The Effect of Field Conditions and of Field Practices on the Development of Black Root in Sugar Beets

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Abstract

Results of the study of an average of 124 diseased fields per year during 1939, 1940, and 1941 are expressed in percentages of diseased acreage saved, under different conditions, and as a result of different field treatments given after the infection was discovered.

Fields planted late or replanted and those with a low level of fertility or with poor drainage had a relatively low degree of recovery from black root.

The percentage saved, after different preceding crops, was highest when sugar beets were planted after such cultivated and usually fertilized crops as navy beans, potatoes, tomatoes, etc. Next in order of value were legumes, corn, and small grains, with beets after beets showing a total loss.

As to remedial treatments given diseased fields, immediate aeration with rotary hoe, weeder, or spike-tooth harrow saved 63 percent; use of a roller or cultipacker saved only 34 percent; delayed treatment of any kind saved only 24 percent, and no treatment resulted in a loss of all but 13 percent of the acreage.

[3]Great Lakes Sugar Company.

The Beet Leafhopper as a Pest of Beets Grown for Seed

VAN E. ROMNEY[2]

Abstract

Beets grown for seed by the annual method in the Mesilla Valley, New Mexico, and in the Salt River Valley, Arizona, are subject to occasional injurious infestations of the beet leafhopper, *Eutettix tenellus* (Baker). These agricultural districts are surrounded by summer breeding areas of this insect, and the amount of damage from year to year depends upon leafhopper numbers and host-plant conditions during the fall months in these breeding areas. Damage results from the transmission of the curly-top virus from plant to plant

[2]Bureau of Entomology and Plant Quarantine, United States Department of Agriculture.

by the insect; the disease has been found to reduce the seed yield. It also retards maturity of the seed, although it has not been found to affect noticeably the quality and viability of the seed.

Beets are planted from mid-August to mid-September in the New Mexico and Arizona seed-producing districts. Beet leafhoppers infest the fields as soon as the beets are up and usually increase in number until late September in New Mexico and until mid-September in Arizona. Further movements to the beet fields usually do not occur until late October and occasionally at later intervals, depending upon host-plant conditions in the breeding area. In Arizona the September infestations thus far have been injurious only to the thinner beet stands, while in New Mexico larger, but not serious, infestations have been found to occur in September.

In the seed-beet fields of the Salt River Valley, infest a lions of 125 to 150 leafhoppers per 100 feet of row, on nonresistant stands ranging from 700 to 1,000 plants per 100 feet of row, may be sufficient to warrant control measures, although this number usually infects less than 20 percent of the plants by the time the crop is mature. In the past, beet stands in the Mesilla Valley have not been so thick as those in Arizona, and there are indications that the leafhoppers carry a more severe virus. For this reason stands of 600 to 800 plants per 100 feet of row in this district probably would require only 75 to 100 beet leafhoppers per 100 feet of row to warrant control measures. In both districts thinner stands would require fewer numbers of leafhoppers.

Experiments conducted during the period 1935 to 1941 have shown that increases in seed yields result, from one application of pyrethrum-in-oil when made as soon as possible after damaging infestations of the insect occur. Not more than two applications have been found necessary even under the most adverse conditions. An application rate of 6 gallons per acre with a low-pressure machine was sufficient within the temperature range of 50° to 75° F., when there was little or no wind. As the temperature rises above 75° F., the amount should be increased, until at about 95° F. as much as 9 gallons per acre may be necessary to maintain large reductions. Wind velocities of more than 8 to 10 miles per hour 4 feet above the ground also inhibit the effect of the insecticide.

Cultural practices can be used to supplement or even take the place of chemical control measures. Beets planted from August 15 to September 15 in the Salt River Valley can be made to cover the soil surface with foliage within about 50 days and thus create an unfavorable environment for the leafhopper. After the beet foliage within the fields practically covers the soil surface, leafhopper num-

bers have been found to be very small, and such fields apparently are not subject to subsequent infestations or additional injury. Fields with small beets after late October have been those more severely injured by the leafhopper, and especially those which remained with poor coverage throughout the winter months, since such fields often were found to receive additional leafhoppers at that time.

Progress Report on Investigations of Insects Affecting Sugar Beets Grown for Seed in Arizona and New Mexico

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Abstract

Insect-population studies have been carried on in fields of sugar beets grown for seed in the Salt River Valley of Arizona. These studies were commenced in 1938 and have been carried on throughout the entire growing season of the crop each year since then. Insofar as possible, studies have been extended to include also the beet-seed-producing areas in the Mesilla Valley, New Mexico, and the areas in the vicinity of Albuquerque. These studies have shown that several species of seed-feeding insects infest the seed-beet fields during the spring months. Of these insects, *Lygus* spp. are the most common, and in the Salt River Valley, where the more detailed studies have been conducted, a direct correlation was found between the numbers of *Lygus* present on the seedstalks in May and the percentage of non-viable seed produced. Three species of *Lygus* have been found to occur in the seed-beet fields of Arizona and New Mexico. The distribution of these species is not the same, however, for the various areas. In the Salt River Valley of Arizona *Lygus hesperus* (Knight) and *Lygus oblineatus* (Say) predominate, and *L. elisus* Van Duzee occurs only in small numbers. In the Mesilla Valley *Lygus oblineatus* and *L. elisus* predominate, with comparatively few *L. hesperus.* At Albuquerque, *L. elisus* occurs in the beet fields almost to the exclusion of the other species. Certain stinkbugs, particularly the Say stinkbug *(Chlorochroa sayi* Stal), also have been found in all the areas studied, but they are considered to be of minor importance except in outbreak years.

[1]Bureau of Entomology and Plant Quarantine, United States Department of Agriculture.