VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the Purdue University Cooperative Extension Service

Issue: 623
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In This Issue

Welcome to a New Year of the Vegetable Crops Hotline

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

Welcome to a New Year of the *Vegetable Crops Hotline* (*VCH*), Purdue Extension's newsletter for people in the business of growing vegetables. Our goal is to provide timely information that will be useful for Indiana vegetable growers. If there is something you'd like to see included, please let us know.

Frequently we include links to websites or publications available on-line. If you aren't able to access these resources, please contact us or a local Extension office to request a hard copy of the information.

Since last year, *Vegetable Crops Hotline* website has a new look. Articles that need your immediate attention are posted under Hot Topics and then will be included in the next issue. If you subscribe to *VCH* via email, you will receive an email when there is a *Hot Topic* article posted. All the previous articles published in *VCH* are available on the website. In addition, the website has a new feature, *Veggie Extras,* that is used for posting articles that may be more in-depth or descriptive than articles included in the regular issue of *VCH*. As usual, we will have fifteen issues throughout the 2017 growing season. You will receive an email when a new issue is released or receive a hard-copy by US mail.

The first issue of the year is sent to all who subscribed to *VCH* via US-mail in 2016 as well as new subscribers for 2017. To continue receiving future copies, renew your *Hotline* subscription or Indiana Vegetable Growers' Association (IVGA) membership using the forms attached with this issue. IVGA members receive the Hotline at no extra charge. E-mail versions are free.

Hope everyone has a happy and productive season.

Ethylene Damage on Tomato Plants

(Dan Egel, egel@purdue.edu, (812) 886-0198)

Almost every year, I have a greenhouse tomato grower or two call me about tomato plants that are distorted and don't seem to be growing right. The problem often turns out to be ethylene damage. This year, I have decided to write an article about it before I get those calls.

Tomato plants with ethylene damage often have leaves that are curled down and stems that are twisted (Figure 1). Stems or leaves that are curled downwards are said to have epinasty (in botanical terms). Epinasty is a common symptom of ethylene damage. Ethylene is a common by-product of incomplete combustion of several different types of fuel. Incomplete combustion is often the result of heaters that are not working efficiently. Tomatoes are very sensitive to ethylene damage; however, other crops may also show ethylene damage.

Figure 1. The tomato seedlings above exhibit downward curled leaves (see plant in upper left corner of photo) which maybe a symptom of ethylene damage and yellow seed leaves with lesions, a possible symptom of sulfur damage (Contributed Photo).

The tomato plants in figure 1 also have yellow seed leaves.

Ethylene damage does not include yellowing. Furthermore, there is a spotting on the lower leaves that is not typical ethylene damage. I believe that the symptoms on seed leaves were as a result of a different compound, perhaps sulfur dioxide, a heavier than air compound that would remain relatively close to the heater. In fact, the yellowing leaves were observed close to the heater, while the curling leaves, caused by ethylene gas, were spread throughout the greenhouse. The production of sulfur dioxide may also be as a result of incomplete combustion.

While some greenhouses are heated with a furnace attached to the greenhouse, many greenhouses are heated with a standalone unit inside the structure. In the example in figure 1, the grower stated that the heater was of this latter type-a standalone unvented unit. While this type of heating is not recommended, natural gas, propane and kerosene generally burn clean and do not need to be vented. However, even units that burn clean fuels may cause problems if out of adjustment (see citation below).

I cannot prove that the symptoms in Figure 1 above are caused by ethylene. But a few years ago, we witnessed ethylene-like damage at a greenhouse here at the Southwest Purdue Agriculture Center (See article in the *November 2007 Vegetable Crops Hotline*. Therefore, we were able to confirm that ethylene was the cause of the symptoms shown in Figure 2. Given the similarities of the two examples and the circumstantial evidence, I believe the example given in Figure 1 was due to a heater malfunction. The grower reports that after the heater was serviced, the plants began to look healthier.

Figure 2. These tomato plants are exhibiting epinasty or a downward growth of the leaves in response to ethylene produced from a malfunctioning heater in a greenhouse. The topmost leaves are growing normally because the plants were removed to a separate greenhouse after exposure to ethylene. (Photo by Dan Egel).

Poorly adjusted heaters can also add water to the greenhouse air-as much as 22 gallons of water a night! This unwanted moisture can lead to disease problems.

