AREA CONTROL OF THE GREEN PEACH APHID IN EASTERN IDAHO

by
Guy W. Bishop, Entomologist
University of Idaho

The green peach aphid, Myzus persicae (Sulz.) is a serious worldwide pest of dozens of crop hosts, causing losses through transmission of more than 100 plant viruses and by killing or weakening plants by direct feeding. The most important losses by the aphid to potato crops is by transmission of potato leaf roll virus. The virus can limit production in regions producing net necrosis susceptible varieties such as the Russet Burbank.

The green peach aphid tends to be a chronic pest at low elevations in the Pacific Northwest and sporadically important in the higher potato producing areas. Lower elevations favor the aphid because milder temperatures allow increased winter survival and more rapid summer development. Also, peach trees, the important winter host of the aphid, are most common at lower elevations.

Sources of Aphids that Initiate Infestations

Infestations of the green peach aphid may be initiated by aphids from one or more of four sources:

1. winter host trees
2. survivors of continuous winter development
3. bedding plants
4. immigrating winged forms

The relative importance of each of these aphid sources in a particular area has a strong influence on aphid control programs and, therefore, will be briefly considered here.

Peach trees are the important winter hosts of the green peach aphid in western states. Although the aphid has been recorded from other species of Prunus including apricot, these are usually of minor importance.

Winter survival of aphids in the active form occurs in mild winters at low elevations in unprotected situations and may occur in most winters in protected situations. In this type of overwintering, feeding occurs whenever temperatures are favorable and several generations are produced from fall until spring. This type of development becomes less common at higher elevations and has not, for example, been observed above 4000 ft. in Idaho. In terms of percent of the total number of aphids initiating infestations in the spring, aphids from this source are frequently of little significance. However, they may perpetuate certain characteristics such as insecticide resistance that would be lost or altered through sexual recombination of genes.

Green peach aphids infest plants in most commercial greenhouses. Bedding plants from these establishments become centers of local infestations where they are planted. In a survey conducted in eastern Idaho during 1972, infested plants were found in 9 of 10 retail outlets. This aphid source becomes relatively more important at higher elevations where peach trees are scarce.

Movement of winged aphids from region to region on air currents is a possible source of infestations. Importance of any such long distance movement is difficult to assess since evidence is circumstantial. However, it may be safely assumed that sources become less important as their distance from a particular location increases.

Idaho's Area Pest Management Program

The Idaho pest management program on the green peach aphid was initiated in May 1972 as a result of a cooperative agreement between the University of Idaho Cooperative Extension Service and the USDA Animal and Plant Health Inspection Service. This agreement is to continue in effect for a 3 or 4 year period. The overall objective of the program is to eliminate the green peach aphid as a pest by directing control measures against the overwintering sources (primary hosts and bedding plants). This approach has been demonstrated to have practical applications by Powell (unpublished) in Washington and by Bishop (1967) in Idaho. Specific objectives are:

1. Conduct a comprehensive, area-wide survey to locate all overwintering hosts of the green peach aphid in eastern Idaho.

2. Develop and execute procedures to eliminate or treat all overwintering hosts in the area.

3. Expand on a region-wide basis, regulatory programs dealing with importation or distribution of infested bedding plants.

4. Monitor green peach aphid population changes and incidence of leaf roll virus net necrosis in the potato growing areas coincident with the implementation of objectives 1 and 2.

The region included in the program is the eastern portion of the State of Idaho, an area about 75 miles wide and 200 miles long. Some 200,000 acres in this region are in potato production, of which 45,000 acres, in somewhat restricted areas, are devoted to the production of potatoes for seed purposes. Over 1,000 farmers are involved in the total production with about 400 almost exclusively involved with seed production.

This region was selected for several reasons. Agronomically, it is largely devoted to potato production and potatoes are the only important crop host of the green peach aphid. Sugar beets are a relevant secondary crop, and the only other crops of major significance are grain and alfalfa. Geographically, the region includes the upper Snake River Plain and adjacent valley systems. Demographically, there is a distinct separation from the southcentral region of Idaho, in which potato production is almost exclusively for commercial purposes. Elevations range from about 4400 to above 6000 ft. The climate of the region is, therefore not conducive to the commercial propagation of the primary hosts of the green peach aphid. This factor is of importance to ultimate success of the project. Primary host trees are present in limited numbers (as ornamentals or as occasional crop trees) but are almost entirely associated with urban areas. Aphid overwintering other than as eggs on primary host trees has not been observed. Further, annual importation of the green peach aphid into the region is known to be almost exclusively by means of bedding plants for vegetable and flower gardens.

During 1972 an area, which was mostly urban, containing about three-fourths of the population of the management area was surveyed. This area contained about 4400 peach trees. When the survey is completed in 1973 the total is expected to reach about 5000.

A green peach aphid monitoring program utilizing yellow trap pans for winged forms and field counts for developing populations was conducted in 1972. This program will be continued in 1973 and the information from the two years will be used as a base for comparison of aphid numbers after the control phase of the program is fully activated in 1974.

LITERATURE CITED

Bishop, Guy W. 1967. Green peach aphid distribution and potato leaf roll virus occurrence in the seed potato producing areas of Idaho. Jour. Econ. Ent. 58(1):150-153.

_____ 1967. A leaf roll virus control program in Idaho's seed potato areas. Amer. Potato Jour. 44(9):305-308.