

**MEETING MINUTES
MICHIGAN BLUEBERRY GUTHION TRANSITION TASK FORCE**

**Spring 2008 Meeting
February 11, 2008**

**Trevor Nichols Research Complex
Fennville, Michigan**

Attendees (35 people):

Blueberry growers: Adam Kiel, Art Thomas, Carl Nelson, Chris Hodgman, Dennis Hartmann, Doug Wassink, Gary DeJonge, Jeff Groenhof, Pat Hartmann, Larry Bodtke

Aerial applicators: Dan Robertson, Kristen Helms

Crop consultants: Claudia Arkestyn (Wilbur Ellis Co.), Creela Hamlin (Hamilton Agronomy), Stephanie Meert (Green Valley Ag)

Industry representatives: Allyn Anthony (Michigan State Horticultural Society), Dave Trinka (MBG Marketing), Ken Nye (Michigan Farm Bureau)

Government organizations: Nikhil Mallampalli (Environmental Protection Agency), Wilfred Burr (USDA Office of Pest Management Policy), Brian Rowe and Brian Verhougstraete (Michigan Department of Agriculture Pest and Plant Pest Mgt. Division), George Heffner (Kalamazoo Conservation District), Kyle Mead (Van Buren/Allegan Co.)

Agrochemical industry: Kent Hughes (DuPont)

Michigan State University: Rufus Isaacs, Keith Mason and Steve Van Timmeren (Dept. of Entomology), John Wise (Trevor Nichols Research Complex), Carlos Garcia-Salazar (MSU Extension West Central Region), Mark Longstroth (MSU Extension, SW Region), Larry Olsen and Lynnae Jess (Northcentral IPM Center), Mike Brewer and Paul Jenkins (IPM Program)

The meeting was called to order at 12.05pm.

Rufus Isaacs thanked all attendees for taking time to come to the meeting, and thanked TNRC staff and Keith Mason and Paul Jenkins for meeting preparations, also describing the local arrangements. An overview of the meeting was given; to review current Guthion Transition Plan and develop priorities for research, extension, and regulatory issues related to Guthion phase-out. The Task Force was charged with giving feedback to EPA on effectiveness of alternatives, and this group is aiming to be proactive about this issue (hence the reason for this meeting in 2008). It was mentioned that everyone in the meeting should feel free to state their opinions and respect other peoples' opinions.

The agenda was reviewed (see end of document), and the mission of the Task Force was described: *To help the Michigan blueberry industry respond to the phase-out of Guthion while maintaining fruit quality and yield.*

Dave Trinka provided background on the EPA's mandate from the Food Quality Protection Act, to review the registrations of pesticides, and apply different parameters when calculating risk. For Guthion, the risk is driven by concerns regarding worker exposure and environmental impact, not residues in food. The phase-out plan includes a ban on aerial application of Guthion on 30 Sept 2009. This was seen as a big

concern for the industry (see below). The seasonal limits decrease through to 2012 (2.5 lb in 2008-9, 1.5 lb in 2010-12), with a maximum application rate of 1.5 lb of Guthion. Restrictions are also placed on distance to bodies of water and dwellings, and there are longer PHI's set for U-pick fields. See the Transitions Task Force website for details of the phase-out plan (www.isaacslab.ent.msu.edu/AZM.htm).

Primary concerns with the phase-out of Guthion were described. These include maintaining the grower's ability to meet the zero tolerance for insect pests, the high pest pressure in the Great Lakes region, the low number of effective alternative insecticides and relatively small number of tested and economical IPM tactics, the loss of aerial application, and the lack of export tolerances for most alternatives in most export markets. Concern was expressed regarding the slow implementation of IPM tactics and the current high dependence on Guthion meaning that the industry is not ready for a change to alternatives that many growers have not yet had experience with. The potential impact of this phase-out on the blueberry export market was described by Dave Trinka. Blueberries are exported globally (UK, Canada, Japan are top regions), and although these countries have tolerances for azinphos-methyl, most alternative chemicals do not have tolerances in place, or if present they are much lower than US tolerances (e.g. 3ppm tolerance in US for esfenvalerate compared with 0.02ppm in UK).

