



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. 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

- **Grape Growers Workshop, May 14, 2011.** Lazy L Grape Ranch, near Mechanicsburg, IL. Topics include shoot thinning and positioning, cluster thinning and leaf removal, vineyard floor management, and petiole sampling. Registration begins at 9:30 a.m. On I-72 east of Springfield, take Exit 114 into Mechanicsburg. Turn left (east) onto W. Main Street, then right onto S. Church Street, which turns into Roby Road. Continue south past Darnell Road and turn left (east) onto Moomey Road. The vineyard is on the right (south) and visible from the road. Registration is \$20.00 for individual IGGVA members or \$30.00 per vineyard or non-IGGVA member. Registration is at the door and includes lunch. For further details, contact Elizabeth Wahle at wahle@illinois.edu or 618-692-9434, ext. 21.
- **SW Illinois Orchard Twilight Meeting, May 19, 2011.** Broom Orchard, located 2.3 miles south of Carlinville/IL-108 on the Alton Road/Shipman Road. Program begins at 6:00 p.m. For more information contact Elizabeth Wahle at 618-692-9434, ext. 21 or wahle@uiuc.edu.
- **Central Illinois Sustainable Farming Network** field days and workshops include **Equipment for Small Farmers, May 21, 2011**, 1:00-3:30 pm (registration starting at 12:30 pm), [Spence Farm](#), 2959 N 2100 E, Fairbury, Illinois. For more information, see the University of Illinois Extension Small Farms website at <http://web.extension.illinois.edu/smallfarm/events.cfm>.
- **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 Tree Fruits, June 14, 2011.** University of Illinois Dixon Springs Agricultural Center, Simpson, IL. More information in the next issue of this newsletter. **For those who can spread the word, a special invitation is extended to high school vocational agriculture teachers in southern Illinois. More details soon.**
- **"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, cool weather has persisted, with highs in the 40s to low 70s and a few night-time lows in the upper 20s. May 3 and 4 brought freezing temperatures of 28 to 32 degrees F in the northern counties bordering Wisconsin. Fortunately, a warm-up is on the way.

Soil moisture levels remain very high in areas towards the central parts of the state that received over 5 inches of rainfall in April and an additional inch the first week of May, and some fields in those counties are still flooded. A few counties north of Interstate 80 did not get a lot of rainfall in April, and field operations are underway on many farms.

Apples are in the tight cluster to pink stage and may reach full bloom next week. Tart cherries are in the tight cluster, with some white petals showing. Pears are in white bud, and grape buds are still dormant. There was some winter injury on blackberry canes; trusses of flowers are emerging from strawberry crowns. Orchardists are using sprays listed for application at "pink" in apples primarily to control apple scab and fire blight. Ground has not been worked in many vegetable fields due to wet weather, and tomatoes, peppers, melons and other warm-season vegetable transplants are still inside greenhouses.

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

Notes from Chris Doll

WET or WETTER ... still the situation in south-central and southern Illinois. Reports of 8 to 10 inches of rain in the last week of April and 10-20 inches for the month at Centralia and Carbondale surpass the 9 inches for April here. The May total here is 1.0 inch as of May 6, with more forecast for Mothers Day weekend. Ruts in orchards continue to get deeper, and some peach trees are dying from asphyxiation. Some tree planting remains to be done as does lots of field corn and other crops. The phenology chart continues to be later 7-10 days later than last year.

Orchard observations during the past week show that insect and disease control has been good to this point. No apple scab was seen, and the only fireblight seen was four blossom blight strikes in my Back-40. Cedar galls had been in full bloom in Missouri, and it was too soon to evaluate control of that disease. The rains and cool weather have kept the codling moths fairly inactive for my contacts. After enough trapping in Missouri on April 25 to set a biofix, things were quiet for five days and then the numbers picked up a little. Nothing has been trapped in two nearby orchards as of May 6 and numbers were low at Alto Pass too. A trace of plant bug and curculio injury has been seen, but it's nothing to compare with hail injury in some areas. Rosy apple aphids appear to have succumbed to treatments too. Publicity about the brown marmorated brown stink bug has hit this area but none have been found that I know of.

