Vegetable Crop Update

A newsletter for commercial potato and vegetable growers prepared by the University of Wisconsin-Madison vegetable research and extension specialists

No. 17 – July 18, 2012

In This Issue

Calendar of Events

July 24 – UW-Hancock Ag Research Station, Field Day, 12:30-4:00PM
August 2 – UW-Langlade County Ag Res Station Field Day Antigo, 1:00PM
October 24&25 – Hancock ARS-Storage Research Facility, Potato Variety Harvest Expo, 8AM-4:30PM

Vegetable Crop Update – A.J. Bussan, Professor, Department of Horticulture, UW-Madison, Phone: 608-225-6842, E-mail: ajbussan@wisc.edu.

Heat has continued and forecasts continue to indicate the warm weather will continue. Many parts of Wisconsin did catch some precipitation over the past 48 hours, but its impact will depend on the crop and the stage of development. Basic resources on the drought are available through extension at widrought2012.crowdmap.com.

Potatoes: We were delaying the newsletter so I could provide updates on the current status of the crop. Unfortunately, I just learned the bulking trials will not be harvested until tomorrow due to other activities. I will share information on stem and tuber numbers across varieties and average tuber size at Hancock Ag Research Station next week.

The crop was setting up to have good yields and quality. Reality is, I think we are still going to be in good shape, but productivity will depend on how the crop has responded to the heat and potential drought stress and the relative ability of the crop to continue bulking through the rest of the summer.

Many growers have passed on observations that different varieties of potatoes seem to be reacting differently to the heat. Some appear to be maintaining bulking rates relatively well while other crops have certainly slowed down. We do know that warm soil temperatures can decrease tuber bulking. This is in part due to reductions in starch synthesis in the tubers that leades to lower bulking rates as well as reductions in solid content or specific gravity.

The potato breeding program is participating in several screening trials with chip and processing potato lines from across the country. This summers climatic conditions should be a good test for

these lines to find potato cultivars that tolerate hot conditions and are able to maintain bulking rates and achieve good yields and quality while under stress.

We are also evaluating several management practices for trying to manage soil temperatures and wetting of the rooting zone again this summer. This includes evaluation of potatoes planted in beds as compared to hills and drip irrigation. Our previous research has shown lowering irrigation in drip systems by 15% (to 85% of ET) had no adverse effects on yield or quality in Gold Rush. This year we will see if we can lower watering even under adverse heat conditions in Snowden, Norkotah, and Burbanks.

Irrigation management has been critical for maintaining crop growth over the past month. You know that heat stress compounded with drought stress can multiply the negative impacts on the crops. Questions have been posed as to whether the heat is affecting irrigation. We have been pursuing this question to 1) determine if irrigation efficiency has been impacted and 2) if ET estimates for the crop are accurate.

Irrigation efficiency in Wisconsin is typically assumed to be at or near 100%. This assumption is derived from low water vapor potential in the irrigation water. Low vapor potential that typically occurs because our primary water source is groundwater which is approximately 50°F and high relative humidity over much of the summer. This year, relative humidity has been relatively low compared to other years which may be creating a higher water vapor potential for the irrigation water even though it is 30 to 40°F cooler than the air. This may lead to evaporation – especially during hot sunny days.

Some have asked if ET estimates are accurate and suspect the ET might be estimated lower than actually occurring. The ET calculations were done several decades ago at the Hancock Ag Research Station with lysimeters that could actually measure the evaporation and transpiration of the water from the soil by the crop over the course of the summer. We may in fact be estimating ET a little to low, but it would only by a couple 0.01 of an inch.

What to do? Reality is, irrigation needs to be ground truthed regularly. Go to the fields and check soil moisure in the crop rows and between the crop rows – especially in the top foot of soil. This should be done in addition to some type of scheduling tool to make sure your estimates of soil water balance are accurate. Make sure to check soil moisture in front of the irrigation system just prior to application of water and contrast areas of the field that were watered 60 minutes ago.

Processing vegetables: The recent showers could be a huge benefit if they fell on late planted fields of snap beans or sweet corn. Crops that are approaching tassel or bud stage in particular should benefit from this moisture.

Snap bean water use is typically between 6 and 7” per year. With a rooting systems of 24 to 36”, medium textured soils at or near field capacity at planting should hold around 60 to 70% of the moisture necessary for the crop to mature. However, this assumes minimal losses due to evaporation which could be high under the conditions we have had for much of the summer. These rains should help crops a great deal in early stages of reproductive growth.

