# VEGETABLE CROPS HOTLINE

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

Issue: 629
June 8, 2017

In This Issue



## White Mold of Vegetables

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

White mold has a large host range including tomatoes (where it may be referred to as timber rot), cucumbers, lettuce and snap beans as well as many more. In this article, I will concentrate on white mold on tomatoes in a greenhouse situation. Although white mold will occur in a field situation, this disease is more common in a greenhouse due to the higher relative humidity than in a field situation.

Perhaps the most common symptom of white mold of tomato is the light brown area on the lower stem (Figure 1 and 2). This brown area is essentially dead and will result in the wilt and death of the plant above that point. Either on the outside of this dead area or inside the stem, dark, irregularly shaped fungal bodies can usually be found. These fungal bodies (known as sclerotia) are diagnostic of white mold.

Figure 1. White mold or timber rot of tomato

causes a light brown area on the stem and a wilt of the plant.

Figure 2. The stem and small fruit of a cucumber plant after incubation in a plastic bag with a wet paper towel. Note dark fungal bodies known as sclerotia.

Recently, I had a complaint of severe white mold of tomato in a high tunnel. The grower reported that white mold of lettuce was found in the field last year about 50 feet from the high tunnel. The grower wanted to know how the white mold made its way from last year's lettuce to this year's tomatoes.

The fungus that causes white mold survives from year to year by the sclerotia that drop to the soil. Most likely, sclerotia dropped to the soil in the lettuce field. These fungal bodies then produced very small mushrooms this spring. The spores from this mushroom can drift in the wind as much as 300 feet. When the spores land on a leaf or flower petal, they may survive for several weeks. Successful infections tend to result from spores that land on old senescent tissue such as flower petals or older leaves.

It is possible that soil from the lettuce field was tracked into the high tunnel. If the soil included sclerotia, then a small mushroom could have been produced. (The mushrooms that are produced from sclerotia are very small and unlikely to be observed).

Anything that can be done to minimize relative humidity and leaf moisture will help reduce the severity of white mold. Therefore, vent the greenhouse in the evening (if possible) and space the tomato plants far enough apart to allow air circulation. A good rule of thumb is to leave 5 feet between rows and 20 inches between determinant tomato plants.

A biological control is available for white mold. The product, known as Contans®, has an active ingredient that is a fungus that parasitizes the white mold fungus. Contans® is usually added to

the soil the fall before planting.  In the case described above, If Contans® had been added to the lettuce field in the fall, the sclerotia may have been prevented from forming mushrooms. However, the mushrooms were produced in an area that didn't receive Contains®, then there would have been no control. It may not be effective for greenhouse growers to treat the ground in a greenhouse with Contans if the spores are coming in from outside. For more information about Contans®, read the label and/or see the *Midwest Vegetable Production Guide for Commercial Growers 2017,* also known as the ID-56 **mwveguide.org**.

Another strategy for minimizing the severity of white mold is to keep an area around the greenhouse free from weeds. At the Southwest Purdue Agriculture Center (SWPAC) we have spread gravel for at least 50 feet in all directions from our high tunnels. Under the gravel, we have placed a weed barrier. I believe that this practice has helped to reduce white mold in our tunnels. However, we still observe white mold.

At SWPAC, in order to minimize disease, use weed barrier between rows. Diseased plant residue (such as tomato stems with sclerotia), if it does fall to the ground, can easily be swept up and discarded well away from any crop production area.

Products that may be applied to the foliage for control of white mold of tomato are limited. Actinovate AG® is listed in the ID-56 and may be applied in the greenhouse. Cabrio EG® and Priaxor® are listed for white mold of tomato, but may not be used in the greenhouse.