We dodged a bullet on May 3 when the temperatures dropped to 34.6 degrees here and a moderate frost coverage was seen on ground crops. My uncovered strawberry blossoms survived and I hope everyone else's did too. Northern apples should have been enough behind to avoid the kind of injury that occurred in the May 9 freeze last year. We are in the late bloom period for strawberries (just observed the first pink on a couple of berries), black raspberries are in full bloom, thorny blackberries are in early bloom, and fruit clusters of American grapes are prominent.

It's time for the third application of Apogee locally. It is also time for beginning calcium sprays on apples, but leave it out of the tank when spraying the PGR. Good response was seen from the first two sprays in a couple of orchards.

Fruit set in the area appears to be variable in contrast to the amount of bloom. Lots of natural thinning happened to peaches so that the crop set is much less than last year. Thinning will still be needed for most varieties, but the fruit size should not be impaired as much as usual. Twin peaches are showing, and that apparently is a result of high

temperatures during bud formation last summer. Set on apples is also lighter than normal, as evidenced by Gala trees with many single, double and triple clusters instead of the usual 3-5 fruits. Plum set is generally light, and based on observations of my sweet cherry crop, it is a failure with less than five percent of a crop.

Lots of spraying during rainy seasons like 2011 is the cause of the rutting mentioned earlier, and for sure some soil compaction on well sodded orchards as well. Soil compaction is caused by any heavy weight item like tractors, sprayers and even human feet that compress the soil, causing it to lose pore space. Recovery from this problem in an orchard situation is complicated by the inability or impractical use of deep tillage and soil amendments in an established orchard. Nature is supposed to help alleviate some of the problem by giving you droughts and freezes. In this area, droughts are common enough, but not welcome. Deep freezing is not very common and usually not welcome. So, I am at a loss to come up with a satisfactory and economical answer, except to advise that new sites be well drained to escape some of the drainage and soil problems we have now (and my Back-40 drainage problems are my fault because I bought the site because of the house my wife wanted and not the fruit garden site I needed).

Chris Doll

Specialty Crops and Local Foods Issues

Notes on Upcoming programs

Equipment for Small Farmers, Saturday, May 21, 2011. Location: Spence Farm, 2959 N 2100 E, Fairbury, Illinois (Livingston County). Marty and Kris Travis will present information about the function and use of tractors and other implements including a bale mulcher, crop cart, tractor tiller, converted horse drawn cultivators, and a potato planter. They focus on how to set up a small farm inexpensively using older equipment and also being innovative with some newer equipment. The program runs from 1:00-3:30 pm (registration starting at 12:30 pm). To register, see the [Central Illinois Sustainable Farming Network Field Days Registration \(http://www.cisfn.org\)](http://www.cisfn.org) or contact Deborah Cavanaugh-Grant at cvnghgrn@illinois.edu, 217-968-5512. The Central Illinois Sustainable Farming Network's (CISFN) mission is to promote the development of local food systems in central Illinois through farmer support and training. Network members are committed to sustainable farming and are willing to share knowledge and participate in learning opportunities. Programming for CISFN is facilitated by the University of Illinois Extension and The Land Connection.