Sweet corn water use is typically around 10 to 12” depending on the hybrid and the growing conditions. This estimate assumes minimual evaporation from the soil surface as well. Sweet corn will require 4 to 6” of precipitation to complete its maturity on medium textured soils. Nearly all the later planted crop should benefit a great deal from this moisture if good stands were established in the absence of any rainfall during June.

If fields fail to meet yield or quality specifications due to hot and dry weather and will not be harvested for canning, determine if the crop might have value for feed. There is great demand for feed in forage throughout the country and some crops might be salvageable for livestock feed if no pesticide applications were made that would prohibit this use.

Fresh Market Vegetables: Last week I talked a great deal about the effects of uneven watering or drought stress on crop quality. Throughout the southern parts of Wisconsin you might have received 1 to 2” of rain tonight. Crops growing under drought stress will likely benefit from this rain, but you might see some poor quality.

Drought conditions might have led to damage on the harvested portions of the crop such as the fruit of tomato, pepper, squash, melon, tubers of potato, or roots of carrot, beet, or onion. This rain will now lead to rapid growth of the fruit, tubers, roots, or other parts. However, the damage that occurred during the dry conditions will lead to weakening of the fruit, tubers, or roots and the rapid growth will cause these crops to split open or crack. I have purchased produce at farmers markets with growth cracks in tomato, cucumber, zucchini, potatoes, kohlabi, radish, beet, and even onion.

These recent rains are going to increase this issue on many vegetable crops. On fruiting vegetables this will be short lived, and the next flush of crop will have much improved quality, especially if the rains continue. Unfortunately, the damage to root crops and potatoes is likely going to be increased by this rain. If you have crops at marketable size of development you might consider harvesting and selling these crops before the growth crack appear.

Vegetable Disease Update – Amanda J. Gevens, Assistant Professor & Extension Vegetable Plant Pathologist, UW-Madison, Dept. of Plant Pathology, 608-890-3072 (office), Email: gevens@wisc.edu.

Vegetable Pathology Webpage: http://www.plantpath.wisc.edu/wivegdis/

Current P-Day (Early Blight) and Severity Value (Late Blight) Accumulations

Location	Planted	50% Emergence	P-Day Cumulative	DSV Cumulative	Calculation Date
Antigo Area	Early 5/1	5/30	325	20	7/16
	Mid 5/10	6/6	288	20	7/16
	Late 6/1	6/16	221	20	7/16
Grand Marsh Area	Early 4/3	5/8	468	14	7/16
	Mid 4/15	5/16	421	14	7/16
	Late 4/30	NA	366	13	7/16
Hancock Area	Early 4/1	5/1	527	15	7/16
	Mid 4/15	5/10	470	9	7/16
	Late 5/1	5/17	426	9	7/16
Plover Area	Early 4/3	5/17	480	18	7/16
	Mid 4/19	5/18	415	18	7/16
	Late 5/1	5/27	352	14	7/16

P-Days and Early Blight: All plantings of potatoes in Central WI and early planted potatoes in the Antigo area have P-Day values exceeding the threshold of 300 of this time. Mid and late plantings in the Antigo area are approaching the threshold. Fungicides for early blight control should be applied on all (with the exception of late planted potatoes in Northern WI) susceptible cultivars of potato at this time. An accumulation of 300 P-Day values indicates a time at which early blight is favored and first infection may occur.

DSVs and Late Blight: **All potato plantings in the Antigo area have exceeded the threshold with 20 DSVs. Earlier potato plantings in the Plover area have reached the DSV threshold of 18.** An accumulated DSV of 18 indicates time to initiate fungicide applications for late blight control. While it has been hot and dry, overhead irrigation coupled with microclimate effects of a closed canopy and cooler nights may promote prolonged periods of leaf wetness, favoring the promotion of late blight if the pathogen is present.

