

AN IMPORTANT FIRST STEP IN BIOCONTROL: DON'T KILL THE GOOD INSECTS!

Your **CD11 Mealybug Biocontrol Research Focus Group** has put together this regionally-specific chart, based on the **UC-IPM Relative Toxicities of Insecticides and Miticides Used in Grapes to Natural Enemies and Honey Bees Table**, available online at ipm.ucanr.edu/PMG/r302900111.html, and years of real-world experience.



Help the good insects (beneficials, predators, parasites) help you!
 What GOOD insects are we trying to keep ALIVE, anyways?

The *Anagyrus wasps*, *Cryptolaemus beetles*, and *Lacewings* who attack mealybugs.











The **predatory mites**, **six-spotted thrips**, and **minute pirate bugs** who attack mites.












The *Anagrus wasps* and **green lacewings** who attack leafhoppers.










The **parasitic wasps** and **flies** who attack caterpillars and omnivorous leafrollers.



Trade Name	Common name	MOA	Good insects stay alive	May reduce good insects	Good insects are killed	Notes
Acramite	bifenazate	20D				
Admire Pro (soil)	imidacloprid	4A				
Altacor	chlorantraniliprole	28				
Altrevin	metaflumizone bait	22B				
Apollo	clofentezine	10A				
Boric Acid	disodium tetraborate	unknown				

Trade Name	Common name	MOA	Good insects stay alive	May reduce Good insects	Good insects are killed	Notes
Bt	<i>Bacillus thuringiensis</i>	11A				
Envidor	spirodiclofen	23				
Esteem ant bait (soil)	pyriproxyfen	7C				
Intrepid	methoxyfenozide	18				
Movento	spirotetramat	23				
Nealta	cyflumetofen	25A				
Omni Supreme	narrow range oil	contact				
Onager	hexythiazox	10A				
Surround	kaolin clay	-				
Tango	S-methoprene	7A				

Trade Name	Common name	MOA	Good insects stay alive	May reduce good insects	Good insects are killed	notes
Trilogy	neem oil	multiple				broad spectrum but low toxicity to beneficial insects
Actara (foliar)	thiamethoxam	4A				may cause flare-ups of spider mites
Admire Pro (foliar)	imidacloprid	4A				toxic to bees and parasitic wasps
Agri-Mek	abamectin	6				appears to kill six-spotted thrips; moderate toxicity to predatory mites
Applaud	buprofezin	16				kills lady beetles
Assail (foliar)	acetamiprid	4A				toxic to bees and parasitic wasps
Belay (foliar)	clothianidin	4A				toxic to bees and parasitic wasps
M-Pede	insecticidal soap	dehydration				broad spectrum – moderate toxicity to all insects
Success, Entrust	spinosad	5				may kill predatory thrips, flies, lacewings, and beetles
Venom (foliar)	dinotefuran	4A				toxic to bees and parasitic wasps
Zeal	etoxazole	10B				sterilizes female predatory mites

Trade Name	Common name	MOA	Good insects stay alive	May reduce good insects	Good insects are killed	Notes
Danitol	fenpropathin	3A				broad spectrum toxicity to beneficial insects and predatory mites
Delegate	spinetoram	5				moderate toxicity to beneficial predators and parasites
Fujimite	fenpyroximate	21A				high toxicity to predatory mites
Imidan	phosmet	1B				high toxicity to beneficial insects
Lorsban Advanced	chlorpyrifos	1B				high toxicity to beneficial insects
Malathion	malathion	1B				high toxicity to beneficial insects
Pyganic	pyrethrin	3A				moderate toxicity to beneficial predators and parasites
Pyrenone	pyrethrin/piperonyl butoxide	3A				high toxicity to beneficial insects
Sevin	carbaryl	1A				moderate toxicity to beneficial predators and parasites

For the “**May reduce good insects**” category, you may wish to seek further advice from your local Farm Advisor because the risk to beneficials can be dependent on application, timing, and cover crop use. Remember to rotate chemistries and follow label application instructions carefully to delay resistance development. Using **beneficial insects** for **biocontrol** of other insects/mites is an **IMPORTANT** part of **resistance management** in your vineyard.

Please share your personal vineyard experiences with different plant protectants and their effect on beneficial insects! stephanie@lodiwine.com