# Pest Control Adviser (PCA) Plant Pathogens Practice Exam (Sample)

## Study Guide


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# Questions

**1. What type of organism does Sclerotium sp. belong to?**

**A. Bacteria**

**B. Basidiomycetes**

**C. Ascomycetes**

**D. Deuteromycetes**

**2. Which crop is particularly affected by Damping-off pathogens?**

**A. Potato**

**B. Corn**

**C. Floricultural crops**

**D. Wheat**

**3. What symptom indicates air pollution caused by ozone?**

**A. Brown leaf margins**

**B. Fleeking and stippling**

**C. Leaf curling**

**D. Growth atrophies**

**4. Which practice is recommended for managing Rhizoctonia sp.?**

**A. Plant in fields with a history of Rhizoctonia**

**B. Avoid planting in fields with a lot of plant debris**

**C. Use high-nitrogen fertilizers**

**D. Rotate crops with legumes**

**5. Which symptom is commonly associated with herbicide injury?**

**A. Wilting of leaves**

**B. Stunted plants**

**C. Leaf distortion and chlorosis**

**D. Excessive root growth**

**6. What is a primary strategy for preventing fire blight infection in apple and pear trees?**

- **A. Regular soil testing**
- **B. Pruning to remove affected branches**
- **C. Pruning to avoid infection**
- **D. Using chemical pesticides**

**7. What class of organisms does Phytophthora sp. belong to?**

- **A. Ascomycetes**
- **B. Zygomycetes**
- **C. Oomycetes**
- **D. Chytridiomycetes**

**8. What describes a 'latent infection'?**

- **A. The infectious agent is actively causing symptoms**
- **B. The infectious agent is dormant with no symptoms present**
- **C. The plant has recovered from an infection**
- **D. The symptoms are severe but not visible**

**9. Which pathogen is responsible for peach leaf curl?**

- **A. Taphrina sp.**
- **B. Venturia sp.**
- **C. Fusarium sp.**
- **D. Botrytis sp.**

**10. When are foliage sprays and dusts most appropriately used?**

- **A. For soilborne diseases only**
- **B. Primarily for root rot treatment**
- **C. To control powdery mildew in grapes**
- **D. Only during the harvesting season**

# Answers

**1. B**
**2. C**
**3. B**
**4. B**
**5. C**
**6. C**
**7. C**
**8. B**
**9. A**
**10. C**

# Explanations

## 1. What type of organism does Sclerotium sp. belong to?

**A. Bacteria**

**B. Basidiomycetes**

**C. Ascomycetes**

**D. Deuteromycetes**

**Sclerotium sp. is classified as a fungus, specifically within the division of Basidiomycetes. This group of fungi is known for producing basidiospores, a dominant reproductive structure. Sclerotium species are recognizable by their ability to form sclerotia, which are dense aggregates of hyphal cells that help the fungus survive adverse conditions. In the context of plant pathology, Sclerotium sp. is important because it can cause diseases in a variety of plants, affecting crop yields and health. Understanding its classification is crucial for identifying its life cycle and determining effective control measures. The ability to properly identify Sclerotium sp. as a Basidiomycete provides insights into its biological behavior and the environmental conditions it prefers, which is vital for pest management strategies. The other classifications listed—Bacteria, Ascomycetes, and Deuteromycetes—represent different groups of organisms that do not encompass the defining characteristics of Sclerotium sp. Understanding its correct classification allows for more effective study and management of plant diseases caused by this organism.**

## 2. Which crop is particularly affected by Damping-off pathogens?

**A. Potato**

**B. Corn**

**C. Floricultural crops**

**D. Wheat**

**Damping-off pathogens are particularly detrimental to floricultural crops, which include a variety of ornamental plants and flowers. This group of pathogens, primarily caused by fungi such as Pythium and Rhizoctonia, thrives in warm, moist conditions that are often present in greenhouse settings where these crops are cultivated. They attack seedlings during the germination and early growth stages, leading to seedling death both before and after sprouting, which is characteristic of damping-off disease. Floricultural crops are especially vulnerable because they are often grown in high-density settings with significant humidity and moisture levels that favor these pathogens. It's not only their susceptibility but also the economic impact of damping-off on these crops that makes them a focal point for pest control advisers. In contrast, while other crops like potatoes, corn, and wheat can be affected by various diseases, they are not the primary targets of damping-off pathogens, which tend to flourish in the controlled environments typical of floriculture where young plants are most at risk.**