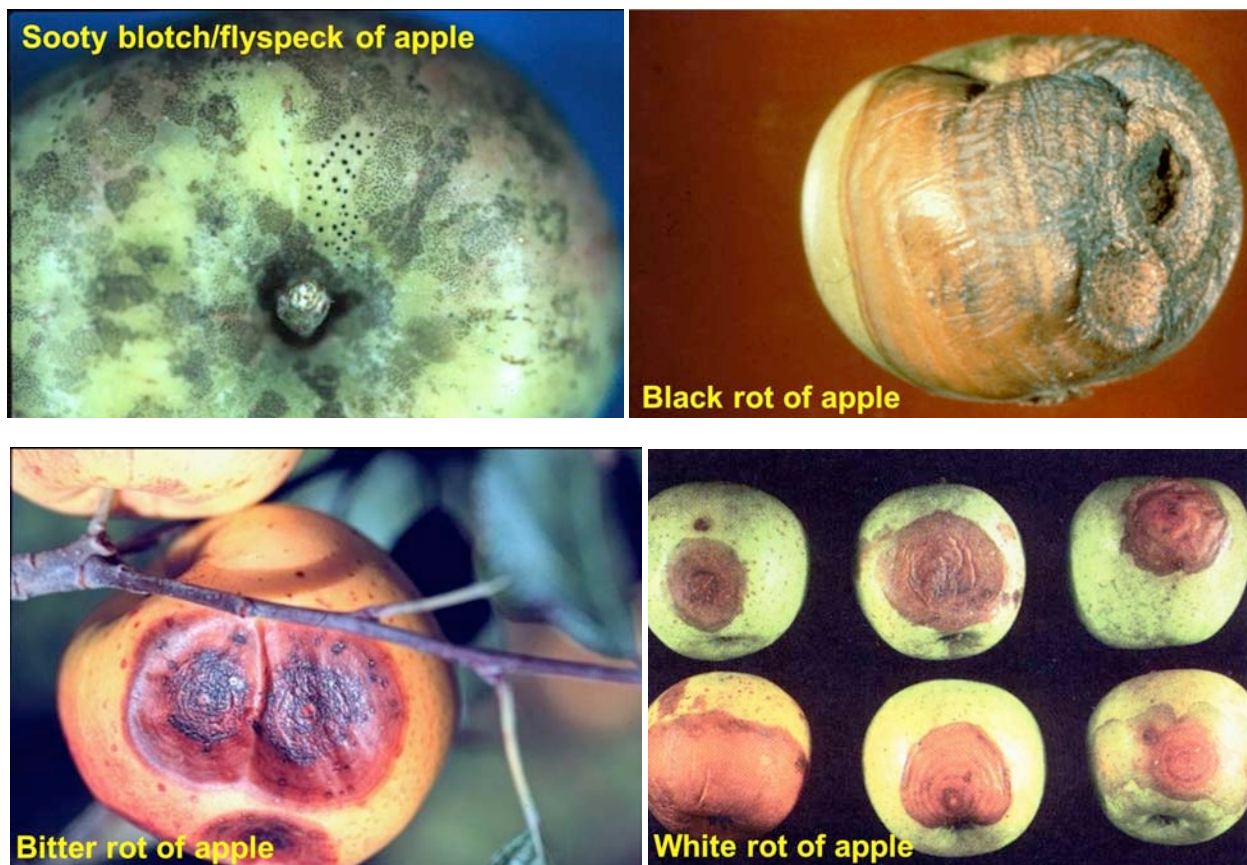
Is Entrepreneurial Farming for You? As the demand for local, sustainably grown food continues to rise, farmers and aspiring farmers are working to meet the demand through the creation of small-scale farm businesses. To encourage the continued growth of these enterprises and address the needs of a new 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

Summer Diseases of Apples

Major summer diseases of apples in Illinois include the sooty blotch/flyspeck complex and fruit rots (black rot, bitter rot, and white rot). These diseases occur widely throughout the state. Where trees have been left untreated, complete yield losses due to bitter rot infection, particularly in 'Empire,' have occurred in recent years. Similarly, occurrence of sooty blotch and flyspeck has resulted in 100% unmarketable apple fruit.



Sooty blotch and flyspeck, caused by several fungal pathogens, are surface blemish diseases that commonly appear together on apples in late summer. Sooty blotch appears as sooty smudges or olive-green spots on mature fruit. Individual spots vary from discreet circular colonies to large lesions with diffused margins. Different colony appearances are attributable to different fungal pathogens which comprise the disease complex. Flyspeck is characterized by clusters of 10 to 50 sharply defined black shiny specks (round to irregular) on the fruit surface. These pathogens are commonly found on apple shoots. Infections occur after petal fall, and are highly favored by frequent rain periods and poor drying conditions.

