



# UNIVERSITY OF ILLINOIS EXTENSION

College of Agricultural, Consumer, and Environmental Sciences

## *Illinois Fruit and Vegetable News*

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*A newsletter for commercial growers of fruit and vegetable crops*

*"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle*

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-244-2126, [weinzierl@illinois.edu](mailto:weinzierl@illinois.edu). The *Illinois Fruit and Vegetable News* is available on the web at: <http://www.ipm.illinois.edu/ifvn/index.html>. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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**University of Illinois Extension Specialists in Fruit & Vegetable Production & Pest Management**

### *Upcoming Programs*

- **St. Charles Grape Grower Field Day **Cancelled****. Due to frequent heavy rains and flooding, the vineyards at the St Charles Horticulture Research Center have not had adequate attention for preparation for a public event. Consequently, the annual Grape Grower Field Day at St Charles, scheduled for August 14, is cancelled for 2010. An average of 2 inches of rain per week has fallen since Memorial Day. Some of the heaviest rain has fallen in late July and early August. Flooding has become persistent in parts of the of the research center, and poor opportunities to work and prepare the vineyards have resulted. More heavy rain is in the forecast, and hopes for a quality field day have diminished, resulting in a decision to cancel this year's event. Please bear with me in hopes for a more successful effort in 2011. Any questions can be directed to me (Bill Shoemaker) at 630-584-7254, or [wshoemak@illinois.edu](mailto:wshoemak@illinois.edu).
- **North American Fruit Explorers. August 19-21, 2010**. Best Western Motel/Conference Center, Lafayette, IN. To view the program and registration form, check: <http://web.extension.illinois.edu/edwardsvillecenter/foodcrophort3031.html>. For additional details or questions: contact Ed Fackler at [cefackler@gmail.com](mailto:cefackler@gmail.com) or 812-366-3181.
- **2010 Sustainable Agriculture Tours**
  - **August 13, Romance Tour – Flowers and Wine**, Bright Flower Nursery and Famous Fossil Vineyard & Winery, Jo Daviess County and Stephenson County
  - **September 15, Agritourism – Farm Fresh Fun**, Country Corner, Henry County.A fee of \$20 per person will be charged for each tour, which includes lunch. This year two adults pay \$30 when registered together and children under the age of 10 attend free. Registration at least one week in advance is required. Visit [http://web.extension.illinois.edu/smallfarm/ag\\_tours.cfm](http://web.extension.illinois.edu/smallfarm/ag_tours.cfm) to register and for more details about each of the tours including a map and agenda. To register by phone, contact Donna Cray at 217-241-4644. For more information, contact Deborah Cavanaugh-Grant (217-968-5512; [cvnghgrn@illinois.edu](mailto:cvnghgrn@illinois.edu)).
- **2011 Illinois Specialty Crops Conference. January 5-7, 2011**. Springfield, IL. We are in the planning stage for this program ... **mark your calendars, and if you have any suggestions for the program, please contact Rick Weinzierl at [weinzierl@illinois.edu](mailto:weinzierl@illinois.edu) or 217-244-2126.**

## ***Regional Updates***

**In southern and southwestern Illinois**, weather and harvesting are the primary topics of interest. The southern region has been sizzling with back-to-back 100° days but finally got a break for a few days from a passing thunderstorm system leading a cool front. One has to know it's been hot when the weatherman announces the daily high will only reach 90°, and that sounds cool! The northern portion of the region continues to be wet, while the southern portion is relative dry in comparison.

Disease pressure is high in the wetter areas, and growers are advised to maintain tight disease management programs during the hectic harvest season – the most likely time to miss a spray. Many of the rainstorms in the area have been heavy, causing a lot of splashing and blowing of pathogens. Sanitation is also critical. Plow down harvested fields as soon as possible to aid decomposition of plant material and reduce the spread of inoculum.

