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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. 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

- **Illinois Summer Horticulture Day, June 9, 2011.** Braeutigam Orchard, 2795 Turkey Hill Lane, Belleville, IL. Registration begins at 8:00 a.m. Program includes tours, displays, updates, and equipment demonstrations. Preregistration is \$25.00; registration at the door is \$30. Contact Don Naylor at 309-828-8989 or ilshortsoc@yahoo.com.
- **Dixon Springs SARE-sponsored Field Day – Efficient Techniques for High Tunnels, Vegetables, and Fruits, June 14, 2011.** University of Illinois Dixon Springs Agricultural Center, Simpson, IL. Register on-site beginning at 9:30 a.m. 10:00 a.m. to noon: high tunnels (intro, construction, irrigation, tomato varieties, training, and small fruits); noon to 1:00 p.m.: lunch on site; 1:00 to 3:00 p.m.: blueberries, apples, and peaches (production practices, varieties, pest management). The registration fee is \$10 (to cover lunch and handouts). For more information, contact Rick Weinzierl at weinzierl@illinois.edu or 217-244-2126.
- **"Is Entrepreneurial Farming for You?" Workshops** will be held in University of Illinois Extension offices from 5:30 p.m. to 9:00 p.m. on **June 30, July 7, and July 14** at the following locations: Sangamon County Extension Office on **June 30** (2501 North 8th Street, Illinois State Fairgrounds, Bldg #30, Springfield), McLean County Extension Office on **July 7** (402 North Hershey Road, Bloomington) and the Peoria County Extension Office on **July 14** (4810 North Sheridan, Peoria). Registration for each workshop is \$30 and includes a light supper. Payment can be processed online at <http://central.illinoisfarmbeginnings.org> or by contacting The Land Connection at 217-688-2570. See the brief article on these workshops below under the *Specialty Crops and Local Foods* heading.

Regional Updates

In northern Illinois, highs in the last two weeks have ranged from the 50s to the low 90s, and lows have varied from the upper 30s to mid 60s. Soil temperature is in the low 60s, and field activities are going on in many farms in the region. The region received about 1 inch of rainfall between May 9 and 22.

Apple bloom is ending now, with most varieties in the petal fall and fruit set stages. Most pear varieties are at fruit set, and peaches are in the shuck split stage. Tart cherries are at shuck stage, and cherry leaf spot control programs are underway. Grape flower clusters are starting to open up, as are strawberry blossoms all the way to the northern counties bordering Wisconsin. Sprays to control apple scab and powdery mildew are going on, and thinning is underway as well. Codling moth traps are up ... reports to come in future issues.

Asparagus and rhubarb harvests are underway, and growers are planting sweet corn. Transplanting of tomatoes, peppers, eggplant, and other warm season vegetables has also begun. Planting of cucurbits such as cucumber, squash, melons, and pumpkins will commence this week. Tomatoes grown in high tunnels are flowering in some farms in the region.

Maurice Ogutu (708-352-0109; ogutu@illinois.edu)

Notes from Chris Doll

What a spring in SW Illinois! Generally, it has been a very wet spring, with some drying out despite 2.5 inches of rain during three weeks, and corn growers have pushed to get that crop into the ground. Some fruit growers still have nursery stock in storage or en route while awaiting better planting conditions. That includes strawberry growers too. But things are green and growing, with apples at 18-28 mm in size and peaches at loosening or thinning stage. The phenology chart shows that we are about "normal," which is 7 to 10 days behind last year. Earliglow strawberries have been picked three times, and later varieties were ready to begin harvest on the 22nd.

The old Fruit Calendar published by the University of Illinois some 70 years ago was based on records and observations of phenology of plants, insects and diseases. My copy says the week of May 22-29 for this area of Illinois should see the first egg-laying by codling moth, the end of chemical thinning of apples, peaches ready for pole thinning, and the first appearance of cicadas (our 13-year brood). And for the record, it's time for the addition of calcium to apple sprays for cork pitting control.

