Insect Management- Read the Label, Avoid the Fine

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At the writing of this article on July 19, 2016, there is very little going on in the way of insect pests. Japanese Beetle are starting to ramp up the populations in certain areas (see Andy Muza's article in this newsletter), grape leafhopper feeding can be found in some vineyards, Grape rootworm has been absent for the past two weeks in our 8 project vineyards and, according to the grape berry moth (GBM) model on NEWA "The most effective time for treatment of second generation grape berry moth is over", and we have a ways to go until we reach the next scouting opportunity at 1470 DD.

So, this is basically a good time to look to the future in developing a good grape berry moth management strategy. I will stress once again that the two most important cornerstones to managing grape berry moth is to 1) take the time to classify your vineyard according to the level of risk it is at for damage from grape berry moth and 2) scout *both* the interior and exterior of all your vineyards on a block by block basis. If you need assistance in classifying your vineyards into a risk category, you can review New York's Food and Life Sciences Bulletin 138 *Risk Assessment of Grape Berry Moth and Guidelines for Management of Eastern Grape Leafhopper* at https://ecommons.cornell.edu/handle/1813/5202. Knowing whether your vineyard is at low-, moderate- or high-risk for damage from grape berry will help you develop a management strategy to use in conjunction with the grape berry moth model found on the Network for Environment and Weather Applications website (http://newa.cornell.edu). Over the past few years I have seen a trend where the lack of scouting allows grape berry moth to spread across a vineyard and populations to build to high levels before they were noticed in vineyards that were previously considered to be at low- or moderate-risk for grape berry moth damage. The statement "They came out of nowhere and I had damage across the whole block" has been made a number of times around harvest when picking crews run into high levels of GBM damage. Regular scouting, timed using the GBM model on NEWA, in all vineyard blocks will take care of this problem. Grape berry moth are not known to be strong flyers so moving across a decent sized vineyard in one year should not be considered practical (The exception to this would be newly planted vineyards 5 acres and smaller that are surrounded on at least three sides by woods and they should be classified as high risk vineyards). While they do increase their population size with each generation as the season progresses we have not seen where they have gone from manageable to devastating from one season to the next. So the take home message is: 1) Know the characteristics of your vineyard which affect its risk for damage from grape berry moth (classify your blocks), 2) Scout every block, every year using the timing provided on NEWA and 3) scout both the interior and exterior of the vineyard block to eliminate surprises.

IRAC Codes, Resistance Management and Understanding seasonal limits for active ingredients of insecticides

For years you have heard about rotating chemistries to decrease the risk of the development of resistance. Table 1 shows the IRAC number for a number of common pesticides used in the New York and Pennsylvania grape industry for both grape berry moth and grape rootworm, along with some of the more popular insecticides not labeled for grape rootworm but found in the same IRAC group as those that are. Just a little review, IRAC numbers help you determine the mode of action of a particular insecticide so you can easily manage resistance by choosing an insecticide with a different IRAC number if more than one insecticide is needed in a season. Or, in the case of grape rootworm, so you can change the mode of action used against this pest from year to year.

Grape growers actually have a number of different modes of action to use against grape berry moth. However, there are only four insecticides, representing 3 modes of action that are labeled for use against grape rootworm in New York State. Sevin is labeled while we have FIFRA 2ee recommendations for Admire Pro, Danitol and Sniper. (Note: growers applying insecticides to vineyards in Pennsylvania do not have all of the same restrictions for New York vineyards where both the crop and the pest need to be on the pesticide label).

The difficulty is not in the number of materials we have labeled, but the seasonal use restrictions on the more popular modes of action. Note in Table 1 that there are three modes of action; 1A Carbaryl, 3A – Pyrethroids and Pyrethrins (a subgroup of 3 – Sodium Channel modulators), and 4A Neonicotinoids, a subgroup of 4 Nicotinic acetylcholine receptor competitive modulators). Carbaryl, or Sevin, is the only grape rootworm insecticide that does not share a mode of action with insecticides labeled for grape berry moth, so the seasonal use limits are fairly straight forward; do not use more than 10 quarts (10 lbs of active ingredient) of Sevin 4F in a year.