Wet soils continue to cause problems not only in fruit and vegetable crops, but also for row crop growers. Sudden Death Syndrome is being reported in soybeans, and is most likely in soybeans planted early into cool, wet soils followed by heavy midsummer rains saturating the soil. For more details on this particular disease, see: <http://www.extension.purdue.edu/extmedia/BP/BP-58-W.pdf>

Peach harvest has moved into the late season varieties, starting with Cresthaven. Fall apples are coloring, but with the continued heat, texture and color development may be impacted if some cool night temperatures don't come along soon. Although high temperatures are nothing new to the southern region, the ongoing high relative humidity in combination with the heat is unusual. With the high relative humidity, a plant's ability to cool using the transpiration stream is reduced, resulting in even greater heat stress.

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**In the northern region**, very hot weather and spotty but heavy rainfall have characterized the last 10 to 14 days. Soil moisture is very low and irrigation systems are operating in some parts of the region, and other areas have experienced significant flooding.

Cover sprays continue in orchards, and harvest of early maturing varieties of apples such as Pristine and Lodi started last week in many orchards. Picking of other early maturing cultivars such as Redfree, Ginger Gold, Williams' Pride, and Zestar has started in some orchards and will commence next week in more northern counties. Incidence of apple scab infestations of codling moth have been light. Harvesting of peaches is underway, and picking of summer-bearing raspberries continues on some farms. Some early grape varieties are in the veraison stage and need protection from birds.

Harvest of cucumbers, squash, sweet corn, early tomato varieties, and other vegetables continues throughout the region. Muskmelon harvest is underway in the Kankakee area and will soon commence in other areas in the region. Insects and related pests observed in vegetable farms are: western corn rootworm beetle feeding on pepper, pumpkins, and sweet corn leaves (and silks); aphids feeding on leafy vegetables; squash bugs on pumpkins; thrips feeding on onion leaves; and spider mites on melon leaves. I received reports on blossom end rot on tomato fruits, sunburn on pepper fruits, leaf tip burn in cauliflower, rust on sweet corn leaves, powdery mildew on pumpkins and squash, anthracnose on cucumbers and muskmelons, and fusarium crown rot on pumpkins.

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## ***Notes from Chris Doll***

Peach picking continues, and the current weather conditions make me happy that I'm too old to be doing it. To me, the "good old days" included picking fuzzy peaches that had been covered with sulfur for brown rot control. Most of today's varieties are not as fuzzy as Hale Haven and Elberta, and the fungicides are more favorable for disease control and itch-free. As per every letter this year, the season is early in comparison with most others, for both peaches and apples. Cresthavens are in, and everything else will follow. One of the mysteries to me however, is that the report from SW Michigan 10 days ago reported that Early Gold apples were harvestable, and my first picking 350 miles SW

was two days ago. The original Gala in the Back-40 had the first picking a week ago, but the color sports are a week away.

Locally, July rainfall totaled 6.5 inches, which is above normal, and the year's total is 23.8 inches. The two 100-degree days this week after many 90-degree days in the past month has reduced soil moisture somewhat, but vegetation is mighty green for early August. Corn and beans in the area look fantastic.

The data logger misfired last week so that degree day accumulations were not completed. However, harvest in the Back-40 and by grower reports have been good as far as codling moth control goes, and Oriental fruit moths are generally controlled. Neither has been seen in my hobby orchard. But there are plenty of other pests around, like mites, spotted tentiform leaf miners, woolly apple aphids, San Jose Scale, and its time (maybe a little late) for peach tree borer. Grower reports have been OK about brown rot on peach, but it is a problem for me as the weather has been quite favorable for its development. The neighbors unsprayed apples are nearly 100 percent black from sooty blotch, and I have seen several apples with both black and bitter rot. White rot is about due, so the fungicide program this month can be important.

I mentioned the use of Retain on apples in the last letter. It is getting late in the peach season, but the following note in the July 27 issue of the Rutgers "Plant and Pest Advisory" relates to peaches:

"Retain is labeled for many stone fruits including peach, nectarine, plum, prune, and apricot. Several NJ growers have inquired if there are any stop-drop materials labeled for plums and peaches. Retain is the material. As in apple it is a harvest management tool. It delays maturity slightly, depending on the cultivar. It makes the fruit firmer and thus helps it hold up longer for direct market sales. Several growers have used it for September-ripening peaches that tend to have some drop. Retain has helped with this problem. It is not as dramatic as in apple but is significant.

