Management of Pink Rot *(Phytophthora erythroseptica)*

**Pink Rot Disease Cycle**

Pink Rot, caused by *Phytophthora erythroseptica*, can cause significant losses to potatoes in storage throughout North America. The Pink Rot pathogen survives in the soil by producing oospores. In the presence of potatoes, oospores will germinate to produce mycelia and sporangia. In warm, moist soils, sporangia can germinate directly or release swimming spores called zoospores. Roots of potatoes can be infected by the Pink Rot pathogen at almost any stage of plant development; however, symptoms tend to be more severe in young roots.

Once roots or stolons are infected, the Pink Rot pathogen can grow into the tuber. Tubers can also become infected directly through the eyes or lenticels during long periods of high soil moisture. The Pink Rot pathogen will readily produce oospores in the plant that are returned to the soil when the vines are killed.

**Symptoms**

Symptoms of Pink Rot in mature plants include brown or blackened roots or stolons. In severe cases, infection can result in leaf chlorosis, stunting and wilting symptoms in above-ground stems. Infected tubers will remain intact; however, they will appear dark and may be wet and spongy, exuding clear liquid. The internal tissues of an infected tuber will turn salmon pink after exposure to the air for approximately 20 minutes. Secondary infection of soft Rot bacteria can often occur in tubers infected by Pink Rot resulting in tuber breakdown.

**Disease Management - A Holistic Approach**

Metalaxyl-m, the active ingredient in Ridomil® Gold, is an effective tool for the management of Pink Rot as well as Pythium leak in potatoes. Ridomil Gold 480EC can be applied in-furrow at the time of planting. Ridomil Gold Bravo®, applied as a foliar application starting when the tubers are dime-sized, will also provide protection. Studies have also demonstrated that Ridomil Gold provides protection from Pink Rot even in the presence of Late Blight.

Ridomil Gold is a powerful tool, but it takes more than Ridomil Gold to control Pink Rot. It takes a holistic understanding of the disease cycle and the factors that favour disease development.

**Risk Factors**

**Pre-Plant:**

- **Field disease history** – Pink Rot inoculum can persist in a field for several years. Do not plant potatoes in consistent hot spots.
- **Crop rotation practice** – Suitable host crops will increase Pink Rot inoculum in a field including potato and kidney beans. Best rotation options following potatoes are small grains or corn.
- **Seed source and variety** – Pink Rot can be moved on contaminated seed; thus, use disease free seed. There has also been a documented varietal response to Pink Rot so use a variety that has a low susceptibility in areas of concern.
- **Soil type & pH** – Soil with pH>7.5 and/or wet soils can favour Pink Rot development.

**At-Planting:**

- **Fertilization** – Excess soil nitrogen or quick release nitrogen fertilizers may encourage the development of Pink Rot.
- **Water management** – Excessive soil moisture can increase stolon-end infection and infection through tuber eyes.
**Harvest & Storage Risk Factors:**

- **Weather** – When applied in-furrow, excessive rainfall on sandy soils may reduce the amount of Ridomil Gold 480EC available for uptake. A subsequent foliar application may be necessary. Plant stress (drought or excessive moisture) during foliar application of Ridomil Gold Bravo may reduce uptake and movement of the active ingredient into the tubers.

**Foliar application methods** – If an in-furrow application of Ridomil Gold 480EC has not been made, then 2 foliar applications of Ridomil Gold Bravo should be made. The initial foliar application should be timed to when the tubers are dime-sized. Plants should be vigorously growing and free of stress.

- **Water management** – Avoid excessive irrigation during the growing season. Continuously wet soil conditions are more conducive to Pink Rot. Excessive water late in the season under conditions of high soil temperature may be especially problematic.

- **Weather** – Optimum soil temperatures for development of Pink Rot are 65 – 70°F. Prolonged exposure to optimum soil temperatures in combination with excessive soil moisture can lead to tuber infection even when Ridomil Gold has been used.

**Tuber skin set** – Ensure a good skin set prior to digging as this will enhance storability and decrease mechanical damage during harvest & transport. Ridomil Gold 480EC or Ridomil Gold Bravo active ingredient is concentrated in the outer cell layers of the tuber. When this layer is damaged, the protection provided is decreased.

- **Pulp temperature** – Allow tuber pulp temperature to cool to at least 65°F prior to harvest. Do not move field-heated tubers into storage.

- **Weather** – When possible, harvest prior to frost.

- **Infected field areas** – Either do not harvest or harvest separately those areas with high levels of infection.

**Resistance:**

In a national survey conducted in 2005, isolates of Pink Rot were collected and tested for their sensitivity to metalaxyl-m. In summary, 7 isolates out of 49 collected showed insensitivity to metalaxyl-m. In 2006, all isolates tested were found to be sensitive to Ridomil Gold. These results demonstrate that the prevalence of Pink Rot insensitivity to Ridomil Gold is very low nationally. In addition, in situations where shifts in sensitivity have occurred, there will still be sensitive isolates in the population that will be controlled by Ridomil Gold. However, it does reinforce the need for resistance management to ensure that we maintain the functionality of this key disease management tool. As indicated above, it is crucial that a holistic approach is taken for the management of soil-borne storage diseases. All of the risk factors listed above should be taken into consideration as well as appropriate use of Ridomil Gold.

- Position Ridomil Gold brands early in the season
- Use recommended application rates
- Ridomil Gold brands are still the most effective chemical control option for incorporation into a storage disease management strategy.

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