Black rot is a fungal disease that can cause serious fruit rot. After petal fall, infections on young fruit begin as reddish flecks which develop into purple pimples. These enlarge into dark brown necrotic areas as the fruits mature. New infections on more mature fruit are often black, irregularly shaped and surrounded by a red halo. As the lesions enlarge, they are often characterized by a series of concentric rings alternating from black to brown. Lesions remain firm and are not sunken. The pathogen overwinters in dead bark, twigs, cankers and mummified fruit.

Bitter rot, also caused by a fungal pathogen, can cause up to 100% yield loss. Fruit rots begin as small, slightly sunken lesions that are light brown to dark brown. On mature fruit, lesions may be surrounded by red halos. Fruiting bodies of the pathogen are produced in a concentric circle around the point of infection. In cross-section, the lesion appears V-shaped. This is a reasonably reliable characteristic that can be used to distinguish bitter rot from white rot or black rot. The fungus overwinters in dead wood or mummies in the tree.

White rot is another common fungal disease of apples in Illinois. Although white rot occurs in almost all apple orchards in the state, yield losses rarely exceed 5% in any orchard. Fruit lesions begin as small, often circular, slightly sunken, tan spots, which may be surrounded by red halos. As lesions expand, the rotten area extends inward toward the core, forming a cylinder of rotten flesh. In more advanced stages, the core becomes rotten and the rotten area advances from the core region into the flesh until the entire fruit is rotten. Rotten fruits usually drop. The pathogen overwinters in dead bark, twigs, and cankers within the tree.

Sooty blotch/flyspeck and fruit rots can be managed by proper pruning of trees – removing dead wood from the orchard, mummies from the trees, current-season pruning from the orchard, fire-blighted twigs from trees, and newly infected fruit from trees – cultural practices that facilitate drying of fruit following rain or dew and by application of fungicides. Growers who use “leaf wetness” monitors should begin spraying their orchards after accumulation of 175 leaf wetness hours from the first-cover spray. Growers who practice traditional fungicide applications can manage the summer diseases by fungicide sprays at 14-day intervals following the first-cover spray. Effective fungicides for control of summer diseases of apples are listed in the *2011 Midwest Tree Fruit Spray Guide* (<http://www.extension.iastate.edu/Publications/PM1282.pdf>). Repeated studies have shown that spray applications of thiophanate-methyl (Topsin-M) plus captan alternated with kresoxim-methyl (Sovran), at 14-day intervals, beginning with the second-cover spray, are effective in controlling sooty blotch/flyspeck and fruit rots.

Mohammad Babadoost (217-333-1523; babadoos@illinois.edu)

Postbloom Nitrogen and Ethrel Applications in Apples

Applications of nitrogen and ethrel postbloom increase fruit size, improve fruit finish/color, and increase return bloom. Dr. David Ferree, an Emeritus Professor at Ohio State University, left very good words of wisdom about nitrogen and ethrel application on “Red Delicious” before he retired. He suggested adding 5 pounds of calcium nitrate with every cover spray starting at one-half inch green and until the third cover spray. In addition, he suggested adding a one-half pint of ethrel starting at first cover. Nitrogen application is highly encouraged in years of snowball bloom to help young leaves and fruits grow and to help build the reserve carbohydrates for the following year.

It is well documented that a successful thinning program results not only in increasing fruit size, but it also provides a balance in the energy reserve of the tree, enabling it to produce an adequate crop the following year. However, some cultivars, like Red Delicious, Braeburn, Fuji, Golden Delicious, Honeycrisp, and Pacific Rose, have strong tendencies toward biennial bearing, even when adequately thinned the previous season. Studies have shown that the developing seeds in the heavy crop year produce a large quantity of the natural hormone gibberellic acid (GA). Diffusion of GA from the seed into the developing buds is believed to inhibit flower initiation. GA treatment in the low-crop year has been shown to reduce flower bud initiation for the following season. Chemicals that inhibit GA (either its synthesis or action), have been shown to increase flower bud initiation. Ethylene, ethrel, and NAA have been shown to inhibit GA synthesis. Postbloom applications of NAA and ethrel in the heavy cropping year have been found to inhibit gibberellin (GA) and increase return bloom in the off-year. In one study it was found that application of 150 ppm ethrel at six weeks after bloom on Fuji increased return bloom by as much as 15%, while four applications of 5 ppm NAA, starting two months after full bloom, increased return bloom by about 14%. Combination of ethrel and NAA resulted in 32% (more than double the return bloom of either of the chemicals alone.)

