Frost surprised some folks this week as the grass was crisp and ground wet on Monday and Tuesday morning this week. Many crops may show symptoms of frost damage. This would include white coloration of leaves, distorted growth, or leaf necrosis (death). Plants may die if the growing point was damaged by the frost. Inspect low lying areas for damage if you have concerns.

**Potato.** Potato planting has begun in Northern Wisconsin and on the muck soils across the state. Early planted potatoes have emerged. Early planted potatoes (prior to April 26th) have cracked and even emerged in Central Wisconsin. Potatoes planted the first week of May have sprouts about 1” long and are developing root systems.

**Processing Crops.** Sweet corn and snap bean planting are well under way. Carrot and pea planting are wrapping up as well.

**Fresh Market Vegetables.** Some folks are seeing unusual growth habits in greenhouses around the state. Several factors are contributing in plants expressing odd growth such as wrinkled or truncated leaves, twisting of stems and leaves, or chlorosis (yellowing), white or water soaked lesion. Causes for this type of damage vary, but are typically related to one of a few potential reasons.

One potential cause of damage is ethylene or other volatile organic compounds that are by-products of combustion of propane. We have had a cool spring and demand for supplemental heat in greenhouses and hoop houses has been substantial. Propane heaters placed in growth...
structures without proper or adequate exhaust and ventilation can cause accumulation of ethylene or similar compounds causing damage seen in many tunnels and houses this spring.

Another cause of damage can actually be frost or exposure to cold temperatures. Often cold air can find its way into greenhouses or tunnels. This is evident if damage occurs near ventilation structures, fans, or seams in the plastic. Cold temperature damage is easy to identify as the crop quickly recovers following exposure to cold stress.

Finally, some plants are beginning to be quite leggy. As plants increase in size they can quickly become drought or nutrient stressed. In Southern Wisconsin, bedding plants should be moved to cold frames for cold temperature treatments and prevention of transplant shock when they are moved to the field in the next 7 to 10 days. In Northern Wisconsin, transplants should be moved outside in 7 to 10 days to prepare for transplanting by June 1.

Vegetable Insect Update – Russell L. Groves, Vegetable Entomologist, 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

Exotic and Invasive Insect Pests in Wisconsin

Brown Marmorated Stink Bug (BMSB): The Brown Marmorated Stink Bug is a pest to a large variety of fruit trees as well as vegetables, leaving circular damaged areas on leaves and sunken necrotic lesions on damaged fruits. Originally from Asia, the Brown Marmorated Stink Bug made its way to North America and has been a pest ever since. Their color makes them effective camouflaged insects. Both nymphs and adults feed off of the leaves or fruit sources. Stink Bugs generally derive their namesakes from the foul-smelling odor that the insect produces when threatened or disturbed, produced by specialized stink glands in both the male and female. The insect not previously seen on our continent, was apparently accidentally introduced into eastern Pennsylvania. It was first collected in September of 1998 in Allentown, but probably arrived several years earlier. As of November 2010, Halyomorpha halys has been collected from Dane and Manitowoc counties, but no reproducing populations have been confirmed in the state. Vegetable and fruit growers who suspect BMSB are asked to collect and submit a sample for official verification to Phil Pellitteri, Department of Entomology, University of Wisconsin, 1630 Linden Dr., Madison, WI 53706.

This species probably has a single generation per year in Wisconsin depending on the temperatures. Warm spring and summer conditions could permit the development of two or three generations. However, in parts of sub-tropical China, records indicate from four to possibly six generations per year. Adults will emerge sometime in the spring of the year (late April to mid-May), and mate and deposit eggs from May through August. The eggs hatch into
small black and red nymphs that go through five molts. Adults begin to search for overwintering sites starting in September through the first half of October. This insect will likely become an important agricultural pest in Wisconsin. At other locations in the eastern US, it produced severe losses in some apple and peach orchards as well as blackberry, sweet corn, field corn and soybeans. Damaging populations of the insect have also been observed on tomatoes, lima beans and green peppers.

Feeding damage caused by the BMSB in both apples and sweet corn, G. Dively, University of Maryland, 2010.

