Missouri Produce Growers Bulletin

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WHO'S WHO

James Quinn
Bulletin Editor
MU Horticulture
573-634-2824
QuinnJa@Missouri.edu

Sanjun Gu State
Vegetable Specialist
LU Extension
573-681-5524
Sanjun.Gu@LincolnU.edu

Dave Trinklein State
Floriculture Specialist
MU Extension
573-882-9631
TrinkleinD@Missouri.edu

Jaime Pinero State
IPM Specialist
LU Extension
573-681-5522
PineroJ@LincolnU.edu

MU county offices, specialist& phone

Daviess— Tim Baker
660-663-3232

Greene— Pat Byers
417-881-8909

Harrison- H. Benedict
660-425-6434

Henry— Travis Harper
660-885-5556

Morgan— Joni Harper
573-378-5358

Vernon— Pat Miller
417-448-2560

Webster— Bob Schultheis 417-859-2044

The Drought of 2012 and Vegetable Production .....by James Quinn

I went to visit growers with Central and Clark Produce Auctions in late July/early August and was impressed to see vegetable production holding up fairly well. This was further verified by an article in Vegetable Growers News, titled 'Vegetables coming to market despite the drought'. The article summed it , saying if you had the water, the crops seemed to do well despite the heat.

With that overview, below are some observations by growers or MU specialists:

- If irrigation was provided, but limited, fruit size was smaller.
- Tomato blossom end rot was notably worse this year, as was fruit cracking.
- Dryland pumpkins have had very poor fruit set. Even irrigated pumpkins are less.
- Sweet corn was difficult to grow, even with irrigation; the systems for sweet corn are generally designed to supplement water, not provide it all.
- Green beans were difficult to grow for a 2nd year in a row.
- Tomato health overall
- Growers forced to supplement with county water are getting noticeably high water bills.
- Irrigation wells sources appear to have held up.
- Irrigation ponds are very low, but it seems they'll hold out. A few folks have pumped from two different ponds, or pumped one pond into another, or from a well, to get some extra water.
- Growers used the dry weather last year, and this year's to deepen and widen ponds. Please note the insert which may be helpful in providing guidance on deepening and enlarging existing ponds.

Greenhouse/High Tunnel Shading.....by David Trinklein

Light is the source of energy a green plant uses to sustain itself; without it, they cannot survive. Additionally, it often is the limiting factor in greenhouse produc-tion, especially during the winter months and into early spring. In most cases there is a direct correlation between the amount of light a plant receives and its growth and productivity. As spring progresses, however, the days lengthen and temperatures become warmer. It is at this time of the year when excess light actually can be detrimental to plant growth because of the heating affect it has in a structure such as a greenhouse or high tunnel.

Light is a form of radiant energy and, as such, brings with it an increase in temperature in the interior of a closed structure with a transparent cover. Most of us are familiar with the "greenhouse effect" in nature, currently being blamed for global warming. The term was borrowed from the greenhouse industry since it is well known that shorter, more energetic wavelengths of light penetrate the covering material of a greenhouse, strike an object, and are converted to longer, in-fared wavelengths that lack the energy needed to escape through the covering material. Instead, they cause the interior of the structure to become warmer.

In winter and early spring the greenhouse effect is welcome since it helps heat greenhouses and reduce fuel costs. In the late spring and summer we would rather avoid it since it causes temperatures to rise to levels that make many greenhouse species less productive than they would be at lower temperatures. Plant productivity can be expressed as the difference in rate between the processes of photosynthesis (the manufacture of food) and respiration (the usage of food manufactured). It has been well-established, that the optimum temperature for photosynthesis is considerable lower than that for respiration. Therefore, as temperatures increase above the optimum for photosynthesis less food is manufactured but more is consumed because of the increase in the rate of respiration.

Additionally, many species grown in greenhouses or high

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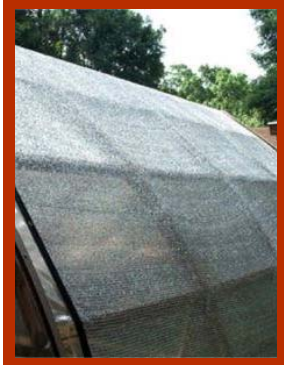
Shading (continued) .....by David Trinklein



This greenhouse is covered with an aluminized shade cloth, which has an added benefit of 'reflecting' solar heat. This reduces heat build-up that occurs at the top of a greenhouse underneath a black shade cloth. White shade cloth is also available and it also provides a similar heat reducing benefit.

tunnels (including tomato) are "light saturated" at levels about one-half the intensity of direct sunshine. The end result is the additional light cannot be used by the plant and actually begins to decrease its productivity because of the temperature increase that accompanies it. Other tomato disorders such as poor fruit-set, white core and yellow shoulder have been linked to high temperature stress.