## Add Shade to High Tunnels

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

Tomatoes growing in high tunnels are in the middle of or close to harvest. Developing and maturing fruit are under leaf canopies. On the top of the plants, many flowers are still blooming. These flowers will contribute to the second big harvest. Although tomatoes in June are most valuable, we certainly appreciate big, red and delicious tomatoes in July and August.  To ensure a sustained yield, it is important for these flowers to set fruit. The process of fruit set is very sensitive to excessively high temperatures. When temperatures rise above 100°F, even just for a few hours for a handful of days, tomato flowers may be aborted and fruit set fail. Night temperatures above 75°F may also cause tomato fruit set failure. In addition to fruit set, high temperatures affect fruit ripening process. Ethylene associated ripening decreases markedly at a temperature above 93°F. As a result, there might be an increasing number of yellow-shoulder tomatoes.

Because of the negative effects of high temperature on excessive-heat-sensitive crops, for example, tomatoes, it is reasonable for Indiana growers to consider adding shade to high tunnels. In general, growers have two options, shade cloth (Figure 1) and shade paint. Black shade cloth is the most commonly used shade materials in our region. It comes with different percentages, which indicates the percentage of light blocked by the shade. For example, the definition of 40% shade is that 60% of light can pass through it. In general, 30% shade is the most common recommendations for growing vegetables. It should be noted that the percentages do not directly translate to heat reduction. In a comparison of high tunnels with and without a 30% black shade cloth, we found the 30% shade cloth reduced the temperature from 119°F to 109°F in a sunny day but with little effects on night temperatures. An alternative option is reflective shade clothes. Reflective shade cloth might be white or aluminet shade clothes. They may provide addition cooling effects during the days because they tend to reflect the sun energy instead of blocking and absorbing it. Shade cloth with other colors are also available; they are used to grow specific crops by filtering different wavelengths of light.

Figure 1. A 30% black shade cloth was added to one of the high tunnels at SWPAC

Shade paint is another option some growers prefer. It is a liquid designed to spray on the outside of high tunnels or greenhouses. A commonly used product is called Kool Ray Liquid Shade®. It is normally applied in the early summer, and slowly weathers off. Manufacturers recommend different dilution rates to vary the light blocking effect. Shade paint is easy to apply and there is no need to take it off. Using shade paint also avoids the problem of having shade cloth moving around in the wind. Regarding cost, using shade paint to cover a high tunnel in one year is cheaper than purchasing shade clothes. However, it should be pointed out that shade cloth can be used for more than 10 years with good protection while shade paint needs to be purchased every year.

## Taking Care of Plant Nutrition in Your High Tunnel – Water Soluble Fertilizer Calculations

*(Petrus Langenhoven, plangenh@purdue.edu, (765) 496-7955)*

Every grower will have to do some basic calculations when mixing a nutrient solution. Understanding some of the calculations will help you to apply the correct concentration of a nutrient or determine the concentrations of a combination of nutrients applied. In the previous article *Taking Care of Plant Nutrition in Your High Tunnel-Water Hardness and the Removal of Unwanted Ions*, we have discussed how to manage hard water, and

unwanted high concentrations of sodium, chloride, iron, manganese and sulfur.

Growers have different nutrient solution mixing and application options. Depending on the size of your high tunnel or greenhouse operation and the sophistication level of your nutrient solution application system, you might decide to use a single-bag mix (contains all needed elements), a two-bag mix (Tank A-calcium and iron, and half of potassium nitrate; Tank B-all other elements including phosphates and sulfates), or an individual element mix (individual compound fertilizers). The one-bag mix allows the grower to pick a desired concentration and measure out the exact amount of fertilizer needed. With the two-bag mix, the grower can make-up stock solution tanks at a much higher concentration and then directly inject it at the desired rate into the main water supply line. When making use of individual elements to mix your nutrient solution, a high level of technology is required to inject the exact amounts of fertilizer. All of these actions require some calculations. In this issue, we will discuss some of the basic calculations made.

**Water Soluble Fertilizer** – The number on the bag indicates the percentage of each nutrient in it e.g. a 5-11-26 fertilizer contains 5% nitrogen, 11% phosphate and 20% potash. Recommendations are usually given in ppm (parts per million) of a specific fertilizer nutrient or in pounds and ounces (weight basis) of a formulation per 100 gallons of water. The manufacturer's label provides a guaranteed analysis (%) with an indication of what the blend is derived from. It will also provide a summary chart of all elements (ppm) present in the blend. Recommendations on a weight bases do not readily present a specific fertilizer nutrient concentration. However, recommendations based on parts per million (ppm) specify the exact concentration of a specific fertilizer nutrient concentration. Preparation based on ppm take into account that different fertilizers have different nitrogen, phosphorus and potassium concentrations.

