

# Yellow Clover Aphid on Alfalfa

pest not ruinous to state's alfalfa industry but production costs increased by frequent field inspections and treatments

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By mid-May 1955 the populations of the yellow clover aphid—*Therioaphis trifolii* (Monell)—in alfalfa fields in the desert areas of California had dropped off to such an extent that many fields did not require treatment.

After the yellow clover aphid was discovered in California on February 7, 1954, there was a surge of heavy populations—a common occurrence with many new pests—but there seems to be a settling down to a less injurious annual pattern.

Following the initial flare-up in the desert in June and July of 1954, the aphid sank to low numbers in August and September. By October, 1954, the aphid population was rising and through the fall and early winter there was some damage to hay and a great deal of damage to seedling fields. Populations were generally low in December, 1954, and January, 1955. This spring it began to build up with warmer weather and was damaging alfalfa hay in some fields by March 1. Damage to untreated fields continued severe into May but then the populations subsided.

Localities nearer the coast have their population peaks shifted toward the summer. It appears that the yellow clover aphid may never be a pest in a true coastal climate.

The highest population counted in the current investigations amounted to about 600 aphids per stem of alfalfa, or more than one billion per acre. Short hay alfalfa begins to show stickiness at about 40 aphids per stem, or 70 million per acre. Populations injurious to seedling alfalfa may be much lower, possibly not more than one aphid per plant on very small seedlings.

An important fact in yellow clover aphid populations is the high percentage of winged forms produced. Stands have been ruined in a few days by aphids that have flown in from adjacent hay fields.

Yellow clover aphid feeding seems to be poisonous to the alfalfa plant. This is particularly evident in small seedling alfalfa. The little plants die suddenly from the feeding injury.

Damage to hay crops may take the form of retarded growth, stickiness from honeydew—aphid excrement—that interferes with harvesting and baling, or sometimes complete loss of quality from

the dropping of the lower leaves and blackening by sooty mold fungus which grows on honeydew. A special type of injury is prevention of regrowth after cutting. Aphids may completely cover the developing shoots when they are about 1" long and stop their growth entirely. If allowed to persist, this situation may cause the death of many plants and seriously thin the stand as heavy aphid populations on large alfalfa may do. The aphid appears to be aided in stand thinning by soil fungi that invade weakened roots.

The yellow clover aphid in California goes by the scientific name of *Therioaphis trifolii* (Monell), also called *Myzocallis trifolii* (Monell). It has become increasingly evident that the yellow clo-

ver aphid in California is not identical with the yellow clover aphid that has been present on clovers in eastern and midwestern United States for the past 80 years.

The yellow clover aphid in California seems to be the same one that has lived on alfalfa in India and in the Mediterranean region for a long time. Whether this alfalfa-preferring yellow clover aphid is a distinct species, a subspecies, or a host-preference strain will have to be worked out later.

It is very probable that the yellow clover aphid in California was accidentally introduced into New Mexico about two years ago. From that center it has spread west through Arizona into Cali-

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## biological control

natural enemies of aphid in California sought in European, Mid-East countries

C. P. Clausen

**Field observations** on the yellow clover aphid were made in southern California during the past year to determine the status of the predators that attack the aphid and the presence or absence of internal parasites. No internal parasites were found.

The Indian aphid predator—*Chilomenes sexmaculata*—which was obtained from the United States Department of Agriculture last year, has been reared in quantity, and a number of releases were made in infested alfalfa fields in Riverside, in Imperial, and in San Diego counties.

Research on the pest is being done in Italy and France to determine whether parasites attack the yellow clover aphid there. If any parasites are found, they will be shipped to California for rearing and release.

A parasite search has been initiated in Israel that will probably extend for one year and will cover the known range

of the yellow clover aphid from northern Europe through Egypt and the Near East to India. The work was started in Israel because entomologists in that country have reported that at least two parasites of the yellow clover aphid occur there. There are no parasites recorded in other countries.

An effort is being made to obtain specimens of the parasites in Israel for shipment to California. Large-scale rearing and colonization will be conducted at Riverside immediately upon the arrival of shipments of parasites of the yellow clover aphid.

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S. E. Flanders, Professor of Biological Control, University of California, Riverside, is making the field observations in Italy and France.

Robert van den Bosch, Assistant Entomologist in Biological Control, University of California, Riverside, is conducting the search for parasites in the Near East countries.