College of Agriculture, Food and Environment
Cooperative Extension Service

Plant Pathology Fact Sheet **PPFS-AG-F-10**

Possible Causes of Yellowing Alfalfa

Paul Vincelli
Extension Plant Pathologist

Chris Teutsch
Extension Forage Specialist

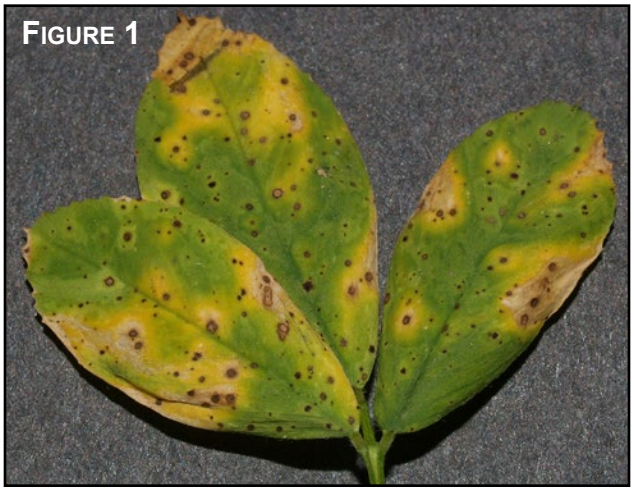
Kiersten Wise
Extension Plant Pathologist

Alfalfa fields may periodically exhibit yellow foliage. Possible causes for these symptoms are discussed below.

Possible Causes

Leaf Spot Diseases

During spring, several leaf spotting diseases—including Leptosphaerulina (Lepto) leaf spot (Figure 1) and spring black stem/leaf spot—are common in alfalfa. Leaf spotting diseases result in distinct round to elongated spots that sometimes have a dark margin. Very wet weather in spring and early summer favor activity of leaf spotting diseases in first and second cuttings. Wet and humid weather during summer favor other leaf spotting and blighting diseases. All leaf spots and blights weaken plants, but alfalfa often outgrows the damage in later cuttings. Maintain a regular cutting schedule, cutting at 30- to 35-day intervals.



Root Rots

There are a variety of root-rotting diseases of alfalfa that can cause yellow leaves, and these diseases are favored by saturated soils. Dark brown to black lesions appear on diseased roots, while above ground symptoms include yellowing and stunting.

The most damaging of the root rot diseases is Phytophthora root rot (Figure 2), which can attack any part of the root system of plants of any age.

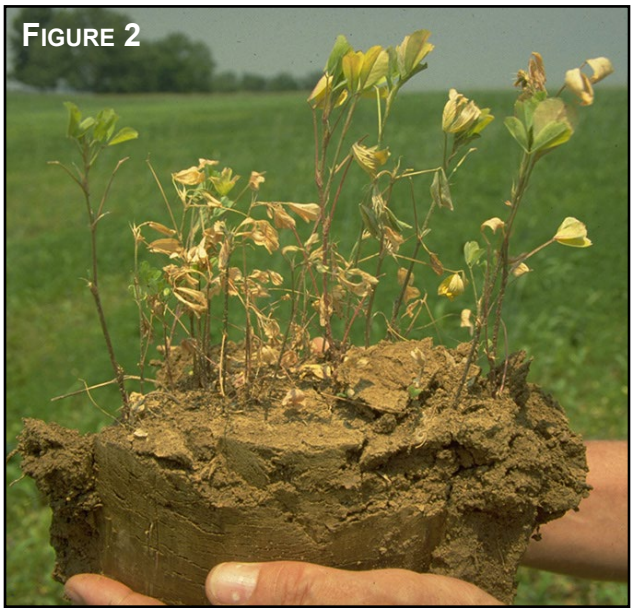


Figure 1. Leaf spotting diseases, such as Lepto leaf spot (Leptoshaerulina leaf spot) shown here, cause foliage to yellow. These diseases can weaken plants.

Figure 2. Phytophthora seedling blight results in wilting, yellowing, and plant death.

Aphanomyces (FIGURE 3) and *Pythium* species are also known to attack the fine feeder roots of mature plants of alfalfa when soils are saturated. Always select varieties that have resistance to Phytophthora and Aphanomyces root rots when seeding alfalfa in Kentucky. Unfortunately, there is no known resistance in commercial cultivars to *Pythium* infection, but improving soil drainage and minimizing soil compaction will help with all three diseases.

FIGURE 3. APHANOMYCES DAMAGES FINE FEEDER ROOTS IN SATURATED SOILS.

Crown Rot Diseases

Alfalfa plants with brown discoloration in their crowns likely have crown rot (FIGURE 4). A variety of soil-borne fungi can cause this type of decay, including species of *Rhizoctonia*, *Sclerotinia*, and *Colletotrichum.* Adapted varieties of alfalfa can sometimes recover from crown rots; but if disease is severe, it can significantly affect long-term health of the stand. If there is a high frequency of crown rot in a particular field, rotation to a different forage crop is needed.

Assessing stand density can help determine when to rotate to a different forage crop. Guidelines for assessing stand based on crown density or stem density are described below. These are only approximate guidelines. For example, a beef cattle producer often will meet his/her production goals with a much lower density of alfalfa crowns than a hay producer. If stands are less than what is needed to reach yield goals, rotate away from alfalfa for at least 1 year before re-seeding to alfalfa again.

