

Some customers confuse blemishes, worms and bugs, and dirt spots with unsanitary conditions. While a restaurant serving a mud-spotted tomato or corn containing a worm would not be considered very sanitary, it is not clear that this analogy fits marketing operations. Assuming that produce from any source that is not peeled or skinned must be thoroughly washed before it is eaten, there is no evidence that food at the farmers' market is less sanitary than food offered through commercial outlets.

Belief #10: Farmers' market food is fresher. This is true. Many small producers have no cold storage facilities and harvest their produce early in the morning of market day or the night before. The availability of cooperative cold-storage lockers which would be in the interests of the producers would lessen the difference in freshness between farmers' market and super-market produce.

Belief #11: Produce sold at certified markets is "organic." By and large, this is false. There is no requirement that fruits and vegetables sold at certified markets must be organic. At one market, 14 out of 25 sellers described their farming operations as *organic* or *somewhat organic*. The latter description referred to a minimum use of

pesticides. The ambiguity of the term *organic* is evident. While a significant percentage of small producers will claim to grow organically, the customer at the farmers' market has no assurance of what this means without specific discussion with the grower.

Belief #12: Small producers selling at farmers' markets are primarily hobbyists. True in some cases, not in others. Some small producers are retired people who do not depend on farming for a living. They are not particularly concerned about doing more than breaking even. However, this is not the attitude of the young farmer whose livelihood is farming or who expects it to be. Although financial returns for the new young farmer often have to be supplemented by outside jobs, most hope to expand their farming operations to the point where farming will provide a satisfactory livelihood. Most of these young producers are seriously committed to farming as a long-term vocation.

Belief #13: Farmers' markets attract only middle class shoppers who view it as a social experience. Our observations do not support this. Although it has not been possible for us to determine the income levels of people at the farmers' markets, our impres-

sion is that their incomes reflect a cross section of the community. There seem to be, however, a disproportionate number of older and retired people: when the market first opens early in the morning, white heads are particularly evident.

The Woodland market attracts many of the city's Hispanic population. Attendance counts on three successive market days showed Hispanic customers comprising 13.7, 16.8, and 18.3 percent of customers. The presence of students from Asian and African nations is particularly evident at the Davis market. For wives of foreign students, often tied to home and young children and not fluent in English, the public market is a familiar institution in a strange land.

Belief #14: People come to the farmers' market to watch the action. True to a point. It is also true that many of the growers enjoy selling at a public market. Throughout the world, people have considered market days to be a festive occasion. This is hardly a criticism of direct marketing operations. Farmers would not continue to bring their produce to such markets if customers were not buying.

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Climbing cutworms: early-season pests of grapes

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Tests show that several treatments are effective against two major pests of grapes—the climbing and the variegated cutworms.

The variegated cutworm, *Peridroma saucia*, and the spotted cutworm, *Amathes c-nigrum*, are two climbing cutworm species that feed primarily on swollen grape buds. Less common is the presence of four to five other species. Damage results from nocturnal feeding in the spring during a two-week bud-crack period, negating or deforming growth of fruit-yielding canes. Temperature may lengthen or shorten this period.

An extremely wide host range dispersed throughout California's widespread plantings of grapes causes these pests to be ubiquitous and very serious early-season pests. Cutworms may occur in light to heavy numbers and are normally sporadic as to years, areas, and field site infestations. Populations start from a ground source and the in-

sects move up the vine trunk to feed at night. The variegated cutworm retreats to the ground and the spotted cutworm stays in the grapevine during the day in the North Coast grape growing area. The major cutworm pest in the San Joaquin Valley, the variegated cutworm, also commonly stays hidden under bark during the daylight hours.

Baits applied to the ground may work well in one area, but are of less value in another. With the loss of Dieldrin and the slow demise of Chlordane sprays, tests were necessary to find replacement chemicals. Field plots were set up in a number of vineyards after close daily observations determined population density was sufficient for test evaluations. Depending on the number of cutworms present and the consistency of

vine row infestations, 6 to 50 vines were used per plot with three to six replicates of each treatment. Applications were made by high-pressure handgun in small plots and by inverted "U" over-the-vine spray booms in the larger plots. Sprays were directed at the vine trunk, arms, and soil base. Baits were broadcast over the vines or placed within an 18-inch circle around the trunk base. Performance counts were made in some tests by counting the total number of damaged (feeding injury) buds per vine at one, two, and three weeks after treatment. A second method was also used where the total number of dead cutworms was counted on the clean soil under the vines. The latter technique usually required an early post-treatment count, as wind and preying birds influenced cutworm recovery.