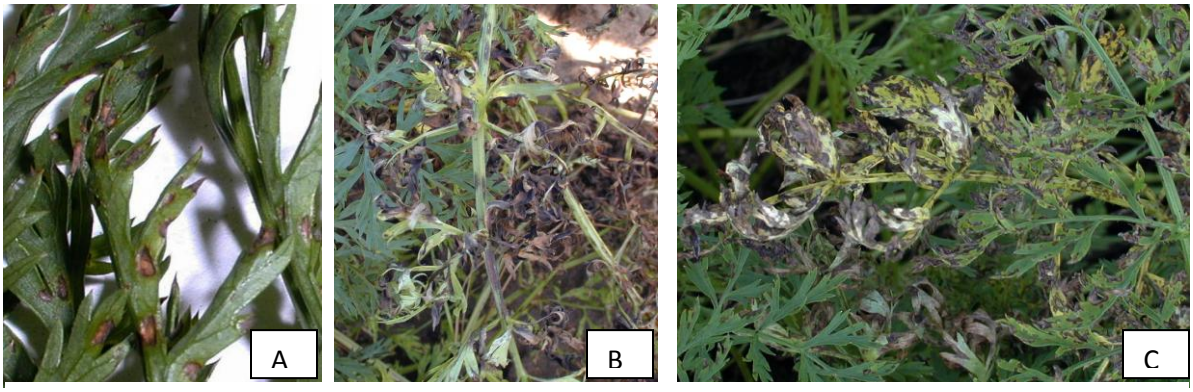
There are no reports of late blight in Wisconsin at this time. This past week there were a few new late blight reports from MA (tomato), CT (tomato), NY, (tomato), and PA (tomato). To date this production year, late blight has been reported in CA, CT, FL, MA, ME, NC, NJ, NY,

PA, and VA. The website: http://www.usablight.org/ indicates location of positive reports of late blight in the U.S. and provides further information on disease characteristics and management.

Carrots: In our field scouting in the Hancock area, we have seen very early lesions of Alternaria leaf blight on margins of older leaves. Incidence is very low (at or below 1%). Alternaria and Cercospora leaf and petiole blights of carrot are very common here in Wisconsin. Further information is provided below on how to identify the two diseases. However, it is important to keep an eye on leaf blights in carrot as they can spread rapidly when conditions are warm and periods of leaf wetness increase. It is raining as I type this in Dane County and while precipitation is welcome, we need to be thinking about foliar pathogens that are promoted by moisture and warmth.

Alternaria leaf blight of carrot is caused by the fungus *Alternaria dauci*. The pathogen typically attacks leaf margins creating oblong or irregularly shaped lesions resulting in chlorosis and necrosis of the leaf tissues (pictures below). Complete foliar decline and death can occur if left unmanaged. The pathogen prefers older or weak foliage, particularly most mature leaves and of plants that may not be appropriately fertilized. Spores (conidia) will be continually produced on carrot foliage, so management of the pathogen in its earliest stages is critical. The pathogen overwinters in carrot debris or on wild carrot species, or can be seedborne. Spread in field occurs by wind and splash rain dispersal of spores.

Cercospora leaf blight of carrot is caused by the fungus *Cercospora carotae*. Spores (conidia) will be continually produced on carrot foliage, so management of the pathogen in its earliest stages is critical. The pathogen overwinters in carrot debris or on wild carrot species, or can be seedborne. Typically, Cercospora leaf blight is seen earlier in the season than Alternaria leaf blight and is often on younger leaves. Symptoms are distinct from Alternaria in that lesions are much more concise, with orange to tan circular or elliptical lesions on petioles and leaflets (pictures below). While Alternaria tends to favor leaf margins, Cercospora can be found anywhere on the leaf. Spread in field occurs by wind and splash rain dispersal of spores.



Alternaria and Cercospora leaf blights of carrot. A. Symptoms of Cercospora leaf blight. B. Symptoms of Alternaria leaf blight. C. Combined symptoms of Alternaria and Cercospora leaf blight. (Photos courtesy of: Dr. Walt Stevenson, UW-Plant Pathology Emeritus Professor)

Management of foliar leaf blights of carrot:

Resistant varieties include: Bolero, Calgary, Canterbury, Carson, Cheyenne, Commanche, Goliath, Halfback, and Sirocco. **Moderately resistant varieties include**: Canada, Danvers 126, Enterprise, Indiana, Nandrin, Nevis, Prospector, Recoleta, SugarSnax 54, and 713087. **Susceptible varieties include:** Early Gold, Fontana, Gold King, Heritage, Lucky B, Prodigy, Protégé, PY-60, Sunrise, Yellowstone, and 80494. (W. Stevenson)

Fungicides can effectively manage foliar blights in carrot when appropriate products are selected and applied in a timely manner. A disease forecasting model, TOMCAST, has been developed for use in WI to trigger follow up fungicide sprays after 1% level of infection has been established. Further information on this forecasting model can be found in the UW BioIPM Manual for Carrots, link below.

http://ipcm.wisc.edu/download/pubsBIOIPM/Bio_IPM_Carrot_web.pdf

In recent years, fungicide programs containing a protectant of chlorothalonil (Bravo, Echo, Equus, Initiate, and others) alternated with a reduced risk site-specific fungicide such as azoxystrobin (Quadris) have been adopted with success. A typical program, depending on initiation date, may include up to 5 fungicide applications. In 2011, my program evaluated several fungicide regimes for control of foliar blights of carrot. The report can be accessed at:

http://www.plantpath.wisc.edu/wivegdis/pdf/2011/Carrot%20Foliar%20Blight%20Gevens%202011.pdf