To avoid damage from ethylene and other air pollutants:

1. Have unit heaters checked by a professional and follow maintenance recommendations.
2. Assure adequate air supply for complete combustion. For each 2500 BTU's of heater output, 1 sq. in. of vent cross section is needed.
3. Prevent back drafts. Make sure the chimney extends 2 ft. above the ridge of the greenhouse, or 2 ft. above a 10-ft. line to any part of the structure.
4. Install an inexpensive carbon monoxide detector. If carbon monoxide levels rise it's likely ethylene and other pollutants are present also. And if carbon monoxide levels are high it is a significant human health hazard.
5. Scout for possible growth effects of ethylene and investigate right away if you see anything.

Additional Resources: Bartok, J.W. Problems with Using Unvented Greenhouse Heaters

This article was originally published on the veggiediseaseblog.org,at https://ag.purdue.edu/arp/swpap/VeggieDiseasesBlog/Lists/Posts/Post.aspx?ID=10

Growing Grafted Tomatoes in High Tunnels

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

There are several potential benefits of growing grafted tomatoes, particularly for early season tomato production in greenhouses or high tunnels. If you are interested in trying this technique but wondering whether it is possible to graft tomato plants by yourself, a Purdue extension publication, *Techniques for Tomato Grafting,* (https://extension.purdue.edu/extmedia/HO/HO-260-W.pdf) provides a step-by-step guideline for small growers to explore this technique.

A question I am often asked is: when should I start to plant the seeds to produce grafted plants? The chart below shows a general timeline and materials needed for producing grafted tomatoes on a small scale on your farm. As a general rule, the grafting process delays seedling growth for 6-7 days. The delay normally does not make a noticeable difference on the size of seedlings after the grafted plants are grown in a greenhouse for more than 2 weeks prior to transplant. As a matter of fact, grafted plants could potentially grow faster than normal transplants after they are fully recovered, assuming cell size does not limit their growth. With that said, there is no need to start seeds much earlier than you would normally start seed.

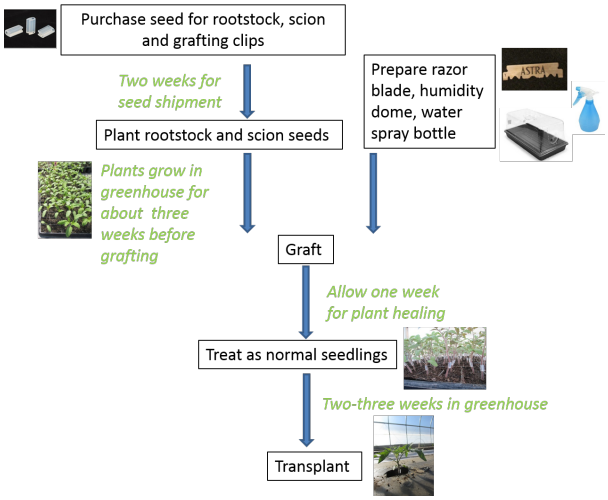

Figure 1. A general timeline and materials needed for producing grafted tomatoes on a small scale on your farm.

Seed companies now provide several tomato rootstocks. It is nice to have choices, but it is not always a good idea to have too many choices for a beginner. If you are new to tomato grafting, and your primary aim is to increase yield instead of controlling soilborne disease, my recommendation is as follows: use the rootstocks that are most readily available. Maxifort might be a good choice to start with simply because it has been on the market for several years and there is lots of research data to support its performance. Under certain conditions, Maxifort rootstock might make tomato plants grow too bushy because of its vigor, and it is true that some of the newer rootstocks may be able to address this challenge. Several other factors such as tomato variety, fertility, pruning and trellis technique also affect the balance between vegetative growth (grow leaves and shoots) and reproductive growth (setting fruit). It would make more sense to explore different types of rootstocks after seeing how the grafted plants perform under your normal production systems.

It is important to note that grafting will not control foliar diseases. As a matter of fact, because grafted plants tend to grow more vigorous than normal plants, they are more likely to create a microclimate condition that is suitable for the development of foliar diseases. Therefore, giving plants plenty of space, timely pruning and trellising, as well as maintaining a good air flow is more critical when growing grafted plants.

If you have questions about tomato grafting and growing grafted plants, please do not hesitate to contact me at guan40@purdue.edu, 812-886-0198.

Alternaria Leaf Blight of Carrot

(Dan Egel, egel@purdue.edu, (812) 886-0198) & (Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

Last fall, my lab received a carrot sample with disease-like lesions (Figures 1 and 2). There are at least 3 carrot diseases that may appear similar. These diseases are: Alternaria leaf blight (late blight), Cercospora leaf spot (early blight) and bacterial leaf blight. Often an examination in the laboratory is necessary. My examination revealed the characteristic spores (conidia) of *Alternaria dauci*, causal agent of Alternaria leaf blight.