**Useful Conversions Factors for Calculations**

$K_2O$ = 83% actual potassium (1 ounce of $K_2O$ = 0.83 ounces of K)

$P_2O_5$ = 44% actual phosphorus (1 ounce of $P_2O_5$ = 0.44 ounces of P)

1 gal. = 3.78 liters

1 oz. = 28.35 grams

1 tablespoon = 3 teaspoons

1 once = 3 tablespoons (dry)

1 ounce = 9 teaspoons (dry)

1 pound = 16 oz. (dry)

**Weight Basis Calculation**

**Scenario 1:** A grower receives a recommendation to apply 5-11-26 water-soluble fertilizer to a final concentration of 16 oz per 100 gallons of water.

**Question:** How much fertilizer should be mixed in a 25-gallon stock tank if an injector with a 1:30 injection rati444o will be used?

**Things You Need to Know:**

- Recommended fertilizer application rate: **16 oz per 100 gal.**
- Fertilizer formulation and analysis: **5-11-26**
- Injection ratio: **1:30**
- Size of stock tank in gallons: **25 gal.**

**Step 1:** Adjust the rate for the stock tank size using the following equation

**Equation:** oz per 100 gal. ÷ (100 gal. ÷ stock tank size) = oz fertilizer per stock tank size

**Answer:** 16 oz per 100 gal. ÷ (100 gal. ÷ 25 gal.) = **4 oz** of 5 – 11- 26 per 25 gal. water

**Step 2:** Adjust the rate for the 1:30 injection ratio (injector will proportion 1 gal. of fertilizer concentrate into every 30 gal. of water).

**Equation:** oz per stock tank size x injector ratio = oz per stock tank using injector

**Answer:** 4 oz per 25 gal. x 30 = 120 oz per 25 gal. water using a 1 : 30 injection ratio

**Parts per Million Calculation**

**Scenario 2:** A grower receives a recommendation to apply 150 ppm nitrogen using 5-11-26 water-soluble fertilizer.

**Question:** How much fertilizer should be mixed in a 50-gallon stock tank if an injector with a 1:100 injection ratio will be used?

**Things You Need to Know:**

- Recommended fertilizer application rate: **150 ppm nitrogen**
- Fertilizer formulation and analysis: **5-11-26**
- Nitrogen in formulation: **5%** (can be presented as decimal fraction (df), 0.05)
- Injection ratio: **1:100**
- Size of stock tank: **50 gal.**

**Step 1:** Convert the ppm recommendation to a weight basis using the following equation.

**Equation:** desired ppm ÷ (df fertilizer nutrient x ***75***) = oz fertilier per 100 gal. water

**Answer:** 150 ppm ÷ (0.05 x **75**) = **40 oz** of 5 – 11 – 26 per 100 gal. water

***Where did the 75 come from in the equation?***

**The rule of 75**

1 ounce per 100 gallons = 75 ppm

**Where did this come from?**

One ounce (28.35 grams) of any pure dry substance that will dissolve 100% in a volume of 100 gallons of water equals 75 ppm

**1 ounce = 28.35 grams or 28,350 milligrams**
**28,350 milligrams ÷ 378 liters = 75 ppm**

(1gallon = 3.78 liters or 100 gallons = 378 liters)

