

A STRATEGIC SCREENING PROGRAM FOR IR-4 REGISTRATION OF INSECTICIDES IN GRAPE

MGWIC – 2006 Final Report

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Problem Statement

In August of 1996 President Clinton signed into law the Food Quality Protection Act (FQPA). This law fundamentally changed the basis by which the EPA registers and regulates pesticides in the USA. One of the results of this new legislation is that the EPA is likely to eliminate or severely restrict many of the conventional pesticides (i.e.; organophosphate and carbamate insecticides) traditionally relied upon for fruit production. In fact, ten of the top 30 most at-risk pesticides listed in MSU's Pesticide Risk Database constitute the primary pest management tools that the Michigan fruit industry presently rely upon for fruit production. In addition, the cost for re-registering existing pesticides and registering new chemistries has become inordinately high, such that many pesticide manufacturers are not able to justify product development for minor-use crops. Because of these circumstances, minor-use crops, like grapes, blueberries, cherries, apples, peaches, and pears, may be left with a significant short-fall in pest management tools for the future.

The USDA IR-4 project serves as the primary avenue that pesticide chemistries, not fully supported by their parent manufacturer, can be registered for minor-use crops. The MSU Trevor Nichols Research Complex (TNRC) is designated as an IR-4 Field Research Center and is one of the few facilities in the state capable of conducting this GLP field residue work. The demand for registering new pesticides through IR-4 has risen since FQPA, making it increasingly necessary to provide significant evidence of product performance in order to attain the priority rating needed for timely field trial initiation. Because of this a strategic grape-pest chemical screening program has been established at the TNRC to identify promising new insecticide candidates for IR-4.

Objectives

- 1) To maintain a strong IR-4 field residue program as a major component of the MSU Trevor Nichols Research Complex's research priorities.
- 2) To establish a strategic grape-pest insecticide screening program to identify and evaluate potential new pesticide candidates for IR-4 field residue trials.

Objective 1. IR-4 program involvement and current successes.

Based on results of last year's screening trials we submitted an IR-4 "clearance request" for one new compound, novaluron (Rimon®) for prioritization at the annual IR-4 Food Use Workshop. Rimon has performed well in screening trials for control of the grape berry moth and other lepidopteran pests. This provided us with strong supporting evidence for achieving an "A" priority at the workshop. At the workshop there was strong support among grape producing states to get Rimon registered with the EPA, but there was request by the registrant to delay the initiation of work one year in order for a new formulation with higher levels of plant-safety to be developed. Although this resulted in only a "B" priority for this year, we are confident to attain

an “A” next year to lead to a future registration in grapes. There was another PCR request for grapes considered for prioritization at the workshop. It was to amend the current label of bifenthrin (Capture®), from its current 28 day pre-harvest interval (PHI) to a 1 day PHI, in order to be useful for control of the Multi-colored Asian lady beetle. This received a “B” priority at the workshop in part because an already registered pyrethroid insecticide Baythroid has a 3 day PHI and may serve the purpose.

Objective 2. Screening trial to evaluate new candidates.

The primary focus of the 2006 insecticide screening trial was to test the performance of the Emmamectin Benzoate (Proclaim 5SG®) and V-10170 (instead of the original S-1812 35WP Valent experimental material) on the grape berry moth (GBM), *Endopiza viteana* in grape. Insecticides were applied to 23 year old ‘Concord’ grape vines (Vineyard 1) at the Trevor Nichols Research Complex near Fennville, MI with an FMC 1029 airblast sprayer calibrated to deliver 50 gpa at 2.5 mph. Plots consisted of single 18-foot long rows of vines arranged in a randomized complete block design with four replications. Vine spacing was 6 x 10 ft, with a buffer row separating all plots. Regular foliar maintenance applications of Nova, Sovran, Penncozeb, and Ziram were applied separately to all treatments. Applications of test materials were made on 22 Jun (1st generation GBM egg hatch), 22 Jul (2nd generation GBM egg hatch), 9 Aug (3rd generation GBM egg hatch), and 25 Aug, as indicated in the following tables. GBM evaluations were made on 19 Jul, 4 Aug, and 14 Sep by examining 25 clusters per replicate for injury, and are reported as the mean percentage of clusters damaged per plot. Mean percent control of cluster damage was calculated using Abbott’s formula; $[1 - (n^{\text{treated plot}} / n^{\text{control plot}})] * 100$. In addition, severity ratings were taken on 14 Sep by pulling apart the clusters and counting the number of injured berries per plot. Mean severity ratings were then calculated by dividing the sum of injured berries by the number of damaged clusters in each plot, and all data were analyzed using ANOVA and means separation by Duncan’s New MRT at $P = 0.05$.