Rufus Isaacs reviewed the current role of Guthion in Michigan blueberries. USDA-NASS chemical use survey data were presented that show an overall dependence on broad spectrum insecticides, with gradual adoption of reduced-risk alternatives. Guthion is currently used on almost 60% of blueberry acreage in the Great Lakes region (USDA-NASS survey data) with the current situation being driven by pest pressure from cherry and cranberry fruitworm (CFW and CBFW), Japanese beetle (JB), and blueberry maggot (BM). The primary use of Guthion is for fruitworm control, and this pesticide is applied immediately after bloom. It is highly effective against all life stages, and can prevent infestation by these pests. In situations where fruitworms are not controlled, Michigan fields can experience 80% infestation of berries.

There followed a grower discussion of the current use of Guthion:

Pests controlled: CBFW (main target), CFW, leafrollers, spanworms (before bloom), plum curculio (not a direct target of sprays, but is in the complex).

Timing of application: Post-bloom is the main timing. Larry Bodtke stated that the period when it was most needed is during the 3 weeks starting at end of May/first of June.

Number of sprays: 1-2 per season

Residual control: Claudia Arkestyn considered Guthion provided 7-10 days of control, and there were nods of agreement all around.

Rates applied: 1 pound had the most nods of approval, though Chris Hodgman mentioned using $\frac{3}{4}$ of a pound rate due to his specific sprayer. The option of a higher rate for high infestation situations was mentioned.

Application methods: Larry Bodtke mentioned that much of his application is made by ground sprayer, although he does also use aerial application. Others mentioned using a fixed wing airplane or helicopter for application. Mark Longstroth mentioned how smaller growers are more likely to use an airplane because they are less likely to have ground application equipment. Kristin Helms from Robertson's Crop Dusting described how in a typical growing season 55 individual growers use aerial application but it has been as high as 70 with generally more growers using aerial application when the weather makes fields muddy and therefore difficult to enter with a tractor. Aerial application is used across the primary growing regions, with four main businesses supplying the growers with aerial application services.

Editors note: Aerial application is used currently by many of the largest Michigan blueberry farms, in addition to those farmers with smaller acreage.

Nikhil Mallampalli provided a short list of information to attendees that the EPA would like to know more detail about, related to the current use of Guthion in blueberry. He described how a survey of application parameters for Guthion and other insecticides would be very useful in EPA's understanding of the situation related to Guthion use in this crop. The government agencies cannot give the survey, so this would need to be done by growers or university extension. An additional question that would be useful to ask would be: 'Are there other insecticides that you could apply aerially that aren't going to be restricted?'

Larry Bodtke mentioned that newer chemicals require increased gallonage to achieve coverage of the fruit clusters, and this is not as easy to achieve with aerial application.

John Wise stated that there are other factors besides field acreage that can affect the need for aerial application, including the need to treat fields at a specific timing, and the need to get into fields that may be wet and inaccessible by tractor. Larry Bodtke stated another reason in addition to wet fields early in the season; tractors knock berries off the bushes later in the season. Pat Hartmann described how at the first of June when the fields are wet, the airplane is the only way to make pesticide applications to the fields. Dave Trinka added that as the industry continues to work with MSU to implement GDD models, when the model calls for spray applications, large growers will need to treat many fields in a short period, which you can do with aerial application but this is much harder when you have to spray by ground (because it can take quite a while to get all your acres sprayed by tractor). Kent Hughes mentioned that aerial application is on the label of many of the alternative pesticides and questioned whether we know if aerial application works as well as ground application. Rufus Isaacs answered that we do not have much current information with side-by-side comparisons of aerial and ground application for fruitworm control. There is a research project underway to examine this during 2008. If this is a research priority of the group, the group could decide which compounds to test for this.

The current status of IPM options for fruitworm control was discussed, led by Rufus Isaacs. For fruitworms these include monitoring traps, scouting of bushes (looking for eggs is time-consuming and they are difficult to detect, scouting for infestation is too late for control but can provide pest distribution information. Degree day models are in development for fruitworms and there have been some past studies on biological control of fruitworms. However, biocontrol cannot be relied on for meeting the zero tolerance standards. Insecticides used for fruitworm control include the broad-spectrum insecticides Asana, Danitol, Mustang Max, Sevin, and Imidan. Of these, Asana has been adopted by some growers for the post-bloom timing. Danitol and Mustang Max have only recently been registered, and Sevin and Imidan are generally used later in the season with Imidan being used for Japanese beetle and blueberry maggot control. Of the selective insecticides, Confirm is being used on ~30% of acres particularly for in-bloom timings where it has largely replaced Bt. Of the reduced-risk insecticides with activity on fruitworms (SpinTor, Entrust, and Delegate), SpinTor has not been adopted on many acres due to short residual and susceptibility to wash-off. Entrust has some adoption with organic growers and Delegate was only registered during Winter 07-08 so it has not yet been used.