Consider the use of Retain for enhanced fruit quality on peaches and plums. Note the application timing is different; it should be applied 1-2 weeks before harvest. Consult the label for more details on use."

Both black raspberry and thornless blackberry plants have made superior growth this year and are now moving into the tip-layering stage, which is a rat-tail appearing terminal shoot that grows toward the soil or ground cover to penetrate and make roots on a new plant. Nothing wrong with this if you are in the nursery business ... when left in the natural state, all the new plants become like weeds. Prevention is by pruning back the shoots a couple of times this month or pulling up the new plants before the roots have them well anchored by fall.

Remember the latest date to collect leaves for analysis from fruit trees is August 15.

*Chris Doll*

## ***Fruit Production and Pest Management***

### ***Late summer Oriental fruit moth and codling moth control***

Just a reminder ... Even though efforts to control Oriental fruit moth and codling moth have been ongoing for what seems like a long time, the season is far from over for these insects, and choosing insecticides to overcome resistance problems is increasingly important in late season. Many codling moth populations in Illinois and other parts of the country have some degree of resistance to the organophosphates (Guthion, Imidan, and Diazinon), and those populations often show resistance to Intrepid and to pyrethroids such as Pounce, Asana, and Danitol (and presumably others) as well. Oriental fruit moth will continue to infest peaches as late-season varieties mature, and where infestations have developed in peaches earlier this summer, they will also move to apples. In portions of southwestern Illinois, resistance to pyrethroids used in peaches (Pounce, Asana, Baythroid/Renounce, Warrior, and Mustang Max) also has resulted in control failures.

Insecticides that are effective against populations of these insects that are resistant to organophosphates or pyrethroids (or both) include Altacor, Assail, Belt, Delegate, and Rimon. See the [2010 Midwest Tree Fruit Spray Guide](#) for rates and restrictions.

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### ***Pre-harvest fruit drop ... What are your options?***

As apple fruits reach maturity, many will drop before harvest, with some varieties dropping more than others, and in some years fruit drop is more severe than in others. For example Cortland, Empire, Mutsu and Idared hang very well, while McIntosh and Spartan in certain years may drop all their fruit before harvest unless treated. Many physiologists agree that the main reason for fruit drop is fruit/tree stress. Trees that have been exposed to too much water or too little water are likely to drop their fruits that those that were not stressed. Other factors that contribute to tree stress such as magnesium, boron, and/or calcium deficiencies, too much leaf nitrate nitrogen, heavy crop, sick trees from diseases or insects, very high daytime and nighttime temperatures, mechanical injury have also been attributed to fruit drop. The mechanism of fruit drop is not very well defined, although the abscission layer at the base of the fruit petiole is a ring of only a few cells wide. It is distinguishable by a small bulge at the bottom of the petiole. Some researchers suggested that the drop is caused by a drop in the plant hormone auxin and a rise in two other hormones, ethylene and abscisic acid. Ethylene and abscisic acid stimulate two enzymes (polygalacturonase and cellulase) in the cells of the abscission zone. Polygalacturonase breaks down the pectin in the walls of the cells in the abscission zone. Pectin is the glue that keeps the cells cemented together. The other enzyme is called cellulase, which as the name suggests breaks down the cellulose microfibriles. Once the pectin and cellulose disintegrate, the cells fall apart and the fruits drop. Fruit drop can be slowed down considerably by keeping the level of auxin in the cells high and the level of ethylene low. NAA or naphthaleneacetic acid is a synthetic auxin that has been in use as a stop-drop for more than 60 years. NAA does not reverse the abscission process but slows down the activities of the two enzymes and hence fruit drop. NAA, like many other auxins, is not readily soluble in water but it is readily soluble in alcohol. You do not need to waste your good alcohol on getting NAA into the fruit if you use soluble formulations; they have added inert chemicals that dissolve NAA.