A few reports of early cicada emergence were heard on the 18th. On the 20th I toured an orchard with a heavy emergence. This orchard block was scouted on May 16, 1998, and my notes say that cicadas were emerging on that date. The same diary said that by the 20th, they were out in most of the area. This block of trees had a history of near continuous apple production, and the current trees are now 26 years old. The bare herbicide strip in the tree row is perforated with emergence holes, and number flying and sitting was fairly high. All other blocks of trees in the area were under 13 years of age, and only a few flyers were present. I am lucky in the Back-40 and have seen only one skeleton to date. Control suggestions will be left to Dr. Weinzierl.

Codling moth data are somewhat confusing. Two growers set April 23 as the biofix date, based on trap counts. Once that date was set, the trap counts dwindled down to near zero for a few days before slowly building up to double digit numbers. Several others have not caught enough moths to set the biofix date. On that basis, I have calculated 326 degree days (DD) for the April 23 biofix date, and 232 for the arbitrary date of May 1 that I selected for the Back-40. The latter is mighty close to the beginning of egg-hatching time for the pest and control measures will be applied accordingly.

Luckily and skillfully, growers have done a good job of controlling apple scab, fireblight, and rots of strawberries. An intense scouting effort has revealed only a trace of apple scab, and fireblight control is excellent. No rotten berries were found in three matted row strawberry fields that survived over 10 inches of rain in the past month. Some of the fields required spraying for flower thrips, and the same growers are now spraying blooming blackberries for this pest.

Young apple and peach trees in a cicada-populated area will need to be watched for the pest and protected to prevent severe damage from egg-laying mamas. These same trees might need some help in developing good angle crotches by spreading with toothpicks or clothespins. Topworked trees by budding last summer or grafting this spring most likely can use follow-up care by removing shoots in the vicinity of the new scion.

Chris Doll

Specialty Crops and Local Foods Issues

MarketMaker/MarketReady: Liability Considerations for Local Food Producers

While the need for liability insurance coverage is on the radar of most business owners, especially farmers, the steady expansion in the number of small scale producers as well as developing marketing opportunities make it especially important to highlight these issues on a regular basis. Depending on the scope of the operation, several policies may be necessary to provide adequate coverage of risk exposure. Discussion with an insurance professional is the best way to develop a strategy to manage liability risk for individual growers.

Grocery stores, restaurants, and food distributors are stepping up efforts to source local products, and it is common for these buyers to require suppliers (growers) to show proof of product liability insurance of a required amount. Insurance requirements vary depending on the buyer, however amounts commonly range from 1 to 5 million dollars. It is important for growers to understand that this Product Liability insurance is not the same as the liability coverage that would be provided under a general farm policy. A farm policy usually states that the coverage provided pertains to activities that are deemed “customary” or “traditional” farming practices related to crop or livestock production. These policies might protect equipment and buildings and cover accidents resulting from operating equipment, spraying, or livestock occurring on the farm or while traveling between farms. Issues related to food safety, processing, activities that create excessive visitor/customer traffic, etc. are usually excluded from coverage under a farm policy. These exclusions necessitate an additional insurance policy or policies to address risks associated with activities above and beyond the purpose of the basic farm policy. The following links are recommended as sources of additional information, however, an insurance agent will be the best source of information ...

http://www.nyfarmersmarket.com/NYFM_Training_Manual.pdf (see the “Understanding Liability Insurance” section) and http://www4.ncsu.edu/~rmrejesu/Food_Safety_Risk/ag-710%20final%20printed.pdf (good overview of coverage options).

When discussing potential marketing opportunities with commercial buyers, it is important to verify the company’s vendor requirements where proof of insurance is concerned. Obtaining the necessary insurance is usually not overly expensive, however, some extra record keeping may be required. Being proactive in securing the coverage is recommended since it will require some time for paperwork to be processed. Also be sure that the required minimum insurance levels are adequate coverage for your operation. In some cases the 1 or 2 million dollar coverage levels may not be enough if the total assets involved in an operation far exceed the required amount of coverage.

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What is the MarketMaker Buy & Sell Forum?