Figure 1 shows a stand of carrots with several leaves that appear chlorotic (yellow) and necrotic. A closer examination reveals small lesions on the leaves (Figure 2). Loss of leaves may lead to fewer or smaller carrots. Sometimes severe infections can lead to the premature separating of the leaves and root.

Figure 1. A stand of carrots with chlorotic leaves due to Alternaria leaf blight of carrot (*Photo by Wenjing Guan*).

Figure 2. Necrotic lesions caused by *Alternaria dauci* on carrot leaves. (*Photo by Dan Egel*)

Alternaria leaf blight can be rapidly spread between plants by the conidia that are produced on the plant surface. I could easily find these spores on the surface of the carrot leaves brought to my lab. The conidia may germinate to cause infection with as little as 2 hours of leaf wetness. It is easy to imagine spread of the disease with wind and rain.

Since leaf wetness is necessary for disease initiation and spread, avoid overhead irrigation. The disease may be spread on seeds, therefore care should be taken when purchasing or saving seed. Carrot varieties may vary in susceptibility; ask your seed representative for varieties with partial resistance. Crop rotations of at least two years will help to lessen disease severity. When carrot production is complete, old crop residue should be plowed under as soon as possible.

Finally, several fungicides may help to manage this disease. With the addition of Michigan State University to your *Midwest Vegetable Production Guide* (ID-56) team, some modifications have been made. For example, application of fungicides for Alternaria leaf blight of carrot may be scheduled with TOM-CAST (use 15 disease severity values). See details in your *2017 ID-56* or mwveguide.org for more details. Organic gardeners may find copper hydroxide or copper sulfate formulations that are approved for use.

Watermelon Variety Considerations

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

— Notes from Watermelon Research and Development Group Annual Meeting and 2016 Indiana Watermelon Variety Trial

We are proud to be in Vincennes, the heart of watermelon producing counties in Indiana. In case you are unfamiliar with watermelon production here, Indiana is just behind Florida, Texas, Georgia, California and South Carolina in watermelon production nationwide. Indiana has more than 7,000 acres of watermelons valued at over $30 million value.

In the recent Watermelon Research and Development Group (WRDG) annual meeting, the group that comprise members from academia, government and industry discussed watermelon varieties. In this article, I will summarize my notes from this year's meeting and discuss the varieties we tested in Indiana watermelon variety trials in 2016.

Mini-watermelons

One of the interesting things I learned in the meeting is from a talk by Mr. Greg Hitt from Walmart. He shared data that shows Walmart increased the sale of mini watermelons by 21% in the past 52 weeks. The sale of mini-watermelons and traditional seedless watermelons do not compete with each other. They are purchased by 2 different types of consumers. If this is a general trend, it is likely we are going to see a continuous increase of mini watermelon market. The group agreed that the ideal size of mini watermelons is about 6-7 lbs. Interestingly, Mr. Greg Hitt pointed out he had observed traditional watermelon growers fail to produce mini-watermelons. One of the challenges is the difficulty in deciding when the fruit are ripe. Last year, we evaluated four mini-watermelons (Extazy, Krimson Kiss, Ocelot and Serval) in our variety trial. Determining the maturity of the fruit is indeed a challenge even for our most experienced crews. Among the four varieties, Extazy and Krimson Kiss had high yield. But these two varieties tend to have large fruit. Krimson Kiss is superior in sugar content.

Seedless watermelons

The collaboration of the seed industry and academia to evaluate varieties in major production areas is one of the best success stories of the watermelon industry. Varieties that stand out in this year's trial and consistently perform well in Indiana include Premont (majority 45-count), Excursion (majority 36-count), Traveler, KB12106 (very uniform fruit size at 45 count) and Exclamation. A few other varieties that yield well in Indiana as well as in Kentucky and Delaware in 2016 are Talca (dark strip), Crunchy Red and Wolverine (majority 45-count).

For growers that primarily market at road stands and farmers markets, outstanding fruit quality and uniqueness often attract consumers. Unfortunately, varieties that have the high sugar content tend to have low yield. Sugar Fresh, Poseidon, Road Trip, Secretariat and Joy Ride are a few varieties that have high sugar content and also maintain satisfactory yields.

