ESTIMATION OF LOSSES IN CANE AND SUGAR YIELDS CAUSED BY INFESTATIONS OF CHILO AGAMEMNON BLES.

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ABSTRACT

Due to serious losses in both cane and sugar yields during the past decade from infestations of the lined borer, Chilo agamemnon Bles., a need arose to estimate the effect of borer infestation. Results indicated that each 1% of infestation caused 0.55% loss in cane yield of the variety Co 413 and 0.52% loss in variety NCo 310. In respect to yield of sugar, each 1% infestation was estimated to cause 0.65% and 0.67% loss for Co 413 and NCo 310, respectively.

INTRODUCTION

Sugarcane is cultivated in a large area in most of the governates of upper Egypt. During the past decade, personnel supervising the sugar industry and growers in the Abu Qurqas area of Minia Governate have been concerned about serious attacks of the lined sugarcane borer, Chilo agamemnon Bles., causing considerable annual losses in sugar production, particularly during outbreak years. Consequently, field methods for estimating losses to be anticipated from varying levels of infestation by this stalk borer are needed.

The only information found in the literature dealing with the subject is the work of Ezzat and Atries (1967). They estimated the loss in yield at different degrees of borer infestation in sugarcane varieties Co 413 and NCo 310 and found evidence that in sugarcane with sound tops reduction in yield did not usually occur unless the total length of tunnels/stalk exceeded 12 cm, while death of the tops reduced yield even in tunnel-free stalks.

Investigations were conducted in the Abu Qurqas area of Minia Governate during the harvesting period of 1967 with the object of obtaining factors that would enable growers and the farm and factory supervisors to estimate losses in yields of cane and sugar to be expected from different levels of borer infestation.

MATERIALS AND METHODS

Two dominant commercial varieties of sugarcane, Co 413 and NCo 310, were included in the tests. Highly infested fields were chosen for the experiments. Five plots, each 1050 sq m in area, were selected of each variety in March 1967. The stalks in each plot were classified into 2 categories: dead hearts (dead tops due to infestation by C. agamemnon) and live hearts (live tops, although the stalks may have been infested). For purposes of this study, stalks having dead
tops are described as infested, while stalks having live tops are treated as uninfested, even though they may have contained borer tunnels. The weight of each stalk was determined and recorded. Then, 10 samples of 25 kg/sample were taken from each of the 2 infestation classes (dead hearts and live tops) on a plot. Each sample of stalks was milled separately immediately after harvest, and the extracted juice was weighed and recorded. Brix and percent sucrose were then determined from each sample of juice.

The data obtained from each plot were used to estimate the percentage of loss in cane yield and in sugar yield due to each 1% of infestation. The estimated loss in cane yield was derived from the total no. of stalks/feudan, the percent of stalks with dead hearts, estimated cane yield/feudan (from no. of stalks × wt/stalk), and the presumed yield/feudan if all stalks had had live tops (from no. of stalks/feudan × wt/stalk having live tops).

Loss in sugar yield for each 1% dead hearts was estimated from the following data: total no. of stalks/feudan, no. stalks/feudan with dead hearts, no. stalks/feudan with live tops, wt/stalk with dead hearts, wt/stalk with live tops, estimated cane yield/feudan of stalks with dead hearts, estimated cane yield/feudan of stalks with live tops, estimated sugar yield/feudan of stalks with dead hearts, estimated sugar yield/feudan of stalks with live tops, and presumed sugar yield/feudan if all stalks had had live tops.

RESULTS

Loss in Yield of Cane

For Co 413, the estimated loss in cane yield due to infestation resulting in dead hearts was 23.53%. Since this percent yield loss was caused by a 42.95% infestation (dead hearts), the percent of loss in cane yield due to each 1% infestation was 0.55.

Applying the same method for cane var NCo 310, it was estimated that an infestation (dead heart) percent of 39.03 resulted in a cane yield loss of 20.52%. Therefore, it appeared that there was a loss in cane yield of 0.52% for each 1% of dead hearts.

Loss in Yield of Sugar

In regard to effect of infestation on loss of sugar in var Co 413, it was estimated that the 42.95% infestation (dead hearts) resulted in a sugar loss of 28.13% or that each 1% infestation caused 0.65% loss in yield of sugar.

For var NCo 310, the 39.03% of infestation (dead hearts) was estimated to have caused a 26.2% reduction in yield of sugar, a loss of 0.67% sugar for each 1% infestation.

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REFERENCES