FIGURE 4. DECAY IN ALFALFA CROWNS IS INDICATIVE OF A CROWN ROT DISEASE.

Crown density estimation

Approximate guidelines for economically acceptable stands, based on UK research, are:

- Three crowns per square foot for hay
- One crown per square foot for grazing

Stem density estimation

In the Upper Midwest, standards for high-quality dairy hay production are based on stem density, since this more closely correlates to forage production than crown density:

- 55 or more stems per square foot: no yield reduction
- 40 to 55 per square foot: some yield reduction
- Below 40 per square foot: give consideration to replanting

Potassium (Potash) Deficiency

High-quality alfalfa removes large amounts of potassium from the soil each year. Deficiency symptoms, which generally appear on older leaves first, include spotting or yellowing along leaf margins. Soil test potassium (K) levels should be monitored closely and potassium fertilizer applied whenever it is recommended. It is possible that some plants in fields may exhibit mild potassium deficiency symptoms even if levels in the soil are adequate; roots that are limited by compaction and/or root rots will be less effective at taking up potassium. Maintaining recommended soil test levels and preventing soil compaction will help to assure maximum productivity and stand longevity.

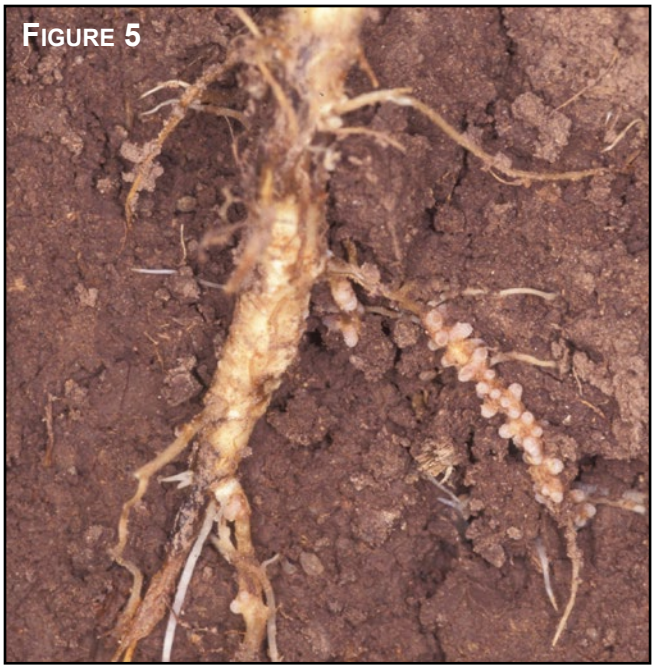


Figure 5. Healthy root nodulation is essential to a vigorous alfalfa stand.

Figure 6. Soil compaction can prevent proper root development, as shown in this plug taken from a compacted area of an alfalfa field.

Figure 7. V-shaped yellow areas develop on foliage following leafhopper feeding.

Poor Nodulation

Check nodulation of new seedings by carefully digging and washing root systems, and then examining for nodules (Figure 5). Poor nodulation of roots may be the result of root-rot infections or of poor viability of the *Rhizobium* bacterium on the seed. If the cause is poor viability, an inexpensive practice to improve the chances for nodulation can be found in *"Emergency" Inoculation for Poorly Nodulated Legumes* (PPFS-AG-F-04).

Soil Compaction

Equipment movement on wet soils in spring during preplant operations or hay harvesting operations can result in severe compaction in some fields. Check for soil compaction by digging and examining root systems (Figure 6) and soil structure. If the compaction is so severe that taproots cannot pass through the compacted zone, yields will be reduced significantly, and plowing and replanting might be the only option. Remember, it is much easier to prevent, than to alleviate, soil compaction.

Potato Leafhopper

Potato leafhopper is common in Kentucky alfalfa fields. Yellow V-shaped areas known as "hopper burn" develop on damaged foliage (Figure 7). Leaves may also appear reddish or purplish in color (Figure 8). Information on recognition, scouting, and management are available from the UK Entomology Extension program. Refer to *Potato Leafhopper*s (EntFact-115) or contact a county Extension office for more information.

Figure 8. Leafhopper feeding may also result in reddish/purplish foliage.

Diagnosis

Accurate diagnosis is a critical first step when considering management options. For assistance in diagnosis, growers should consult their county Extension office.

Referenced Publications

- "Emergency" Inoculation for Poorly Nodulated Legumes (PPFS-AG-F-04)
http://plantpathology.ca.uky.edu/files/ppfs-ag-f-04.pdf
- Potato Leafhoppers (EntFact-115)
https://entomology.ca.uky.edu/ef115

Additional Resources

- Plant Pathology Extension Publications (Forages)
http://plantpathology.ca.uky.edu/extension/publications - FORAGES
- Entomology Extension Publications (Field Crops)
https://entomology.ca.uky.edu/fieldcrop
- Plant and Soil Sciences Extension Publications (Forages)
http://www.uky.edu/Ag/Forage/ForagePublications.htm

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Editor: Cheryl Kaiser, Extension Support Staff
Photos: Bruce Watt, University of Maine, Bugwood.org (1); Paul Vincelli (2, 3, 4 & 8), Lee Townsend (5), University of Kentucky; Bryan Jensen, University of Wisconsin, Bugwood.org (6); and Gerald Holmes, California Polytech at San Luis Obsipo, Bugwood.org (7)