



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 Path Webpage: <http://www.plantpath.wisc.edu/wivegdis/>

Late blight update: Tomato late blight has been detected in Milwaukee County WI earlier today. This is the second county with report of late blight in WI in 2014. The genotype has not yet been determined, but notification will be sent out when we have this information.

We have genotyped additional potato late blight samples from Portage County WI and have determined that both US-8 (18 Jul) and US-23 (25 Jul) are present. We have not identified both genotypes in the same variety and field, but both appear to be causing late blight on potato in close proximity. US-8 is an A2 mating type and is resistant to metalaxyl/mefenoxam fungicides. US-23 is an A1 mating type and is sensitive to metalaxyl/mefenoxam fungicides.

Outside of WI, all other reports of tomato and potato late blight from the U.S. in 2014 have been of the US-23 genotype.

Late blight is a community plant disease and it is important that all growers of tomatoes and potatoes (commercial and home gardens) be familiar with late blight symptoms, be actively managing late blight, and be aware of the potential for crop loss. All infected plants can be a potential source of more inoculum for further spread. Careful management of this disease during the production season and into the Fall/Winter is critical to ensure a clean, pathogen-free start to the 2015 season. Management at all levels of production greatly aids in overall reduction in late blight and need for intensive fungicide usage which is costly in economic, as well as human and environmental health aspects.

What to do to limit sources of potential late blight inoculum:

Know the symptoms of late blight for early identification and management

Symptoms include pale green to brown-black colored irregularly shaped lesions on leaves and stems. When conditions are wet, lesions look water-soaked, dark brown, and almost appear oily in nature. When conditions are dry, lesions are pale green and may appear papery in texture. Look on leaf undersides or on lower stems for white fuzzy growth in association with the lesion. These are pathogen signs or spores. This phase of the disease very active and most threatening as this means more spores are being produced and are moving in the air – and can find new plants to make more disease. Scout first in protected areas of fields or gardens (near tree lines or around irrigation pivots). Take immediate action by removing/destroying worst-affected plants and treating with fungicides, preferably those with anti-sporulant properties. It is also important to get late blight confirmation from a UWEX county agent or other specialist that can confirm the pathogen and can forward sample to my program for genotyping. Images of tomato and potato late blight are included at the end of this Disease Supplement.

Avoid placing late blight-infected tomato plants (foliage and fruit) and potato plants (foliage and tubers) in to unmanaged or improperly managed compost piles

Unmanaged compost piles can remain warm during winter months, preserving plant tissues and the late blight pathogen. In spring, viable infected tissues can generate late blight spores which move aerially and create infections in susceptible, unprotected tomato and potato crops. Plants can be destroyed by various means depending on production scale - including burning, killing with herbicide, and removing and bagging entire infected plants and setting out in sun until plants die (bags can then be disposed of along with household waste).

Avoid deeply burying late blight-infected tomato plants (foliage and fruit) and potato plants (foliage and tubers) in the soil

Buried infected plant tissues (deeper than ~8 inches) can be harbored from freezing cold temperatures of winter and when ground is worked in following spring, late blight spores can be generated, move aerially, and cause disease. It is best to destroy plants by one of the above-mentioned methods.

Start with clean, disease-free seed (potato or tomato) and transplants (tomato)

Tomato seeds are not known to carry the late blight pathogen, but transplants can transport the pathogen to new locations. Look for healthy plants when purchasing from home garden centers or raise your own tomato plants from clean seed. Evaluate seed potatoes to ensure they do not show symptoms of late blight. Do not save potatoes for seed in subsequent years.

Destroy potato cull piles

Wisconsin DATCP regulates the destruction of potato cull piles with deadline of May 20 of each year (ATCP 21.15 Potato Late Blight 2.a.). Waste potato tubers or discarded pieces of potatoes may contain the late blight pathogen and can sporulate when piled out of doors under favorable weather conditions.

Control potato and tomato volunteers

Volunteers are plants that come up in the field or garden that were seeded from the previous year's crop and are unintended and unmanaged in the current production season. Volunteers can be very problematic after warm winters or winters in which we had early snowfall to insulate the ground. In 2014, we have seen few to no potato volunteers in commercial fields. Volunteer tomatoes, especially varieties producing many fruit, can be problematic and may play a role in carrying the late blight pathogen from one year in to the next. My lab has recently documented survival of new genotypes of the late blight pathogen on tomato seeds frozen for over 3 months at 0°C or 32°F, 25 days at -3°C or 27°F, and 16 days at -5°C or 23°F.

