



Extension

UNIVERSITY OF WISCONSIN-MADISON

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Aphanomyces Root Rot of Alfalfa

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What is Aphanomyces root rot of alfalfa? Aphanomyces root rot (ARR) is a serious disease of both recently seeded alfalfa and established alfalfa stands. ARR can cause severe yield reductions in affected alfalfa fields. Variations of the



Stunting and yellowing of alfalfa plants (leading to increased weed pressure) is typical of Aphanomyces seedling blight and root rot. (Photo courtesy of Craig Grau)

disease also occur on many other legumes (including soybean, snap bean, faba bean, red kidney bean, pea, red clover, and white clover) and can cause significant losses in these crops as well.

What does Aphanomyces root rot look like? Typically alfalfa emergence is not dramatically affected by the ARR, but symptoms appear shortly after seedlings emerge. Young plants appear stunted and yellow and may eventually die. The root systems of affected seedlings are smaller than normal and what roots remain, appear gray and water-soaked. Older alfalfa plants suffering from ARR also tend to be stunted and yellow. They may have a well-developed tap root, but typically relatively few smaller, fine roots.

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Oftentimes growers realize they have a problem with ARR when they notice that weeds in their fields are growing more vigorously than their alfalfa crop.

Where does Aphanomyces root rot come from? ARR is caused by the soilborne water mold (i.e., fungus-like organism) *Aphanomyces euteiches*. *A. euteiches* is commonly found in fields that are poorly drained, fields with heavier (i.e., clay) soils, fields with compaction, and fields that receive excessive water. *A. euteiches* produces microscopic, long-lived resting spores (called oospores) in the roots of infected plants and these spores can remain dormant in the soil for up to 10 years, even in the absence of a susceptible crop. Once a susceptible crop is present, oospores can germinate and directly infect plants or, under wetter conditions, can produce numerous microscopic swimming spores (called zoospores) that can subsequently infect plants.

There are several variants of *A. euteiches* and these variants tend to have preferences for which plant hosts they will infect. For example, some variants tend to infect alfalfa, others tend to infect peas and others tend to infect snap beans. *A. euteiches* that infects alfalfa can be further divided into two races (race 1 and race 2), which can be distinguished based on the particular alfalfa varieties that they most readily infect. Other races of *A. euteiches* that can infect alfalfa likely exist, but at this time have not been fully documented.



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How can I save plants with *Aphanomyces* root rot? There is no way to save an alfalfa crop once ARR has occurred. Fungicide seed treatments may provide short-term protection of alfalfa seedlings. However, foliar fungicides do not provide any ARR control.



Alfalfa plants with *Aphanomyces* seedling blight/root rot have reduced numbers of small, fine roots. (Photo courtesy of Craig Grau)

How can I avoid problems with *Aphanomyces* root rot in the future?

The most important management strategy for ARR is to make sure fields are properly drained. Reducing standing water is important to prevent development of zoospores (which can dramatically increase disease severity). Reducing compaction, using sub-surface drainage tiles and/or re-routing surface water drainage pathways can help alleviate wet soil conditions. If there is a past history of ARR in a field, use alfalfa varieties with resistance to the specific race(s) of *A. euteiches* present in the field. Which race(s) are present can be determined using a soil bioassay. Contact your local county Extension office for more information on how to

collect a soil sample for *A. euteiches* testing, as well as for recommendations on appropriate alfalfa varieties to use once the results of the soil bioassay are available. In some areas of Wisconsin (such as the southwest region), both race 1 and race 2 of *A. euteiches* are widespread. Therefore, routine use of alfalfa varieties resistant to both races may be warranted. Crop rotation is not an effective management strategy for ARR because oospores of *A. euteiches* survive for long periods in the soil. Alfalfa seed treatments may provide protection to seedlings only up until shortly after emergence. Foliar fungicides, fumigants and other biological control products are also not effective in managing ARR.

For more information on *Aphanomyces* root rot: Contact your county Extension agent.