

## APPENDIX II.

*Improved Strains evolved at the Agricultural Research Station, Koilpatti.*

| Strain No.                     | Local variety from which selected                               | Duration | Irrigated or Dry. | Yield per ac. in lbs.                 | Remarks   |
|--------------------------------|---|----------|-------------------|---------------------------------------|---|
| K1 Cholam                      | Irungu Cholam   | 120 days | Dry               | 6,000 lb. (of straw)                  | Purely fodder type  |
| K2 Cholam                      | Vellai Cholam   | 90 days  | Irrigated         | 2,600 lb. (grain)                     | Grain type.   |
| K3 Cholam (Periakanjal Irungu) | Extracted type from cross between Periamanjai and Irungu Cholam | 120 days | Irrigated and Dry | 600 lb. (grain)<br>7,000 lb. (fodder) | A grain cum fodder type under irrigation gives 3,000 lb. grain and 18,000 lb. fodder. |
| K1 Cumbu                       | Kattu Cumbu   | 95 days  | Dry               | 800 lb. (grain)                       |   |
| K1 Ragi                        | Kala Keppai   | 130 days | Irrigated (grain) | 2,600 lb.                             |   |
| K2 Ragi                        | Karunganni Keppai   | 130 days | Irrigated         | 2,600 lb. (grain)                     | Has stiff straw and is resistant to lodging.  |

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## Influence of Fertilizers on the Abundance of Pyrilla, Infesting Sugarcane

by

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**Introduction:** It is not always true that crops grown in soils with nutrients optimum for vigorous plant growth are able to withstand the attack of insect pests better than the crops grown in deficient soils. Experimental facts are available where certain pests have shown a greater preference for crops having luxuriant growth as a result of increased plant nutrients in the soil. Schoene (1941) showed that the injury to apple trees by the mealy bug, *Pseudococcus comstockii* Kuw., was most severe in orchards that had been treated with nitrogenous fertilizers for several years but no damage occurred on unfertilized trees. Gadd (1943) noted increased damage to tea plants by the borer, *Xyleborus fornicatus* Egg., following increased

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amounts of nitrogenous, phosphatic and potassium fertilizers. The results of the field experiments conducted by McGarr (1943) showed that the nitrogenous fertilizers caused a definite increase in the number of aphids, *Aphis gossypii* Glov., on cotton. Eden (1953) found that the damage of the rice weevil on the maize in the field increased with the addition of nitrogen in the soil. During the past several years it has been observed that pyrilla infestation was severe in sugarcane fields with higher level of manuring. Similar observations have also been made by Mathur and Gupta (1940) and Mathur (1941).

Studies have been initiated in Balrampur Cane Development Council area to find out the effect of three important fertilizers on the abundance of pyrilla (*Pyrilla spp.*) in sugarcane fields. The results of some of these studies are reported in this paper.

**Material and Methods :** The sugarcane variety Co. 453 was grown with different rates of the fertilizers as top dressing after germination and just before the forming of tillers. Each treatment consisted of 6 rows, 30 feet long and  $3\frac{1}{2}$  feet wide under the trench system of cultivation. Between the two treatments there was a gap of 5 feet and the treatments were replicated four times in randomised blocks. The treatments were four rates each of the three different fertilizers calculated as the actual plant nutrient in pounds per acre. Sources of the plant nutrients, N, P and K were sulphate of ammonia, super-phosphate and muriate of potash respectively. The experiment was performed in pyrilla years and in the area where serious pyrilla infestation had occurred in the previous year. Moreover, an initial infestation was also made artificially in April. The leaves bearing egg masses were collected from different fields and sorted to carry equal numbers of eggs as far as possible. In each sugarcane row four leaves bearing such egg masses were introduced by tying them on the different leaves of the four different plants at random. The population counts were made in the next November by counting the egg masses per cane as suggested by Khanna *et al* (1950). The experiment was conducted under irrigated conditions and the population assessment was made after the crop had received six irrigations.