**Flea beetles** - Flea beetles are becoming prevalent in several fresh and direct market operations. These insects are one of the most difficult-to-manage pests of eggplant and cole crops. They are also a problem on seedlings of tomatoes, potatoes, peppers, turnips, radishes, and corn. The adults are active leaf-feeders that can, in large numbers, rapidly defoliate and kill plants. Symptoms of flea-beetle feeding are small, rounded, irregular holes; heavy feeding makes leaves look as if they had been peppered with fine shot. Cultural controls for this insect include perimeter trap crops using highly attractive mustards, row covers, and the use of transplants which can tolerate greater levels of damage. Specific insecticides containing spinosad, plus bifenthrin and permethrin can provide good control for about a week. Applications of insecticides containing imidacloprid (e.g. Provado) or thiamethoxam (Actara) can also provide good control and will have a longer residual activity of approximately 10-14 days. However, to protect seedlings, applications usually must be reapplied often. The plants produce continuous new growth and the highly mobile beetles may rapidly reinvade plantings. As with all pesticides, carefully read and follow all label directions. Pay particular attention to ensure that any flea beetle insecticides being considered are properly registered for use on the crop. In 2009, Dow AgroSciences released a product bulletin for the use of spinosad (Entrust) as an organic control option of flea beetles in Wisconsin only. This label amendment includes use on cole crops (*Brassica* Vegetables) and fruiting vegetables.
Potato – Overwintering Colorado potato beetle (CPB) adults continue to slowly emerge over the last week. Very few adult females were collected in central Wisconsin this week as they emerged from overwintering sites adjacent to previously planted potato in 2010. More seasonal temperatures forecast in the coming week could rapidly increase the number of adults emerging from the soil. Recall, early emerging adult beetles cause little economic damage to rapidly growing potatoes unless numbers are large along an overwintering hedge row adjacent to previous year’s potatoes. Monitor these colonizing populations closely to see if the at-plant systemic neonicotinoids remain effective. High concentrations of the neonicotinoids in newly emerging plants at this time of the season ‘should’ provide very good control of early season adult beetles and they are often observed convulsing from exposure in the furrows.

Onions – As reported last week, Wisconsin resubmitted a Section 18, Emergency Exemption Recertification from the US EPA for the use of both spirotetramat (Movento®) and abamectin (Agri-Mek 0.15EC) against onion thrips. This week, Movento was approved by the EPA and a copy of the document can be found at: http://datcp.wi.gov/Plants/Pesticides/Special_Registrations/index.aspx. Remember, applicators must possess a copy of the use directions for these active ingredients on dry bulb onion in Wisconsin prior to any field application. Approval of the Agri-Mek 0.15EC label is pending and expected very soon for use in 2011.

Seed Maggot(s) - As reported last week, the peak emergence and adult flights of seed corn maggot in southern Wisconsin are well underway. The potential still exists for increased damage to early season, direct seeded vegetable crops caused by infestations of seed maggots (Delia spp.). In general, the early season transplants, and directed seeded crops that are slow to emerge and begin rapid growth can be most severely damaged.

Vegetable Disease Update – Amanda J. Gevens, 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/

Cucurbits: In the last two years, Wisconsin cucurbits, particularly cucumbers, have experienced cucurbit downy mildew. Will cucurbit downy mildew be back in Wisconsin again this summer? To date, we have not detected downy mildew in Wisconsin or in the Midwestern U.S.. Reports of the pathogen currently come from Florida and South Carolina. The Cucurbit Downy Mildew Forecasting website is up and running this season and can be accessed at the link below.

http://cdm.ipmpipe.org/

Cucurbit growers in Wisconsin are reminded that we have an extensive list of fungicide products registered for use in controlling downy mildew. These are listed in A3422 along with rates and preharvest intervals. There is not a current need for fungicide application on cucurbits to control downy mildew, but stay posted as disease events unfold.

Disease Forecasting: What are DSVs and P-days?: As we are gearing up to soon post disease forecasting information in this newsletter, and have added new subscribers, it is necessary to provide some explanation of the 18 disease severity value and 300 P-Day concepts used in
disease forecasting and IPM programming. Locations of weather stations/disease forecasts will include: Antigo, Plover, Hancock, and Grand Marsh. Computation of 18 disease severity values (DSVs) relies on maximum and minimum temperatures each day, the duration of relative humidity periods above 90% and the maximum/minimum temperatures during the relative humidity periods above 90%. For a given day, up to 4 DSVs can accumulate. We start the severity value calculations at approximately 50% crop emergence. When we reach a total of 18 severity values, we issue a warning which indicates that environmental conditions have been met which favor late blight. At 18 DSVs, the recommendation for preventive applications of effective late blight fungicides is made. An additional alert is issued when the first symptoms of late blight appear anywhere in the state. The determination of late blight management recommendations is made by taking into consideration DSVs, projected weather forecast, and presence/risk of inoculum. This information is published in our newsletter and will be disseminated in various other outlets as the season progresses.

We started the 2011 growing season with risk of late blight. Following the 2009 and 2010 seasons in which late blight was present, we had a winter with early snow cover, providing protection to potatoes remaining in the field, and an early season with volunteer potatoes growing in fields where potatoes were grown last year. Growers have been very careful to plant disease-free seed, to destroy cull potatoes prior to new crop emergence, and to control volunteers. Other potential sources of late blight in WI come from overwintered infected tomato plants, and inadvertent planting of infected seed saved from 2010. No reports of late blight infected potato volunteers or tomato transplants have emerged from WI at the time of this report. No new reports of late blight in potato seed from WI have been detected. Molecular tests were unable to identify the late blight (*Phytophthora infestans*) genotype.

The Potato P-Day accumulator is used to generate early blight recommendations. Once we reach 300 P-Days, calculated from emergence on, our spray recommendations take both the P-Day and severity value totals into account to generate 5 day, 7 day or 10 day spray interval recommendations. The interval is variable depending on prevailing weather conditions and the presence of disease in the area.