



# Newsletter Extension

## Fruit ICM News

Volume 8, No. 3  
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## Calendar

**February 15-17: Ohio Grape Wine Short Course** Area vintners are invited to The Lodge at Sawmill Creek Resort in Huron, Ohio for the Ohio Grape Wine Short Course, offered February 15-17, 2004. There is also a special marketing session for new and potential wineries on Saturday, February 14. The program features six speakers, including Elizabeth Slater, marketing consultant to the California wine industry. The topics to be covered include ice wine production and technical subjects, such as managing the Asian Lady Beetle. Registration cost is \$175 for the first attendee and \$160 for each additional registrant. The event is sponsored by The Ohio Grape Industries Committee, The Ohio Wine Producers Association, and The Ohio State University. For a brochure or more information, call Terry Beck at Ohio State University Extension, Wayne County (330-264-8722), or visit the OWPA web site at: <http://www.ohiowines.org>.

**February 26, 2004: Ohio Fruit Growers Society Committee Meetings**, (Tree Fruit, Small Fruit, Program, Forward Phase, Juice, & Public Affairs), Best Western, Wooster, Ohio. Contact Tom Sachs at 614-246-8292, [growohio@ofbf.org](mailto:growohio@ofbf.org), or <http://www.ohiofruit.org>.

**February 26, 2004: Ohio Apple Operating Committee Meeting**, Best Western, Wooster, Ohio. Contact Tom Sachs at 614-246-8292, [growohio@ofbf.org](mailto:growohio@ofbf.org), or <http://www.ohioapples.org>.

**March 4-5, 2004: Growing Your Business Through Fruit and Vegetable Food Safety Workshop** sponsored by the Ohio Specialty Crop Food Safety Initiative, Columbus, Ohio. Contact Jennifer Hungerford at 614-246-8289, [maahs@ofbf.org](mailto:maahs@ofbf.org) or visit <http://www.midamservices.org> and click on "projects." See later article.

## Pesticide Groups for Berries - Part I

*Source for Parts I, II, & III: Kathy Demchak, PennState Small Fruit Specialist (Thanks to Dick Scaife for asking about fungicide groups.)*

You will see, on some of the newer pesticide packaging, words such as "Group 11 Fungicide", as with Cabrio, for instance. Growers often ask with what other pesticide they should alternate a particular material, and this labeling should help to answer their questions. However, the labeling is voluntary, so only time will tell how many packages bear this information. The "activity groups" into which pesticides fall are based on the mode or target site(s) of action that each pesticide has. To delay the buildup of resistance to a particular chemical, it should be alternated or combined with a material with a different mode of action (one that falls into a different activity group). With fungicides labeled for berry production in Pennsylvania, the activity group and fungicides currently in each category are listed below.

This information was obtained from *Pesticide Registration (PR) Notice 2001-5, Guidelines for Pesticide Registrants on Pesticide Resistance Management Labeling* on EPA's web site <http://www.epa.gov>.

### **Fungicides:**

- **Group 1** - Inhibition of tubulin formation: benomyl (Benlate) and thiophanate-methyl (Topsin M)
- **Group 2** - Affect cell division, DNA and RNA synthesis, and metabolism (dicarboximides): iprodione (Rovral) and vinclozolin (Ronilan)
- **Group 3** - Demethylation inhibitor: myclobutanil (Nova)
- **Group 4** - Phenylamides - affect RNA synthesis: metalaxyl (Ridomil)
- **Group 9** - Anilinopyrimidine: cyprodinil (one of the active ingredients in Switch)
- **Group 11** - Quinone outside inhibitors: azoxystrobin (Quadris and Abound) and pyraclostrobin (Cabrio)
- **Group 12** - Phenylpyrroles: fludioxinil (the other active ingredient in Switch)
- **Group 17** - Hydroxyanilide: fenhexamid (Elevate)
- **Group M** - multisite activity: fosetyl-Al (Aliette), fungicides containing copper or sulfur as the active ingredient, thiram (Thiram), ziram (Ziram), captan (Captan or Captec), and dodine (Syllit)

You'll notice that Group M fungicides are the ones about which we generally (but not always) worry less about resistance buildup, and often recommend for combination or alternating with other fungicides that have a more specific activity. Fungicides that fall into the same activity group should not be alternated with each other for resistance management purposes.

