



Figure 1. This field has been infested with alfalfa stem nematode, *Ditylenchus dipsaci*, and was responsible for an estimated 60 percent reduction in stand. Photo was taken in Chandler area. See treatment below.

The alfalfa stem nematode, *Ditylenchus dipsaci*, is a pest of alfalfa that significantly reduces hay yields in several areas of Arizona. The nematode is known to occur in Graham, Pinal, and Maricopa counties. The microscopic worm is most active during the wetter, cooler fall and spring months. Recent studies show, however, that they are present in the plant throughout the year, but only when conditions are optimum for reproduction do population explosions occur and alfalfa growth is retarded. Not only is growth reduced, but stands are thinned as many infected plants die. It has not been determined if plant death is a direct result of nematode infection or if the host is so weakened that it becomes more susceptible to other pathogenic organisms.

The alfalfa stem nematode has the unique ability to survive long periods

*Systemics Control . . .*

# Alfalfa Stem Nematode

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Figure 2. This is same field, but after treatment. It now shows healthy stand of alfalfa because of the effectiveness of the systemic insecticide which was used to treat the alfalfa stem nematode.

of time during unfavorable weather conditions. In the last larval stage or pre-adult form, the small worm may become completely inactive, and may survive for more than 15 years in a quiescent desiccated state. When they come in contact with moisture, they revive and their life processes then function normally. Investigations have shown that when dehydration is repeated the same results occur. However, each time the population is revived, survival is greatly reduced. In the laboratory a population was desiccated and revived four times over a period of two years. Under field conditions where they are protected by the host tissue, they could possibly

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remain alive for several months during hot and arid weather. Hay protected from moisture could harbour population for many years.

In Arizona during the hottest and coolest weather conditions, the nematodes survive as inanimate pre-adults. When fall rains occur and temperatures are reduced, the worm revives and reproduction begins immediately. Each female produces up to 500 eggs which hatch in 2 to 7 days after the female has deposited them in the tissue upon which she has been feeding. In alfalfa, the larvae may feed in the area where they hatch or they may move to the upper stems of the plant in a film of water. In established stands of alfalfa the nematode seldom infests the soil although it may be found there when infected stems are broken and fall to the ground.

Control measures are difficult because the nematode is protected by its habit of feeding under the leaf sheaths and in developing buds. Field studies in several locations in Arizona during the past four years indicate that systemic insecticides, if applied at the correct time, will effectively control the alfalfa stem nematode. The systemic insecticides, Disyston or Dimet, applied in granular form at the rate of 1 pound of active ingredient per acre will reduce the population of stem nematode and increase alfalfa production by 50% where the infection is severe. Application should follow the last cutting in late September or early October and before irrigation. Care should be taken to follow the directions on the label of the products which refer to cutting dates following application or the use of treated alfalfa for pasture. Another application will be necessary in late February or March to prevent damage from spring infestations which build-up with the advent of high humidity during those months. Investigations have demonstrated that fall applications will not reduce the population sufficiently to eliminate spring treatment.

Cultural practices can greatly help in reducing infection or spread of the population throughout the entire field. Soil water from infested fields should not be used for irrigation purposes nor should manure be spread on the fields the hay fed to the livestock happened to be infected. Although the



Figure 3. Close-up of fields pictured at left shows dead alfalfa stems as a result of the alfalfa stem nematode infestation. Plastic tube is in photo only to show relative size and point for rephotographing.

nematode is unable to survive the digestive system of an animal, manure can be infected when the contaminated hay falls into the feed lot. Care should also be exercised in transferring sheep from infested fields to non-infested fields as contaminated hay may adhere to the fleece and hooves.

Alfalfa varieties resistant to the stem nematode are all winter dormant types which are adapted only for higher elevations of Arizona. Selections are being made from African types for resistance to the nematode. Such a variety will assist in reducing alfalfa production costs in the Southwest.

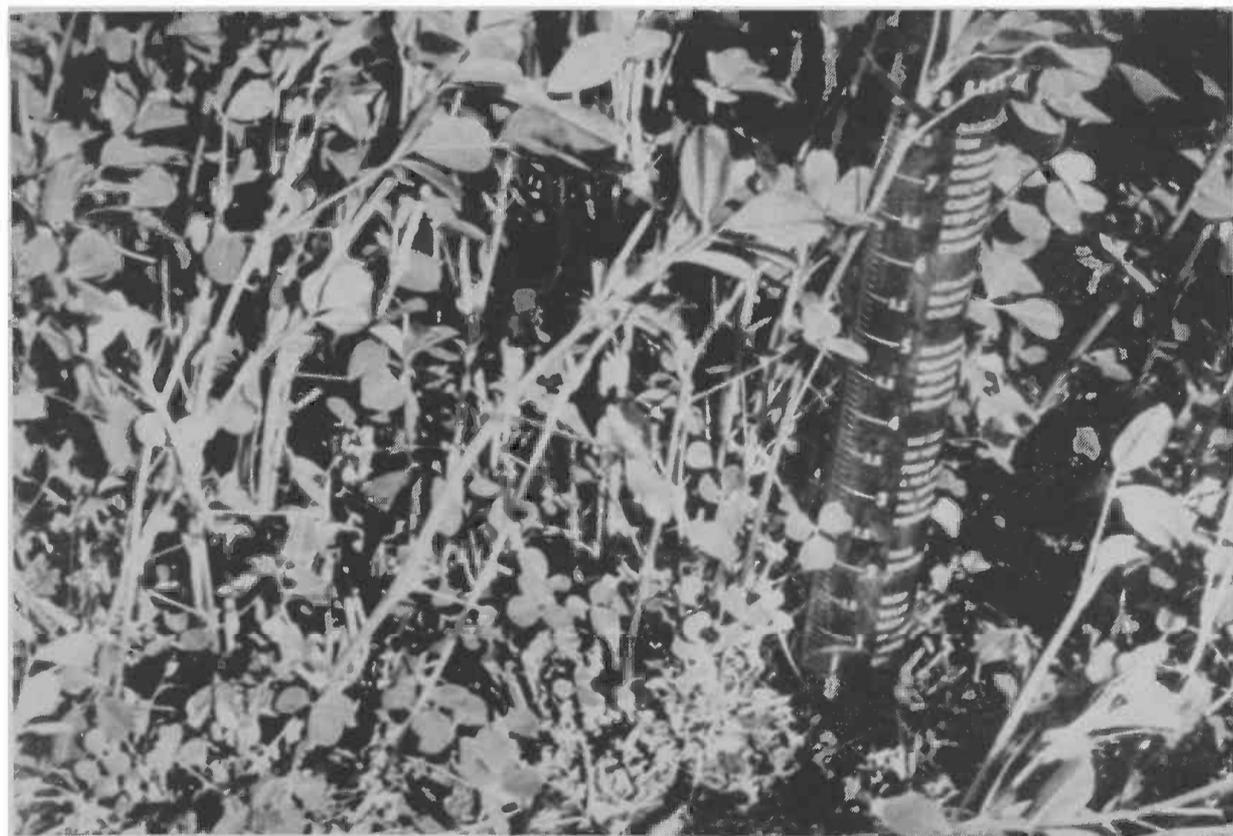


Figure 4. The same area as above after treatment with a systemic insecticide resulted in a healthy regrowth for successful treatment. The nematode has been found in Graham, Pinal and Maricopa counties.