Plant varieties with late blight tolerance or resistance, if available

There are several tomato varieties with resistance to current late blight genotypes. While resistance is not complete when disease pressure is heavy, it is significant and can aid in managing infection and reducing reliance on fungicides. Varieties include cvs. Mountain Magic (large cherry type), Plum Regal (plum type), Defiant (mid-sized slicer), and Iron Lady (mid-sized slicer). Some potato varieties have tolerance to late blight, including 'Defender' and 'Jacqueline Lee.' Varieties which have fewer stems and open canopy architecture, or that senesce or experience earlier vine tipping can be helpful in limiting the environmental conditions favorable for late blight – and aid in achieving better fungicide coverage for improved plant protection.

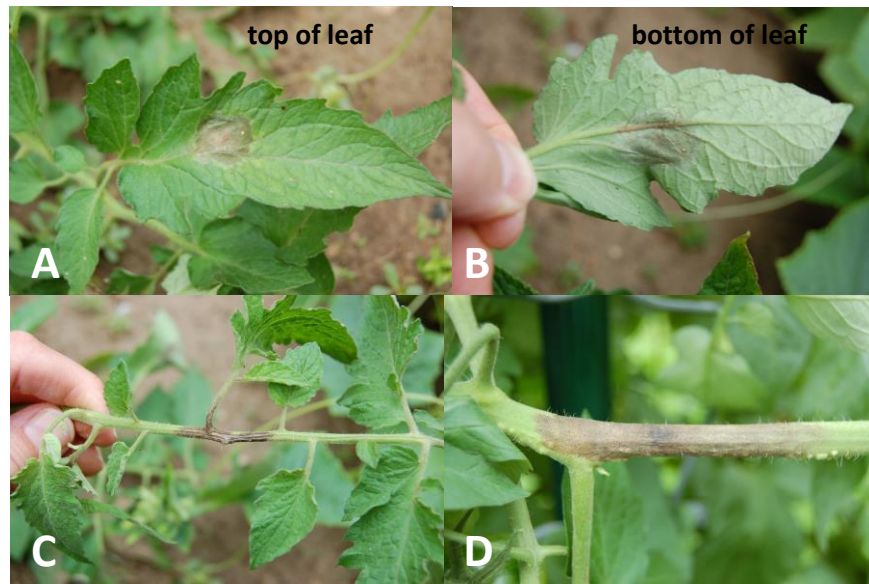


Figure 1. Symptoms of late blight on tomato leaves and stems.

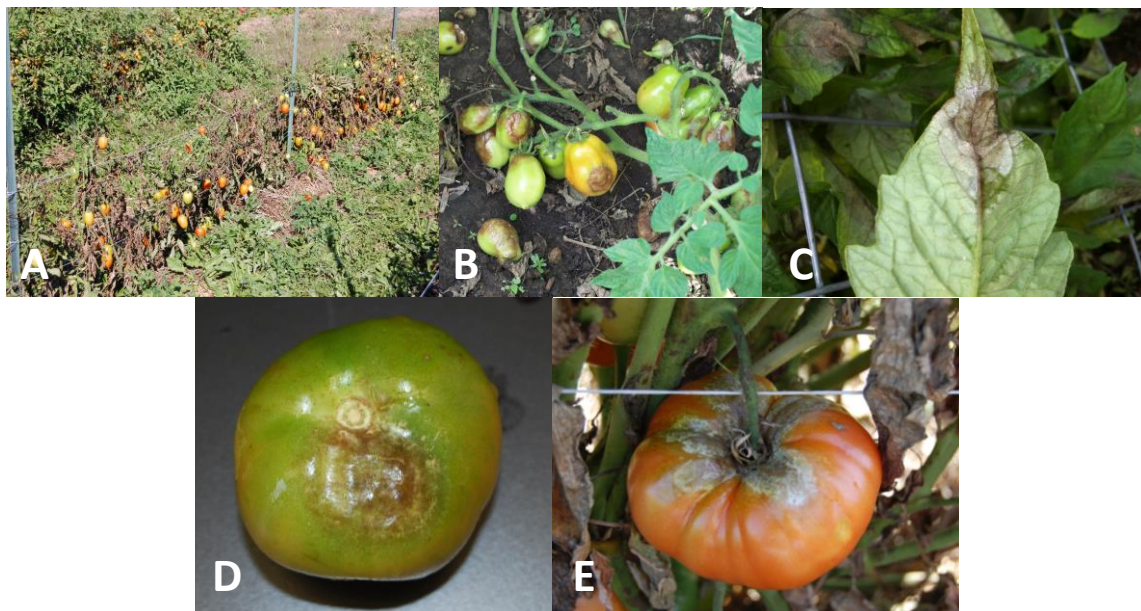


Figure 2. Symptoms of tomato late blight on tomato leaves and fruit. A. Entire row of plum tomatoes with dead foliage due to late blight. B. Brown, firm, late blight lesions on 'Roma' tomato fruits. C. Late blight lesion on tomato leaf. Note brown, water-soaked lesion with white pathogen sporulation. D. Close up of brown, firm, late blight lesion on green tomato fruit. E. Sporulating late blight lesion around the stem and shoulders of a ripening tomato fruit.

