Late blight was first reported in potatoes on July 10, 2015 in central Bingham county. With frequent rain showers and thunderstorms moving through the Snake river plains in South East Idaho this summer, conditions have been ideal for the outbreak of late blight epidemics. Since the first report of late blight, additional outbreaks have been reported from Power and Minidoka Counties. Genotyping of late blight strains from the outbreaks in Bingham and Power counties identified the strain as US23. This is the same genotype that was responsible for late blight outbreaks in August 2014. This year there have also been severe outbreaks of late blight in Michigan and Wisconsin. To date, most of the late blight strains in the outbreaks there have also been identified as US23.

For further information see: http://www.idahopotatodiseases.org

Late Season Disease Biology and Recommendations

Sporulation in this pathogen is favored by wet weather with moderate temperatures (60 – 80°F), high humidity and frequent rainfall. Under such conditions, the disease can spread extremely rapidly and has the potential to completely defoliate fields within three weeks of the first visible infections if no control measures are taken. In addition to attacking foliage, P. infestans can infect tubers at any stage of development before or after harvest and rot of tubers often occurs in storage following tuber infections.

Symptoms

The first symptoms of late blight in the field are small, light to dark green, circular to irregularly shaped water soaked lesions. These usually first appear on the lower leaves where the microclimate is more humid. However, they may occur on upper leaves if weather conditions are favorable and the pathogen has been carried into the field by air currents. Lesions often begin to develop on the compound leaf near the point of attachment to the petiole (which is often cupped) or edges, where dew is retained longest. During cool, moist weather, lesions expand rapidly into large, dark brown or black spots, often appearing greasy. Lesions are not limited by leaf veins, and if formed at leaf tips or edges, they can cause young expanding leaves to be misshapen. As new infections occur, and existing lesions coalesce, entire leaves may become blighted and killed within a few days. On stems, lesions are often initiated at the point of attachment to the stem and leaves become detached shortly after infection. The lesions continue to develop along the length of the stem and even in hot dry weather can remain active.

In the early morning or during cool damp weather, a white velvety growth may be seen on the underside of infected leaves. This white velvety growth distinguishes late blight from several other foliar diseases of potato. A pale green to yellow border is also often present around lesions.

Late blight infection of tubers is characterized by irregularly shaped, slightly depressed brown to purplish areas on the skin. These symptoms may be less obvious on russet and red-skinned cultivars. A tan to reddish-brown, dry, granular rot is found under the skin in the discolored area, extending into the tuber usually less than half an inch. The extent of rotting in a tuber depends on the susceptibility of the cultivar, temperature, and length of time after the initial
infection. The margin of diseased tissue is not distinct and is marked by brown finger-like extensions into the healthy tissue of the tuber. In time, the entire tuber becomes blighted and discolored. Late blight rot of tubers is often accompanied by soft rot.

Positive identification of late blight can be made by microscopic examination of lesions from infected leaves or tubers collected when the fungus is producing spores. The water mold can be quickly identified by the distinctive size and shape of the spores and spore bearing stalks. Samples with suspicious lesions should be submitted to the University of Idaho offices at Aberdeen, Kimberly or Idaho Falls for positive identification.

**Late Season Disease Cycle**

Tubers may become infected if spores produced on the foliage are washed down into the soil by rain or irrigation water. Water-borne spores appear to follow stems and stolons in a water film into the soil, reach tubers, and cause infection. Tubers near the soil surface are thus more likely to be infected.

Sporangia of *Phytophthora infestans* may be spread from infected plants in one field to healthy plants in surrounding fields by wind, splashed rain, mechanical transport and animals thereby continuing the disease cycle. Many reproductive cycles are possible within a season that accounts for the rapid increase in disease once it becomes established in a field.

**Recommendations**

Late in the season it is advisable to avoid excessive irrigation as tubers become infected with late blight when spores wash down through the soil from infected leaves. Late season fertilizer applications should also be limited as although they will maintain green vines and promote tuber bulking, green and vigorous vines can also be difficult to kill with desiccants and immature tubers are more prone to skinning and therefore infection at harvest. Green vines may also harbor inoculum that can infect tubers during harvest. At the end of the season petiole nitrate levels should drop down to levels that encourage vine senescence. Vines should also be killed at least two weeks before harvest, especially in blight infected fields. This interval minimizes the chance of tubers getting contaminated with late blight inoculum during harvest, and allows previously infected tubers to decompose in the field. If blight is present in the field or in the vicinity of the field at harvest, it may also be beneficial to spray foliage after vine killing with labeled fungicides to kill living late blight spores on the foliage.

Finally, after harvest if tubers are stored, they should be dry when placed in storage, and the storage air temperature and humidity should be managed so that the tubers remain dry. Condensation of moisture on tubers, resulting from air circulating through the tubers that is warmer than the temperature of the tubers, will cause any late blight present to form spores, and late blight may spread in the pile. Potatoes should be held at the lowest temperature possible consistent with their ultimate use (table stock or chipping). Most fungi do not grow much at temperatures of 38°F or lower, but some development will occur at higher temperatures.
Late blight foliar symptoms:
Late blight tuber symptoms in field:

Late blight tuber symptoms in storage: