

# Missouri Produce Growers Bulletin

*A joint publication of the University of Missouri and Lincoln University*

SPRING 2010

## WHO'S WHO

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## MINI CLINIC DATES/ LOCATIONS

Central MO Produce Auc	May 5th
North MO Produce Auc	May 11th
Clark Produce Auction	May 14th
Highway C Produce Auc	May 21st
4 County Produce Auc	May 25th
Bates & Vernon Counties	June 3rd

## Specialized Vegetable Activities for 2010

MU Extension has received support from the EPA Region 7 for 2010 to continue and enhance its specialized programming on IPM and vegetable producers selling at produce auctions. Lincoln University will continue to be a partner in Missouri, and Iowa State University is involved with four auction sites there.

Two rounds of 'mini clinics' will be held, one in the spring, and another mid summer. The clinics will focus on insect pest and disease topics as well as other relevant current production issues. Farm visits by specialists following the clinics are a key feature.

Other activities are a farm tour in late summer, with a feature of that tour being IPM tactics or techniques that some growers are

'trying' with support of the project. (support is receiving the growing supply of interest for free). What growers are trying varies with the different locations (see list to the lower left), but include plastic mulch, reduced risk



**Several growers have experimented with plastic mulch the last two years, including green, white on black, and fall applying. This year others are trying the corn starch based biodegradable black product.**

pesticides, floating row cover, insect traps for scouting, and pest resistant vegetable varieties (e.g. BT sweet corn).

For the 4 County Produce Auction, we have a grower using BT Sweet Corn and pheromone insect trapping to aide with corn earworm control. Biodegradable black plastic mulch is also being tried.

We'd also like to conduct a survey on typical pesticide uses for the most common vegetable crops/pests. So if you'd give us your mailing address this growing season to help out with that, we'd appreciate it.

**Special thanks to the EPA Region 7, Strategic Agricultural Initiative Program for another year of support.**

## LU's New Kid on the Block

Dr. Jaime Pinero started at Lincoln University this April. His position is as an IPM Specialist focused on vegetables and fruit crops. This is exciting because he will be available to be out in the field much more than MU or LU Extension has every had for horticulture in this capacity before.

Jaime is from Mexico where he received his BS in Agronomy. In 2005 Piñero earned a Ph.D. in Entomology from University of Massachusetts. He conducted two post-Doctoral projects: The first one was at the Swiss Federal Institute of Technology in Zurich Switzerland, and the second one

(2007-2010) in Hawaii, working on IPM in commercial papaya orchards. During his time in Hawaii, he actively promoted farmer's adoption of the novel detection and control tactics developed by the Hawaii Area-Wide Integrated Pest Management Program.

ALL ARTICLES BY  
JAMES QUINN UNLESS  
NOTED OTHERWISE

# Fertilizing Tomatoes

By Dave Trinklein

Tomatoes are heavy feeders, especially of nitrogen which is important for plant growth and high yields. About 40 to 50 percent of the total seasonal nitrogen can be applied at planting, With the remainder applied through the drip system over the course of the growing season. Additional nitrogen can be applied through the drip irrigation system at a rate of 8 to 10 pounds per acre per week, or

2.9 to 3.7 ounces per 1,000 square feet per week .

Foliar feeding of nitrogen, phosphorus and potassium is not effective relative to soil application of these major nutrients. Fertilizer nitrogen is available as nitrate or ammonium. Tomatoes respond favorably to nitrate nitrogen. Nitrate nitrogen is readily available to the plant and typically has low salt relative to ammonium fertilizers (ammonium nitrate, urea).

Choose nitrogen fertilizers low in salt because salt levels can accumulate in the soil in a high tunnel.

Many commercial high tunnel tomato growers choose to fertilize with calcium nitrate and then alternate weekly with a fertilizer high in potassium (4-18-38), particularly during fruit ripening.



Gummy stem blight of watermelons (pictured) or black rot is one disease whose management can be improved using Melcast

*"I cannot find any peer reviewed research publication to support this idea"-*  
Sanjun Gu

By Sanjun Gu

I've heard enough growers talking about high °Brix. The information received is that vegetables are more disease resistant if they have high °Brix. However, I cannot find any peer reviewed research publication to support this idea. °Brix is a measurement of the mass ratio of soluble solid (mostly sugar) to water in a liquid. A 15 °Brix solution roughly equals 15 grams of sugar dissolved in 85 grams of water. °Brix is the most

important index in viticulture for harvesting. For most vegetables, however, no similar criteria have been developed although we know it is closely related to fruit quality in watermelon, melons and tomatoes.

Perhaps most growers get the idea of high °Brix from the Acres monthly magazine which is not a peer-reviewed journal. Acres claims itself "A Voice for Eco-Agriculture". Also, there is a website [www.highbrixgardens.com](http://www.highbrixgardens.com) that specifically sells high °Brix. However, I believe that they misconnected food quality to disease resistance in plants. It was wrong or at least misleading to say "All disease is the results of a mineral deficiency". I do not intentionally explain in detail here, but the take home message is that there is no scientific evidence for the high °Brix theory. I

would recommend growers who have been doing foliage feeding of sugars, and perhaps calcium, to stop. Foliage feeding of sucrose to tomatoes doesn't even raise the °Brix level in plants. Actually, I was only able to dig out two papers talking about the responses of tomato plants to foliage feeding of sugars, which were published in 1948 and 1960 respectively. Both papers don't support foliage sugar feeding, at least for the raising °Brix purpose. The feeding might not hurt the plants significantly but most sugar will deposit on leaves, which encourages fungus growth and blocks light transmission that reduces photosynthesis.