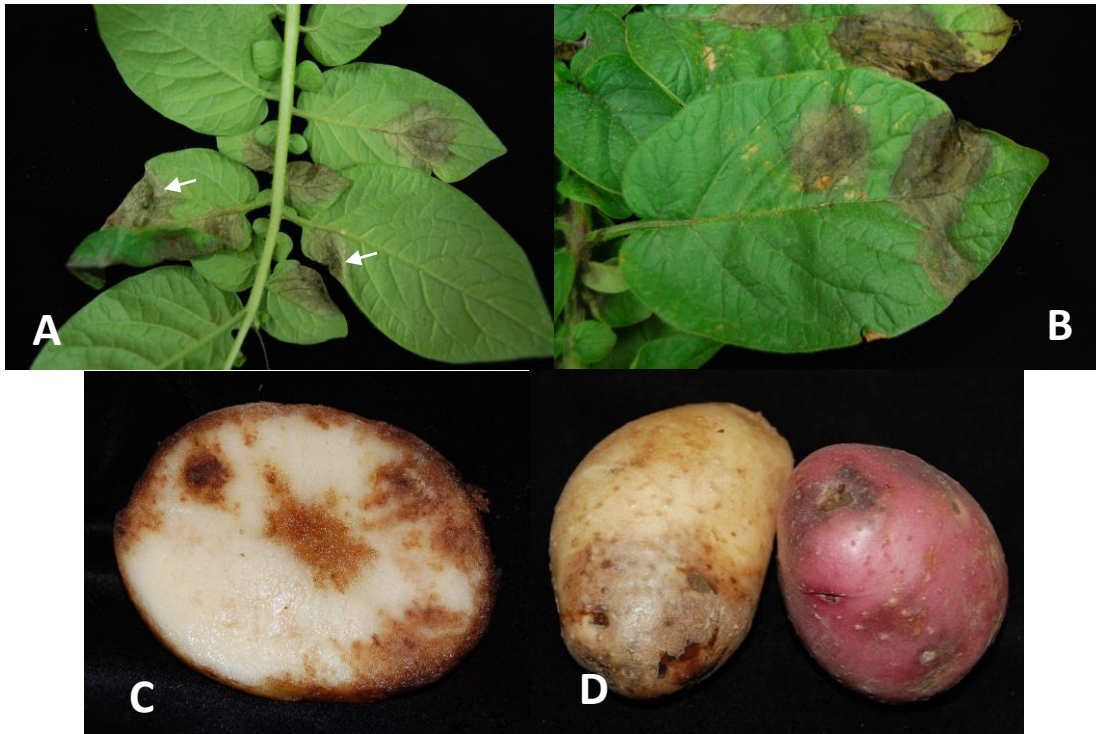


Figure 3. Symptoms of potato late blight on leaves and tubers. A. Undersides of leaves showing late blight lesions. Note white fuzzy growth on lesions (white arrows). B. Dark brown, water-soaked late blight lesions on surface of potato leaves. C. Late blight lesions on internal potato tuber tissues. D. Late blight lesions on potato tubers. External symptoms include brown discoloration, sometimes appearing purple on red varieties. Lesions may at times be sunken.

For further symptom and management information:

2014 WI organic tomato and potato late blight fungicides (disease status comments from 2013):

<http://www.plantpath.wisc.edu/wivegdis/pdf/2013/Organic%20late%20blight%20control%202013.pdf>

2014 WI commercial potato late blight fungicides:

<http://www.plantpath.wisc.edu/wivegdis/pdf/2014/Potato%20Late%20Blight%20Fungicides%202014.pdf>

In order to help better understand the disease at hand, **please submit samples to my lab** or work through your county agent and request that they send to me for genotyping. *Even if a sample has already been submitted from your county and a genotype determination has been made.* All we need to know is the county of sample origin. Identification of genotype at the county level would be very helpful in improving our understanding of this epidemic and potential future risks. Lab address is: Amanda Gevens, 1630 Linden Dr, Room 689, Plant Pathology Dept., University of Wisconsin, Madison, WI 53706. Please send infected leaves in a slightly inflated ziplock bag with no paper towel. Overnight shipping is best.