A degree day model for fruitworm control is under development at MSU and has been tested in a research trial during 2007. Treatments of Confirm at 100 GDD after biofix followed by another one week later were more effective than treatments starting at 200 or 300 GDD after biofix, and provided similar (although slightly higher) infestation as two post-bloom treatments of Guthion. Larry Bodtke asked about whether 50 GDD would perform better. John Wise replied that we do not have any data on that, but this could be tested during 2008. It may be that this is as good as the insecticide can perform. The relative expense of Confirm and Guthion was discussed, and Claudia Arkestyn mentioned that Confirm cost approx. \$15/acre/application whereas Guthion cost about \$9. A question was asked about why Imidan was not used for fruitworm control, and this was considered by the growers to be more useful for later in the season in part because of its shorter (3 day) PHI compared with that of Guthion (7 day). It was noted that the current labeling for Imidan in blueberry allows 5 applications per season. Rufus Isaacs stated that Imidan was highly active on fruitworms.

John Wise discussed the current status and performance information for the alternative insecticides. He emphasized that the various new insecticides should not be thought of as simple replacements or tank swaps, but stated that how they work in the real world requires more knowledge than current compounds. This will be especially important to consider when maximizing performance of these new insecticides because most are more expensive than Guthion.

Many of the new pipeline compounds are different from current compounds in that broad-spectrum insecticides kill all life stages (eggs, larvae, adults) whereas many of the alternatives have specific modes of action (just larvae, or only eggs and larvae, etc.). Because of this, newer compounds require more precise timing and coverage (knowledge-intensive tools). A list of pipeline insecticides that have been tested in Michigan at the Trevor Nichols Research Complex against fruitworms and other insects was provided to the audience:

Intrepid (methoxyfenozide) registration is expected soon. This is a hormone mimic compound and is specific to moth pests. This is expected to replace the closely-related compound Confirm.

Altacor (rynaxypyr) is from a new chemical class, so it will benefit resistance management. It is active on the muscle system of insects and has been highly effective against fruitworms in recent trials in Michigan.

Alverde (metaflumizone) was highly active in recent trials against fruitworms. It is also beneficial for resistance management because it is another new chemical class.

Avaunt (indoxacarb) registration is expected soon. It has good activity on fruitworms with additional activity on leafhoppers and aphids, plus it is in a new oxadiazine chemical class.

Belt (flubendiamide) is specific to moth pests and in the first year of testing against fruitworms (2007), it showed high activity.

Delegate (spinetoram) was highly active in recent trials against fruitworms. It is also beneficial for resistance management because it is in the same chemical class as other spinosyns, which have typically not been used for fruitworm control.

Proclaim (emamectin benzoate) has shown good activity against fruitworms in recent Michigan trials.

Calypto (thiacloprid) is a neonicotinoid with activity on moth pests and various sucking and chewing insects. Registration of this insecticide is on hold because of risk assessments and risk cup issues.

Rimon (novaluron) is a growth regulator with excellent activity against fruitworms in Michigan trials. It is active on all life stages and has potential as an IR-4 priority for field trials once a formulation issue is resolved.

Mike Brewer asked whether the risk assessment for new insecticides changes when you have a broad-spectrum product being phased out. Nikhil Mallampalli mentioned that EPA tries to estimate the percent of crop treated for a group of crops for a specific chemical, so during this assessment they try to take into account the Guthion phase-out, but it is somewhat of a guessing game given all the unknowns. Kent Hughes stated that there are other groups of growers that do a better job of registering the IR4 compounds, and that the group should look at some other grower groups in different crops to see how they are getting the registrations faster. John Wise responded that he doesn't think it has anything to do with the blueberry growers, but some other component of the process that delay or limit the registrations. Larry Bodtke asked that if a compound is effective and labeled for other crops, why does it take so long to get labeled in blueberries? Rufus Isaacs also was concerned about this issue given the delay in registration of Intrepid for blueberry, years after the label in apples and other crops.