**Step 2:** Adjust the rate for the stock tank size using the following equation.

**Equation:** oz per 100 gal. ÷ (100 gal. ÷ stock tank size) = oz fertilizer per stock tank size

**Answer:** 40 oz per 100 gal. ÷ (100 gal. ÷ 50 gal.) = **20 oz** of 5 – 11- 26 per 50 gal.

**Step 3:** Adjust the rate for a 1:100 injection ratio.

**Equation:** oz per 50 gal. x injector ratio = oz per stock tank using injector

**Answer:** 20 oz per 50 gal. x 100 = **2000 oz** per 50 gal. using a 1 : 100 injection ratio

**Step 4:** Convert ounces to pounds and ounces where, 16 oz = 1 pound (dry).

**Answer:** (2000 oz ÷ 16 oz) oz per 50 gal. = 125 lbs of 5 – 11 – 26 per 25 gal. for 150 ppm N

**How many ppm phosphorus and potassium will be applied with the 150 ppm N from the 5-11-26 fertilizer?**

**Phosphorus:**

oz fertilizer per 100 gal. x 75 x df fertilizer nutrient = ppm actual phosphorus

*40 oz × 75 × 0.11 $P_2O_5$ = 330 ppm $P_2O_5$*

For actual Phosphorus: $P_2O_5$ is 44% elemental phosphorus

*330 ppm $P_2O_5$ × 0.44 = 145.2 ppm actual phosphorus*

**Potassium:**

oz fertilizer per 100 gal. x 75 x df fertilizer nutrient = ppm actual potassium

*40 oz × 75 × 0.26 $K_2O$ = 780 ppm $K_2O$*

For actual Potassium: $K_2O$ is 83 elemental potassium

*780 ppm $K_2O$ × 0.83 = 647.4 ppm actual potassium*

Finally, the solution will consist of 150 ppm N, 145.2 ppm P, and 647.4 ppm K.

**Ammonium and Nitrate Nitrogen Calculation**

The following figure illustrates a typical guaranteed analysis of a fertilizer product. From this analysis, we can determine how much ammonium and nitrate nitrogen is in the formulation.

**Equation:**

**% ammonium =** (% ammonium + % urea) ÷ % total N) x 100

% **nitrate** = (% nitrate ÷ % total N) x 100

**Answer:**

**% ammonium** = ((7.3 + 1.1) ÷ 21) x 100 = **40**

% **nitrate** = (12.6 ÷ 21) x 100 = **60**

**GUARANTEED ANALYSIS 21-5-20**

Total nitrogen (N) . . . . . 21%
7.3% ammoniacal nitrogen
12.6% nitrate nitrogen
1.1% urea nitrogen
Available phosphate ($P_2O_5$) . . . . . 5%
Soluble potash ($K_2O$) . . . . . 20%
Boron (B) . . . . . 0.0262%
Copper (Cu) . . . . . 0.0262%
0.0262% water soluble copper (Cu)
Iron (Fe) . . . . . 0.105%
0.105% chelated iron (Fe)
Manganese (Mn) . . . . . 0.0525%
0.0525% water soluble manganese (Mn)
Molybdenum (Mo) . . . . . 0.0105%
Zinc (Zn) . . . . . 0.0525%
0.0525% water soluble zinc (Zn)

**Derived from**: Ammonium Nitrate, Ammonium Phosphate, Potassium Nitrate, Urea Phosphate, Boric Acid, Copper Sulfate, Iron EDTA, Manganese Sulfate, Ammonium Molybdate, Zinc Sulfate

The percent ammonium versus nitrate nitrogen in the solution is very useful to know especially if you would like to manage soilless substrate pH, the pH of a recirculating nutrient solution, or if you grow an ammonium sensitive crop.

**Potential Acidity and Basicity**

The potential acidity and basicity information will also typically appear under 'Product Properties' on the 'Product Analysis' sheet.

**Product 1:** The potential acidity (to neutralize acidity produced by fertilizer) of the fertilizer product below is high and indicates that a likely **DECREASE** in substrate pH will occur. Note that all nitrogen is applied as ammonium nitrogen.

**GUARANTEED ANALYSIS 21-7-7**

Total nitrogen (N) . . . . . 21%
10.4% ammoniacal nitrogen
10.6% urea nitrogen

**PRODUCT PROPERTIES**

Potential Acidity . . . . . 1518 lbs calcium carbonate equivalent per ton
Conductivity of 100 ppm N . . . . . 0.52 mmhos/cm
Maximum Solubility . . . . . 4 lbs/gal

**Product 2:** The potential basicity (limestone needed to equal the acid neutralizing power of the fertilizer) of this fertilizer product indicates that a likely **INCREASE** in substrate pH will occur. Note that this formulation contains about 79% nitrate nitrogen.