There are a few varieties that have unique rind patterns, which might attract consumers in some markets. One of the varieties is Wayfarer (Figure 1A); the blocky-round fruit fall in the 10-18 lbs category. The very dark green rind and occasional faint stripe separate Wayfarer from other varieties. Wayfarer was one of the top yielding variety in the 2016 Indiana trial. The fruit have firm flesh and good sugar content. Prime and Chubbiness are two varieties from an Asian seed company Known-You who are new in the U.S. Both varieties have unique rind patterns. They are oval-shaped; the fruit range in size from 10 to 17 lbs. Prime (Figure 1B) has a bright dark green rind with faint tiger stripe, soft flesh and moderate sugar content. Chubbiness (Figure 1C) has a very dark green rind, almost like Black Diamond and is high in sugar content and has a moderate-low flesh firmness. However, yields of both Prime and Chubbiness are in the lower range. Another two varieties from the same company also have unique rind patterns: 3F-4139 (Figure 1D) and 3F-4186 (Figure 1E). These two varieties have basketball-size fruit with light green rind and thin and dark green strip. 3F-4221 has yellow flesh with very high sugar content. We are very excited to see a spotted type seedless watermelon in the trial: KB 15010 (Figure 1F). The plant has moderately to high yield but low in sugar content. Another interesting watermelon is ORS6227 (Figure 1G) from Origene seeds. It has a dark green rind with light green strips. Instead of a smooth rind, it has bumps which extended from the blossom end to stem end. ORS6227 is moderate-low in yield and low in sugar content.

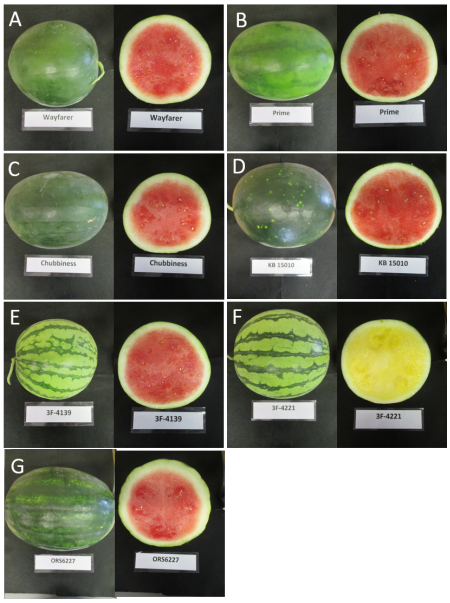

Figure 1. Seedless watermelon varieties in 2016 variety trial that have unique rind patterns

Seeded watermelon and pollinizers

Mr. Greg Hitt also told the group that the sale of seeded watermelons accounted for about 10% of total watermelon sale in Walmart. Seeded watermelon plants can serve as pollinizers for growing seedless watermelons. The benefit is that both seeded and seedless watermelons can be harvested. However, Dr. Jonathan Schultheis's study showed that yield of a seedless watermelon with a seeded watermelon variety as the pollinizer had lower yield compared with yield of seedless watermelons grown with specific pollinizer plant. With that said, growers probably should only consider use of a seeded watermelon for pollinizers when they know they have a market. Dr. Schultheis's also shared his promising results about SP7, a new pollinizer from Syngenta. It outperformed SP6 in increasing yield of a seedless watermelon.

One of the things that has made us proud this year is Dr. Dan Egel was recently selected as the vice-president of the Watermelon Research and Development Group (WRDG) in Mobile, AL. This is a group comprised of members from academia, government and industry, both nationally and internationally. Congratulations Dan!

Presentation Slides for Winter Meetings Available Online

(Liz Maynard, emaynard@purdue.edu, (219) 548-3674)

Presentations from the Illiana Vegetable Growers Symposium are available as pdfs at https://ag.purdue.edu/hla/fruitveg/Pages/presentations.aspx. Presentations from portions of the Indiana Horticultural Congress will be available at this site soon.

The Results are in: Pesticide Residues in Produce

(Dan Egel, egel@purdue.edu, (812) 886-0198)

Vegetable growers are familiar with pesticide labels that specify how much of a product may be applied. As commercial growers, we usually think about such instructions as telling us how much pesticide is the right amount to apply to a crop to be effective. While such an interpretation is correct, there is more to the labeled rates of a pesticide.

While many researchers (including myself) are involved with experiments to try to manage pests with pesticides, others are involved in trying to determine the pesticide concentrations that may safely exist in the produce we all eat. The latter is known as the pesticide tolerance. Both efficacies of the pesticide and human safety are involved in determining the label rates and timing of each pesticide. Indeed, some pesticides are not labeled for certain crops for reasons of safety.

There is mostly good news in the just released 2015 Pesticide Data Program. Each year, the USDA's Agricultural Marketing Service (AMS) publishes a Pesticide Data Program Annual Summary. The report includes produce from all over the U.S as well as imports from other countries. While the report is rather long and complicated, the aim is to determine the pesticide tolerances in produce in the U.S. for 2015. The types of produce tested are rotated every year. In 2015, the produce tested included: apples, cucumbers, lettuce, strawberries, sweet corn, tomatoes, watermelon and many more.

