

Summer Leafroller Control

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As we approach the timing for obliquebanded leafroller (OBLR) egg hatch in many areas of the state, it is time to review the OBLR degree-day model and insecticides used to control this pest. Leafroller activity can be predicted using degree-day models, although the information is not as reliable as that provided by the codling moth model. Using GDD42 for OBLR, first adult emergence is at approximately 900, 1150 to 1200 for peak adult activity, and 1250 to 1350 for first egg hatch. First sustained moth capture (capture on two successive dates) in pheromone traps is used as a biofix, thus if moth flight peaks between 250 and 300 GDD after initial biofix, the heaviest egg hatch should be about 400 GDD later. If the overwintering generation was effectively controlled earlier in the spring, then scouting orchards for obliquebanded leafroller larvae in actively growing terminals is the best way to judge whether infestations will require further control. This investment of time could result in saving several sprays.

Optimal timing for summer sprays varies according to the product of choice. For conventional insecticides, like organophosphates (OPs), pyrethroids, and carbamates, the first sprays should be targeted between 400 and 450 GDD to control hatching larvae before they can damage fruit. OBLR are resistant to OPs in most apple growing regions of the state, so are not generally recommended for control. Bt's are most effective when applied during warm weather conditions (daily highs in the 70's F). If Bt products are used, the latter timing (450 GDD) may be the better choice because they have a short residual, which must be present to control the larvae at the time and location they are actively feeding. If the first application is applied too early, it may take four or more sprays to keep the foliage treated throughout the long period of larval activity. Bt products are generally more effective with a lower tank pH. SpinTor has a similarly short residual (seven to ten days), but provides some contact efficacy, which will help kill larvae as they move to the actively growing terminals. SpinTor is also a good choice for leafroller control in cherry blocks where control with OPs and pyrethroids is failing to provide adequate protection.

In contrast, if Intrepid is used early it should be targeted to cover obliquebanded leafroller egg masses, around 350 GDD post-biofix, so that larvae will consume the chemical as they eat their eggshells upon emergence. Intrepid can also be used later to protect fruit against damage from older larval instars. Upon application, Intrepid has a long residual effect, but should be reapplied where necessary on a 14-day interval to insure coverage of new terminal growth. Good, thorough coverage is key to leafroller control with materials requiring ingestion to be effective. The addition of an agricultural adjuvant to Intrepid 2-F is recommended to improve spray deposition.

Though usually targeted for the overwintering generation of obliquebanded leafroller, the insect growth regulator Esteem applied at obliquebanded leafroller **egg laying** timing will also provide some control.

It should also be noted that use of SpinTor for the summer generation of obliquebanded leafroller will provide some control of codling moth, Oriental fruit moth, and spotted tentiform leafminer. Intrepid applied at the earlier summer obliquebanded leafroller timing will also provide some added control for codling moth and tufted apple budmoth. Esteem will provide control of San Jose scale crawlers and some added control of

codling moth. Bt's can also be expected to control other leafrollers when applied for summer generation of obliquebanded leafroller.

As with many of our key apple pests, OBLR has a track record of developing resistance to insecticides. Currently there are some good options for control of this pest. Practicing good resistance management should help conserve their efficacy. We encourage you to rotate materials with different modes of action. For example, alternate the use of SpinTor and Intrepid. During periods of warm weather, Bt is an excellent option and a good resistance management strategy.

Compound Trade Name	Chemical Class	Life-stage Activity	Optimal Spray Timing for CM	Residual Activity	Mite Flaring Potential
Guthion, Imidan	Organophosphates	Larvae	Biofix + 400-450 DD	10-14 days	L - M
Lannate, Sevin	Carbamates	Larvae	Biofix + 400-450 DD	5-7 days	M - H
Asana, Warrior, Danitol, Decis	Pyrethroids	Larvae	Biofix + 400-450 DD	7-10 days	H
Deliver, Dipel, Crymax	<i>Bt's</i>	Larvae	Biofix + 450 DD	5-7 days	L
Spintor	Naturalyte	Larvae	Biofix + 400-450 DD	7-10 days	L
Intrepid	IGR (MAC)	Eggs, Larvae, Adults (sublethal)	Biofix + 150-200 DD Residue over eggs	14+ days	L
Esteem	IGR (juvenoid)	Eggs, Larvae	Biofix + 100 DD Residue under eggs	10-14	L

Obliquebanded Leafroller GDD Model

DD° Base 42 (Post Biofix)	Event	Action
Tight cluster	Majority of larvae have emerged from shelters	Examine fruit buds for larval activity
0 DD° = biofix (~900 DD° after Jan 1)	1 st sustained moth captures	Set DD° = 0
220-250 DD°	Peak moth flight - overwintering generation	
400-450 DD°	Start of egg hatch	Timing for scouting-based treatment
1000 DD°	End of egg hatch	
2300 DD°	Peak moth flight - 2 nd generation	
2750 DD°	Start of 2 nd generation egg hatch	Timing for scouting-based treatment