

THE BLUE ALFALFA APHID IN ARIZONA

M. W. Nielson and R. T. Kodet
Research Entomologist and Graduate Research Assistant
USDA, ARS and University of Arizona, Tucson

The blue alfalfa aphid (Acyrtosiphon kondoi Shinji) was first found in Arizona in Yuma County in February 1975. During the following 3 months, populations were found in alfalfa in several localities in Maricopa and Pinal counties. In June, specimens were identified from alfalfa in Tucson in Pima County, and later in the summer an unconfirmed report of the pest in Graham County was received. The aphid is now well established in the major alfalfa growing areas of the State.

Populations of the aphid started building up in the spring and extended well into the summer months. In late July and August, however, the pest was low in numbers and by November, populations were still very low except for an outbreak in Tucson in an experimental plot. The aphid was frequently found in association with the pea aphid (Acyrtosiphon pisum (Harris)), but only in a few instances was it the dominant species in alfalfa.

Identification

Specimens of the blue alfalfa aphid from Arizona were first identified as Acyrtosiphon sp. loti group by V. F. Eastop, British homopterist. Later, specimens sent in from different localities in Arizona were identified as Acyrtosiphon caraganae (Cholodkovsky). Recent determinations by Eastop, however, revealed that the species is A. kondoi Shinji, a Japanese species on Trifolium and Medicago. Apparently the pest was introduced from Japan.

Damage Characteristics

Damage to alfalfa caused by feeding of the blue alfalfa aphid is very severe. Plants are stunted and the leaves show marked chlorosis. Populations can cause severe stunting within 2 weeks following initial infestation. Recovery is slow and regrowth is retarded about 50% during the first 2 weeks after aphids have been killed off. The damaged portions of the plant never seem to recover. Among the important aphid pests of alfalfa in Arizona the spotted alfalfa aphid (Therioaphis maculata Buckton) causes the most severe type of damage followed by the blue alfalfa aphid and then by the pea aphid.

Host Plants

Preliminary studies have shown that the blue alfalfa aphid prefers other legume species over alfalfa. Table 1 shows the preference of the aphid for legume species in a limited test conducted at Tucson, Arizona. The list is only a partial one of a proposed study of over 200 species of legumes. Astragalus rubyi was the most preferred host and horsebean, Vicia faba, was a non-host. Horsebean is a preferred host of the pea aphid.

Table 1. Comparative fecundity of the blue alfalfa aphid on 9 species of legumes. Tucson, Arizona, 1975.

<u>Astragalus rubyi</u>	22.0
<u>Lotus arabicus</u>	14.0
<u>Caragana arborescens</u>	14.0
<u>Medicago sativa</u>	11.0
<u>A. mexicanus</u>	9.0
<u>L. corniculatus</u>	7.0
<u>C. decorticans</u>	7.0
<u>A. cicer</u>	1.0
<u>Vicia faba</u>	0.0

Rearing Populations

Rearing of the blue alfalfa aphid on potted alfalfa plants in the greenhouse is rather difficult. The aphid reproduces rapidly during the first 8-10 days, then declines as the population develops winged forms. Good maintenance and population increase can be done by transferring the aphids to new regrowth every 10 days. This requires the development of a system in which potted plants are cut back periodically so that when regrowth is about 6-8 inches high the plants are in the proper condition to induce and maintain good aphid reproduction. Populations can be increased much easier on Astragalus rubyi, Lotus arabeus, and Caragana arborescens. However, A. rubyi is damaged during the first week of infestation whereas L. arabeus and C. arborescens show no apparent damage during the same period of infestation.

Host Plant Resistance

The potential for developing resistant alfalfa cultivars is very great. Although preliminary work showed that many alfalfa cultivars are susceptible to the aphid, there is good evidence that germ plasm for resistance is readily available in many alfalfa sources. Evaluation tests of many cultivars and a new resistant experimental line, UC-102, developed by Dr. W. F. Lehman of the University of California, showed remarkable promise in the early part of the evaluation.