Dr. Ferree was convinced, after years of experience applying calcium nitrate and ethrel, that alternate bearing would not be an issue if these chemicals were applied in combination with a good thinning program.

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

Early Season Vineyard Observations in Northern Illinois

In northern Illinois we are having an unusually slow start to the season. It’s hard to believe, but we’re into May with no budbreak in grapes as of May 4 in St Charles. I don’t think we’ve ever gone this late without having budbreak, but when overnight temps are in the thirties, it is reason to be grateful. Still, it is also reason for concern, as it puts us behind schedule for developing heat units and maturity at the end of the season. It may not impact maturity

because the season may yet turn warm and accumulate heat units rapidly once we get into summer, but it is important to keep in mind the heat drives plant growth and development, and maturity occurs in a given variety only if its needs for heat units are met. That is a key reason we don't grow 'Norton' grapes in northern Illinois. We just run out of heat units in most seasons.

One issue we need not be concerned about is moisture. According to a recent report from the Illinois State Water Survey, all of Illinois is above average for soil moisture. Northern Illinois has been spared the excessive rains that saturated soils in the south, but we can be confident that vines will have sufficient moisture heading into the warmer half of spring. Grape vines should have the water resources they need to get off to a good start when heat units begin to accumulate and budbreak occurs, which should be any day now. Early varieties such as Marechal Foch and Marquette are at full budswell and just need a little boost of heat to break open and start displaying the first true leaf. By the time this newsletter is published, that should have happened. If fertilizers are needed in your vineyard, they should have been applied by now and incorporated into the soil. The roots of the vines are looking to feed under these conditions and at this stage of development. Grape vines produce many feeder roots early in the season to support the rapid flush of new growth.

Once buds open and leaves begin to appear, the challenge to manage disease begins. It's important to remember that pathogens cause disease, but that plant disease is more than just the presence of pathogens. A basic principle of plant pathology is that disease is the result of the confluence of 4 factors; a susceptible variety, a pathogenic organism, conditions conducive to disease development, and sufficient time for infection to occur. We know many of the varieties we grow are susceptible to certain diseases, such as black rot, phomopsis leaf blight, and downy mildew. The organisms that cause these diseases are often present in the vineyard constantly. But whether disease develops or not depends on the other three factors. If you grow Marquette, you may not worry too much about the three diseases mentioned. If you grow Frontenac, you may have concerns about the risk of black rot disease. But it will only occur if conditions are conducive to disease development, such as the wet season we experienced last year. This knowledge can guide management decisions and the selection of tools to monitor and address the risk of disease. If you grow Marechal Foch, your primary concern may be powdery mildew, which means you may need different tools and you have a different kind of risk. The conditions that guide disease development may be different for different diseases, but at this stage we know that the vines are entering a period of susceptibility. Green tissue is emerging and growers should monitor for risk of disease. Questions can be addressed in the current annual *Midwest Small Fruit and Grape Spray Guide*, which can be downloaded free from <http://www.ag.purdue.edu/hla/Hort/Documents/ID-169-2011.pdf>.