MarketMaker’s Buy & Sell Forum (<http://www.marketmaker.uiuc.edu/main/marketplace>) is an excellent way to advertise the products you want to sell. Whether you have excess products or just want a way to promote in-season products, let MarketMaker’s “Looking to Sell” section help you sell it. It’s an easy, no cost way of advertising. Don’t forget to check out the “Looking to Buy” section as well. This is a listing of items that users would like to purchase. Someone might want to purchase the items you have to sell! You will also find a section for services and equipment for those who need or offer processing services for value-added agriculture in the Buy & Sell Forum, and a transportation section for those looking to haul or have products transported. The Buy & Sell Forum also provides a great way of making the producer/farmers market connection. Farmers market managers are encouraged to post ads free of charge under the “Services and Equipment” listing. It is helpful for them to include days, times, and location along with contact information.

Steps to post an ad:

1. First, you must have a user account for your business. If you don't, request one by going to the Register/Log In page (<http://www.marketmaker.uiuc.edu/reg/index/food/17>), click on Request Account Access and enter the information requested. Your user account information will be emailed to you.
2. Once you have your user account information, log in by inserting it in the Members Area of the Login area. After logging in, you will be in your Members Area.
3. To post your ad, click on My MarketPlace then click on New Ad. Select the Category – Looking to Buy, Looking to Sell, Services, or Transportation.
4. Insert a title for the product you have to sell/buy.
5. Write a complete description of the product. You can use the Formatting tool to make your text look more professional by adding bolding, font color, lists, etc. to your information.
6. Enter your Product Availability by inserting the start and end date when you will have product to sell or when you are looking to buy.
7. Determine the number of days you want your ad to run (7 – 90 days), and select it from the drop down list. Click Continue.
8. You can post up to 5 images with your ad. Make sure you resize them before trying to upload. They can't be any larger than 400x400 pixels and 300 KB in size. If you don't have a program to edit your images, there is one included on the image page. Once they are the correct size, browse on your computer for the image you want to insert. Once you have selected it, click Upload to send it to our server. You will see a small version of the image uploaded below where you entered the image location. Enter all images you want included, then click Continue.
9. You will see the Ad Preview next. Look it over to make sure it is correct. If you see some changes needed, click on Edit to take you back to the area you want to fix. When done, click Submit to complete your ad submission.

For more information, email marketmaker@extension.uiuc.edu or call 309-792-2577.

Lori Dalfonso (309-792-2500; dalfonso@illinois.edu)

Notes on Upcoming programs

Is Entrepreneurial Farming for You? As the demand for local, sustainably grown food continues to rise, farmers and aspiring farmers are working to meet the demand through the creation of small-scale farm businesses. To encourage the continued growth of these enterprises and address the needs of a new generation of aspiring farmers, University of Illinois Extension and The Land Connection are collaborating to host the workshop “Is Entrepreneurial Farming for You?” at three locations in central Illinois in late June and early July. The 3.5-hour workshop is designed to help people who think they might want to get their feet wet in sustainable farming learn what it takes to start and manage a farm-based business and decide whether this is the path they are ready to take. “Is Entrepreneurial Farming for You?” covers resource assessment, goal-setting, financial planning, and marketing options. Workshop participants have the opportunity to meet experienced sustainable farmers, other prospective farmers, and graduates of the 12-month farmer training program. These workshops will be held in University of Illinois Extension offices and will run from 5:30 p.m. to 9:00 p.m. at the Sangamon County Office on **June 30** (2501 North 8th Street, Illinois State Fairgrounds, Bldg #30, Springfield), the McLean County Office on **July 7** (402 North Hershey Road, Bloomington), and the Peoria County Office on **July 14** (4810 North Sheridan, Peoria). “Is Entrepreneurial Farming for You?” workshops are facilitated by Deborah Cavanaugh-Grant, Extension Specialist, Small Farm and Sustainable Agriculture with University of Illinois Extension, and Micah Bornstein, Farmer Programs Coordinator with The Land Connection. Registration for each workshop is \$30 and includes a light supper. Payment can be processed online at <http://central.illinoisfarmbeginnings.org> or by contacting The Land Connection at 217-688-2570.