John Wise reviewed the currently available data on performance of alternative insecticides, noting that even if we swap out Guthion for newer compounds we still have the price problem, so we have to find out how to get more performance out of these compounds (different combinations of compounds in a program can potentially increase performance). He concluded that such direct swapping will not be sustainable for growers.

Claudia Arkestyn asked whether the new compounds are stand-alone products. John Wise replied that he has seen both sides, i.e. you might need multiple compounds/spray to get effective control, or using 'program partners' can make compounds perform better. It will depend on the compound and pest being targeted. He emphasized the need for research to optimize performance and noted that the commercial setting is different from small-plot trials, so there needs to be on-farm testing of these new compounds before adoption will increase.

Rufus Isaacs reviewed results from on-farm trials during 2003-6 in the Blueberry RAMP project in which Confirm was used during and after bloom for fruitworm control, compared with the grower's standard B.t. and Guthion program. In the first two years, the RAMP program was effective but too expensive (grower feedback). In the third and fourth years, a program with Confirm during bloom followed by Asana postbloom was used to decrease the cost of program but to still have it avoid the OPs and carbamates targeted by FQPA. Overall, there was slightly higher cluster infestation from CBFW, but lower larval survival when berries were collected. The RAMP results show higher natural enemies in some years for some species, but the results were not consistent. Insecticide costs in the RAMP program were decreased by the end of the study, but it was still higher by ~\$20-30 (and this did not include the costs of scouting).

There followed a grower discussion about what IPM tactics are used for fruitworm control, and what is needed to allow adoption of additional tactics

Do you use monitoring traps? – unanimous yes

For which pests?- Creela Hamlin: CBFW, BBM Claudia Arkestyn: OBLR, CFW, CBFW, BBM (both are crop consultants). Spheres for blueberry maggot monitoring/control were not reported as being used because they were considered too expensive and too messy.

How do you use traps? Creela Hamlin: time is a limitation (ideally trap in every field but time restricts that, so they are used in hot spots. Both consultants said that traps are checked once a week and based on that, management decisions are made.

Would you use a degree day model and what would it take to adopt this tool? Creela Hamlin stated that more grower education is needed. She works with apple growers who have more models and use this tool more, and it takes time for growers to become comfortable with these tools. Mike Brewer agreed that it takes education before growers are comfortable with using the models, and Enviroweather has someone who can help with that. Larry Bodtke stated that if MSU Extension tells the grower community that we have a model that works, it will be used.

Do you scout fields for fruitworm infestation? Claudia Arkestyn stated that it is done but you have to cover a lot of ground in fields to use it for management. Art Thomas stated that infestation scouting is really an evaluation of your spray program for next year, since it is too late for control this year.

Are any practices used to increase biocontrol? Doug Wassink stated that it is one of the factors you think about when deciding how to manage a pest, but not the most important one. Dave Trinka stated that for some growers he works with, it is a lot higher on the list. Larry Bodtke added that it is not going to be an all or nothing sort of thing, but biocontrol might take the top off the infestation you have but you still have to spray to meet the zero tolerance for infestation.

Have you adopted new insecticides? Which ones? Doug Wassink uses Confirm and Asana. He gets lots of CBFW adults in traps but not in fruit, but he also has found very few CFW adults in traps but has seen infestation of this pest in fruit. There were murmurs of agreement by other growers and consultants in the room. Jeff Groenhoff asked whether Confirm applied during bloom would be taken back to hive from flowers and fed to the larvae? Rufus Isaacs replied that he thought you would need high levels of this