Also emerging right now are weeds. Many species of plants can become weeds in vineyards. They are weeds because they show up where they are not wanted and they compete with the vines. For those growers who have just planted new vines, this is especially true. Young transplants, whether greenhouse grown plants or dormant nursery stock, are at a distinct disadvantage to weeds when they compete. First, weeds often grow fast, with roots that colonize soil and take up valuable resources. They often compete vigorously for nutrients and moisture, resulting in fewer resources for the new vines. This can delay development of the new vines and reduce their capacity to build up energy, which they'll need to survive the winter and grow into producing vines. After all the resources a grower puts into establishing a new vineyard, it is critical that resources be used to control weeds. The value of the initial investment into a new vineyard can be quickly diminished by the failure to minimize weed competition. Herbicide registrations for grapes also are presented in the *Midwest Small Fruit and Grape Spray Guide* referenced above.

Bill Shoemaker (630-584-7254; wshoemak@illinois.edu)

Vegetable Production and Pest Management

Tomato Spotted Wilt Virus

Last week Dan Egel, Extension Plant Pathologist at Purdue University's Vincennes research facility, posted an article on Purdue's *Vegetable Crops Hotline* (<http://www.btny.purdue.edu/pubs/vegcrop/index2011.html>). I'm repeating it here with slight modifications for Illinois.

From Dan Egel ... Tomato Spotted Wilt Virus (TSWV) was confirmed on tomatoes grown for production in a greenhouse in northern Indiana. Symptoms of TSWV on tomatoes include dark, brown necrotic spots on leaves,

dark streaks on stems, stunted growth and discolored fruit. Symptoms vary according to host. Other vegetable plants affected by TSWV include tomato, pepper, potato, eggplant, lettuce, spinach and cucumber. Several ornamental plants are also affected by TSWV, and many weeds may serve as hosts.

TSWV is spread from plant to plant by thrips. Thrips are insects less than 1/20th of an inch long. TSWV can be vectored by western flower thrips, eastern flower thrips, and onion thrips. The western and eastern flower thrips are the most efficient vectors, but they don't survive our cold winters well. Onion thrips survive just fine in our climate, but they are not as effective in vectoring TSWV. TSWV is acquired by thrips in the larval stage, however the adults are responsible for most of the spread of the disease. Adults cannot pass on the virus particle to the larvae. The entire life cycle of thrips is about 30 days. Insecticide control of thrips is complicated by the fact that eggs are inserted into the flesh of the plant host and the larvae pupate in the soil – both of these locations are beyond the reach of most insecticide applications.

TSWV has usually been a more serious disease of vegetables in tropical and subtropical climates than areas of the Midwest such as Indiana [or Illinois]. This is because the thrips vectors do not overwinter well here. Greenhouses provide an excellent opportunity for thrips survival and population growth. Where thrips are abundant, TSWV can become a problem. TSWV can move from a greenhouse to a nearby field of susceptible crops, such as tomato. If you have TSWV and thrips in a greenhouse near where you plan to grow field tomatoes, you should make every effort to eliminate the virus and thrips before you plant in the field.

Management of TSWV centers on controlling the thrips vector.

- Preventing TSWV is easier than halting the spread of this important disease. ***Do not plant ornamentals and vegetables in the same greenhouse.*** TSWV may be introduced on ornamentals that are propagated by cuttings. The disease can then spread to vegetables.
- Use transplants known to be free of both TSWV and thrips.
- Plant resistant varieties if possible. For example, there are a few tomato cultivars with resistance.
- Use yellow [or blue] sticky traps to monitor thrips populations or directly observe flowers.
- Thrips should be managed with insecticides when populations reach an average of 5 thrips per flower. However, if plants show symptoms of TSWV and thrips are present, control measures should be implemented. Effective insecticides that can be used in the greenhouse include Conserve®, Rimon®, and Venom®. See product labels for specific crops. When using insecticides to control thrips, coverage is critical. Thrips are very small and often will hide in seams and crevices, so make sure you have sufficient water and pressure to get the insecticide mixture to where the thrips are. If TSWV symptoms are suspected, send samples to the [University of Illinois Plant Clinic] (<http://plantclinic.cropsci.illinois.edu/>).
- Remove symptomatic plants from a greenhouse with TSWV. Do not compost such plants; instead destroy them. Avoid crop debris in the greenhouse such as older leaves that have fallen or pruned leaves.
- Keep the area clear of weeds that may serve as hosts for TSWV. Vegetable growers, particularly those who produce greenhouse tomatoes, should be on the lookout for TSWV symptoms and implement the preventative measures above.