The good news is that out of 10,187 samples, only 441 samples (0.53%) were reported to the FDA (Food and Drug Administration) as Presumptive Tolerance Violations (pesticide residues over the established limit). Out of the 441 tolerance violations, 4 were from cucumber, 2 from tomato and 6 from watermelon. See the report at the link at the bottom of this article for the full list. While there is no mention of where the violations were found, we want to make sure that in Indiana we do our best to avoid any violations. We all want a better report next year.

What causes pesticide tolerances to be exceeded?

1. Too much of a pesticide is applied. This can happen if:
    1. The upper limit of a pesticide rate is ignored or misread.
    2. The pesticide is incorrectly applied due to a calibration error or a field overlap.
    3. Too many applications of a pesticide are used in a season. Many pesticide labels state how many applications can be made in a season.
2. An application of a pesticide is made too close to harvest. The Pre-Harvest Interval (PHI) lets growers know how close to harvest a pesticide may be applied. (The Restricted-Entry Interval (REI), in contrast, is used to protect workers who may come in contact with a pesticide).

Much research has been conducted to assure that pesticides applied according to the label will result in produce within the pesticide tolerance. Fruit or vegetables treated with pesticides according to the label are very unlikely to have pesticide tolerance violations.

To stay within the pesticide tolerances set for produce, growers should:

1. Read the label. Even if one has used the product in the past, read the label again for changes.
2. Consult Extension Guides like the *Midwest Vegetable Production Guide for Commercial Growers* (*ID-56*) for changes and guidelines. Consult an *ID-56* of the current year, not an old version. But remember, the authors of the *ID-56* can make mistakes. Always rely on the label for rate and timing information. Use the *ID-56* as guide only.
3. The *Vegetable Crops Hotline* is another good source of information.
4. Contact your favorite Purdue University Extension Specialist. We can help you with rates of pesticides, up-to-date information and pest management techniques. Better to call than to make a mistake.

The full report is available at

https://www.ams.usda.gov/datasets/pdp. If you have questions about the report or this article, feel free to contact me. I look forward to reading an even better report card from the AMS next year.

Organic Certification Cost-Share Program (OCCSP)

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198) & *(Michael J O'Donnell, modonnel@purdue.edu, (765) 747-7732)*

OCCSP provides cost share assistance to producers and handlers of agricultural products who are obtaining or renewing their certification under the National Organic Program (NOP). Certified operations may receive up to 75 percent of their certification costs paid during October 1, 2016, through September 30, 2017, not to exceed $750 per certification scope. Certified organic producers and handlers who have paid certification fees may apply for reimbursement of the incurred cost. Producers and handlers may submit OCCSP applications to Farm Service Agency county offices beginning on March 20, 2017. More information about the program can be found at https://www.fsa.usda.gov/programs-and-services/occsp/ or https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/FactSheets/2016/organics_fact_sheet_2016.pdf

NCR-SARE 2017 Professional Development Program Call for Proposals

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198) & *(Roy W Ballard, rballard@purdue.edu, (317) 462-1113)*

NCR-SARE's Professional Development Program (PDP) provides funds for professional development projects that provide sustainable agriculture training to agricultural professionals and educators. Projects can be up to three years in duration, and funding level is capped at $75,000 for each project. The 2017 call for proposals is now available online at http://www.northcentralsare.org/Grants/Our-Grant-Programs/Professional-Development-Grant-Program Proposals are due at 4:00 pm CDT on April 5, 2017.

Purdue Looking for Watermelon Growers to Collaborate on Research Study

(Laura Ingwell, lingwell@purdue.edu)

As part of a multi-state effort being headed by Dr. Ian Kaplan at Purdue University in the Department of Entomology, we are investigating how to best manage insect pests on cucurbits, in our case watermelons, while having the least possible impact on pollinators. The research is being funded through the USDA/NIFA Specialty Crop Research Initiative. The premise of this research is based on the fact that neonicotinoid insecticides, which are a versatile and powerful pest management tool, have been implicated as a factor contributing to pollinator declines. Thus, farmers growing pollinator-dependent crops—including watermelons—are confronted with a potential trade-off between two competing aspects of crop production: effective pest suppression and successful pollination. Our objective here is to identify insecticidal management strategies that simultaneously optimize pest suppression while minimizing non-target exposure to cucurbit pollinators.

To achieve this objective, we are currently looking for producers to collaborate with members of the Entomology Department at Purdue University. Your involvement would include giving us permission to access a watermelon field where we will be counting cucumber beetles, observing pollinator activity and sampling male flowers and soil to measure the amount of neonicotinoid residues. If you are interested in learning more about this project and becoming a participant, please contact Laura Ingwell at lingwell@purdue.edu or 208-669-2321. Thank you.

