

BLUE ALFALFA APHID DAMAGE AND ITS CHEMICAL CONTROL
IN THE IMPERIAL VALLEY, CALIFORNIA

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A new aphid species which closely resembles the pea aphid was first discovered in abundance on alfalfa hay in the Imperial Valley, California during the spring 1975. Positive identification of the new aphid is somewhat uncertain. However, taxonomists have tentatively identified it as Acyrtosiphon kondoi. It is currently being called the blue alfalfa aphid. This aphid was originally described as a new species when collected in Northern China about 40 years ago. Its host range includes a number of legumes but alfalfa is its most important crop host.

History of the New Aphid in California

Specimens of this new aphid were unknowingly collected by one of the authors from alfalfa near Bakersfield, California in 1974. The samples were taken to detect lygus bug parasites and the aphids in the samples were not counted. Fortunately, the samples were preserved for other observations. When the new aphid reached outbreak in 1975, the Bakersfield samples were re-examined and specimens of the new aphid were identified by R. C. Dickson, UCR.

In 1975, the new aphid was first noticed in Imperial County when commercial fieldmen observed somewhat less than satisfactory control of aphid populations, i.e., chemicals applied for pea aphid control.

Field surveys showed an aphid of slightly different appearance than the familiar pea aphid was widespread throughout Imperial County. In addition, this smaller bluish green aphid was inflicting damage to a number of alfalfa fields.

Field Observations

The blue alfalfa aphid closely resembles the pea aphid. However, there are subtle differences. The new aphid is smaller, more bluish green and has a waxy appearance in comparison to the lighter green and more shiny pea aphid. In the southern desert areas the new aphid cannot tolerate high temperatures which is similar to the pea aphid. Both aphids disappeared about mid-May 1975.

Damage

The blue alfalfa aphid prefers to feed on the tender succulent parts of the alfalfa plant. The aphid colonies are clustered on the terminal growth. As the populations increase, they tend to congregate on the tender shoots and beneath older leaves.

A good number of fields heavily infested with the blue alfalfa aphid were observed in the Imperial Valley during the spring 1975. There was a severe stunting of the stems which is characterized by smaller leaves and short internodes. Leaf curling is a common symptom in severely infested fields. The plants also show yellowing and eventual leaf drop.

Field observations suggest that the new aphid may inject a toxin into the plant but a virus may also be involved.

In the early spring (1975) growers in the Imperial Valley attributed the stunting of alfalfa plants to the unusually cool weather conditions. However, differences in growth were observed in adjacent treated and non-treated hay fields. Aphid free fields, although somewhat retarded in growth due to cool weather, were observed to have nearly normal leaves and internode characteristics in comparison to the severe yellowing and stunted plants in fields with high aphid populations.

A number of fields were observed where blue alfalfa aphid infestations delayed cutting schedules and a few were observed where there was a loss of as much as a full cutting or more.

Chemical Control

A number of chemicals were applied on alfalfa to obtain data on their effectiveness on the blue alfalfa aphid and on the pea aphid.

In one replicated experiment, Supracide® at 8 oz ai/acre applied by air gave about 80-85% control of both aphid species.

In another test, Phosdrin®, Methomyl, Furadan®, Malathion®, Penncap, Diazinon®, and Supracide® were applied to simulate commercial dosages. The insecticides were applied by a hand sprayer using CO₂ to give a constant 40 psi. The plot sizes were 15 x 50 ft and each material and the untreated plots were replicated four times in a randomized complete block design. Five sweep net counts were taken from each plot at 4, 8, and 16 days after application. The areas sampled on each sampling date were avoided on the next sampling date. The samples were collected in alcohol and examined under a microscope to differentiate the winged forms of the blue alfalfa aphid and the pea aphid. Differentiation was based on a difference in size between the two aphid species. No attempt was made to distinguish the nymphal stages of the two aphid species.

All chemicals mentioned above gave good control of the total nymphs and winged and non-winged adult forms of the pea aphid and the blue alfalfa aphid in comparison to untreated plots at four days after application. However, Penncap, Furadan® and Diazinon® gave the highest kill. In general these insecticides appeared to give longer control when compared to other insecticides mentioned in this test.

The general impression of the authors is that the blue alfalfa aphid appears quite easy to kill with most materials used on alfalfa for aphid control.

In 1975, the aphid population pressure for rapid reinfestation of treated commercial fields was common. This gave an impression of poor knockdown. The rapid reinfestation also increased the insecticide load on alfalfa hay and undoubtedly took a heavy toll of predators and parasites of other pests. This may well have contributed to high worm populations in mid-summer.

However, until resistant varieties, biological control agents and possible cultural control practices become available, insecticides appear to be the only method of suppressing the new aphid to avoid damage to alfalfa.