Again, this article was adapted from information provided by Dan Egel, Purdue University.

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

Starter Fertilizers for Vegetables

I am sure many vegetable growers are familiar with the importance of starter fertilizers and are applying them. However, some may not know that starter fertilizers are very important when the weather is wet and cold, which makes this spring an ideal time to consider applying a starter fertilizer with all your plantings. A starter fertilizer is a small quantity of either soluble or granular fertilizers that contains mainly nitrogen and phosphorous and in some cases potassium and other micronutrients as well. Phosphorous in particular is very important because of its poor mobility in the soil, which makes it difficult for the roots of young seedlings to get the necessary amount for root growth, unless soil analysis indicates that the soil is high in phosphorous.

What starter fertilizers to use? There are many to choose from, but make your decision based on a soil test. Generally a high quality starter fertilizer that contains at least nitrogen and phosphorous will be helpful. A standard starter fertilizer is 8-32-16 or 10-52-8, but any water-soluble fertilizer that is high in phosphorus will be satisfactory. In soils with high phosphorous (more than 15 ppm), ammonium nitrate is a good starter fertilizer, while in soils with high pH and low phosphorous, ammonium sulfate maybe a better choice. If soil test show less than 10 ppm, phosphorous, then a starter fertilizer containing two to three times more phosphorous than nitrogen, such as mono- or di-ammonium phosphate, will be better. You can also add micronutrients, such as boron, manganese, and iron with the starter fertilizers if soil analysis indicates deficiency.

What rates to apply? The rate of starter fertilizer to apply will depend on the soil analysis and the crop. Read and apply the recommended amounts listed by the manufacturer. Here are general recommendations for some vegetables. For example, in sweet corn, if the soil test shows low phosphorous, less than 10 ppm, then apply about 40 to 50 lb/acre along with about 10 to 20 pounds of nitrogen. Apply the fertilizer banded in a furrow about 3 inches away from the seeds and about 3 inches below the seed depth. In other words, if you planted the seeds at 3 inches deep then place the starter fertilizer at 6 inches deep. If soil tests show more than 15 ppm, then reduce the amount of phosphorous to 10 to 20 pounds. In peppers, if the soil test is less than 10 ppm, broadcast 80 to 90 pounds phosphorous before transplanting and then apply 30 to 40 pounds of either ammonium phosphate or another form of starter fertilizer in furrows below the transplants as mentioned above. Nitrogen levels in the starter fertilizer should be somewhere around 10 to 15 lb for both chili and sweet peppers. Watermelons and cantaloupes will also respond to a starter fertilizer, depending on soil analysis. A 50 to 60 lb per acre rate of phosphorous, along with 10 lb of nitrogen maybe applied if the soil analysis shows less than 10 ppm phosphorous. Make sure to band the fertilizer and to provide adequate soil moisture at or soon after the fertilizer application.

Soil nutrient levels exceeding crop needs can be as harmful as deficient soils. Very high P levels (above about 310 lbs P₂O₅ /acre or 140 lbs P/acre) in the soil may lead to iron and zinc deficiencies. Serious nutrient imbalances can also occur in soils high in potassium, magnesium or calcium. For these reasons, soil nutrient analysis is highly recommended at least every two years in order to help establish rates of starter and regular fertilizers needed for good growth and best yield.

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

Less seriously ...

For those who are fans of public television, Steve Smith is better known as Red Green, the master handyman who understands the limitless value of duct tape. He's doing a tour of shows – the Wit and Wisdom tour – to raise money for PBS, and an upcoming performance is to be in Champaign, Illinois. Consequently, the local newspaper, the *News Gazette*, ran an article about him, the Red Green Show, and the local performance that's coming to town.

At the beginning of the article, Steve Smith (Red Green) says something that I could say just as accurately ...

“I taught school for a couple of years – 5th and 6th graders – and I saved a generation ... by quitting.”

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