

MANAGEMENT OPTIONS FOR DOWNY MILDEW

SITUATION

Downy mildew is a soil-borne fungus that infects sunflowers shortly after germination and again at the four- to eight-leaf stage. It also can lead to a secondary infection if spores are splashed or blown on the leaves. New strains of downy mildew have overcome genetic resistance in some sunflower hybrids.

FACTORS TO CONSIDER

- Infection type
- Symptoms
- Infection source
- Management
- New downy mildew strains

ACTION PLAN

1. Understand the infection and symptoms. Downy mildew infects sunflowers soon after germination, when roots are less than 2 inches in length. This is known as systemic infection, when roots come in contact with the pathogen. Symptoms of systemic infection include stunted growth and yellowing of the leaves and veins. White fungal spores also can be found on the underside of the leaves. Many seedlings will die, and those that live will be stunted and nonproductive. Delayed systemic infection also can occur when downy mildew infects at the four- to eight-leaf stage. This will cause similar symptoms on a larger plant.

Secondary infection occurs when the pathogen is splashed or blown onto leaves and is characterized by small white lesions on the leaf. Secondary infection damages only a portion of the leaves and will usually have little effect on yield.

2. Know possible sources of infection. Downy mildew can reach a field in many ways. Spores have been known to survive in the soil for 10 years. They also can be transported by wind and water. Wild sunflowers and other weeds in the composite family, such as marshelder, also serve as hosts for downy mildew.

3. Manage infection to retain yield. Crop rotation can help manage downy mildew pressure, but it does not ensure immunity, due to spore longevity and mobility. Seed treatments also are available to suppress downy mildew. Planting resistant sunflower **hybrids** is still a good management tool; however, **new strains** have overcome resistant genes. Yield still can be salvaged if loss is uniform, as sunflowers can compensate for open space and missing plants.

SUMMARY

Downy mildew is a fungal disease that primarily has been controlled by genetic resistance bred into sunflower hybrids, but new strains identified in 2009 have overcome this genetic resistance. While plant breeders work to develop hybrids with resistance to the new strains, consult your local Mycogen Seeds customer agronomist or trusted agronomic adviser for additional advice on managing downy mildew.



Symptoms of downy mildew include yellowing of the leaves and veins, and stunted growth.



White fungal spores can be seen on the underside of infected leaves.

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