Shading a greenhouse or high tunnel to exclude excess light is a management practice that helps to limit the rise of its interior temperature. In days-of-old, shading compounds such as white wash were applied to the structure's covering to limit the amount of light allowed to enter. Shading compounds were relatively inexpen-sive to apply, could be used on any covering material and structure, and reflected light outside the green-house before it entered and caused temperatures to rise. One disadvantage of shading compounds is the amount of light blocked tends to decrease during the summer as rain slowly washes it off. Newer types of shading compounds are a bit longer lived and usually require physical removal at summer's end.

Upon the arrival of the plastic age, shading compounds gave way to the use of shading fabrics (shade cloth) as a method of limiting the amount of light entering a greenhouse. Shade cloth is rated according to the percentage of light it blocks from passing through it. The later, in turn, is dictated by the tightness of the weave of the fabric. Shade cloth initially is more expensive than a single coat of shading compound but can be used for many years given proper care. Additionally, it can be applied in a fraction of the time needed to apply shading compounds.

Modern shade cloth is comprised of (usually) black polypropylene plastic strands either woven or knitted together to form a fabric. Woven shade cloth must be hemmed in order to keep it from fraying. Hemming can add significantly to the initial purchase price of a shade cloth panel. Knitted shade cloth does not need to be hemmed but some care must be taken not to stretch it out-of-shape for fear of reducing its sun-blocking ability. A newer type of shade cloth is comprised of polyethylene strips that have been laminated with aluminum. The aluminum tends to reflect the sun and the energy it contains whereas polypropylene blocks and absorbs it.

Two management decisions that must be made when using any type of artificial shade include: 1) what percent of the light intercepted by a structure should be blocked, and 2) when should the shade be applied? We will answer these questions using tomato as an example.

During the summer the sun's intensity can be as high as 8000 or 9000 foot candles (f.c.). Using the latter value as an extreme, tomato is light-saturated at half the sun's strength (about 4,500 f.c.). The covering material of a plastic greenhouse or high tunnel often blocks up to 20 percent of the light striking it depending on its age and clarity. Therefore, shade cloth that is rated at 30 percent blockage is a good choice for tomato growers. Together, the plastic covering and shade cloth should block 50 percent of the 9000 f.c., allowing the desired 4,500 f.c. to enter.

When to apply shade cloth is a bit more subjective. An unusually warm (early) spring would dictate an early application; the opposite would be true for a cool (late) spring. Applying shade before excess temperature becomes a problem can lower productivity. Generally, late May or early June is the time of the year many tomato growers apply shade to their structures. Depending on their cropping regimen, the shade usually is left in place until late September or early October when excessive temperatures are no longer a problem.

LU Hires an Extension Horticulture Plant Pathologist .....by Jaime Pinero

On October 15, 2012, Dr. Zelalem Mersha-Ayele will start working for Lincoln University (LU) as the Extension State Plant Pathology Specialist. His Extension responsibilities will include the development and delivery of research-based information including recommendations for the prevention and management of diseases affecting vegetables and small fruits throughout the state. This is a very much needed area of expertise for LU to expand and continue providing support to vegetable and small fruit farmers in Missouri. As soon as Dr. Mersha is on board we will inform readers of this IUPM Newsletter about trips that Dr. Mersha will conduct with Dr. Jaime Pinero, State IPM Specialist, to various regions of MO so that farmers meet him and provide him with input on the most relevant diseases that Dr. Mersha should focus on. Dr. Mersha is very interested in integrating disease prevention and management as part of an overall IPM scheme for increased and sustainable production of small fruits and vegetables.

GAPs and How Extension Can Assist You...by James Quinn

In the last issue of this newsletter I described the unanticipated wait for the proposed final rule of the Food Safety Modernization Act (FSMA) to be published. Not a lot of action or interest is occurring for produce auction growers during this time, but the voluntary component of this process is still going forward. And for this, there is an important role that extension can play, which I wanted to bring to your attention.

Some growers will decide to become GAP certified, even if they are not required to under the FSMA. They might do so because it will give them a marketing advantage, or they may sell directly to a large customer who requires it. *[If you need to get GAP certified to sell to your largest customer, you might say 'it is not voluntary', but it really is. You have right to find other customers and not sell to them anymore! However, most probably won't do that, instead deciding to comply to the customer's demands. This is what a number of Rich Hill growers have done, or are in the process of doing.]* In July I was contacted by a pumpkin grower in Central Missouri who made the decision to become GAPs certified during their harvest season.

This grower sells pie pumpkins to a major retailer who is now requesting GAP certification from their growers. Because the pumpkins are for pies or 'food', there was a desire (by the retailer) to demonstrate that food safety handling risks had been addressed. So the growers did their homework and were making preparations for an USDA inspection in the harvest season. Why wait until the harvest when it would be busier? In addition to field production they had a packing house with a washing and sorting line; there was no way to inspect this line until it was 'in use'. So their interest was having someone knowledgeable about the topic come and look through their paperwork and walk their facility beforehand to give them some tips and advice. Also to discuss some of the vagaries of the paperwork and calm their concerns. Was there anyone who could do this? The answer is 'yes' and this is a role that Extension can fill.