***Cucurbit Downy Mildew*:** has not been identified in Wisconsin at this time in commercial fields, home gardens, or our sentinel monitoring plots. Several states have reported cucurbit downy mildew this season across a wide range of cucurbit hosts in AL, DE, FL, GA, MD, NC, NJ, NY, OH, PA, SC, VA, and Ontario Canada. **The newest reports within the past 7 days have been primarily on cucumber with closest detects in OH and Ontario Canada**. I will be keeping tabs on disease reports in the region and will provide updates in this newsletter. No forecasted risk of movement of spores from states reporting detects to Wisconsin at this time. Disease forecaster, Tom Keever of North Carolina State University reports, "high risk for cucurbits in southern Ontario, northeast OH, northwest / central / southeast PA, central NJ, and central AL. Low to moderate risk for most of the rest of the Southeast and mid-Atlantic regions (with the exception of western VA and western and northern PA), CT / RI / Long Island, northwest OH, and southern MI. Minimal Risk to cucurbits otherwise." The website: http://cdm.ipmpipe.org/ offers up to date reports of cucurbit downy mildew and disease forecasting information.

For further information on any fungicides that may be mentioned in this newsletter, please see the 2012 Commercial Vegetable Production in Wisconsin Guide A3422. An online pdf can be found at the link below or a hard copy can be ordered through the UWEX Learning Store.

http://learningstore.uwex.edu/assets/pdfs/A3422.PDF

Vegetable Insect Update – Russell L. Groves, Associate Professor and Applied Insect Ecologist, UW-Madison, Department of Entomology, 608-262-3229 (office), (608) 698-2434 (cell), or e-mail: groves@entomology.wisc.edu.

Vegetable Entomology Webpage: http://www.entomology.wisc.edu/vegento/index.html

Corn Earworm (CEW) – Adult trap captures continue to be reported over much of southern Wisconsin in the past week to 10 days. Recall that these adult moths will preferentially seek silking sweet corn in these areas and begin oviposition soon after mating. As such, silking sweet corn should begin to be protected over the next few weeks, depending upon Hartstack, pheromone trap captures, to avoid significant infestations. A remedial treatment is advised when adult moth counts exceed 5-10 moths in three consecutive nights and should be applied every 4-5 days until silks brown.

European corn borer (ECB) – Adult moth captures in blacklight traps should increase in the coming week over much of southern Wisconsin as degree days have surpassed the predicted 1,400 DD to initiate adult emergence. In snap beans, larvae that bore into pods are the main concern, because the resultant holes render the beans unmarketable. In sweet corn, larvae will feed initially on foliage, but will move to the developing ear where significant damage can occur and has already been witnessed. Properly timed insecticide sprays are an effective tool for ECB management in snap beans. The timing and number of applications in sweet corn is influenced by moth activity during silking and the history of ECB damage in specific field locations.

Two-spotted spider mites – Spider mites are becoming prevalent in several vegetable crops (vine crops principally) in the last two weeks, likely as a result of the very warm and dry weather of the summer. The lack of soil moisture has become a stress factor which has contributed to increases in mite populations. The two spotted spider mite is a serious pest of a variety of vegetable crops as well as ornamental plants. These mites feed by using mouthparts modified to pierce plant cells. The contents of the plant cells are sucked up by the mite resulting in the characteristic speckled appearance of leaves. Large colonies of spider mites produce webbing around the leaves where they feed and toward the tops of plants where they tend to aggregate. Populations of two spotted mite can explode during periods of low humidity and high temperatures, but dry conditions prevailing recently over much of central Wisconsin seem to be the driving force. This mite regularly begins to cause noticeable yellowing of leaves in the outermost rows of affected fields, particularly during periods of prolonged dryness.