Tests applied in Fresno County during the last week in March compared baits and spray information. Counts of larvae were made three times over a 10-day period. Since the bait applications were concentrated (hand placed) around the vine trunk, and prior to the time that most of the variegated cutworms had climbed up the vines, a better-than-commercial degree of control was realized (see table 1). Sprays were applied at 30 gpa and for the most part provided better control than baits. Carbaryl (Sevin) performed the best, followed by Dylox, Lorsban, Methomyl, and Chlordane. Carbaryl plus molasses (Sevimol) did not appear as good as the above nor did Supracide or Orthene at the rates used per acre. The relative number of dead cutworms in the treatments align quite well with number of post-treatment damaged buds.

Another test, run the first week of April in Stanislaus County, showed Azodrin, Sevin, Pydrin, Dyfonate, Imidan, and Dylox to be quite effective (see table 2). These compounds were followed by Orthene, Chlordane, and Sumithion. Due to inclement weather, dead variegated cutworms were counted only once at 24 hours after treatment. Since populations and the kill

were high, this was considered a very good test regardless of single worm count. Bud damage incurred after treatment follows the above counts closely when evaluated at six days. Exceptions to this are Dylox and Sumithion, which show no further cutworm feeding. This would indicate that these two materials would probably have shown much better kill had a two-or-three-day worm count been possible. Both Dyfonate and Chlordane apparently allowed some cutworm survival as shown by the 14-day bud feeding count.

Spotted cutworm trials applied in Napa and Mendocino counties the end of March showed all treatments to be very active against this pest (table 3). Not significantly different were sprays of Sevin, Azodrin, Sumithion, Dyfonate, or Orthene. Sevin bait was as effective as the sprays, because it was applied on the vines topically by hand. Since this cutworm is more mobile in its habits than the variegated species in North Coast counties, it may be subject to greater exposure of the pesticide deposit. This could, therefore, be the reason for high performance with all compounds. Nocturnal ground roosting is obviously why baits are effective. In addition to the one- and two-week bud feeding counts, an ex-

cellent fruit yield relationship is shown between treated and untreated vines.

A Stanislaus County comparison of ground applications to fixed-wing aircraft using Sevimol 4F at 2 pounds active ingredient per acre (AIA) showed 50 percent better control by ground. Also Sevin plus Dibrom at 2 pounds and 1 pound AIA and Sevin alone at 2 pounds AIA performed better than Sevimol.

The standard cutworm treatment for grapes, Sevin, is very effective for both climbing species, the variegated and spotted cutworm. This material, as with the others tested, requires proper timing and application coverage.

Grower concern over the loss of primary buds due to cutworm feedings, which in turn limits fruit yielding canes, is shown to be very real and warrants close pest management prior to and during bud swell.

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Variegated cutworm feeding on grape bud (left); in bark of grapevine trunk during daylight hours (right).

TABLE 1. Grape Bud Damage and Number of Dead Variegated Cutworm Larvae under Various Treatments

Material	Rate	Average number/3 vines (10 days)	
	AIA*—lbs	damaged buds	dead larvae
Sevin 80S	2	0	9
Dylox 80S	1	0	8
Lorsban 4EC	1	1	7
Methomyl 1.8 L	.875	2	6
Chlordane 8F	1	3	5
Sevimol 4F	2	2	4
Sevin 5% bait	1	5	4
Dylox 5% bait	1	8	3
Supracide 2E	1	6	3
Orthene 75S	1	5	3
Check	—	14	1

*Amount active ingredient per acre.

TABLE 2. Percent of New Grape Bud Feedings and Dead Larvae of Variegated Cutworm under Various Treatments

Material	Rate AIA*—lbs	Average counts/12 vines		
		Dead larvae (1 day)	Percent of new bud feedings	
			6 days	14 days
Azodrin 5E	2	26	2.9	0
Sevin 80S	2	25	4.8	0
Pydrin 2.4EC	0.2	24	5.9	0
Dyfonate 4E	2	21	4.5	16.7
Imidan 50WP	2	21	7.1	0
Dylox 80S	2	21	0.0	0
Orthene 75S	0.5	19	9.1	0
Chlordane 8E	3	17	8.7	25.0
Sumithion 40WP	2	17	0.0	0
Check	—	0	17.6	30.8

*Amount active ingredient per acre.

TABLE 3. Spotted Cutworm Damage to Grape Buds and Harvest under Various Treatments

Material	Rate AIA*—lbs	Average/vine		
		Damaged buds		Pounds fruit (harvest)
		1 week	2 weeks	
Sevin 80S	3	0.6	0.6	8.9
Azodrin 5E	1	0.3	0.2	8.1
Sevin 5% bait	1.5	1.4	1.1	7.4
Sumithion 8E	2	0.7	2.0	7.1
Dyfonate 4E	2	0.9	1.5	7.0
Orthene 75S	1	1.2	1.3	6.0
Check	—	8.8	12.5	0.9

*Amount active ingredient per acre.