## 3. What symptom indicates air pollution caused by ozone?

**A. Brown leaf margins**

**B. Fleeking and stippling**

**C. Leaf curling**

**D. Growth atrophies**

**Fleeking and stippling are specific symptoms that are notably associated with ozone pollution in plants. This occurs when ozone, a reactive gas found in smog, infiltrates leaves through the stomata. Within the leaf tissue, ozone can cause cellular damage, leading to the development of light-colored flecks or stipples, which provide a visual indicator of the harmful effects of ozone on plant health. The other symptoms listed do not directly indicate air pollution caused by ozone. Brown leaf margins are more often associated with factors such as drought stress or nutrient deficiencies. Leaf curling can be indicative of numerous stressors, including herbicide damage or environmental conditions like drought. Growth atrophies could signal a variety of issues, such as nutrient deficiency or pest damage, rather than specifically pointing to ozone injury. Therefore, fleeking and stippling stands out as the most recognized symptom related to ozone pollution.**

## 4. Which practice is recommended for managing Rhizoctonia sp.?

**A. Plant in fields with a history of Rhizoctonia**

**B. Avoid planting in fields with a lot of plant debris**

**C. Use high-nitrogen fertilizers**

**D. Rotate crops with legumes**

**The recommended practice for managing Rhizoctonia sp. is to avoid planting in fields with a lot of plant debris. This pathogen thrives in environments rich in decomposing organic matter, as the debris can provide both a habitat and a source of nutrients for the fungus. By minimizing the amount of plant debris in the field, the likelihood of Rhizoctonia sp. surviving and proliferating is significantly reduced. Moreover, managing plant debris can interrupt the life cycles of the pathogens, thereby lowering their population density in the soil and plant material. This practice is particularly important in preventing diseases caused by Rhizoctonia, which can be devastating to various crops, leading to issues like root rot and damping-off. The other practices mentioned, such as planting in fields with a history of Rhizoctonia or using high-nitrogen fertilizers, could actually exacerbate the issue by providing favorable conditions for the pathogen. Crop rotation with legumes may be beneficial for other pathogens or nutrient management, but does not specifically address the management of Rhizoctonia, emphasizing the importance of reducing plant debris as a primary method for managing this soilborne pathogen.**

## 5. Which symptom is commonly associated with herbicide injury?

**A. Wilting of leaves**

**B. Stunted plants**

**C. Leaf distortion and chlorosis**

**D. Excessive root growth**

**Leaf distortion and chlorosis are commonly associated symptoms of herbicide injury in plants. When a plant is exposed to herbicides, such as growth regulators that mimic natural plant hormones, it may exhibit abnormal growth patterns. This can lead to the twisting, curling, or distortion of leaves, which is often accompanied by chlorosis, a condition where leaves turn yellow due to insufficient chlorophyll. These changes occur because herbicides disrupt the normal physiological processes within the plant, directly impacting its growth and development. While wilting of leaves and stunted plants can be symptoms of various plant stressors, including water stress or nutrient deficiencies, they are not as specifically indicative of herbicide damage as leaf distortion and chlorosis. Similarly, excessive root growth is generally not associated with herbicide injury; it tends to relate more to soil conditions or other types of growth stimulators. Therefore, leaf distortion and chlorosis provide a clearer and more specific indication of herbicide impact on plants.**

## 6. What is a primary strategy for preventing fire blight infection in apple and pear trees?

**A. Regular soil testing**

**B. Pruning to remove affected branches**

**C. Pruning to avoid infection**

**D. Using chemical pesticides**

**Pruning to avoid infection is a primary strategy for preventing fire blight in apple and pear trees primarily because it helps reduce the availability of infection sites and controls potential spread. Fire blight, caused by the bacterium Erwinia amylovora, typically infects trees through open wounds, often made during the growing season by poor pruning techniques or environmental factors. By strategically pruning trees to minimize the risk of infection, such as removing branches that are overly dense or damaged, growers can help ensure that air circulation is optimized and that humidity levels are lowered, thereby reducing conditions that favor the bacterium's proliferation. Additionally, pruning can remove any potential sources of the pathogen by cutting away affected branches before they have the chance to spread the bacteria to healthier parts of the tree. This preventative action is integral, especially during the blooming period when trees are particularly susceptible to infection.**

