

Morning-Glory Leaf Miner

to sweet potatoes in California

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Sweet potatoes typically have fewer insect pest problems than do most other vegetable crops. However, a potentially serious pest in California which occasionally reaches outbreak proportions on sweet potatoes is the morning-glory leaf miner—*Bedellia somnulentella* Zeller.

The morning-glory leaf miner is ordinarily considered not to be of economic importance, though it has occasionally been reported to cause damage to sweet potato foliage. The miner was noticed for the first time in southern California in 1959. Surveys made during 1959 and 1960 revealed its presence in San Diego, Orange, Riverside and San Bernardino counties. The many locations within which the miner was found indicate that it probably has been in southern California for some time.

When a sweet potato leaf is heavily infested, almost all the material between the upper and lower epidermises is consumed. The mined leaves remain on the plants but become dry and shriveled, giving a burned or frosted appearance to the foliage. The potential damage which could be caused by the morning-glory leaf miner was observed during the summer of 1959 in the San Luis Rey Valley of San Diego County. Several nearly mature fields of sweet potatoes had lost the major portion of their green vegetation. The crop possibly would have sustained a reduction in yield if the miners had not been controlled through prompt insecticidal treatment.

Studies of the biology of the morning-glory leaf miner were conducted in a greenhouse maintained at a temperature of 80° F and a relative humidity of 50%. The leaf miner adults are small tan-to-gray moths. They lay their translucent white eggs singly, usually cementing them next to the veins on sweet potato leaves. After 4½ days at 80° F, the small caterpillar hatches from the egg. It penetrates through the portion of the shell adjacent to the leaf epidermis and feeds its way into the leaf between the upper and lower surfaces, forming a mine. By

the time it has molted twice, the larva has constructed a meandering, serpentine mine. The miner then chews a hole through the lower epidermis and crawls out onto the surface of the leaf. After forming a loose network of silken strands



Mature caterpillar of the morning-glory leaf miner.

which extends to the petiole and to adjacent leaves, it bites a new hole in the leaf surface and feeds its way in, forming an irregularly shaped blotch mine. The feeding caterpillar always keeps its anal end near the hole through which it entered the leaf. The miner leaves by way of the same hole before the mine becomes larger in radius than the length of its body; it constructs more webbing, and cuts a new hole in the leaf surface, forming another blotch mine. Thus, each larva forms one serpentine and several blotch mines. The area below a heavily infested leaf is thickly webbed by intercrossing silken strands, which are littered with black excrement pellets.

The morning-glory leaf miner goes through five larval stages or instars. Each instar has certain characteristics of form and color which differentiate it from the other instars. The newly hatched first-instar larva is yellowish-gray and has no legs. The second instar is similar in appearance, though legs have appeared. The third instar has pale pink spots along both sides of the body, the fourth has prominent red tubercles, and the fifth has a large portion of its body surface covered with both red and white tubercles.

After feeding for about eleven days— at 80° F—the larva suspends itself in the webbing below the leaf, where it pupates

without forming a cocoon. The adult moth emerges after about four days.

The morning-glory leaf miner can attack many plant species belonging to the family Convolvulaceae. These include the wild morning-glories and bind weeds which are common in many areas along roadsides and in neglected fields. In the San Luis Rey Valley, wild morning-glory leaves were found to contain actively mining caterpillars throughout the winter of 1959-60.

The miners are very susceptible to many commercially available insecticides. They were controlled by sprays of Diazinon at 0.8 pound, DDT at 0.7 pound, toxaphene at 4.3 pounds, Dylox at 0.6 pound, parathion at 0.2 pound, and malathion at 0.2 pound of toxicant per acre. However, of these products, only

Control of Morning-Glory Leaf Miner Larvae in Sweet Potatoes with Insecticide Sprays, San Luis Rey

Test	Material	Pounds per acre	% control after 3 days
1	Malathion	2.1	100*
	Diazinon	0.8	100*
	Parathion	0.2	99*
	Dylox	0.8	96*
	DDT	1.5	96*
2	Toxaphene	4.3	92*
	Malathion	0.7	99*
		0.2	89*
	Dylox	0.6	86*
	DDT	0.2	73
	0.7	89*	
	0.2	54	

* Significant reduction in numbers at the 5% level.

DDT, toxaphene and parathion are registered for use on sweet potato foliage. If DDT or toxaphene is used, the tops should not be used for livestock feed. Parathion should not be applied within 15 days of harvest.

A wasp—*Apanteles bedelliae* Viereck—parasitizes the caterpillars. The wasps were very prevalent in infested fields and may be largely responsible for keeping the miner under control in most areas during most years.

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