Deborah Cavanaugh-Grant (217-968-5512; cvnghgrn@illinois.edu)

Fruit Production and Pest Management

Oriental fruit moth phenology and mating disruption programs

Oriental fruit moth management in peaches (and to a lesser extent at this time of the season in apples) will be a key concern in the coming weeks. This is especially true for growers in western Illinois (Calhoun and Jersey counties) where pyrethroid-resistant populations are not controlled by the pyrethroids (Warrior, Asana, Mustang Max, permethrin, and others) commonly used for stink bug control.

Initial flight of first generation moths in Calhoun County was observed around April 12. This date serves the biofix for the phenology model that describes the timing of development of oriental fruit moth populations for the remainder of the season. The table below (taken from the University of Illinois Degree-Day Calculator site at <http://ipm.illinois.edu/degreedays/index.html>) describes oriental fruit moth development according to degree-day accumulations based on a 45-degree F base or threshold.

Oriental Fruit Moth		Base = 45°F
Accum Deg Days	Generation	Stage
175	1	first adult emergence
250	1	first egg laying
325-425	1	peak adult emergence
525	1	peak egg laying
950	2	first adult emergence
1100	2	first egg laying
1300-1425	2	peak adult emergence
1500	2	peak egg laying
1900	3	first adult emergence
2200-2450	3	peak adult emergence
2500	3	peak egg laying

The key points to note in this table are that second generation moth flight begins about 950 DD (base 45F) after the beginning of first generation flight (biofix) and that peak egg-laying by second-generation moths occurs around 1500 DD after biofix. For growers who are using mating disruption for oriental fruit moth control, it is essential that dispensers be in place before second generation flight begins at 950 DD. Using a biofix date of April 12 and weather from the most appropriate location on the Illinois WARM data base (Brownstown), DD accumulations on May 23 had reached 614 in that area, and the prediction for 2 weeks into the future (June 6) is 916 DD. So for those who are waiting to apply mating disruption dispensers, they should be in place not much later than June 6 in Calhoun and Jersey counties. For growers who plan to use one well-timed application of an additional insecticide (Altacor, Assail, Delegate, or Rimon) in mating-disruption blocks to prevent damage during the peak of second generation egg hatch, using the Degree-Day Calculator site (you can start at <http://www.isws.illinois.edu/warm/pestdata/sqlchoose1.asp?plc=#> and choose your location, select oriental fruit moth, and enter the biofix date for your orchard) will provide an estimate of when peak laying will occur. If you use Rimon, the best time for application is early in egg-laying (perhaps around 1200 degree-days). For Assail, Altacor, or Delegate (which are more effective against newly hatching larvae), timing should correspond to the period when the greatest number of eggs are hatching – around 1400 to 1700 DD. The date for this period will depend on temperatures over the next few weeks, but DD accumulations in Calhoun County will probably reach 1400 sometime around the first of July.

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

Codling moth management

As Chris Doll mentioned in his notes above, codling moth phenology can be difficult to understand when traps catch a few moths, then cold weather arrives and traps remain empty for a while, then counts go back up with warmer conditions. Do the early counts justify setting a biofix and starting phenology models to estimate the best timing for

insecticide applications? There is no single correct answer to this, but if traps captured more than a few moths (3 to 5 per trap in any block), mating and egg-laying likely occurred at levels that will generate at least some early infestations of fruit when larvae hatch from eggs beginning about 240 DD (base 50 F) after the initial captures. Preventing those infestations still requires that an insecticide residue be on fruit when larvae chew through the “skin” of small fruits before they begin tunneling toward the center. Several good insecticides can be used to protect fruit; they include older compounds where there are no resistance problems (Imidan, Guthion, Intrepid, and others) and a number of new alternatives such as Altacor, Assail, Calypso, Delegate, and Rimon.

