

## Sugar Beet Insect Research Summary

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Sugar beet insect research in recent years has involved the comparison of several insecticides as to their efficiency in controlling the green peach aphid and beet armyworm. Other research focuses on the establishment of economic injury levels for beet armyworm in sugar beet seedlings. Establishment of these levels is important to maintain timely and efficient use of insecticides. Current and proposed research includes insecticide evaluations on the control of the sugar beet root aphid and beet armyworm plus refinement of economic injury levels.

### Previous Research:

Insecticide evaluation on green peach aphid using a single application of Monitor, Di-syston, Thimet and Thiodan indicated Thiodan to be the least effective in reducing aphid populations. The initial population reduction by Monitor, Di-syston and Thimet were effective and approximately equal whereas Monitor maintained a longer residual effect.

An insecticide evaluation using Monitor and Methomyl (Lannate) against the beet armyworm showed both to be effective and equal in controlling this insect. Methomyl is currently registered and is recommended for beet armyworm control. Monitor has yet to clear for use on sugar beets.

This initial research on economic injury levels involved 2 population levels of beet armyworm larvae on sugar beet seedlings. Seedlings were 14 days old when treatments were initiated. Treatments included an untreated check, treatments initiated at .5 larva per plant and 3 larvae per plant. Untreated check reached an average population of 3.5 larvae per plant while both treated plots averaged less than 1 per plant after initial treatment. Results of these population levels and yield are presented below.

Treatments	Average Number Larvae Per Plant	Number Of Insecticide Applications	Beets - Ton Per Acre	Per Cent Sucrose
Check	3.5	0	40.42	14.9
1	.23	3	38.80	15.1
2	.87	1	39.08	15.4

### Current Research:

Insecticide Evaluations - The objective of insecticide evaluations or screening is to measure and compare efficiency of various insecticides to control specific insect pest species.

Beet armyworms are generally the most important pest insect found on sugar beet seedlings. At the present time, only one insecticide, Methomyl,

is recommended in Arizona for control of this pest.

In an effort to find alternative insecticides, an evaluation study is now in progress that will accomplish preliminary screening of certain insecticides that may show promise on the control of beet armyworms. The test consists of an untreated check and the use of Methomyl as the standard insecticide. Monitor, which has been previously tested but not yet registered, and three experimental materials, an ACNPV virus, a synthetic pyrethroid, and an insect growth regulator, are being compared with the standard insecticide.

Economic Injury Level - Economic injury levels are considered more accurate when insect populations are measured on a per plant basis. For this reason, the on-going research involves a 4 treatment experiment on beet armyworm populations in seedling beets. This test consists of an untreated check, allowing populations to fluctuate at will, and 3 treatments that receive insecticide applications at predetermined population levels. One treatment receives an application when at least 1 plant in 20 is infested, another receives an insecticide application when 5 plants in 20 are infested and the third receives an application when 10 plants in 20 are infested. Yield data, taken at the end of the season, should indicate which level of infestation is economically important in sugar beets.

Sugar Beet Root Aphid Investigations - Preliminary investigations on biology of the root aphid are being conducted in the field and laboratory. Aphid cultures have been established in the laboratory and winged forms have been successfully obtained from the cultures. Winged forms are necessary for accurate species identification, biological information and life history studies. Field work is in progress to determine if alternate host plants are involved and to determine if they would be important to the occurrence and dissemination of this insect.

Outlook - 1977:

The screening for alternate and economical insecticides effective against beet armyworm will continue. Additional studies will attempt to determine the effects of predators, parasites and pathogens on beet armyworm populations.

Insecticide evaluation will be initiated against the sugar beet root aphid. However, determination of economic importance and biological information of the root aphid must be obtained before adequate control measures can be established. Information concerning the root aphid will include alternate host plants, rate and time of dispersal, pathological relationships and natural enemies.

Previous research on economic injury levels and population sampling of beet armyworms by pest management personnel indicates that higher population levels can be tolerated. Expanded efforts will attempt to ascertain more precisely the levels that can be tolerated before yield loss occurs.