**GUARANTEED ANALYSIS 15-5-15**

Total nitrogen (N) . . . . . 15%
1.1% ammoniacal nitrogen
11.8% nitrate nitrogen
2.1% urea nitrogen

**PRODUCT PROPERTIES**

Potential Basicity . . . . . 131 lbs calcium carbonate equivalent per ton
Conductivity of 100 ppm N . . . . . 0.69 mmhos/cm
Maximum Solubility . . . . . 3 lbs/gal

Alternating fertilizers may help to stabilize substrate pH. It is recommended that the ammonium nitrogen content of a recirculating nutrient solution not exceed 10% of the total nitrogen content.

This is the third article in a 7 part series that look at soil fertility and nutrient solution management for high tunnels. In the next issue, we will concentrate on 'Fertilizer and Nutrient Solution Mixing Tips' and a few more calculations'.

## Service and Companion Animals at Direct-Market Venues

*(Scott Monroe, jsmonroe@purdue.edu, (812) 886-0198)* & *(Amanda Mosiman, bailey1@purdue.edu)*

Managing domestic animals in a direct market venue can be very challenging. While best practice is to exclude domestic animals from production and packing areas, produce may be exposed to domestic animals at the point of sale if selling at a produce auction or farmers market. When selling through a direct market venue, growers should take steps to exclude domestic animals from produce. This may mean appropriate signs discouraging or prohibiting pets or a designated area where buyers may tie-up their pets away from the display area.

Service animals present a special case. Service animals are protected by both the Americans with Disabilities Act (ADA) and Indiana Law. Under the ADA, a service animal is a dog that has been individually trained to perform tasks or do work for the benefit of a person with a disability. The tasks or work the animal does must be directly related to the person's disability. In some cases, a miniature horse may also qualify as a service animal under the ADA. Both the ADA and Indiana law state that owners of public buildings and businesses cannot deny access to service animals (although service animal owners may be required to pay for any damages caused by their animal).

According to Indiana Law, a service animal is an animal trained as:

- a guide animal (for example, a guide dog that assists a visually impaired person in navigation and travel)
- a hearing animal (such as a hearing dog, that alerts its handler to important noises, like the phone, doorbell, or alarm)
- an assistance animal (including an animal that pulls a wheelchair, pushes an elevator button, or retrieves items)
- a psychiatric assistance animal (such as an animal that interrupts self-destructive behavior, reminds its handler to take medication, or calms an anxiety attack with soothing pressure)
- a mobility animal (such as an animal that provides physical support and balance to its handler)
- a seizure alert animal (an animal that warns its handler of an impending seizure, and may also protect its handler during a seizure), and
- an autism service animal (which may interrupt self-harming behavior, or initiate calming touch for a handler who is anxious or agitated).

Neither the ADA nor Indiana's service animal law includes pets or "emotional support animals". Emotional support animals are those animals that provide a sense of safety, companionship, and comfort to those with psychiatric or emotional disabilities or conditions. Although these animals often have therapeutic benefits, they are not individually trained to perform specific tasks for their handlers. Unlike service animals, owners of public buildings and businesses are not required to allow access to emotional support animals.

According to the ADA, if it is not obvious what service an animal provides, only limited inquiries are allowed. The only two questions that can be asked are:

1. Is the animal a service animal required because of a disability?
2. What work or task has the animal been trained to perform?

It is illegal to ask about the person's disability, require medical documentation, require a special identification card or training documentation for the animal, or ask that the animal demonstrate its ability to perform the work or task.

Local health departments can be a useful resource. Remember that they may also have policies and regulations concerning domestic animals. Always contact the local health department to determine if additional regulations apply in your area.

Operators of direct market venues such as produce auctions or farmers markets should develop standard operating procedures (SOP's) that detail how domestic animals are to be managed. The SOP's should include definitions of domestic and service animals, steps that should be taken to limit interactions between domestic animals and produce, procedures for communicating with owners who bring animals to the market, and a plan for dealing with the occasional excrement left by animals.