Most of the regional specialists listed to the side in this newsletter have received training on GAPs. If they haven't, they should be able to contact a specialist in your region who has. Extension is not regulatory like the Department of Ag or USDA; in Missouri we are strictly educational. As we get exposed to the GAP certification process and meet with growers, see fields and facilities, we will get better at understanding the process, what is important and what might be trivial. Once we have done a visit like this, and a grower is inspected, it will be good for us to hear the results- 'how it went'. We can then learn even more and pass some of that knowledge on to the next grower seeking assistance. If several growers close together are interested in GAPs certification, it would be beneficial for an Extension specialist to visit them in one trip; maybe they would even be able to go to each other's farms with that specialist and learn from those examples. We do have some resources (e.g. publications) that might be helpful. For my recent visit, I think a grower GAPs self-assessment booklet proved to be of value.

A few days after my visit I received this message:

Hello Jim, I wanted to thank you again for coming up and going over the food safety regulations/books with us. It was helpful, and I appreciate borrowing the USDA book as well. I haven't been able to talk to the USDA inspector since we visited, but hope to soon. Thanks again for your availability. (name withheld upon request)

We can also be discrete about the visit and keep what was discussed and your name/farm confidential.

IPM Related Announcements.....continued

Virus and Cucurbits

Four fields in the Rich Hill area tested positive viruses. All four had both Potyvirus group and Zucchini Yellow Mosaic virus. One field tested for a third, Papaya Ringspot Virus. Two of the viruses also occurred last year and were identified late season.

All three viruses are relatively common and transmitted by aphids. As aphid populations build up and successive plantings are made, the likelihood of the disease appearing increases. Early season incidents of the disease could be more destructive, as more plants would be likely to get infected.

Typical virus symptoms expressed by a zucchini this fall in WC MO.

Aster Yellows in Midwest Garlic

The dry spring is suspected of bringing in an early horde of leafhoppers, which then transmitted Aster Yellows to garlic (which is up very early). This disease is a minute bacterium termed 'Phytoplasma'. Most folks only noticed afflicted heads at or after harvest- small heads or ones that easily or quickly rotted. Any garlic head that is suspected of being affected should not be used as a source of planting cloves. The cloves are considered safe for human consumption

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We'd like to thank the following agency for their financial assistance with our outreach activities, such as this newsletter and travel costs associated with educational activities.

EPA Region 7 Strategic Agricultural Initiative 901 N. 5th Street
Kansas City, KS 66101
913-551-7003 or 800-223-0425

About this mailing list

You are being mailed this newsletter because you were involved in some type of MU Extension program recently. Names and addresses are only kept by your local specialist or James Quinn. They will not be shared with anyone else. If you would like to be removed please let me know-

James Quinn
Cole County Extension
2436 Tanner Bridge Road
Jefferson City, MO 65101

MU's Plant Diagnostic Clinic is not open this summer

IPM Related Announcements.....by James Quinn

Tomato Bacterial Canker Webinar Viewings

Tomato bacterial canker occurred in Ohio and Indiana this summer, as well as North, West and Central Missouri. This spurred Jaime Pinero of Lincoln University to organize presentations by plant pathologists from Ohio and Indiana on July 30th. Dan Egel from Purdue University covered the biology of the disease and Sally Miller of Ohio State University covered the prevention and control of it. These presentations were recorded and are available to be viewed. One sees the PowerPoint presentations and hears their recorded voices. Questions and answers during the presentation are also heard.

For the relatively few growers in the state that had some problem with this disease, viewing this 'webinar' is an excellent opportunity. This disease was more widespread in 2011; it is suspected as coming in on tomato seeds that year. In 2012 most farms that had the disease also had it the previous year, thus the occurrence of it this year is suspected as coming (primarily, if not entirely) from inoculum on the farm.

The dates and locations for scheduled viewings are as follows:

- Tuesday October 2nd (9 AM); Morgan County Seeds
- Thursday November 8th (9 AM); Morgan County Seeds
- Tuesday October 2nd (6 PM); North Missouri Produce Auction

Additional viewings can be scheduled if needed.

Endosulfan Phase Out

EPA is taking action to end the use of the pesticide endosulfan because it can pose unacceptable health risks to farmworkers and wildlife and can persist in the environment.

Effective July 31, 2012 the use of endosulfan was banned for most vegetable crops. The only crops it can be applied to are the 'Group E' vegetables.

Endosulfan is still allowed to be used until July 31, 2015 on the 'Group E' vegetable crops, which are:

- Peppers
- Potatoes
- Tomatoes
- Sweet corn
- Pumpkins
- Winter squash

What caught many growers' attention was a comment about it being banned on melons. It is also NOT allowed on two other Cucurbit crops- cucumbers and summer squash (zucchini). It is a bit confusing with it being banned on some Cucurbit crops but not others. It is a violation of federal law to apply it on crops for which it is banned.

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