APHIDS AND THEIR CONTROL

by
Wayne J. Colberg[1]

During the past two or three years there has been a tremendous program in the development and promotion of new insecticides, fungicides and weed killers. Growers have reason to be enthusiastic over the results obtained from the use of these new organic chemicals, but many have probably failed to realize just what has taken place in the insect world, ecologically.

Tests have shown that most of the newer insecticides will control most of the potato insects effectively, with the exception of the potato aphid. In all cases there has been some degree of aphid control, but not enough to protect the growers' fields from disease infection.

Virus infection of certified potato fields has become increasingly serious during the past two years, and along with this, the aphid problem has become steadily worse. However, the occurrence of other insects affecting potatoes has become of less serious consequence.

Because of rapid reproduction the aphids build up such populations that within a short time whole fields may be infected with aphid-borne diseases. Experiments have shown that the aphid is directly responsible for the spread of many virus diseases.

The aphid has its natural enemies, including insect predators and parasites and because of these, there may be a reduction in the aphid population—even though no insecticide has proved lethal. The larvae and adult of the lady bird beetle and the larvae of the Lacewing fly (aphis lion), are predators of the aphid; while the braconid wasp is parasitic, with the aphid acting as host. However, the use of insecticides may greatly reduce the number of natural enemies, thus eventually resulting in greater numbers of aphids.

The use of new weed killers has reduced weed abundance including many of the weeds serving as hosts for the aphid. The wild rose bush is one of the winter hosts, and aphids have been found in early spring on mustard, ragweed and other weeds. This reduction of weeds has resulted in the early migration of aphids to other vegetation including adjoining potato fields.

During the summer of 1948, the writer had occasion to observe the effects of insecticides upon the natural enemies of aphids, and on the aphids themselves.

The department of entomology had set aside small plots of potatoes, where no insecticide was used, for the sole purpose of building up insect populations. Approximately seventy-five feet to the south of these plots, the plant pathologist had potatoes growing for the purpose of conducting moisture tests and vine killing

[1]Assistant Entomologist, State Seed Department & Student Assistant, N. Dak. Agr. Experiment Station.

experiments. Here, applications of insecticides were applied frequently, with the result that there were no insects (including beneficial insects) present during the early part of the season on the plots undergoing moisture and vine killing tests; on the entomology plots, insects were present in great numbers, including natural enemies of the aphid. Checks made on July 19, showed that there were 1773 wingless aphids on 25 plants in the treated plots, compared to 16 wingless aphids on the entomology untreated plots. The reason for this apparently lies in the fact that natural enemies of the aphid were present in abundance on plants in the untreated plots and controlled the aphids.

It was decided that all insecticidal applications would be suspended for a period of time to allow numbers of predators and parasites to build up. It was found that within 8 days the aphid numbers were reduced to practically nothing; while the predators and parasites had built up to large enough numbers to keep the aphid population down. The count made on July 27, 1948 showed 73 aphids on 25 plants on the insecticide treated plots, and 32 aphids on the same number of plants in the untreated plots.

Even though the natural enemies did build up in sufficient numbers to control the aphid, they did not control them sufficiently enough to keep down infection of disease. Within two or three weeks the plants began showing symptoms of top infection.

The conclusions reached herein are in harmony with those expressed by Ulyett[2] and indicate that:

1—Use of the newer chemical treatments will doubtless continue, if we expect to keep the major insect pests reduced to insignificant numbers.

2—While growers continue to use the newer insecticides, certain insects beneficial to man will simultaneously be reduced in numbers—along with those classified as "injurious" or "pests." As a result, the use of the newer chemicals will result in bringing about new problems to the research worker and the grower which may be called "ecological," i.e., the relationship of the organism to its environment.

3—Results obtained thus far show that biological control can not always give a satisfactory economic control of a pest when used alone. It is also known that the use of insecticides in the control of major pests may not prove economical. It would seem that a good working combination of the two methods may be worked out to be satisfactory to the grower.

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[2]Ulyett G. C., 1948, Insecticide Programs and Biological Control in South Africa. Journal of Economic Entomology 41 (2): 337-339