

WESTERN GRAPELEAF SKELETONIZER: NEW APPROACHES TO MANAGEMENT

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Western grapeleaf skeletonizer can be a serious pest of grapes. Unmanaged populations can completely defoliate a vineyard, leading to problems with fruit maturity, sunburn, and quality loss. Defoliation after harvest can affect food reserves of vines and weaken them. Skeletonizer larvae can also be a nuisance to field workers who may get welts if skin contact is made with the long poisonous spines.

Management of western grapeleaf skeletonizer is accomplished through a combination of biological and chemical control. Biological control with granulosis virus is highly effective; without it all San Joaquin Valley vineyards would likely have to be sprayed chemically on a yearly basis to avoid severe defoliation. Recently, though, virus has not been sufficient in some locations to prevent unacceptable levels of feeding damage in commercial vineyards. As a result, this project was used to determine which reduced-risk insecticides could provide the best control for when control by the virus is insufficient.

We evaluated seven reduced-risk insecticides for their effects against western grapeleaf skeletonizer larvae. The most important of these trials was conducted in a commercial Thompson Seedless vineyard in Mettler, Kern County during the summer of 2004. Larvae at the time of spraying were in the latter end of the 3rd instar stage. Plot size was three vines long and applications were made at 200 gallons per acre with a backpack sprayer. The specific purpose of this trial was to see what effects new reduced-risk insecticides had as knockdown products for large skeletonizer larvae.

Data from the Mettler trial are shown in Table 1. The longstanding grower standards for small larvae, Kryocide[®] and Dipel[®], performed poorly against large larvae. Intrepid[®], which is excellent against grape leafhopper, produced poor results against skeletonizer. Avaunt[®], which is not yet registered in grapes, resulted in significant reductions in skeletonizer compared to the control, but were not as good as the best treatments. Excellent results were achieved from three insecticide products: Success[®], Assail[®] and Provado[®] (highlighted by the black box, Table 1). Success[®] is a spinosad product which has recently been registered for its effects against thrips. Assail[®] and Provado[®] are both neonicotinoid chemistries that are recognized for their effects against sucking insects such as leafhoppers and glassy-winged sharpshooter.

The excellent control provided by Success[®], Assail[®] and Provado[®] results in not only some new effective pesticide chemistries, but also some new approaches to management.

1. Shift from preventative to knock-down control with insecticides

A knock-down approach to skeletonizer control is much better than a preventative one. Since there are no treatment thresholds for this pest, a PCA can now wait to see the level of defoliation before deciding on a treatment. This removes the need to speculate on the level of damage that populations of small larvae will produce when they mature. It also increases the window of opportunity for when chemical applications can be applied, thus increasing the ability to save money by tanking them in with another application. Potentially the greatest benefit is that a PCA can determine the level of granulosis virus in the skeletonizer population which may potentially lead to not having to spray at all.

2. Killing two birds with one stone

Success[®], Assail[®] and Provado[®] all have the benefit of providing skeletonizer control while treating for other pests. Success[®] is an excellent product for thrips control in table grapes. This bloom-time spray will also control any skeletonizer present at the time. The one problem with this scenario is that overwintering pupae are just emerging into egg-laying adults when this application is made. Undoubtedly there will be excellent control of any small larvae present, but it is uncertain if sufficient residual will be present to kill all larvae from all clusters of eggs that continue to be laid by first-generation adults during the bloom period.

Assail[®] and Provado[®] are best known for their effects on leafhoppers and sharpshooters. Therefore, using these products in season for these pests will result in control of skeletonizer. Either of these products could also be used just prior to harvest where leafhoppers and skeletonizer need to be removed out of courtesy to field-workers who will be picking the grapes. Admire[®], which is the soil-applied label for the active ingredient in Provado[®], will likely also have effects on skeletonizer populations.

Summary

By incorporating reduced-risk insecticides that are already registered for grapes into skeletonizer control programs, there should no longer be the need for organophosphates and carbamates against this pest. Control in some cases can be achieved as a secondary effect of thrips or leafhopper sprays, and the reduced-risk nature of the insecticides will allow minimal disruption to beneficial insects and mites necessary for IPM programs. The knockdown properties of Success[®], Assail[®], and Provado[®] will allow treatments to be made only when virus is not present and defoliation makes the treatment economically justified. There is no longer the need to treat small larvae in anticipation of the level of damage that they may or may not cause as they mature.

Table 1. Effects of insecticides on large western grapeleaf skeletonizer. Mettler, Kern Co., 2004

		western grapeleaf skeletonizer larvae per two vines				
		Precount	5 DAT	10 DAT	14 DAT	20 DAT
Kryocide	8 lb	868 a	100 ab	69 a	146 c	63 ab
Dipel	1 lb	648 a	256 c	186 b	156 c	80 ab
Intrepid	12oz	693 a	152 bc	72 a	131 bc	59 ab
Avaunt*	6oz	785 a	68 ab	60 a	34 ab	27 a
Success	4oz	487 a	26 a	6 a	0 a	3 a
Success	6oz	923 a	54 ab	4 a	0 a	10 a
Assail	1.1oz	874 a	62 ab	14 a	1 a	5 a
Provado	1oz	537 a	38 a	39 a	9 a	24 a
Control		642 a	240 c	224 b	148 c	148 b
<i>F</i>		0.79	4.60	7.23	15.18	3.47
<i>P</i> (df=8,24)		0.6140	0.0017	<0.0001	<0.0001	0.0085

* Avaunt is not currently registered for grapes in California

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