It is when we start using Admire Pro, Danitol or Sniper for grape rootworm that a closer examination of the label and season use restrictions come into play. Notice in Table 1, if you use Admire Pro (IRAC 4A) for grape rootworm you will need to watch your use of Leverage 360, Leverage 2.7 SE and/or Brigadier for grape berry moth as they all contain the active ingredient imidacloprid (IRAC 4A) which has a seasonal use limit of 0.10 lb AI. It does not matter that you are applying these materials for grape berry moth and the active ingredient imidacloprid does nothing for grape berry moth control, it is the seasonal limit that counts. The active ingredient bifenthrin can present a larger problem when planning grape berry moth management if it was used for grape rootworm as it has a seasonal limit of 0.10 lb active ingredient per acre which is basically only two applications of any of the insecticides containing bifenthrin combined.

Looking at the label and active ingredients you would think you could switch to Mustang Max or Mustang Maxx which have zeta-cypermethrin as the active ingredient. However, looking at the IRAC number you see that it is listed as 3A or Pyrethroids and Pyrethrins as are bifenthrin, ß-cyfluthrin and cyflurthrin. Switching from one to the other would be similar to when we started seeing resistance to Bayleton, our first sterol inhibiting fungicide. Switching to Nova (another sterol-inhibiting fungicide) provided better control of powdery mildew but showed resistance development much quicker than Bayleton. Rubigan was the last sterol-inhibiting fungicide to become available to growers in the eastern US and was effective for a bit but was fighting an uphill battle as this group of sterol inhibiting fungicides gave Concord growers in the Lake Erie region their first good experience with resistance development and the importance of managing it.

The take home messages are;

1. Watch seasonal limits on use of products.
2. Watch seasonal limits on active ingredient as many of the commonly used insecticides can share one active ingredient.
3. The best way to strengthen your resistance management strategy, as well as alleviate the problem with seasonal use restrictions would be to use products with a totally different mode of action (check the IRAC number) such as Altacor, Intrepid (not registered in NY), Belt, Tourismo, Delegate, etc.

If you would like help coming up with an IPM plan for insects in your vineyards, please shoot me an email at thw4@cornell.edu. Our phone system is still down to one line coming in with no ability to leave messages, but if that is your preference give me a call at (716) 792-2800 between 8 and 4 PM.

Insecticide	Active Ingredient	Seasonal Use Limits	Active Ingredient Seasonal use limits	IRAC Number*
Admire Pro	Imidacloprid	14.0 fluid oz/A	0.5 lb AI/A	4A
Danitol	Fenpropathrin	42.66 fl oz/A	0.80 lb AI/A	3A
Leverage 360	Imidachloprid + ß-cyfluthrin	6.4 fl oz/A	0.10 lb AI Imidacloprid 0.05 lb AI ß-cyfluthrin	3A & 4A
Leverage 2.7 SE	Imidacloprid + Cyflurthrin	8.0 fl oz/A	0.10 lb AI Imidacloprid 0.07 lb AI Cyflurthrin	3A & 4A
Baythroid XL	ß-cyfluthrin	12.8 fl oz/A	0.10 lb AI/A	3A
Brigade 2EC	Bifenthrin	6.4 fl oz/A	0.10 lb AI/A	3A
Brigade WSB	Bifenthrin	16 fl oz/A	0.10 lb AI/A	3A
Bifenture 10DF	Bifenthrin	16 oz/A	0.10 lb AI/A	3A
Sniper	Bifenthrin	6.4 fl oz/A	0.10 lb AI/A	3A
Brigadier	Bifenthrin + Imidacloprid	12.8 fl oz/A	0.10 lb AI/A Bifenthrin 0.10 lb AI/A imidacloprid	3A & 4A
Mustang Max	Zeta-cypermethrin	24 fl oz/A	0.15 lb AI/A	3A
Mustang Maxx	Zeta-cypermethrin	24 fl oz/A	0.15 lb AI/A	3A
Sevin 4F	Carbaryl	10 Qt/A	10 lb/AI	1A

* Resistance group

Maximum ß-cyfluthrin (in all forms) per season is 0.1 lb AI/Acre
Maximum cyfluthrin (in all forms) is 0.2 lb AI/Acre
Maximum ß-cyfluthrin + cyfluthrin (all forms of both) = 0.2 lb AI/Acre

Example: 4 applications of Baythroid XL at 3.2 fluid oz/Acre = Seasonal use limit of 12.8 oz of product. At 0.025 lbs of active ingredient contained in each 3.2 fluid oz application (maximum rate) the four application would bring you to 4 X 0.025 lb AI = 0.10 lb AI/A or the maximum seasonal use limit.