Control of the juniper leaflet miner in southern California

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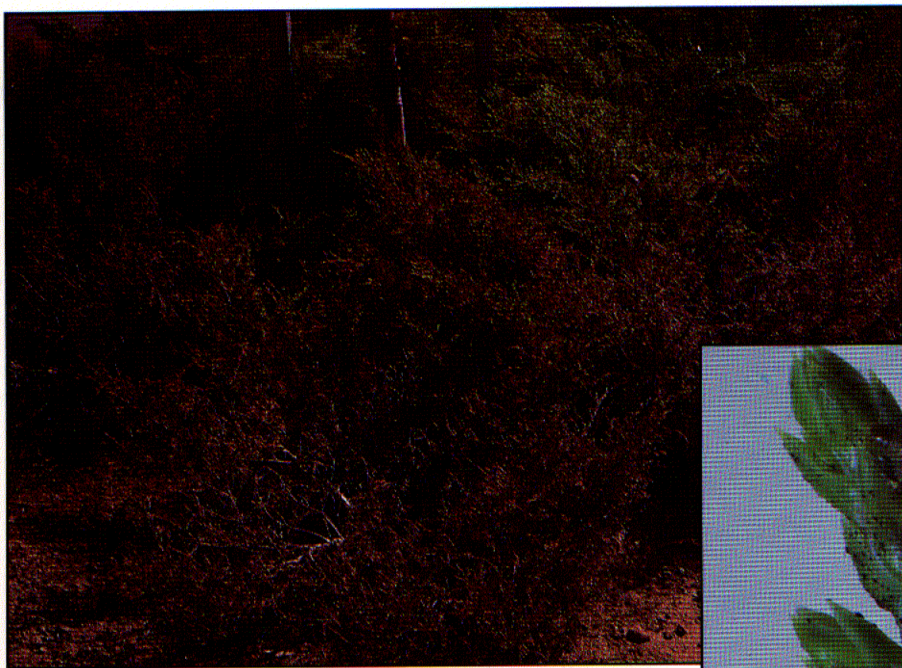
The juniper leaflet miner, *Stenolechia bathrodyas* (Gelechiidae), is a serious pest of juniper and cypress in coastal southern California from Ventura to the Mexican border. The damage caused by this moth initially appears as whitish areas on terminal growth, eventually turning brown. The extent of damage can range from a few twiglets to several branches to the eventual death of the plant.



The juniper leaflet miner can devastate landscape plantings, as it has in the above photo. The twig (right) shows brown, dead twiglet at top center and a recently completed mine at right center. Only the end of a larva chewing a new mine is visible in the photo of the single twiglet.

The severity of injury depends on moth populations and host susceptibility. For example, Tam juniper, *Juniperus sabin* 'Tamariscifolia', is a favored host and may be killed, while Hollywood juniper, *J. chinensis* 'Kaizuka', appears resistant and sustains little, if any, damage.

The juniper leaflet miner is believed to have come into southern California about 10 years ago on infested nursery stock from Japan. It was not positively identified, however, until recently, because its damage had been confused with that of another tiny moth, the cypress tip miner, *Argyresthia cupressella* (Hyponomeutidae).

Argyresthia is similar in size to *Stenolechia*, about 0.25 inch in length, but both moths and larvae are fairly easy to tell apart. *Argyresthia* moths have silver and gold scales. *Stenolechia* moths are light tan with dark gray spots. *Argyresthia* larvae are reddish brown with black head capsules, whereas *Stenolechia* larvae are green with brown head capsules.

Life cycle

The life cycle of the juniper leaflet miner is fairly typical of similar moths. The female moth lays eggs singly on juniper leaflets. After a brief incubation period, the larva hatches, bores through a leaf, and begins to feed. It feeds in the small awl-like leaves and does not mine the twig except for the growing tip. It eats only the spongy mesophyll and does not puncture the pitch gland found at the center of juniper and cypress leaflets. If it did, the toxic pitch would probably kill the larva.

As the larva develops, it mines several leaflets, then leaves the mine and crawls on the outside of the plant to another twiglet, where it mines some more. It may repeat this process several times. As a result of this feeding and migrating, frass and silk are usually visible on damaged twigs. When mature, the larva spins a silken cocoon incorporating bits of frass, leaf litter, and bark chips. It constructs this cocoon between twiglets and pupates. Moths emerge after a short time and fly close to the shrubs; these nuptial flights are normally heaviest at twilight.

In order to develop practical monitoring and predictive strategies in pest control, some indicator of population trends is necessary. Direct counting of the immature stages of the juniper leaflet miner is very time-consuming. Trapping of the adults of some other pests, however, has proved to be a reliable means of following populations. We therefore investigated the use of colored traps to monitor moth flights, conducting this color preference trapping study in 1983 at Sea World, San Diego, California. Sea World has over 40 varieties of juniper planted in landscaped areas throughout the park and has had a serious problem with the juniper leaflet miner.

Results

The traps used were constructed of colored plastic panels in blue, green, yellow, white, and clear, attached to a frame made of redwood stakes. Clear plastic sheets, coated with Tack Trap, were clipped to the fronts of the panels. The traps were placed close to or in an infested shrub in four different juniper plantings. Weekly moth counts were taken from late March through mid-October. Our data failed to indicate any statistical differences among colors, but field observations indicated that the clear panel was best at trapping the moths. We assume the moths saw the host plant through the panel and were trapped on their way to the foliage. It appears that a clear sticky trap placed close to or in an infested plant would be an effective tool for monitoring the moths.

Our results also indicated that there are three distinct generations in southern California, peaking in April, July, and September. This concurs with information reported by Eichlin in 1980.

Insecticidal control experiments were conducted in 1984 on the University of California San Diego campus, La Jolla, and at Spanish Landing on San Diego Bay. The Spanish Landing site was abandoned after the first sampling because of the generally poor condition of the plants.

Trials in two locations were needed to compare insecticides, since no single, sufficiently large, infested juniper planting was available. The first trial compared malathion, diazinon, carbaryl, acephate, and an untreated check. The second compared Zectran, Avermectin, and a check. Samples were taken six to eight weeks after each insecticide application. From each of four replicates, 500 tips were randomly selected and the number of mines counted.

Statistical differences were small, if any, among treatments, but a trend was seen in most cases. Malathion treatments had the fewest mines and visually appeared the best in the field. Zectran and Avermectin each appeared to give good control; however, neither insecticide is registered for this use.

Our control recommendations would be to treat infested plants with malathion as needed. In cases of heavy infestations, treating each generation may be necessary. Also, good plant vigor should always be maintained. The best control in the long run would be eventual removal of the host plant and replacement with a nonhost.

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