Sooty mold can grow on tomato leaves sprayed with a sugar solution

# Top Ten IPM Tips for 0'10- Vegetable Insect Pests



1) Cucumber beetles emerge to feed on cucurbits anytime from the end of April until mid May. Use of a systemic insecticide drench (like Admire) will provide 3 to 4 weeks of protection. What is not appreciated is that the grubs of cucumber beetle also cause damage with their feeding on the roots. A systemic drench will afford some protection that a foliar product likely will not. Having an insecticide on the transplants from the beginning can aide against bacterial wilt, which the adults transmit. The striped one can arrive in dramatically large numbers and suddenly with a few

**Spotted cucumber beetles usually precede their striped cousin**

less numbers, if that is of any help.  
2) Maintain good weed control. It improves spray coverage to the crop, makes scouting easier, and reduces alternate habitat for the insect pest.  
3) Apply a broad spectrum pesticide as soon as 'tough to kill' insect pests (e.g. stink bugs and squash bugs) are noticed. You'll kill some of the adults, but maybe more importantly, you'll have product on the foliage that will kill the nymphs which will shortly hatch. Some of these adults you are seeing are overwintered females and are active-

hot days, so timing a preventative application to 'just before needed' can be tricky. The spotted ones usually show up a bit earlier and in

ly laying eggs.

4) Review how you might scout or monitor for insects pests in a more effective fashion. Some growers are using corn earworm and stink bug traps to better time their pesticide applications. Use of sentinel plants like Turk Turban can be an effective scouting method for cucurbits. Remember to scout at the right time of the day, in the right weather conditions (e.g. dry and warm times).

5) Apply insecticides in a way to protect pollinators as best possible. Late evening is preferred. Use products with less harmful residue. Establish a buffer area around hives and don't apply product upwind.

**"Honeybees have been suffering serious losses recently; native pollinators are being considered to fill their niche with some horticulture crop systems."**

## (continued) Top Ten IPM Tips for 0'10- Diseases

6) Cucurbits-Rotate your fungicides between groups. While diseases resistant to common fungicides have not been reported in this area, it is always possible. Both SW Indiana and SE Missouri have resistant problems (see photo and caption). Do you understand the MOA code (Mode of Action)? Can you find it on the label or another resource? Have you evaluated your disease control program with this in mind?

7) Tomatoes- Can you tell the difference between Early Blight and Septoria, our two most common fungal diseases? Can you tell the difference between these and Bacterial Spot (or Speck), our two most common bacterial diseases? Foliar diseases have been a struggle the last

two years because of the rainy and cool weather. Do you have your disease control program ready? Have you reviewed the latest production guide for any new products? Unfortunately there are none for bacterial problems, but have you reviewed Table 22 recently to see if you're doing all you can with cultural management strategies?  
8) Keeping up the nutrition of the crops reduces crop stress and lessens disease problems (e.g. Fusarium wilt). Consider a plant tissue analysis for complete information when a problem develops that is unusual. (did you have your soil tested and did you put down preplant fertilizers accordingly?)

9) Note the disease resistance of the different varieties you have

planted. Pay special attention to those 'without resistance' when scouting for diseases. A disease will likely first appear on the varieties lacking resistance.  
10) Be aware of the 'unusual' and follow up on your suspicions, should it occur. As mentioned adjacently, fungicide resistance has occurred. Late blight flared on tomatoes and potatoes in the NE US this past summer for the 1st time in years. Lastly, we have had occurrences of bacterial canker and some similar diseases not common in Missouri.



**Fungicide resistance has occurred in Indiana's premier melon region recently to powdery mildew and gummy stem blight.**

UNIVERSITY OF MISSOURI

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**Greene County is part of MU Extension's Southwest Region**

IPM is a systematic science-based approach to solving pest problems that provides pest management strategies through all appropriate control methods (both chemical and non-chemical) to keep pest populations below economically damaging levels while minimizing detrimental impacts to the environment. IPM utilizes knowledge about insects, weeds and diseases to provide an effective strategy for managing pests in all arenas. This includes agricultural, residential, public areas and wild lands.

**The 5 steps for effective IPM– 1) Identify pest and their damage; 2) Regularly monitor primary pests; 3) Determine economic threshold; 4) Chose best management tactic & 5) Go back to evaluate it.**



## Your local specialist can help you, but now for the bad news.....

**MU's Plant Diagnostic Clinic will be closed for this year's growing season.** Why? The clinic's former director (Simeon Wright) has taken another job, and the search is on for his replacement. Unfortunately this is expected to take until September before the clinic is ready to go again. Simeon was highly regarded by the extension specialists out in the counties for being timely, professional and straightforward with his responses. Good luck to whoever is coming in behind him!

We appreciate and understand that many growers rely on visits from their local specialist to aide them in correctly diagnosing an insect pest or disease, or some other complicating factor. This does not change for the growing season. And for the majority of these type of visits/situations, addi-

tional diagnostic work is not necessary.



**The picture shows some newly set tomatoes in a high tunnel. Some are stunted and wilted (some died) and healthy ones are in the background. Pythium root rot was diagnosed, aggravated by a high salt level at one end of the tunnel.**

However, some do take additional diagnostic work (note the photo and caption). For this year, we're suggesting you submit to Iowa State University (ISU), a partner on this project (see lead article on front page). Since your sample is not part of MU's services, you'll have to submit directly to their clinic. Your local specialist can assist by printing off their submission form and other information needed to send your sample in correctly. Their contact information is:

ISU Plant and Insect Diagnostic Clinic  
327 Bessey Hall  
Ames, IA 50010  
pidc@iastate.edu  
515/294-0581  
<http://www.ent.iastate.edu/pidc/>  
Standard charge is \$20.