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

Periodical cicadas on young trees

As Chris noted, the Great Southern Brood of 13-year periodical cicadas are now active in many areas in the southern half of the state. For fruit growers, they are most damaging to young trees where females use their ovipositor (egg-laying organ) to cut slits into twigs and lay their eggs in the slits. This “oviposition” damage can kill young twigs and severely damage young trees. For growers with only a few small trees, covering the trees with cheesecloth or spun-bound polyester (the material used in floating row covers) can effectively exclude cicadas. Where a large number of trees makes this impractical, applying pyrethroid insecticides on 7- to 10-day intervals until the cicadas have died off in a few weeks is most effective. Pyrethroids registered for use on apples and/or peaches include Asana, Baythroid, Brigade (peaches), Danitol (apples), Mustang Max, permethrin, Proaxis, Renounce, and Warrior.

Rick Weinzierl (217-244-2126; weinzier@illinois.edu)

Fruit-thinning challenges

Growers are assessing the effectiveness of the chemical thinners that they have applied or will be applying in a few days. The cool weather in the center and upper parts of the state has made it difficult to apply thinners this week. We are hoping that the weather will warm up in the next few days so we can spray the trees before fruit size gets too large. I would like for you to be aware of the following conditions that will affect the response of the trees to thinners.

There are many factors that can make a thinning chemical work effectively and others that make it less effective. Tree physiology and environmental conditions are the two major factors affecting response to most chemical thinners. The physiological factors in the tree that affect thinning response include variety, tree age, tree health, crop load, and severity of pruning. A weak and a very old tree is relatively easier to thin than a healthy and young tree. Similarly, a heavily cropped tree is relatively easier to thin than a lightly cropped tree. However, you should know that even though the chemical may have knocked a large number of fruit off the tree, you may still have more fruit left due to poor chemical coverage. So monitor the number of the fruits that are left on the tree not those on the ground. Another factor that contributes greatly to the effectiveness of a thinner is the variety. For example, ‘Fuji’ fruits are harder to thin than ‘Gala’ fruits. The type of tree is also important; for example ‘Spur’ varieties are harder to thin than non spur varieties. Some studies also suggest that pruning may have an influence on the effectiveness of thinning. Application timing is also important. Some thinners work best when applied at bloom time. Benzyl adenine is much more effective when applied at bloom than after fruit set, while NAA works better when fruit diameter is between 8 and 9 mm than on larger size fruits. Penetration of the chemical thinner is greater through the lower side of the leaf than the upper side, and this difference increases as the leaves age because older leaves have more wax deposited on the upper surface than the lower surface. Interestingly, very little NAA enters the plant leaf through the stomates and instead most enters through an active transport channels across the plasmalemma. In other words the leaves spend energy to get NAA inside so it can cause the fruit to abscise. A tree that has heavy bloom will require a significant amount of energy to take up the thinner, so it is advisable to supplement the tree with some nitrogen at bloom to offset the amount of the energy spent on producing the flower and getting rid of the fruit during thinning.

Environmental factors also have strong influence on the effectiveness of thinning chemicals. Ed Stover and Duane Green published a very nice review in HortTechnology (Volume 15, pages 214-221) on the effect of environment on the performance of thinners. In this article they pointed out several pre-, during, and post-application factors that impact the effectiveness of growth regulators on fruit thinning. During the early stages of growth, leaves deposit waxes on the surface. The amount, structure and composition of these waxes influence leaf witness and penetration of the

thinning chemicals into the leaves and fruits. Deposition of these waxes is affected by the environment. Low light, high humidity, frost damage, and very low temperatures were listed as factors that can increase the response of thinning chemicals while very high temperature and dry conditions reduce the effectiveness of the thinning chemicals. The best thinning response is achieved when the temperature is between 68 and 75 °F. Many environmental factors work synergistically, so if the weather is warm and humid the thinning chemical will work more effectively than if the weather is cold and dry. The biggest uptake of the chemicals occurs right before the chemical completely dries because of the increase in the concentration of the chemicals. However, the uptake decreases drastically when the chemical has completely dried. Therefore, conditions that allow for longer drying periods will increase the effectiveness of thinning. Field studies have also shown that if the chemical droplet dries before it is washed by rain then its activity is not lost, especially if it does not rain for a couple of hours after you apply the thinners. However if the droplet is still wet and a rain occurs, then the chemical will be less effective because it washes off before it gets into the leaf.