### **Pesticide Groups for Berries - Part II**

Only groups which contain insecticides labeled for berries are listed below. This information was almost entirely obtained from *Pesticide Registration (PR) Notice 2001-5, Guidelines for Pesticide Registrants on Pesticide Resistance Management Labeling* on EPA's web site <http://www.epa.gov>, with additional information from IR-4.

### **Insecticides and Miticides:**

Where subgroups are listed, compounds between subgroups can generally be alternated with each other for resistance management.

- **Group 1** - acetylcholine esterase inhibitors (interrupt the transmission of nerve impulses)
  - Group 1A** - Carbamates: carbaryl (Sevin), methomyl (Lannate)
  - Group 1B** - Organophosphates: azinphos-methyl (Guthion), chlorpyrifos (Lorsban), diazinon, malathion, naled (Dibrom), and phosmet (Imidan)
- **Group 2** - GABA-gated chloride channel antagonists (cause repetitive nervous discharges).
  - Group 2A** - Chlorinated cyclodiones: endosulfan (Thiodan, Phaser)
  - Group 2B** - phenylpyrazoles. (No insecticides labeled for berries fall into this group.)
- **Group 3** - Sodium channel modulators, which also results in repetitive nervous discharges, leading to paralysis. This group consists of the synthetic pyrethroids and pyrethrins: fenpropathrin (Danitol), bifenthrin (Brigade), esfenvalerate (Asana) and one of the active ingredients in Pyrellin.
- **Group 5** - acetylcholine receptor modulator: spinosyns (Success, SpinTor)
- **Group 6** - Chloride channel activators - Avermectins (interfere with insect nerve receptors): abamectin (Agri-Mek)
- **Group 10** - Mite growth inhibitors with unknown or non-specific target sites of action: hexythiazox (Savey)
- **Group 11** - Bt microbials with various subgroups depending on the strain: Bt (Dipel, others)
- **Group 12** - Organotin miticides: fenbutatin oxide, aka hexakis (Vendex)
- **Group 18** - Ecdysone agonist disruptor (disrupts insect molting): tebufenozide (Confirm)
- **Group 20** - Site II electron transport inhibitors: dicofol (Dicofol and Kelthane)
- **Group 21** - Site I electron transport inhibitors: rotenone (the other ingredient in Pyrellin)

### **Pesticide Groups for Berries - Part III**

#### **Herbicides:**

Though buildup of resistant populations of weeds is not something we hear a lot about, relative to buildup of resistant strains of diseases or mites, it can happen. Only groups which contain herbicides labeled for berries are listed below. Also, there are many other materials within each group, but if they're not labeled for berries, they are not listed below. This information was almost entirely obtained from *Pesticide Registration (PR) Notice 2001-5, Guidelines for Pesticide Registrants on Pesticide Resistance Management Labeling* on EPA's web site <http://www.epa.gov>.

I'm not listing the target sites of action this time (most of us would need to dig out a reference book or two to understand them). Growers could sometimes guess correctly which ones fall into the same group, based on the similar effects that they have.

- **Group 1** includes fluazifop-P-butyl (Fusilade), clethodim (Select), and sethoxydim (Poast)
- **Group 3** includes oryzalin (Surflan), DCPA (Dacthal) and trifluralin (one of the active ingredients in Snapshot)
- **Group 4** is the synthetic auxins and contains 2,4-D (Formula 40) and clopyralid (Stinger), which isn't labeled for strawberries YET.
- **Group 5** includes simazine (Princep) and terbacil (Sinbar)
- **Group 9** includes glyphosate (Roundup) and sulfosate (Touchdown 5)
- **Group 12** includes norflurazon (Solicam)
- **Group 14** includes oxyfluorfen (Goal) and sulfentrazone (Spartan), mentioned only because of past Section 18's in Pennsylvania.
- **Group 15** herbicides inhibit cell division: napropamide (Devrinol) and pronamide (Kerb)
- **Group 20** inhibits cell wall synthesis at one particular site: diclobenil (Casoron)
- **Group 21** inhibits cell wall synthesis at a different site: isoxaben (Gallery, and one of the active ingredients in Snapshot)
- **Group 22** includes paraquat (Gramoxone).

