on the incidence of borers by more intensive surveys on a smaller scale under controlled conditions.

Seasonal Changes

254. As regards seasonal changes we found significant differences in the rate of attack in different months. During the four months under survey the intensity of attack by sugarcane borers was lowest in December. It reached a peak value in January and February and began to decrease in March. The range of variation from one month to another was however comparatively small indicating that these four months probably belonged to more or less the same season from the point of view of borer attack. It was also possible that the season ran somewhat different courses in different regions. Obviously data for a larger number of months must be studied before the seasonal picture becomes clear.

Concluding Remarks

255. I believe a survey of this type on such an extensive scale is an altogether new venture. The field technique as well as the statistical treatment of the data have to be developed necessarily on experimental lines. In the short time at my disposal I have tried to sketch the bare outline of the picture without entering into details. I have naturally confined myself to the statistical aspects of the survey leaving the biological questions to be dealt with by entomologists. The present Report, I hope, would give a general idea of the kind of information which may be extracted from the field material. I fully recognise that the statistical treatment may have to be modified to suit the special requirements of entomologists and agriculturists. I invite their comments and suggestions so that the method of analysis may be standardized to give the most fruitful results.

Sd: P. C. Mahalanobis

16th June, 1941.