These are only a few of the factors that impact the effectiveness of the thinning chemicals and that is why it is difficult to predict if a thinner will work or not.

Mosbah Kushad (217-244-5691; kushad@illinois.edu)

Early Vineyard Canopy Management Procedures

As the end of May approaches, cold-hardy grape vineyards are reaching 8-12” shoot length in the northern counties of Illinois, a little behind previous years. But as the temperatures warm and soil moisture remains high, shoots will elongate rapidly. It’s time to exert some management on these vines. Shoot thinning can begin in most vineyards, and for those further south, into central Illinois, growers may need to begin shoot placement, or combing the vines into appropriate position in the curtain of the vegetative canopy.

Shoot thinning must be done with consideration of optimum shoot arrangement through the canopy. It should also be done recognizing differences in shoot quality. Some shoots have much more to offer the grower and the plant. Those which will contribute to productivity and plant health and are arranged in the position and structure desired by the grower will be preserved. Others can simply be removed by knocking them out by hand so that the vine will focus its energy on the right shoots. The result will be vines with shoots arranged spatially for optimum light interception and air movement through the canopy. Those same shoots will also either contribute to quality fruit production or future structure on the cordon of the vine. If this is unclear, now is the golden opportunity to observe the vine and consider how it grows and responds to management. As activities such as shoot thinning and pruning take place, the grower is managing the vine’s relationship with its environment, optimizing its ability to harvest sunlight and grow productive wood for the future. These activities also contribute to healthy vines by allowing air to move through the canopy and dry down moist surfaces of green tissues. Once dry, these tissues are at much less risk of infection by disease-causing organisms.

The practice of combing shoots into appropriate position is similarly important. Most growers in northern Illinois are growing cold-hardy varieties in single-curtain cordon (also known as single high wire) training systems. This system keeps the cordon wire up around grower head height and trains vine shoots downward into a curtain of foliage. It only works though when the shoots are combed downward, keeping them in a vertically arranged pattern. The fruit will be produced up near the cordon wire and the curtain of foliage will largely occur below the fruiting zone. This allows filtered light into the fruit zone, which is optimum for producing quality flavors in wine grapes. It also facilitates air movement through the fruit zone, reducing risk of fruit rots. Arranging the shoots downward and keeping them combed down keeps later growth from shading the fruit zone. It also keeps the foliage well-maintained in a curtain down each side of the row. Light hits the curtain, feeding photosynthesis in the plant, strengthening it. The shoots should not create layers of foliage, with foliage underneath failing and turning yellow.

If shoot positioning is done early, the tendrils have not yet latched on to neighboring shoots. But they begin doing this early in the vine’s phenology, so positioning shoots downward early and often will facilitate tendrils grabbing neighboring shoots when the shoots are in the right position. The curtain of shoots will be locked in, holding them in the curtain pattern. This needs to be repeated over several weeks. By then, the shoots will have grown into a curtain of foliage that is “locked in place” by the tendrils. Growers who successfully achieve this will avoid the mid-to-late season aggravation of having to sort out a messy canopy that has grown back up into the fruit zone, a practice which requires much more labor than timely and proper shoot positioning.

As you can see, growing grapes in the Midwest can be demanding for labor and management. Handling shoot thinning and shoot positioning chores early and often significantly reduces that demand later in the season when the chore has grown enormously, just like the grapevines.

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Vegetable Production and Pest Management

EPA registers Colex-D, a new formulation of 2,4-D to be used with the Enlist soybean and corn weed control system

Last year I wrote an article discussing the development of dicamba and 2,4-D resistant field corn and soybean systems. The first step in that process has begun with the US EPA registering Colex-D™ (2,4-D choline). Colex-D™ is a new quaternary ammonium salt of 2,4-D, which is different from the currently used 2,4-D amine or ester formulations. Dow AgroSciences says Colex-D™ has “reduced volatility, minimized potential for drift, decreased odor, plus improved handling and tank mixing characteristics.”

