

**Idaho Grower News from the University of Idaho Extension System**

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**July 2009****Wet Weather May Affect Management of Potato Crop**

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When it rained after cutting the alfalfa, my grandfather used to say—I'm sure he didn't originate the saying—"it's raining oats into the hay." Although the rain wasn't good for the cut hay crop, it was providing moisture for the oats that were used to feed the horses that were then used for farming. The wet June weather provided moisture for many crops eliminating the need to irrigate. However, these same weather conditions may have a pronounced effect on the potato crop. Producers may see an increase in the incidence of diseases such as Fusarium dry rot, stem blackleg and seed piece decay, Rhizoctonia stem canker, and late blight, as well as loss of nitrogen due to excessive rain. The latter two will need the attention of potato producers.

Even healthy seed treated with a fungicide may succumb to seed piece decay with an extended period of wet weather. Poor and uneven plant stands are typical symptoms of seed piece decay and sprout rot caused by Fusarium species. *Fusarium sambucinum* is the most common pathogen causing dry rot in stored seed potatoes and may be effectively controlled by fungicidal seed treatments. However, there is another species of Fusarium that can cause seed piece decay, *Fusarium solani* var. *coeruleum*. In Idaho, *F. solani* var. *coeruleum* is more commonly found in the field and causes disease after planting. Although slow growing, the cold, waterlogged soil conditions that were prevalent in potato fields provided an ideal environment for the growth and spread of this pathogen. The waterlogged soils caused enlarged lenticels on the surface of seed pieces providing entry points for the pathogen.

Seed piece decay may also be caused by the bacterial pathogen *Erwinia carotovora* ssp. *atroseptica* (Eca), which is the same pathogen causing post-emergence

blackleg. Eca can usually be found on all potato tuber surfaces, but problems develop only after infection occurs following wounding, frosting or other physical damage. The bacterium is a facultative anaerobe meaning it lives with or without oxygen. Oxygen deprivation is a common occurrence in waterlogged soils, which can enhance this disease. Once Eca infects a sprout, it develops rapidly following emergence resulting in rotting of the lower stems and roots. The stems are left without anchoring so easily pull out of the ground. Typically, plants affected by Eca are stunted with yellow, necrotic leaves and black stems. Other sprouts from a seed piece may compensate for those that are infected if the seed piece is still intact and healthy.

A third, and maybe more commonly occurring disease even in a year with more normal precipitation levels, is Rhizoctonia stem canker caused by the fungus *Rhizoctonia solani*. High disease pressure from Rhizoctonia results in poor stands, stunted plants, reduced tuber number and size, and misshapen tubers. Disease development is positively correlated with soil temperature. When soil temperatures are in the range of 41 to 77°F, plants are more susceptible to infection from *R. solani*. Wet soils warm up more slowly than dry soils, and this slow warming exacerbates damage because plant development is delayed and the cool, wet conditions favor fungal growth. Damage is most severe at cool temperatures because of reduced rates of plant emergence and slow growth of stems and stolons relative to growth of the fungus. Plants become more resistant to infection after emerging and developing green plant material above ground.

One last weather-related disease is late blight caused by the water mold *Phytoph-*

*thora infestans*. Late blight is favored by moderate temperatures of 59 to 78°F, high relative humidity, and frequent rainfall or wet conditions. With confirmed findings of late blight in 2008 and the favorable conditions this year—cool temperatures and frequent thunderstorms—the probability of late blight occurring is high. *Phytophthora infestans* inoculum can come from many sources. In the spring, the pathogen can be transmitted from infected tubers found in cull piles or volunteers and transmitted to potato foliage by airborne spores. Infected seed potatoes are also a source of disease. However, some infected tubers may rot in the soil before emergence, and not every plant that emerges from an infected tuber will be infested with late blight.

Late blight can be termed a "community disease" because spores from infected plants may spread from plant to plant within a field or to healthy plants in neighboring fields by thunderstorms. With the increased risk for late blight, efforts must be made to monitor crops closely for the incidence of this disease. Particularly after plants close across the rows, look for late blight in the lower portions of the plant where the foliage stays wet longer. Scouting should be concentrated in areas of the field most likely to remain wet for the longest period of time, such as the center tower of pivot irrigation system. If a field is thought to have late blight, care should be taken not to spread the disease from field to field when scouting. Disposable pants and rubber boots that can be washed after leaving a field should be worn if late blight is suspected or was found in a field. Late blight inoculum can also be spread from field to field on equipment, so this should also be washed after leaving the field.

As the risk of late blight becomes greater, crop monitoring should be intensified. Late blight lesions may be confused with those of early blight (*Alternaria solani*) and gray mold (*Botrytis cinerea*), which are less severe diseases. Thus, it is important that an accurate identification of the disease symptoms is made and late blight is confirmed by a qualified diagnostician. If you think late blight is in your field, you should contact University of Idaho for instructions on how to submit a disease sample, or contact your local crop consultant. With optimal weather conditions for a potential late blight outbreak, all growing regions in Idaho should be considered at risk with regard to this disease. A protectant spray should be applied before row closure followed by another application 10 to 14 days later, and then make fungicide applications based on current environmental conditions. Programs based on chlorothalonil (e.g. Bravo® WS, Echo® 90 DF, Equus® DF) or EBDC-containing products (e.g. Dithane®, Manzate®, Manex®, Penncozeb®) will reduce the risk of disease development. Consult your local advisor for additional combinations and the label for appropriate rates. To keep updated

on the threat of late blight, call the late blight hot line at 800-791-7195.

Unfortunately, there's not a lot that can be done to change the outcome from weather, but producers should scout for late blight and keep their crop protected from this disease. Additionally, producers need to carefully manage nitrogen for the remainder of the season. The high amount of rain may have, in some fields, leached a significant quantity of the nitrogen below the potato root zone making it unavailable to the plants. Although weekly petiole nitrate-nitrogen (NO<sub>3</sub>N) monitoring can be used to determine crop N status, it's important to know the amount of nitrogen in the top 18 inches of soil. For Russet Burbank potatoes during the tuber-bulking growth stage, the petiole NO<sub>3</sub>N levels should be 15,000 to 20,000 ppm and the NO<sub>3</sub>N in the upper 18 inches of soil should be 15 to 20 ppm. In some fields, it may be necessary to begin applying nitrogen through an irrigation system sooner than what would be done in a year with more normal rainfall. Also, be sure to closely monitor irrigation amounts to match crop-water use.

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ALWAYS read and follow the instructions printed on the pesticide label. The pesticide recommendations in this University of Idaho publication do not substitute for instructions on the label. Trade names are used to simplify the information; no endorsement or discrimination is intended.

#### Did You Know?

This month's issue of *the Spudvine* newsletter is the 200<sup>th</sup> edition published by William Bohl, who took over distributing the newsletter in 1990.

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# 200th Issue

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