# Some Effects of *Pseudococcus brevipes* (Ckl.) on Pineapple Fruit *

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(Presented at the meeting of December 3, 1931)

During the harvest season of 1931 considerable spoilage of pineapple fruit was reported, caused by cracking of the basal eyes with a resultant leaking of juice from the fruit. The leaking fruits were invariably infested with souring beetles and at the bases of the fruit evidence was clear that high mealybug populations either were, or had been present. In our experimental plot, which had been used for spray experiments for some time previously, it was possible to compare fruits that had been kept clean of mealybugs with those on which high populations had developed. On examination of these plots it was clearly suggested that mealybug infestation bore a close relationship to cracked and leaky fruits. In order to obtain more exact data on this subject a section of the field, California Packing Corporation Field 71, Kunia, Oahu, where a critical study of mealybug population growth and progress into the fields has been made, was selected as a source for obtaining fruit both uninfested and heavily infested with mealybugs.

The section consisted of two sprayed blocks, A and C, on either side of a check or unsprayed block, B. Only the outer eight beds on one end of the sprayed blocks were sprayed with an oil emulsion to keep out the gradual influx of mealybugs from the adjacent wild vegetation. Successive samples of plants taken within these blocks showed that the central portions of the two sprayed blocks were relatively free of mealybugs, or at least with a very light infestation. On the other hand, the outer beds of the check block were very heavily infested with mealybugs.

Here, as elsewhere, it was observed that mealybugs have a tendency to congregate on the more tender portions of the pineapple plant. Prior to the development of the inflorescence, the

* Published with the approval of the Director as Technical Paper No. 45 of the Experiment Station of the Association of Hawaiian Pineapple Canners, University of Hawaii.

mealybugs infest the central tender leaves, but when the fruit is formed, they move up to the fruit and thence to the crown. They propagate to an enormous population on the crown and maturing fruit, especially on the butt end of the fruit where they are more or less sheltered and protected from the numerous predators.

Analysis of the last sample taken on July 2-7, 1931, indicated that beds 36 to 45 of Block A and beds 26 to 40 of Block C had only a very light infestation of mealybugs, whereas beds 1 to 15 of Block B had a very heavy infestation. To facilitate sampling, each of the three blocks was subdivided into small plots of five 60-foot beds, thus forming five plots throughout the width of the 300-foot block. Crown samples were taken at every tenth plant interval, alternately from the first, second and third lines of every odd 3-line bed of each plot of the three blocks. Thus, 12 crown samples were taken from each 300-foot bed.

Out of the 120 samples, taken from the above designated 10 beds of Block A, only one crown had a single mealybug, and of the 180 samples from that of the 15 beds of Block C, 28 were infested with an average of 47 mealybugs per crown infested. Contrastingly, out of the 180 samples taken from the first 15 beds of check Block B, all crowns had a heavy infestation with an average of 190 mealybugs per crown infested. (See Table 1).

The assumption was made that the degree of mealybug infestation on the crowns was indicative of the infestation on the fruits. Subsequently, all ripe fruits were picked from within the designated portions of each of the three blocks on July 23, 1931, when the fruits became mature. They were packed into regular pineapple crates which were marked and segregated according to the respective blocks. These crates of fruits were then brought into the laboratory for inspection.

In the laboratory, each fruit was examined for any superficial manifestations of cracked and leaky spots among the "eyes" of the fruits. The fruits were thereby classified as normal, those showing no cracked or leaky spots; cracked, those with corked-over cracks only; and leaky, those from which the juice was exuding from cracks in the corky tissues. The following record shows the results of the examination:

TABLE 1

Mealybug population from crowns with associated data on fruit quality:

| Block No. | No. of Crowns in Sample | Percentage of Crowns Infested | Average Population of Mealybugs per Infested Crown | Normal Fruits | Cracked Fruits | Leaky Fruits | Total No. of Fruits Examined |
|---|---|---|---|---|---|---|---|
| A | 120 | 0.8 | 1 | 232 | 18 | 0 | 250 |
| B | 180 | 100 | 190 | 92 | 176 | 36 | 304 |
| C | 180 | 15.5 | 47 | 299 | 29 | 4 | 332 |

Although no quantitative data were obtainable on the subject, it was also indicated that the establishment of heavy mealybug populations on the base of fruit so weakened the tissue between the "eyes" that entrance of the souring beetles was very much facilitated. It is also true that a leaky fruit rapidly becomes a fermenting fruit, so that the indirect effect of mealybugs in encouraging souring beetle infestation must also be reckoned with.

## CONCLUSION

The results clearly indicate that the presence of mealybugs in large populations at the base of fruits considerably reduces the quality of fruit by rendering the basal slices unmarketable as well as increasing the number of culls due to leaking and fermentation. No laboratory experiments have been undertaken, but the clear correlation in the field data seems to be conclusive on these points.