## What is IRAC? (Insecticide Resistance Action Committee)

Source: < <http://www.plantprotection.org/irac/>

The information provided in the previous section by Dr. Kathy Demchak is the result of activities initiated in 1984 by the Insecticide Resistance Action Committee (IRAC). The group was formed "to provide a coordinated crop protection industry response to the development of resistance in insect and mite pests." The aim of IRAC is "to keep all classes of insecticides and acaricides as viable control options. By maintaining efficacy, IRAC is dedicated to the support of sustainable agriculture and vector control." (Information about FRAC - Fungicide Resistance Action Committee can be found at <http://www.frac.info/>. A source for herbicide resistance weeds can be found at: <http://www.extension.umn.edu/distribution/cropsystems/DC6077.html>.)

What is insecticide resistance? It is a heritable characteristic that permits an insect or mite to survive exposure to a full field rate of a properly applied insecticide. It may lead to field failure. Insecticide resistance is most likely to arise as a result of poor application technique or failure to follow resistance management guidelines.

Insects may become resistant through a number of mechanisms. They include:

**Metabolic Resistance** - the insect has an enhanced ability to destroy or eliminate the insecticide. A number of types are known.

**Target Site Modification** - the site where the insecticide acts is modified to reduce the effect of the product. These mechanisms are specific to particular classes of insecticides with given modes of action.

**Delayed Penetration** - entry of the insecticide is delayed in comparison to the susceptible types.

**Behavioral Resistance** - resistant insects may detect or recognize and avoid the insecticide.

IRAC has developed a mode of action classification based upon the known ways in which different products act. Effective resistance management (IRM) is dependent on reducing selection pressure, and IRAC has developed and recommends strategies that involve using different modes of action. IRAC promotes product labeling to help growers practice effective IRM through the use of alternatives or sequence of modes of action. IRAC is investigating the value of rotational programs in managing resistance in malaria transmitting mosquitoes.

Stay tuned in following weeks for additional information about insecticide and fungicide groups.

## **Growing Your Business Through Fruit and Vegetable Food Safety**

*Source: John Wargowski, Ohio Farm Bureau Director of Labor Services*

The Ohio Specialty Crop Food Safety Initiative is sponsoring its third Food Safety Workshop on March 4th and 5th, 2004 in Waldo, Ohio at All Occasions Catering. Mary Donnell, Extension Agent, Ohio State University Extension Agricultural Business Enhancement Center and workshop coordinator, says the first day addresses basic good agricultural practices that improve the safety and marketability of fruit and vegetable production. The second day will address advanced good agricultural practices that lead producers from awareness to action.

The featured presenter is Dr. Trevor Suslow, Extension Research Specialist Postharvest Quality and Safety, University of California Department of Vegetable Crops. Dr. Suslow has extensive experience in postharvest quality and food safety issues that will bring a fresh perspective to Midwest producers. Additional presenters include Mary Donnell; John Wargowsky, Executive Director, Mid American Ag and Hort Services; and Dr. Shari Plimpton, Program Manager, Industry Outreach, Center for Innovative Food Technology.

The workshop fee of \$30/day includes a continental breakfast, lunch, workshop materials, and certificate of attendance. Those attending both days may register for \$55. Attendance at one or both days is welcome. The workshop registration deadline is February 25. Complete workshop information is available by contacting Jennifer Hungerford at 614-246-8289 or [maahs@ofbf.org](mailto:maahs@ofbf.org) or visiting <http://www.midamservices.org> and clicking on "projects".

This Initiative is cooperatively managed by the Ohio State University Extension Agricultural Business Enhancement Center, Mid American Ag and Hort Services, and the Center for Innovative Food Technology and is financed in part through a partnership agreement with the United States Department

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Information presented above and where trade names are used, they are supplied with the understanding that no discrimination is intended and no endorsement by Ohio State University Extension is implied. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of consulting the pesticide label and adhering to those directions.

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