Soybean aphids - Statewide surveys which monitor developing populations of soybean aphid continue to suggest that populations are only slowly increasing in selected field locations. No reported fields have exceeded established economic thresholds and only a few isolated plants often contain large numbers of these insects. A few populations in southern and south-western Wisconsin have averaged 25-50 apterous (wingless) aphids per plant with only a few winged individuals observed in fields. At this time, close attention should continue to be paid to the North Central Region's, Aphid Suction Trap Network (http://www.ncipmc.org/traps/)

Cole Crops – Populations of imported cabbageworm (ICW) and diamondback moth (DBM) have increased sharply over the past 2 weeks at many locations in central and southern Wisconsin. Larvae of the ICW feed on the first formed outer leaves of their host plants, which often appear riddled with irregularly shaped holes. As the caterpillars become mature, they feed

in the center of the plant. The last instar larva does the most feeding damage. Initial damage from the DBM results in small incomplete holes caused by young larvae and larger complete holes caused by mature larvae. The entire plant may become riddled with holes under moderate to heavy populations. Larvae also feed in the developing heads of cabbage, causing deformed heads and encouraging soft rots. However, because of their small size, relative to the cabbage looper (CL) and ICW, it takes approximately 20 DBM larvae to defoliate as much cabbage as 1 looper, or 2 ICW larvae. Initial flights of the CL have also been detected in southern portions of the state and adults will be actively laying eggs during the warm weather. Cabbage looper larvae will hatch from the eggs in 3 to 6 days after being laid. They immediately begin feeding on the underside of the leaf producing small holes that do not break through the upper surface of the leaf. The larvae will feed here for for two to four weeks before they drop to the soil to pupate.

Colorado potato beetle (CPB) – Adult Colorado potato beetle continue to emerge from the soil in the Central Sands, and this adult colonization represents the 2nd generation, or 'summer adults'. Recall that these insects, unlike their overwintering parents earlier in the year, are aggressive feeders and can quickly cause significant defoliation if left unchecked. In-field populations are currently mating and laying new egg masses which will quickly hatch into young larvae with the current temperatures and the projected forecast temperatures. In northern Wisconsin, late instar larvae are still prevalent at most locations, and it is very important to follow up with foliar applications to get control of this first generation and lessen the impact of the second generation of CPB that will emerge later in the season. Second generation materials that effectively control a varied set of lifestages include products containing active ingredients such as, chlorantraniliprole (Voliam Flexi, Voliam Xpress), phosmet (Imidan), rynaxypyr (Coragen), spinosad (Blackhawk), or spinetoram (Radiant). In the coming week, we recommend that any of the former products be considered for use as a series of two, successive foliar applications, spaced 7-10 days, but this should be based upon scouting to determine the need for a subsequent application.

News and Upcoming Events

Submitted by Mary LeMere, Storage Research Manager, Hancock Agricultural Research Station, Storage Research Facility, E-mail: lemere@wisc.edu, Office Phone: 715-249-5961.

The SpudPro Committee is looking for your feedback on varieties that should be selected for breeding advancement. Visit the Hancock Agricultural Research Station for the first Potato Variety Harvest Expo anytime from 8:00AM to 4:30PM on Oct 24 & 25 to cast your vote for the new red, processing russet, fresh russet and chipping potatoes that you would like to see advance in the breeding program.

Submitted by Matt Repking, Interim Superintendent, Hancock Agricultural Research Station, E-mail: repking@wisc.edu, Office Phone: 715-249-5961.

The UW-Agricultural Research Station in Hancock extends a Field Day invitation to all potato and vegetable growers, allied partners, and friends of our state potato and vegetable industry.

Advancing IPM in Potato and Vegetable Systems of Central WI
Hancock Agricultural Research Station Field Day Agenda
July 24, 2012 1:00 – 4:30

Storage Research Facility Tour 1:00 – 1:45
1:00 - 1:10 Amanda Gevens - Updates in storage disease control
1:10 - 1:35 AJ Bussan- Title to be announced
1:35 - 1:45 Paul Bethke, Shelley Jansky, and AJ Bussan - Variety evaluations associated with the SCRI acrylamide project. What have we learned so far?

Potato Crop Update Field Tour 1:45-4:05
1:45 - 2:05 Jiwan Palta & Felix Navarro (Field C4) Program breeding research progress: new varieties and selected breeding clones
2:05 - 2:25 Jed Colquhoun (Field R1) Weed management update
2:25 - 2:45 John Panuska & Mack Naber (Field K28) Irrigation water management - soil moisture monitoring and tracking
2:45 - 3:05 Russ Groves, Anders Huseth, and Scott Chapman (Field K25)- Resistance, diapause, and CPB management
3:05 - 3:30 Amanda Gevens & Ann MacGuidwin (Field S4) Managing soilborne diseases with in-furrow fungicides and disease updates for the season & Managing root lesion throughout the rotation
3:30 - 3:45 Bryan Bowen & Mary LeMere (Field S6)-Wisconsin variety, advanced selection and SPUDPRO trialing
3:45 - 4:05 Matt Ruark (Field S8)-The need for late season nitrogen
4:05 – 4:30 Awards and Social Hour
Dinner will begin at 4:30