

Plant Pathology Fact Sheet

Risk Factors for Sclerotinia Crown & Stem Rot in Fall-seeded Alfalfa

by Paul Vincelli, Extension Professor

INTRODUCTION

Alfalfa seeded during late summer or fall is susceptible to the destructive disease Sclerotinia crown and stem rot. Fall-seeded stands are particularly vulnerable to this disease because the young seedlings have not had sufficient time to develop adequate resistance before infectious spores of the pathogen are produced in late October. In contrast, spring-seeded stands are able to develop larger, more resistant crowns prior to this infectious period. Thus, spring plantings are better able to withstand an attack, should these air-borne spores be present in the field.

CAUSE

Sclerotinia crown and stem rot (SCSR) is caused by the fungus *Sclerotinia trifoliorum*. This pathogen only infects alfalfa, clover, and related forage legumes. This is not the same *Sclerotinia* species that attacks tobacco in float beds, canola, or vegetable crops—that species is *Sclerotinia sclerotiorum*.



FALL-SEEDED ALFALFA LOSSES DUE TO SCLEROTINIA CROWN AND STEM ROT. INSET: *SCLEROTINIA* FUNGAL STRUCTURES (NEXT TO A DIME TO SHOW THEIR RELATIVE SIZE) RELEASE INFECTIOUS AIR-BORNE SPORES IN THE FALL.

VARIETAL SUSCEPTIBILITY

Recognize that almost all commercial alfalfa varieties are highly susceptible to SCSR for the first few months of growth. The disease pressure from SCSR is higher here than just about anywhere else in the nation. Varieties found to exhibit partial resistance in other states can often be severely damaged by SCSR under Kentucky conditions. Therefore, only varieties that have been

successfully tested against SCSR under Kentucky conditions should be considered for fall seeding in the Commonwealth. Contact your County Extension agent for more information on variety performance against SCSR in Kentucky.

FALL SEEDING & THE DISEASE TRIANGLE

SCSR can be so destructive that growers who have had wipeouts in fall-seeded fields often forsake fall seeding in the future. On the other hand, many growers successfully seed alfalfa this time of year and don't understand all the fuss about *Sclerotinia*. What accounts for the divergence of experience?

It should be understood that plant diseases only develop when all three components of the disease triangle are present: a susceptible plant, a virulent pathogen, and a favorable environment. Producers who successfully seed alfalfa in the fall are able to do so because one of these components is missing in their fields. Often it is because *S. trifoliorum* is absent or present at levels that are too low to cause damage.

If one has a history of successfully fall-seeding in a particular field, there is probably minimal risk in doing so again. This presumes that the same cultural practices are being followed and the disease has not developed to high levels in neighboring fields. However, even a history of previous success is no guarantee because the farmer may be planting alfalfa into a highly infested pasture for the first time. Furthermore, season-to-



THE *SCLEROTINIA* FUNGUS CAN SURVIVE LONG PERIODS IN THE SOIL AS HARD, BLACK SCLEROTIA.

season variation in disease severity is quite high—the disease can be severe in a field one year and mild the next.

RISK FACTORS

If the farmer has little experience with fall seeding, he/she should consider the following risk factors relative to this disease.

- **Cropping history of site**

This fungus only attacks forage legumes, so sites with a long history of row cropping are likely to have low levels of the fungus. However, I emphasize the word “long”. This fungus can survive in the soil at high levels for 5 to 6 years in the absence of any forage legumes. Also recognize that the fungus can maintain itself indefinitely on volunteer clovers in a pasture.

- **Time of seeding**

Seeding by mid-August is preferable to seeding in late August or September because this gives plants more time to develop some natural resistance. As explained above, spring seedings have very little risk of the disease.

- **Tillage**

I don't recommend plowing as a disease control practice, since soil conservation is important to us and to future generations. However, where the fungus is present, moldboard-plowed fields have the least risk of an outbreak, with reduced tillage next in terms of risk. No-till fields have the highest risk of *Sclerotinia* infections. Tillage practices are important because plowing buries the survival structures (sclerotia), reducing spore levels in the fall.

- **History of adjacent fields**

Even if SCSR has not been observed in the field being sown, the field may still be at risk if the disease has been detected in adjacent fields. Neighboring fields can be a source of

airborne spores for the newly seeded fields. Also, the detection of SCSR in adjacent fields suggests that local conditions have allowed SCSR outbreaks in the past and may allow them in the future.

- **Field size/shape**

Let's assume, for example, that you are going to seed a 2-acre field surrounded by pasture. The field has been planted to tobacco for the past 10 years, and was plowed and disked to create a good seedbed. What is the risk of Sclerotinia disease? Keep in mind that this is an airborne fungus. The pasture surrounding the field could easily provide enough inoculum to cause a serious outbreak. The larger the field, and the less border it shares with possible sources of inoculum, the less the risk.

ADDITIONAL RESOURCES

Disease management and crop production advice can be found in the following University of Kentucky publications available at County Extension offices, as well as on the Internet.

- Alfalfa—The Queen of Forage Crops, ID-76
<http://www.ca.uky.edu/agc/pubs/agr/agr76/agr76.pdf>

- Alfalfa Disease Calendar, PPA-44 (2000)
<http://www.ca.uky.edu/agc/pubs/ppa/ppa44/ppa44.pdf>
- Kentucky Integrated Crop Management Manual for Field Crops: Alfalfa, IPM-1 (2006)
<http://www.uky.edu/Ag/IPM/manuals/ipm1alf.pdf>
- Kentucky Plant Disease Management Guide for Forage Legumes, PPA-10d (1995)
<http://www.ca.uky.edu/agc/pubs/ppa/ppa10d/ppa10d.pdf>
- Managing Alfalfa Diseases, ID-104 (1991)
<http://www.ca.uky.edu/agc/pubs/id/id104/id104.htm>

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Photos by Paul Vincelli, University of Kentucky