This summer, Colex-D™ will likely be used commercially for the first time. Soybeans resistant to 2,4-D are still being developed, thus Colex-D™ will only be used on crops such as corn that have tolerance to 2,4-D and are on the current 2,4-D labels. Given the reduced volatility and potential for drift, the greatest risk of fruit and vegetable crop injury will be from applications of 2,4-D choline immediately adjacent to your fields. Talk with your neighbors about their crop and weed management plans.

You can also help to prevent crop injury. Avoid planting susceptible crops (i.e. grapes, tomatoes, tree fruits) near areas you suspect will be treated with 2,4-D choline. Use sentinel plants to determine any drift. Sentinel plants are 2,4-D sensitive tomato or grape plants in pots. The potted plants are grown in a greenhouse or high tunnel and moved to the field edge immediately before the herbicide application. After exposure, move the plants back into the greenhouse or high tunnel and observe any injury.

Colex-D™ will be part of the herbicide combination (with glyphosate) used in the Enlist™ Weed Control System for 2,4-D - and glyphosate- resistant soybeans and field corn. The Enlist Weed Control System will help manage glyphosate-resistant weeds such as waterhemp. The 2,4-D and glyphosate resistant crop component of the system will likely be introduced in 2013.

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The US EPA has started a registration review of Sinbar®

If you grow strawberries, tree fruit, asparagus, or watermelon, the herbicide Sinbar (terbacil) is an important part of your weed management arsenal. Sinbar at higher rates will provide three months of control for many common broadleaf weeds. The US EPA is in the beginning stages of reviewing the registration of terbacil. They have published the Preliminary Work Plan for Terbacil re-registration (Docket ID Number EPA-HQ-OPP-2011-0054; see http://www.epa.gov/oppsrd1/registration_review/terbacil/index.html). The docket contains the initial science reviews and is relatively favorable. The review process will likely take about five years.

The current registrant of terbacil, TKI, states “[w]e anticipate terbacil can and will be reregistered. However, US EPA is requiring a long list of expensive regulatory studies, many of which may not be necessary by EPA guidelines, and the cost of these studies will impact the cost of Sinbar... Therefore, we request that you send in letters of support to give EPA some needed grower community... input. We greatly appreciate your assistance in this matter.”

The USEPA is accepting public comments until May 29, 2011. I strongly encourage you to provide comments if terbacil (Sinbar) is important for weed management on your farm. Every comment is important and the USEPA does take this information into consideration in re-registration decisions. It is especially important to comment on the effectiveness of terbacil for controlling weeds and provide specific evidence of its economic importance to your farm.

The letter should include the herbicide name [Sinbar (terbacil)], the docket number (EPA-HQ-OPP-2011-0054), your name and address, a description of your farm business, a brief discussion of what makes Sinbar unique for your farm's weed management, and the agronomic or economic benefits (i.e. the lack of economic alternatives, overall weed spectrum, resistance management, crop safety). Submit your comments by electronic submission: <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPP-2011-0054-0001> . Follow the on-line instructions for submitting comments; or mail a letter to the Office of Pesticide Programs (OPP), Regulatory Public Docket (7502P), Environmental Protection Agency, 1200 Pennsylvania Ave., NW, Washington, DC 20460-0001. The Docket Facility telephone number is (703) 305-5805.

John Masiunas (masiunas@illinois.edu)

Water Management in Specialty Crop Production

Plants have several essential requirements, including light, heat, carbon dioxide and mineral nutrients, such as nitrogen and potassium. But the essential requirement that specialty crop producers may need to pay most attention to is water.

Water plays many roles in specialty crops. Water is essential for a number of biochemical processes, including the most important biochemical process to life on earth, photosynthesis. Green plants use their chlorophyll to convert light, carbon dioxide, and water to sugar. Sugar then is a stable form of light energy that the plant uses as an energy resource, just like humans, and for structural purposes, creating woody fibers.

