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Test Your Understanding of Potato Diseases

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There's a short quiz in the daily newspaper to which I subscribe. I don't faithfully read the quiz, but occasionally I'll skim it to see how many answers I know. I do fairly well on some quizzes, but fail miserably on others. Either way, I usually learn something. As a potato grower, you have likely attended many meetings over the winter or read articles discussing potato diseases, so we thought we'd test your knowledge about potato diseases. The answers are at the end of this article, but don't read ahead—test yourself first.

Questions

- Late blight has not been present in Idaho for the last several years, but potato producers are well aware that this disease can show up under the right conditions of cool and wet weather—we've seen those conditions so far this year. In discussing late blight, researchers refer to genotypes, which are:
 - reproductive structures of late blight
 - populations of the late blight organism that have similar traits
 - one of the subdivisions used in classifying disease organisms
- Potato plants can be infected by several different pathogens including bacteria (common scab, soft rot), fungi (early blight, white mold), and viruses (potato leaf roll, potato virus Y). Collectively, that part of a pathogen capable of infecting a potato is referred to as:
 - host
 - inoculum
 - vectors
- For many potato diseases, a plant will become infected but will not immediately show symptoms. The period from the time a plant becomes infected until symptoms are visible is called what?
 - incipient period
 - labile period
 - latent period
- Unlike many diseases, virus diseases that infect potatoes are most commonly spread by aphids that serve as vectors to transfer the virus from infected plants to healthy ones. What part of the aphid is responsible for spreading the virus?
 - legs
 - stylet
 - wings
- Early blight and late blight can both be spread from plant to plant and field to field under the right conditions. What structures are responsible for the spread of these two diseases?
 - phytoplasma
 - sclerotia
 - spores
- Fields can become infested with the pink rot organism that is capable of surviving for years. What microscopic structures allow pink rot to survive from year to year?
 - sclerotia
 - oospores
 - zoospores
- Potato plants that have been infected with *Rhizoctonia* stem canker will generally produce tubers that have black material on the surface. What is the scientific term used to describe this material that is said to be "dirt that won't wash off?"
 - sclerotia
 - sclerotinia
 - sporangia
- Tubers that are shatter-bruised during handling or tubers that are cut for seed can be infected with *Fusarium* dry rot before the wound heals. What layer must be formed during the wound-healing process to prevent infection by the *Fusarium* fungus?
 - suberin
 - pericycle
 - wound periderm
- Which of the following is a recommended management practice to help control common scab?
 - maintain high soil moisture
 - maintain low soil moisture
 - use short rotations
- Late blight is caused by the *Phytophthora infestans* organism. What potato disease is caused by *Phytophthora erythroseptica*, which is in the same genus, but a different species?
 - early blight
 - pink rot
 - soft rot

Answers and Explanations

- b. genotype**—a population of the late blight organism with similar traits—late blight genotypes found in the United States are designated using the letters "US" followed by a number, such as US-8.
- b. inoculum**—structures of a disease organism capable of infecting plants, for example, sporangia of pink rot or mycelia of *Rhizoctonia* stem canker.
- c. latent period**—the period of time from when a plant is infected to when symptoms are produced. A latent period can make managing such diseases as late blight particularly difficult because much more of a field or area can be infected before visible signs are present. Disease forecasting is a tool used in managing

some potato diseases, so fungicides can be applied when they are most effective before a disease is present.

- 4) **b.** stylet—this is a slender mouthpart of aphids used to probe plants for food. Potato virus Y can be instantaneously spread from one plant to the next, but the virus is wiped off the stylet once the aphid probes a plant. Contrastingly, potato leaf roll virus must first circulate through the aphid, but the aphid remains infected for the rest of its life.
- 5) **c.** spores—a reproductive structure produced by fungi. For late blight, the spores must be carried in cool, moist air such as late afternoon thundershowers.
- 6) **b.** oospores—thick-walled survival structures of oomycete fungi.
- 7) **a.** sclerotia—hardened, compact, black mass of fungi capable of surviving from one season to the next.

- 8) **c.** wound periderm—a suberin layer is formed in 2 to 4 days, but the suberin layer cannot stop the *Fusarium* dry rot fungus. The suberin layer, however, does prevent infection by soft rot.
- 9) **a.** maintain high soil moisture—available soil moisture should be at or near field capacity for 4 to 6 weeks beginning at tuber initiation.
- 10) **b.** pink rot—late blight and pink rot are both caused by *Phytophthora*, which are organisms that thrive in cool, moist conditions.

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Did You Know? *Phytophthora infestans*, *Phytophthora erythroseptica* and *Pythium ultimum*, the causal agents of late blight, pink rot and leak are still often referred to as fungi by most of us. Because of several important differences between the organisms of this group and the true fungi, these “oomycetes” or “water molds” are now considered to be members of the Protista kingdom, a separate biological kingdom made up of organisms that have both plant and animal-like characteristics. One reason these disease organisms have been placed in this group is because they all produce zoospores, and these spores can swim!

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