**Results :** Nitrogen - The results of study on the effect of the varying rates of nitrogen on the population of pyrilla is summarised in table 1. In these observations where the rates of N varied from 0 to 120 pounds per acre, the average number of egg masses was 8.09 per cane. The means of the two years varied from 6.00 egg masses per

cane at 0 pound application of nitrogen to 9.85 egg masses per cane at 120 pounds. The difference required for significance was 2.55, hence there were differences between treatments. A significant correlation

TABLE 1

*Effect of the varying rates of nitrogenous fertilizer on the population of Pyrilla.*

| N<br>in pounds<br>per acre | Average number of egg masses per cane |      | Mean |
|----------------------------|---------------------------------------|------|------|
|                            | 1952                                  | 1953 |      |
| 0                          | 7.1                                   | 4.9  | 6.00 |
| 40                         | 8.6                                   | 5.5  | 7.05 |
| 80                         | 10.1                                  | 8.8  | 9.45 |
| 120                        | 9.6                                   | 10.1 | 9.85 |
| L S D 5% level             |                                       |      | 2.55 |

between the rates of nitrogen and the population of pyrilla was evident. The number of egg masses per cane increased with the increasing doses of nitrogen. The correlation coefficient ( $r$  of Snedecor, 1946) was 0.1206; and at 5 per cent level 0.1187 was required for significance.

Phosphate - the results with the phosphatic fertilizer are represented in table 2. The rate of  $P_2O_5$  varied from 0 to 80 pounds per acre. The average number of egg masses per cane for the different

TABLE 2

*Effect of the varying rate of phosphatic fertilizer on the population of Pyrilla.*

| $P_2O_5$<br>in pounds<br>per acre | Average number of egg masses per cane |      | Mean |
|-----------------------------------|---------------------------------------|------|------|
|                                   | 1952                                  | 1953 |      |
| 0                                 | 6.4                                   | 5.2  | 5.8  |
| 20                                | 4.8                                   | 7.4  | 6.1  |
| 40                                | 7.2                                   | 4.8  | 6.0  |
| 80                                | 5.8                                   | 6.2  | 6.0  |

years was 6.05 in 1952 and 5.90 in 1953. The over - all population for both years was 5.975 egg masses per cane. There were no significant differences in the population of pyrilla due to the phosphatic fertilizer in either year.

Potash - Table 3 shows the results with the potassium fertilizer. The rate of  $K_2O$  varied from 0 to 100 pounds per acre. The average number of egg masses per cane in these treatments for

TABLE 3

*Effect of the varying rates of potassium fertilizer on the population of Pyrilla.*

| K <sub>2</sub> O<br>in pounds<br>per acre | Average number of egg masses per cane |      | Mean |
|---|---------------------------------------|------|------|
|   | 1952                                  | 1953 |      |
| 0   | 7.1                                   | 5.3  | 6.2  |
| 25  | 5.3                                   | 6.9  | 6.1  |
| 50  | 6.8                                   | 6.2  | 6.5  |
| 100                                       | 7.3                                   | 4.7  | 6.0  |

the different years was 6.625 in 1952 and 5.775 in 1953. The mean population for both years was 6.2 egg masses per cane. There were no indications that the varying rates of potash influenced the pyrilla population as the results were not significant.

**Summary:** Studies were initiated in 1952 in Balrampur Cane Development Zone to determine the effect of three important plant nutrients, N, P and K to sugarcane on the incidence of pyrilla (*Pyrilla spp.*). Experiment was performed under irrigated conditions and the variety of sugarcane grown was Co 453. The sources of N, P and K were sulphate of ammonia, superphosphate and muriate of potash respectively. Statistical analyses of the results showed that only nitrogen significantly influenced the incidence of pyrilla. The population of pyrilla increased as the rate of nitrogen was increased, The varying rates of phosphatic and potassium fertilizers had no significant effect on abundance of pyrilla.

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