Practical steps can also be taken to limit interaction of domestic animals with produce at the market. Displays can be elevated to exclude smaller animals. Produce can be set back several inches on display tables to limit exposure to larger animals. While these steps may not exclude animals from the area, they will make it more unlikely that animals will contaminate produce.

Growers and market managers who have questions concerning animals at the market should contact Scott Monroe (812-886-0198) or Amanda Deering (765-494-0512) for more information.

References:

ADA Indiana. 2017. Service Animals and the ADA. https://www.adaindiana.org/index.php?pageId=71 [Accessed 06/06/17].

NOLO Legal Encyclopedia. 2017. Indiana Laws on Service Dogs and Emotional Support Animals. http://www.nolo.com/legal-encyclopedia/indiana-laws-on-service-dogs-and-emotional-support-animals.html [Accessed 06/06/17].

# Upcoming Events

### Horticultural Business Webinar

The webinar featuring Advanced Influence and Sales Strategies will be held on June 20, 2017, 11:00 am-12:00 pm EDT. For more information: https://ag.purdue.edu/hla/Extension/nle/Pages/Horticultural-Business-and-Marketing-Symposium.aspx. To register: https://purdue.qualtrics.com/jfe/form/SV_bae0QfPySyoUt0x

### Indiana Fruit & Vegetable Field Tour

The tour will be held at Tuttle Orchards, 5717 North 300 West Greenfield IN 46140, June 28, 9:00 am -4:00 pm. On-site registration 9 am at Tuttle Orchard. Registration fee is $5 per person. For further questions contact Lori Jolly-Brown at ljollybr@purdue.edu or (765) 494-1296.


### Southwest Purdue Ag Center Field Day

Southwest Purdue Ag Center Field Day will be held on June 29, 2017 at Southwest Purdue Agricultural Center, Vincennes, IN.

The field day provides two choices of tours: Horticultural Crop Production and Agronomic Crop Production. The Horticultural Crop Production tour will feature Organic Tomato Production, High Tunnel Vegetable Production, Grape Research, Protecting Pollinators while Managing Insect Pests in Watermelon Production, and Produce Food Safety. A meal will accompany the tour with PARP classes available after lunch. Please contact Barb Joyner (joynerb@purdue.edu, (812) 886-0198) for registration, or register online at https://purdue.qualtrics.com/jfe/form/SV_0rICQrMVJmiMnqZ.

### Organic Vegetable Seed Production & Varietal Selection Workshop

The workshop will be conducted on August 22, 2017, 9:00 am – 3:00 pm. Daniel Turf Center, 1340 Cherry Ln, West Lafayette, IN, 47907. Topics include Seed biology fundamentals; Harvesting, processing, and storing seed; Population size and isolation requirements; Managing pathogens during seed production and after harvest; On-farm variety trialing and participatory breeding techniques. Registration fee is $15 including workshop and lunch. Register at http://tinyurl.com/y7da7dsh


### Beginning Farmer Tours and Workshops

Join Purdue's beginning farmer team for farm tours in 2017.

*June 15.* Clay Bottom Farm near Goshen, IN uses intensive growing methods to support a CSA program on less than an acre of land. Learn about their 'lean farm" approach to support a CSA, supply restaurants, and sell at farmers' markets.

*June 24.* Silverthorn Farm near Rossville, IN uses organic practices to produce a wide variety of fruits and vegetables. The tour will include a session on working with restaurants.

*September 11.* Two tours for the price of one! Tour Little Prairie Farms, a small acreage vegetable farm near Brookston, IN, and the Purdue Student Farm near West Lafayette to learn about farming practices and tools for small acreage farms.

*September 27.* Full Hand Farm is a diverse vegetable farm located near Noblesville, IN. The tour will include information on the use of high tunnels in vegetable production.

*October 2.* Aficionado Farms produces organically grown produce, herbs, and flowers near Elberfeld, IN. Learn about their farm and Farm to School programs.