North Central Regional Center for FSMA Training, Extension, and Technical Assistance Seeking Grower Input – Round 2

(Amanda J Deering, adeering@purdue.edu)

The North Central Regional FSMA Center is again seeking fresh produce growers input in order to determine how they can help growers comply with the Produce Safety Rule of FSMA. This is the second survey for fresh produce growers and will take about 5 minutes to complete.

Your inputs, whether you responded to the first survey or not, are needed to develop useful and relevant materials for producers like you!

We recognize your time is valuable so as a token of appreciation we will hold drawings after each survey round and award three participants a $50 gift card. Note entry in the drawing *will require* that you provide your name and contact information. There will be an optional link at the end of the survey for you to enter your information. Your contact information is NOT tied to your responses and participation in the survey is completely voluntary. Any questions should be directed to Amanda Deering at 765-494-0512 or adeering@purdue.edu.

A Survey on Melons Needs Your Participation

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

The transdisciplinary faculty from eight states (Texas, California, North Carolina, Florida, Georgia, Indiana, and Arizona) are preparing a research proposal for submission to the USDA Specialty Crop Research Initiative. The research and outreach activities will be conducted on melons.Your participation either as

a producer, a retailer, or a consumer will help to establish a need for this research. We would appreciate your help in participating the survey. The survey is anonymous, it will take approximately 8-10 minutes. The survey should be completed by February 18, 2017.

The link to the survey is: https://tamucehd.qualtrics-.com//SE/?SID=SV_1YBuufvEu0wmciF

Upcoming Events

(Wenjing Guan, guan40@purdue.edu, (812) 886-0198)

2017 Indiana Small Farm Conference

Indiana Small Farm Conference will be held from Thursday, March 2 to Saturday, March 4, 2017 in Danville, Indiana at the Hendricks County Fairgrounds. The Indiana Small Farm Conference is a three day learning and networking event supporting small or diversified farms. Information about this year's programs, registration and lodging are available at http://www.cvent.com/events/2017-indiana-small-farm-conference/event-summary-24e5817fd2f040679885e788eb478b61.aspx

Southwest Indiana Melon & Vegetable Growers Annual Meeting

The Southwest Indiana Melon and Vegetable Growers Association (SWIM) will have their annual meeting on Friday, March 10, 2017, 8:30 am to 4:00 pm (EST), at the French Lick Resort & Casino Center, 8670 W. State Rd. 56, French Lick, IN. This year's program includes Cover crops; Precision water and nutrient management; Commercial sweet potato production; Cucurbit pests; How Dicamba on soybeans affect vegetable growers; Food safety update; Watermelon and Cantaloupe variety update, and a PARP topic Utilizing precision Agriculture. Dr. Ajay Nair from Iowa State University is an invited speaker. The detailed program is available at https://ag.purdue.edu/arp/swpap/Documents/SWIM%20agenda%202017%20final.pdf. Membership for the Southwest Indiana Melon and Vegetable Growers Association is $15 per person and will be collected at the time of registration. Membership fee includes lunch on March 10 and also dinner at the winter technical meeting. Private Applicator Recertification Program credits will be available for an additional $10 per person and will be collected at the end of PARP session. Please RSVP to this meeting no later than March 1, 2017 by calling the Southwest Purdue Ag Center at 812-886-0198 or email joynerb@purdue.edu

Starlight Vegetable Growers Meeting

The annual Starlight Area Vegetable Growers Meeting will be held on Thursday, March 16, 2017, 6:00 pm to 9:00 pm (EST) at the Joe Huber Family Farm and Restaurant, 2421 Engle Road, Starlight, IN. This year's topics include Beneficial insects; Pumpkin insect management; Use and calibration of a backpack sprayer; and Drift watch. Private Applicator Recertification Program credits will be available for $10 per person. CCH will be given for Category 1, 3A and RT. Participants please register with Floyd County Extension Office at 812-948-5470. For more information please contact Gina Anderson at gmanders@purdue.edu

Michiana Vegetable & Fruit Growers Meeting

Purdue Extension and Michigan State University Extension services are hosting a daylong event that runs from 8:00 am to 4:00 pm on March 21, 2017, at the Elkhart County 4-H Fairgrounds, 17746 County Road 34, Goshen, Indiana. Topics include: Marketing; Understanding soil test; Nutrient management; Insect management in fruits and vegetables; Greenhouse and high tunnel management; Tomato and cucurbit disease management. The registration fee is $30. PARP credits are available for an additional $10. Registration dealine is March 14. To access the complete agenda and registration, go to https://extension.purdue.edu/Kosciusko/Pages/article.aspx?intItemID=23932 For more information, contact John Woodmansee at jwoodman@purdue.edu