insecticide to have an effect because Confirm is a growth regulator that is specific to moth pests, plus the pollen is inside the blueberry flowers so it's protected from the sprays. Gary DeJong reported that his beekeeper has asked him to only spray at night during bloom so the bees don't pick up the wet chemical. Doug Wassink stated that the data show Confirm is safe whenever bees are around while Spintor, neonicotinoids, etc. you need to hold off on pollinators; so Confirm isn't really what we should be worried about with regards to bee safety. Dave Trinka raised the issue of whether scale insect infestation in blueberry is increasing because of replacement of Guthion with other insecticide classes [note – high Putnam scale infestations were found in 2007 in some west Michigan blueberry fields]. Nikhil Mallampalli asked whether any spinosyns are used [e.g. SpinTor, Entrust, Delegate]. There was no response from the growers (so no use). Dave Trinka mentioned that SpinTor is used mainly in the southeastern US against thrips. Carlos Garcia-Salazar mentioned that the effectiveness of Guthion is derived from its vapor action in which the chemical permeates the insect spiracles, whereas with IGRs the insect has to ingest the compound. Because of this we need better equipment and techniques (newer sprayers, changing how sprays are applied, etc.) to make the transition to newer compounds work.

Growers were asked about their use patterns for Confirm, and answers suggested Confirm is applied at 20-25 gallons of water per acre (GPA) by most growers, while Gary DeJong reported using 40 GPA to ensure good coverage of the fruit with Confirm.

How well do the alternatives work? Of the growers that had used them, some confidence in Confirm and Asana for CBFW control was expressed.

The meeting reconvened after a 10 minute break, and spent the last 40 minutes of the meeting being led by Paul Jenkins in a priority-setting process. First, suggestions of activities to pursue in 2008 in the areas of research, extension/education, and regulatory issues were proposed. The three lists of priorities were written on large sheets on the wall for all to see.

For the regulatory and extension issues, the lists were short enough to have a voice vote on their priority order. For the research topics, growers in attendance were asked to each distribute five votes (sticky notes) on the research topics they most wanted addressed. This led to the following priorities, prioritized in descending order within each group.

AZM Transition Task Force Priorities 2-11-08

Research priorities

1. Degree day model for CFW and CBFW
2. Efficacy of newer chemicals for CFW and CBFW (aerial as well as ground)
3. Importance of coverage for efficacy
4. Effectiveness of Delegate applied pre-bloom for CFW and CBFW control
5. Ensure studies address cherry fruitworm control in addition to CBFW
6. Testing programs on farm to see which is most effective
7. Performance of Intrepid against CFW and CBFW on-farm
8. Aerial Guthion versus aerial Asana
9. Secondary pests, which programs have a greater risk of secondary pests becoming a problem?
10. Concentration of compounds vs. control (related to aerial application)

Education/extension priorities

1. Degree days and how to use them for insect management
2. Update the Blueberry Pest Management Strategic Plan
3. June on-farm IPM meetings to update growers on insect management options

Regulatory priorities

1. Need Maximum Residue Limits for other (newer) compounds in export markets
2. Experimental Use Permits for most promising insecticides to learn about performance
3. Survey of current Guthion use patterns in Michigan blueberries (used by many small growers, so number of acres doesn't tell the whole story)
4. Expedited labeling of Intrepid for 2008 season

The meeting was adjourned at 3 pm.

Funding for the Blueberry Guthion Task Force meeting was provided through a grant to Michigan State University by the USDA-ARS Office of Pest Management Policy, administered through the NorthCentral Region IPM Center.

MICHIGAN BLUEBERRY GUTHION TRANSITION TASK FORCE

Spring 2008 Meeting
February 11, 2008
12 - 3 pm

Trevor Nichols Research Complex
Fennville, Michigan

AGENDA

Buffet-style lunch provided at 11:30 am

1. Welcome and Introductions
2. Mission of the Task Force
3. Background
4. Current role of Guthion in Michigan blueberries
 - a. Use levels and key pests targeted
 - b. Primary use for fruitworms
 - c. Grower description of current use - targets, timing, application method etc., and importance of Guthion for effective pest management

BREAK - 10 minutes

5. Current status of alternative management options
 - a. Fruitworm IPM tactics
 - b. Degree day model,
 - c. Alternative insecticides
 - d. Review of on-farm trials
 - e. Grower-led discussion about what is needed to allow adoption of alternatives

BREAK - 10 minutes

6. Research, Extension, and Regulatory Priorities
(Open discussion about immediate and long-term needs)
 - a. 2008 research priorities
 - b. 2008 education priorities
 - c. What needs to get done during 2008?
 - d. Benchmarks for measuring transition progress
 - e. Reporting progress to the Blueberry Industry and Regulatory Agencies
7. Wrap Up and Next meeting
 - a. Transition Task Force Priorities
 - b. Next meeting date