More information about these tours are available at http://www.cvent.com/events/beginning-farmer-tours-and-workshops/event-summary-0f7526f0380a432788708b2f2edcf1e7.aspx

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

## Registration

**Registration Required!**

**Deadline - Monday, June 19, 2017.**

**Name**_____

**Organization**_____

**Address**_____

_____

**City**_____

**State**_____

**Zip**_____

**Phone**_____

**Email**_____

**Please list the names of those attending.**

_____

_____

**Please mark the tour of your choice.**

_____**Horticultural Crop Production**

_____**Agronomic Crop Production**

_____

Please check box if you require a vegetarian meal

☐ I require a vegetarian meal.

*For those participating in this program for PARP credit, you will need to bring your ID card and $10.00*

**Please mail registration to Barb Joyner at the address below, e-mail to joynerb@purdue.edu, call 812-886-0198 or register online at**

https://purdue.qualtrics.com/jfe/form/SV_0rICQrMVJmiMnqZ

**4369 N. Purdue Road**
**Vincennes, IN 47591**
**812-886-0198**

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**Pike County Farm Bureau**
**Regions Bank**
**Rubisco Seeds**
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**Stokes Seeds Inc.**

If you need a reasonable accommodation to participate in this program, prior to the meeting, contact Barb Joyner at 812-886-0198



# Southwest Purdue Agricultural Center

## Vincennes, IN

# Field Day

# June 29, 2017

8:30 a.m. Registration

*Featured Speaker - Lt. Governor Suzanne Crouch*

Noon - Health Fair

An educational morning packed full of valuable information while observing the research production techniques being conducted at the agriculture center by Purdue Specialists and educators.

*A meal will accompany the tour with PARP classes available after lunch.*

Health Fair provided by Good Samaritan Hospital.

**PARP credit will be available**

PURDUE UNIVERSITY

# Presentation Topics

## Horticultural Crop Tour

**Organic Tomato Production - Lori Hoagland & Dan Egel**

The Tomato Organic Management and Improvement project including foliar disease management of tomatoes will be discussed.

**High Tunnel Vegetable Production - Wenjing Guan & Petrus Langenhoven**

This presentation will discuss tomato, cucumber and melon production in high tunnels. You will learn about vegetable grafting techniques used on tomatoes and cucumbers and melon varieties adapted to high tunnel production.

**Grape Research - Bruce Bordelon**

The Purdue Wine Grape Team conducts research on wine and table grapes to support the rapidly growing wine industry of the state. Plots at SWPAC contain a number of new cultivars and advanced breeding lines to test their adaptation to Indiana's climate.

**Protecting Pollinators while Managing Insect Pests in Watermelon Production - Rick Foster**

Join us to learn what you can do to effectively manage insect pests while preserving pollinators in watermelon field production.

**Produce Food Safety - Scott Monroe**

This presentation will include an update on produce food safety research at SWPAC, as well as other research and extension activities.

## Agronomic Crop Tour

**The Potential of Hybrid Cottonwood as a Bioenergy Crop - Rick Meilan**

A discussion of our poplar species suitability and yield trial, including: 1) how it was established, 2) how the growth data is being used to develop a model for predicting biomass yield, and 3) how poplar wood can be used to produce a biofuel.

**Managing Nutrients for Sandy Soils of SW Indiana - Jim Camberato**

Proper fertility is critical when raising crops. Application rates and timing of N, S, Mg, Zn, and B will be discussed at this stop.

**Don't Forget Economics when Choosing Seeding Rates for Corn - Bob Nielsen**

The cost of corn seed is one of the largest variable input costs for Indiana corn growers. This stop will discuss results from research trials that have been ongoing since 2008 evaluating optimum seeding rates. They will likely be lower than what you expect.

**Winter Canola Production - Chuck Mansfield**

Winter canola is a high oil, cool season crop that fits well in cropping systems of the lower Midwest. At SWPAC, we conduct winter canola variety testing and applied research to fine-tune production practices for our region.

**Soybean Production - Shaun Casteel**

In Indiana, Knox County ranks in the top ten counties for soybean production. Discussion will be focused around Purdue research results that will address hot topics in 2017 soybean production.