## 7. What class of organisms does Phytophthora sp. belong to?

**A. Ascomycetes**

**B. Zygomycetes**

**C. Oomycetes**

**D. Chytridiomycetes**

**Phytophthora sp. belongs to the class Oomycetes, which are often referred to as water molds. This class of organisms is distinct from true fungi, despite some similarities in morphology and life cycles. Oomycetes are characterized by the presence of a specialized reproductive structure that produces zoospores, which have flagella allowing them to swim in water. This adaptation is significant, as it relates to how these organisms spread and infect plant hosts. Oomycetes also have a unique life cycle that includes both asexual and sexual reproduction, with the asexual phase typically involving the production of sporangia. In this way, these organisms can rapidly multiply in favorable conditions, which is one reason they can be particularly pathogenic to plants. Understanding the class Oomycetes is crucial for pest control advisers, as the management strategies for these organisms can differ greatly from those used for true fungi and other plant pathogens.**

## 8. What describes a 'latent infection'?

**A. The infectious agent is actively causing symptoms**

**B. The infectious agent is dormant with no symptoms present**

**C. The plant has recovered from an infection**

**D. The symptoms are severe but not visible**

**A 'latent infection' is characterized by the infectious agent being present within the host organism while remaining dormant, which means there are no visible symptoms of disease. This state is crucial because it allows the pathogen to survive within the host for extended periods without causing immediate harm or triggering a defensive response from the plant. Latent infections can become active later, leading to symptoms if conditions change, such as environmental stresses that might weaken the plant's defenses or allow the pathogen to reactivate. In contrast, the other choices describe different scenarios related to infections. For example, a situation where the infectious agent is actively causing symptoms indicates that the infection is in an acute phase rather than latent. Recovering from an infection refers to the plant's response post-symptom phase and suggests a resolution rather than a dormant state. Lastly, while symptoms being severe but not visible suggests a complex interaction between the plant and pathogen, it does not fit the definition of latency since latency specifically denotes a lack of symptoms.**

## 9. Which pathogen is responsible for peach leaf curl?

**A. Taphrina sp.**

**B. Venturia sp.**

**C. Fusarium sp.**

**D. Botrytis sp.**

**Peach leaf curl is primarily caused by the fungal pathogen Taphrina sp., particularly Taphrina deformans. This pathogen specifically targets peach trees and leads to distinctive leaf symptoms such as curling, thickening, and discoloration of the leaves. The infection occurs when fungal spores invade the leaf tissue, disrupting normal growth and development. Conditions that favor the establishment of Taphrina include cool and damp weather, especially in early spring, which is when the leaves are unfolding. The management of peach leaf curl typically involves cultural practices such as proper pruning, maintaining tree health, and applying fungicides during the appropriate times to prevent infection. In contrast, other pathogens listed, such as Venturia, Fusarium, and Botrytis, are associated with different types of diseases on various hosts. Venturia species cause leaf spot diseases in other fruits, Fusarium is known for root and stem rot diseases, and Botrytis typically causes gray mold in flowers and fruits. These pathogens do not specifically target peach trees in the manner that Taphrina does. Therefore, Taphrina sp. is identified as the correct answer for the cause of peach leaf curl due to its direct association with the symptoms observed on the leaves of peach trees.**

## 10. When are foliage sprays and dusts most appropriately used?

**A. For soilborne diseases only**

**B. Primarily for root rot treatment**

**C. To control powdery mildew in grapes**

**D. Only during the harvesting season**

**Foliage sprays and dusts are most appropriately used to control diseases that affect the above-ground parts of plants, including leaves, stems, and flowers. This method is particularly effective for managing foliar diseases such as powdery mildew, which commonly affects crops like grapes. When powdery mildew is present, timely application of sprays or dust can help mitigate the spread of this fungal pathogen by ensuring that the active ingredient reaches the leaves where the disease manifests. Grapes are particularly susceptible to powdery mildew due to the climatic conditions that favor its development, making the use of foliage treatments essential for maintaining crop health and quality. In contrast, options that specify treatments for soilborne diseases or root rot focus on issues that primarily affect the root system, which require different methods of intervention, such as soil amendments or systemic fungicides. Additionally, limiting foliage applications to only the harvesting season would not fully address the ongoing threats posed by foliar pathogens throughout the growing season when they are most active. Thus, the focus on powdery mildew control in grapes accurately reflects the effective use of foliage sprays and dusts.**