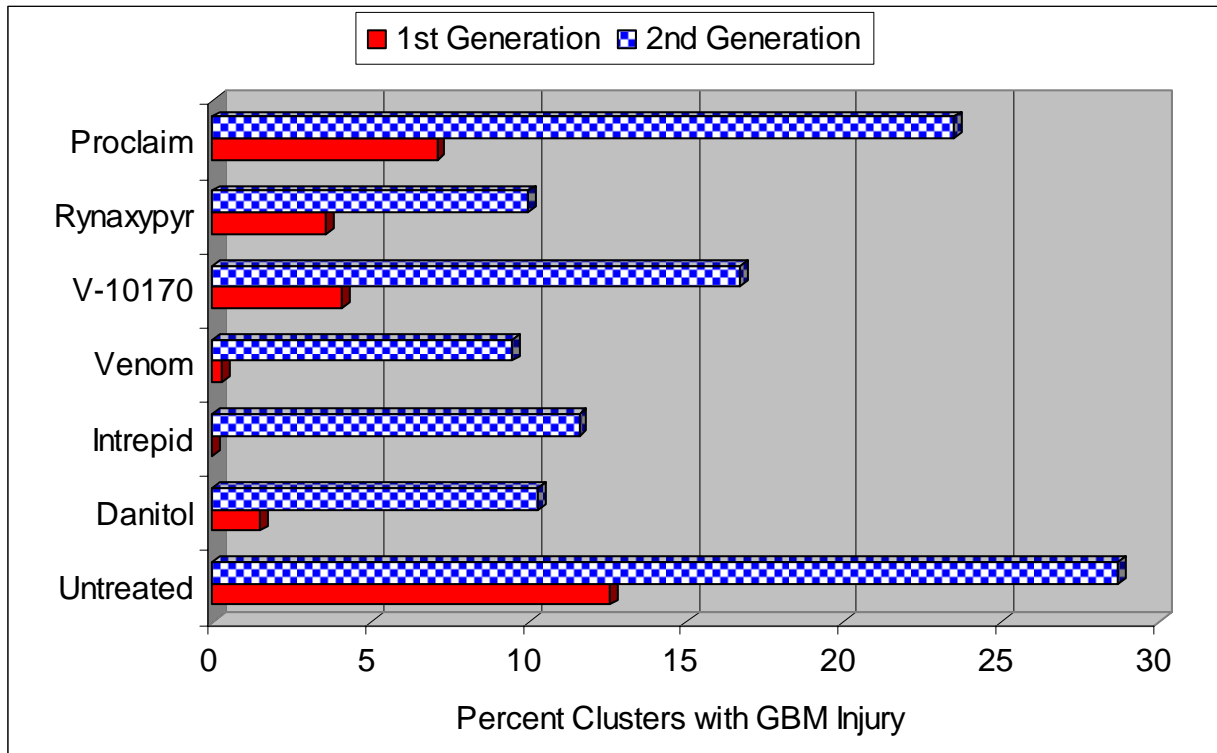
Spring climatic conditions resulted in freeze injury to Michigan grapes, reducing the crop load and enhancing vegetative growth in vineyards. The low crop load and heavy vegetative canopies made adequate treatment coverage difficult given the high grape berry moth population in the research vineyard. None-the-less, Intrepid and Venom provided significant protection of fruit clusters from first generation GBM injury, followed by Danitol, Rynaxypyr, Avaunt and V-10170 (Figure 1). Proclaim only showed moderate activity on GBM. Intrepid, Danitol, and Venom were the only compounds to provide % Control values above 80% at the 28 Jul evaluation (first generation GBM). Statistical treatment separations were difficult for second and third GBM generation evaluations, but the trends remained the same. These data suggest that Proclaim and V-10170 at their currently tested rates and timing may not be worthwhile candidates for future IR-4 submissions, although testing under normal conditions may have shown better performance.

Communications Activities, Accomplishments, and Impacts

Because of the continued loss of critical grape insecticides resulting from the FQPA, there is considerable urgency for developing replacement tools for Michigan's grape/wine production systems. Our ability to identify, develop and register effective alternatives will significantly enhance the chances that the Michigan grape/wine industry will successfully make this difficult transition. Since all of these new chemistries are either strong candidates for or have already received an EPA reduced-risk status, they will likely secure a fast-track avenue for

registration. The findings of these trials have and will be communicated to growers at a variety of forums, such as the 2006 Great Lakes Fruit and Vegetable Expo, and regional MSU Extension meeting in the winter/spring of 2007.

Figure 1. Fruit protection from grape berry moth injury. Means represent the percent grape clusters with feeding damage after treatment applications. Means followed by same letter do not significantly differ ($P=0.05$, Duncan's New MRT).



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