

SUNFLOWER INSECT RESEARCH  
PROGRESS REPORT

By

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While this researcher has attempted to maintain some conversancy with insects affecting sunflower production in North Dakota since 1959, it has only been in the last two years that formalized studies have been undertaken to more adequately define those areas of potential problem that might adversely affect the culture of this oil crop.

If our experience with other crops grown in this area can provide an example, sunflower growers in this region will normally not have to contend with high infestations of incipient populations of those insect species generally considered noxious. Geographic location, environmental factors and cultural practices should tend to assist in keeping such species at low to moderate infestation levels in most years.

However, because these moderate infestations may be of economic importance, studies have been initiated to further explore the biology and ecology of what appear now to be the potential major noxious sunflower insects. These include the sunflower moth, Homeosoma electellum, the banded sunflower moth, Phalonia hospes, sunflower beetle, Zygospila exclamationis and the sunflower maggot, Strauzia longipennis. Additionally the importance of thrips, Franklinealla sp., the melon aphid, Aphis gossypii, and various leafhopper species is under study.

Of primary interest currently is the determination of effects of increased sunflower cultivation on the population dynamics of the above-named insects. Our results to date suggest the following:

1. Significant increase in populations of Zygospila exclamationis have been noted in 1968 when compared to 1967. A slight increase in populations of Strauzia longipennis has also been recorded. At this time populations of Phalonia and Homeosoma have not been determined for this year. In 1967, when the preponderance of head infestations involved only Phalonia, the average number of larvae found in head samples were 2 (down from 9 in 1966), with between 25-30% of the heads examined infested.

2. A significant decline in aphid numbers was observed in 1968 when contrasted to 1967.

3. In general, population densities of the four major noxious species appear somewhat higher in both 1967 and 1968 than they were in 1962 when formal surveys were made in the limited acreage grown at that time.

4. Higher populations are experienced without exception in fields adjacent to previously-cultivated acreages where volunteer sunflowers are not removed. This suggests the importance of sunflower debris in facilitating the overwintering of some of these species in this region.

Studies undertaken to define appropriate controls that can be utilized for sunflower-infesting insects have involved both the cultural and chemical approaches. Research conducted initially in 1960-61 revealed that in this area the use of chemicals (1) will normally necessitate aerial application to obtain the coverage necessary for optimal results and (2) will involve applications over a relatively short period of time if maximum control is to be obtained. Currently, we are evaluating several organophosphate and carbamate insecticides as well as Bacillus thuringiensis for control of the sunflower-insect complex.

The potential utilization of honeybees for pollination makes the chemical approach somewhat tenuous and possibly not feasible. If this occurs, it will accentuate the need for more stringent use of the cultural and non-chemical approaches including better sanitation, removal of volunteer plants and use of insect resistant varieties.

The third area of investigation involves studies to determine the relationships of insects and diseases that affect sunflower. To date several isolates from plants exhibiting mosaic and other virus-like symptoms have been made. Subsequent inoculations under greenhouse and environmental chamber conditions have not indicated these to be insect-transmitted. In some instances these anomalies apparently are genetic or physiological in origin. Continued emphasis is being placed in this area of study.

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