Hydroponic Lettuce Production Workshop

The department of Horticulture and Landscape Architecture is hosting a Hydroponic Lettuce Production Workshop on Wednesday, March 29, 2017, 8:30 am to 11:30 am (EST) in room 222, Horticulture Building at Purdue University. Topics include: Most common mistakes made during hydroponic lettuce production (Petrus Langenhoven); Nutrition, temperature and supplemental lighting for hydroponic lettuce production (Krishna Nemali); Market access (Jodee Ellett), and Tour of hydroponic lettuce research at HLA (Krishna Nemali and Petrus Langenhoven). The workshop is free, please RSVP no later than March 1, 2017 by contacting Lori Jolly-Brown (ljollybr@purdue.edu). For More information, please contact Petrus Langenhoven (plangenh@purdue.edu) or Krishna Nemali (knemali@purdue.edu).

Horticultural Business and Marketing Symposium

The symposium will be held on February 23, 2017, 7:45 am to 4:45 pm (EST) at Discovery Hall, Indiana State Fairgrounds, Suite 201, 1202 East 38th Street, Indianapolis, IN. Potential audience members of the symposium are horticultural businesses who are selling directly to customers or doing direct selling to farmers' markets, restaurants, homeowners, etc. The symposium will offer marketing training ranging from the use of social media, risk management, conflict resolution, business coaching and differentiation strategies. Pre-registration (before Feb. 9) is $110, onsite registration is $150. Please contact Lori Jolly-Brown at ljollybr@purdue.edu or 765-494-1296 for registration. More information and event flyer is available at https://extension.purdue.edu/pages/event.aspx?intEventID=13545&ED=22533

2017 Indiana Farmers Market Forum

The 2017 Indiana Farmers Market Forum will be held on Wednesday, March 1, 2017, 8:30 am to 3:30 pm (EST) at the Hendricks County Fairgrounds Conference Center, 1900 Main Street, Danville, IN. Indiana will also host a SNAP sign-up event during the Forum for markets and farmers who are interested in becoming an authorized SNAP retailer. More information about the Forum is available at https://www.purdue.edu/dffs/localfood/2017/01/26/fmforum/

2017 Small Farms Winter Webinar Series of University of Illinois

University of Illinois Extension presents a weekly educational series for the small farm community. All the webinars are free and are recorded. Topics might interest vegetable growers include ABC of Strawberry Plasticulture Production (Jan. 19); Small Commercial Microgreen Production (Feb. 6); Food Safety Needs for Midwest Produce Growers (Feb. 23); Benefits of Mulching Vegetables (Mar. 23); Soil Management for High Tunnels (Mar. 30). Information about registration and the list of topics can be found at https://web.extension.illinois.edu/registration/?RegistrationID=15522 All the webinars are or will be available at http://www.youtube.com/c/IllinoisLocalFoods

Direct Marketing Webinars of the Ohio State University

Ohio Direct Marketing Team is hosting monthly webinars on various topics related to direct marketing. All the webinars are free and are recorded. Topics might interest vegetable growers include Social Media Strategies for Small Farms (Jan. 19); Organic, Naturally Grown, Chemical Free What do These Mean? (Jun. 15); Marketing Your Farmers' Market (Sep. 21); Getting Market Ready for Wholesale (Nov. 16) and more. The list of topics and webinar date can be found at https://southcenters.osu.edu/marketing/direct-marketing-webinars

eOrganic Webinars

eOrganic provides a series of great webinars in organic farming practices and research. The upcoming webinars that might interest vegetable farmers include Integrated Clubroot Management for Brassica Crops (Feb. 15); Tomato Varietal Improvement (Mar. 7); Using Biofungicides, Biostimulants and Boifertilizers to Boost Crop Productivity and Help Manage Vegetable Diseases (Mar. 30); Use of High Glucosinolate Mustard as an Organic Biofumigant in Vegetable Crops (Apr. 11). Registration and more information about the webinar series are available at http://articles.extension.org/pages/25242/webinars-by-eorganic

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Editor: Wenjing Guan | Department of Horticulture and Landscape Architecture, 625 Agriculture Mall Dr., West Lafayette, IN 47907 | (812) 886-0198

2017 Vegetable Crops Hotline Subscription Form

The *Vegetable Crops Hotline* newsletter provides the commercial vegetable grower with timely information about disease, insect and weed pests, fertility practices, post-harvest problems, pesticide label changes, meetings and much more. Each year, the *Hotline* is published 12 times during the growing season (April - September) with off-season issues in February, March and October.