The general rule for NAA is to apply it at the first sign of fruit drop or one to two weeks before harvest but not less than four or five days so it has sufficient time to get into the cells of the abscission zone. NAA should be added at about 15 to 20 ppm (3.6 to 4.8 ounces per 100 gallons for NAA-200 or 6 to 8 ounces for WP) and should be applied as dilute spray. NAA will not get into the fruit in sufficient quantity unless there is sufficient water to get it there. A minimum of 160 gallons per acre should be used. You should see the effect of NAA within 3 to 4 days, and the effect on drop should last for up to two weeks. Repeat applications have given some help. Nonionic spreaders-stickers will improve uptake of NAA. Ironically, fruits treated with NAA do not keep well in storage, so market fruits that have been treated with NAA soon after harvest.

**Alar** (daminozide) was the most effective stop-drop for nearly 26 years but rightfully or wrongly was taken out of the market. Let us take a moment of silence in its remembrance.

**Retain.** In the last issue Chris Doll wrote about this relatively new stop-drop chemical, and notes on it from Rutgers are included above in this issue. The active ingredient in this compound is aminoethoxyvinyl glycine (AVG). In the late 1970's I did my Master's thesis research at Washington State University on the effectiveness of this chemical as an inhibitor of ethylene synthesis and leaf abscission. The chemical was first extracted from soybean root nodules infected with *Rhizobium japonicum*. I found that Retain is one of the most powerful inhibitors of ethylene synthesis. By inhibiting ethylene, Retain in effect blocks the enzymes that break down the cell wall, and so fruits treated with Retain are likely to stay attached to the tree longer. Because Retain inhibits ethylene, there are several precautions that need to be understood in order to get the maximum benefits.

- The recommended rate is about 50 grams per acre. Some varieties such as Gala, Golden Delicious, and Honeycrisp may need less than the recommended rate. Experiment with different rates.
- It works best when the temperature is in the mid 70's rather than in the 90's.
- Apply Retain as dilute spray (160 gallons/acre) and make sure the leaves and fruits receive full coverage but not to the point of run-off.
- Never combine NAA with Retain.
- It works best if applied alone or with compatible chemicals. Read the label carefully.
- Apply at least 28 days before harvest but not earlier than 35 days before anticipated harvest.
- Retain will reduce fruit color, so it's best to use it on fruit that develop early color.
- Check for fruit maturity using a combination of starch, total soluble solids, and firmness.
- Adding silicone-based surfactants like Slygard 309 will increase the effectiveness of Retain. Check the label for permitted surfactants.
- Because of cost, use Retain on varieties that will give you the maximum return on investment or on trees that are subject to severe drop.

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### ***Managing birds in maturing grapes***

As a grape grower, seeing grapes ripening on the vine gives you a sense of accomplishment and a sense of excitement as you anticipate the harvest. Nothing dashes those hopes more than a flight of hungry birds descending on the vineyard. In Illinois, we have many migrating species of birds that need strong energy reserves to support their flight south for the winter. In the wild there are few food sources as rich in energy as wild grapes. The migrating birds depend heavily on the high-sugar fruit for the energy they need to fly long distances. Imagine how beautiful your vineyard looks to them!



Bird netting in place on grape vines.

If you are to achieve the yield and quality goals you expect for your vineyard, you need to protect the years of investment you've made in them from wildlife. There are many species which enjoy eating grapes because of their food value. Besides many species of birds, both migrating or permanent dwellers, there are numerous mammals, such as raccoons, fox, deer and opossums, which enjoy eating grapes. All of these animals can wreak havoc on a mature crop of grapes. To understand how to protect your grapes, you need to understand how deterrents work.