Water also is used to transport nutrients from the soil to the interior of the plant, where plants can use them where they are needed. Fresh roots are constantly being produced by plants as they grow. Tiny feeder roots allow moisture in, which carries mineral nutrient ions. As the moisture moves through the vascular system it makes the nutrient ions available to the plant, which uses the nutrients in many essential physiological and structural processes. Without water to move the nutrients, the plants would not be able to access them. This illustrates how free water is critical to plant mineral nutrition.

Water in a liquid form actually plays a role in plant structure. That may seem obvious to anyone who bites into a juicy watermelon. In field research we often cut whole plant shoot systems at the soil line and weigh them to determine plant fresh weight. We can also dry them thoroughly in drying ovens to determine dry weight. After driving out all the moisture (water) and weighing the remainder of the plant, we find the dry portion of the plant often weighs less than 10% of the original fresh plant weight. This means that over 90% of the weight of the plant was simply water. This often plays out critically if water is limited when specialty crops produce the marketable portion of the plant, such as tomato fruits, onion bulbs or celery stems. If water is limited, so will the size of the marketed crop be limited. If growers manage water carefully during this stage of crop development, they can have profound impacts on the size and quality of their harvested crop. There can also be profound impacts if growers do not manage water.

Plants also transpire moisture. In fact, most of the water used by plants simply passes through the plant as transpired moisture. Without going into too much detail, plants will allow most of the moisture taken up by roots to travel through the vascular system, into stems, then leaves, and evaporate through stomates in the leaf structure. The evaporation creates a demand for more moisture and the plant continues to take up more moisture from the soil. This creates a stream of water that travels constantly through the plant. Hence the vast majority of moisture taken into the plant simply passes through, evaporating through the leaves. It isn't a waste though. The transpiration process plays a key role in creating turgidity, an internal pressure which allows plants made of soft tissues, such as cucumbers or tomatoes, to remain erect, displaying their leaves properly to capture sunlight. When plants lack water, they are no longer turgid. Without turgidity plants will wilt. Restore the water and turgidity returns, which restores the plant's erect structure, allowing it to display its leaves to the light.

Of all the management practices which impact the success of a crop, water management may be most profound. Many growers find they can rely on frequent rainfall and moisture stored in the soil to support good crop production and enterprise profitability in most seasons. However, as a business practice, it may well be that managing moisture availability to specialty crops can do more than any other field management practice to improve the profitability of a specialty crop enterprise. It can improve the ability of a specialty crop to carry a harvestable yield. Perhaps more importantly, because of the various ways plants use moisture, there can be qualitative improvements that impact the

value of the crop in the marketplace. Securing a place in the market for specialty crops can be challenging. Failure to secure the best markets can be costly. The cost of managing moisture is often less than the cost of not managing water. It's a business decision, but one best made considering all the potential outcomes.

Managing water is a critical element of specialty crop production. There are many fine tools that allow specialty crop producers to efficiently manage water resources. As the warmer (I hope!) part of the current growing season is approaching, I'll write more on this topic in the next issue of the newsletter.

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Less seriously ...

According to the rumor ... Scientists at NASA built a gun specifically to launch standard 4 pound dead chickens at the windshields of airliners, military jets and the space shuttle, all traveling at maximum velocity. The idea is to simulate the frequent incidents of collisions with airborne fowl to test the strength of the windshields. British engineers heard about the gun and were eager to test it on the windshields of their new high speed trains. Arrangements were made, and a gun was sent to the British engineers. When the gun was fired, the engineers stood shocked as the chicken hurled out of the barrel, crashed into the shatterproof shield, smashed it to smithereens, blasted through the control console, snapped the engineer's back-rest in two, and embedded itself in the back wall of the cabin, like an arrow shot from a bow. The horrified Brits sent NASA the disastrous results of the experiment, along with the designs of the windshield and begged the U.S. scientists for suggestions. NASA responded with a one-line memo ... "Defrost the chicken."

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