In addition to the regularly scheduled issues of the *Hotline*, subscribers will be emailed articles published between issues about pressing matters. Growers may also use this form to sign-up for Veggie Texts. These texts, which will be of 160 characters or less, will deliver critical information to mobile phone numbers or email addresses.

Indiana Vegetable Growers Association members are automatically signed up for the *Vegetable Crops Hotline* at no additional charge.

Yes, I would like to subscribe to the 2017 *Vegetable Crops Hotline*. Enclosed is a $15 check made payable to **Purdue University.**

Mail to: Vegetable Crops Hotline Subscription
Southwest Purdue Ag Program
4369 North Purdue Road
Vincennes, IN 47591

******* (Please complete the following) *******

Name: _____

Address: _____

City:_____State:_____Zip Code: _____

Phone:_____(home) and/or_____(work)

____ **Yes, I would like to receive Veggie Texts.** Please provide your cell phone number and provider or an email address:

Cell Phone: _____

Carrier: (eg: Verizon, AT&T) _____

Email address: _____

If you would like to receive free email notification when ***Vegetable Crops Hotline Issues*** are published online, please give us your email address or visit **lists.purdue.edu/mailman/listinfo/vch** to sign up: E-Mail address: _____

Indiana Vegetable Growers Association

Membership Renewal/Application

Benefits of IVGA Membership:

- Midwest Vegetable Production Guide for Commercial Growers, (ID-56) (new edition usually available in Jan.)
- Vegetable Crops Hotline subscription
- Listing in IVGA Directory of Wholesale Vegetable Producers (optional)
- Your web site linked on www.ivga.org
- Corporate members: logo included on corporate members page at www.ivga.org
- Network with other vegetable growers
- Support education and research to improve vegetable production and marketing in Indiana

To renew or join, correct or fill out the form below and send in with your check payable to IVGA. Memberships run January - December. If you have already renewed for the current year, but haven't provided the information requested below, please check here ___, and complete and return this form so we have your current information.

Your contact information below will be printed in the membership directory that is sent to members only. It will also be used to mail you the Vegetable Crops Hotline, to fax or e-mail the Hotline Bulletin, and for IVGA correspondence.

Name: _____

Company: _____

Address: _____

City, State, Zip: _____

Tel: _____ Fax: _____

Email: _____

Web: _____

ID-56 Delivery: Where will you pick up your copy of the ID-56 or should we mail it to you?

___IHC (Indiana Hort Congress),
___IVGS (Illiana Veg Growers Symposium)
___SW Ind. Melon and Veg. Meeting
___Starlight Veg Meeting
___Please send by mail
___I do not want a copy of the ID-56

Would you like to receive **free subscriptions** to trade magazines that may be offered to IVGA members?

___Yes ___No

Check here if you want to receive the **Vegetable Crops Hotline by Email ONLY** (no hard copy) ___

Membership Type:

___Regular, $40.00/year
___Industry/Corporate, $80.00/year

Make check payable to:

Indiana Vegetable Growers Association (IVGA).
Return to:
Indiana Vegetable Growers Association c/o Maynard
PO Box 1321
Valparaiso, IN 46384-1321

The IVGA Directory of Wholesale Vegetable Producers will be updated periodically.

___Check here to be included in the directory.
___Check here if information has not changed since previous year OR provide information below.

Contact information for Wholesale Directory, if different from elsewhere on this form:

Name:_____

Company:_____

Address: _____

City, State, Zip:_____

Tel: _____Fax: _____

Email: _____

The wholesale directory is available to anyone who requests it and will be posted on the web. Indicate quantity of each item: S=small quantities; X=wholesale quantities; T=semi truckload quantities.

__apples
__asparagus
__beet
__black- or raspberries
__broccoli
__cabbage
__cantaloupe
__carrot
__cauliflower
__chrysanthemums
__daylilies
__greens (collards, mustard, turnip)
__corn, stalks
__corn, ornamental
__cucumber
__eggplant
__gourds, ornamental
__herbs
__kale
__lettuce
__onions, bulb
__onions, green
__peaches
__peppers, bell
__peppers, hot
__potatoes
__pumpkin
__pumpkin, mini
__radishes
__snap_bean
__spinach or chard
__squash, summer
__squash, winter
__strawberries
__sweet corn, bicolor
__sweet corn, white
__sweet corn, yellow
__tomatillo
__tomato
__turnips
__watermelon

Office Use Only: Check no._____ Check Date_____ Date Rec'd._____ Rec'd. by _____