There are a large number of products sold to grape growers which are marketed as deterrents to animals feeding on grapes. A brief list should include netting, fencing, cannons, glitter tape, hovering balloons, shotguns and scarecrows. The latter two are a stretch perhaps, but they represent a measure of the frustration growers experience in the attempt to succeed in this battle. Some of the frustration comes from the experience of watching a method fail which a fellow grower was convinced was working for his or her vineyard. This points to the reality that, unlike fungi, bacteria or insects, most animals have a powerful ability to learn and overcome obstacles, including population pressure from their own species. Any strategy a grower employs must address the possibility that the “enemy” may outwit them. I think there’s every reason to believe a grower is smarter, but the strategy may need to be adjusted from time to time.

As you look through the list of products that are available to help address animal pressure on the vineyard, they fall under two main categories; deterrence and barriers. Deterrence includes glitter tape, hovering balloons, scare-eyes, cannons, etc. These products all have features which tap into deep-seated fears. For example, the scare-eye is a balloon which floats above the vineyard and looks like the eye of a predator which feeds on birds. This stimulates a fear in the birds which might feed on the grapes. But birds can get very hungry and overcome their fears. If they succeed in feeding without being harmed, they learn to ignore the device. This is even true for propane cannons. At some point the cannon only achieves annoying the neighbors.

To build a stronger defense of the vineyard, it is better to employ both types of the protection devices. If you have a deterrent in place, it will give them a sense of fear, leading them to hesitate to feed. But as described before, they may continue to make the effort to feed out of hunger, desperation or instinct. If a barrier prevents them from succeeding, they do not overcome the fear. At some point, failure to feed is poor energy economics, and they move on to better opportunities for eating. Typically, the barrier used for controlling birds is netting that is applied over the row of grapes or on a suspension system over the whole vineyard. While expensive, this is a powerful tool for preventing the birds from reaching the vines. However, birds which are not experiencing fear will attempt to burst through or go around the netting. And they often succeed. Using fear devices reduces the amount of time and effort they will employ to get through the nets and get to your grapes. They have powerful incentives. You need powerful strategies.

In our research vineyards we use bird alarms, which are digital devices that emit a cry of birds being attacked by predators. It’s very scary. Birds don’t like it either. The devices can be programmed to emit the cry of numerous species and at an appropriate time cycle. It can easily be adjusted if the species of bird or level of pressure changes. While they are powerful tools for deterrence, they need back-up. We provide that with bird netting. We’ve tried using them alone but have had only fair success. If we use them together and remain attentive to changes in species and levels of pressure, we enjoy very good success. Despite all the expense and effort, it pays off when you have a good defensive strategy. Good luck with your harvest in 2010.

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## ***Vegetable Production and Pest Management***

### ***Fall armyworm and corn earworm in sweet corn***

Fall armyworm infestations are common in sweet corn and non-Bt field corn from southern through at least central Illinois. This insect can destroy a great deal of foliage on corn plants before tasseling, then damage and contaminate ears at harvest. Where damage to foliage is common from prior to tasseling through the time ears are developing, control is recommended. Pyrethroids such as Warrior, Brigade, Baythroid, and Mustang-Max generally give adequate control; Coragen and Radiant also have been effective. Repeated sprays at 2- to 3-day intervals may be required, just as for corn earworm.



Fall armyworm in sweet corn.

Counts of corn earworm moths in traps in several Midwest locations have been and continue to be quite high. Remember that this means that sprays need to be applied before eggs hatch on silks – so within 2 days after silking begins if moths are present – and applications need to be repeated at no greater than 3-day intervals. Among pyrethroids, those listed above (and their generic versions) are the most effective. Coragen and Radiant are effective against pyrethroid-resistant populations of corn earworm.

See the [Midwest Vegetable Production Guide](#) and product labels for rates and restrictions for specific insecticides. For organic growers, Entrust (OMRI-approved) is much more effective against these insects than the other insecticides approved for use in certified organic production systems.

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**Less seriously ...** Web addresses that might not be so smart after all ...

“Experts Exchange” is a knowledge base where programmers can exchange advice and views at: [www.expertsexchange.com](http://www.expertsexchange.com).

For IP software, there’s: [www.ipanywhere.com](http://www.ipanywhere.com).

And the designers at “Speed of Art” await you at their site: [www.speedofart.com](http://www.speedofart.com).

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