Improving Our Understanding of Aphanomyces Root Rot of Alfalfa

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RATIONALE & OBJECTIVES

- Aphanomyces root rot, caused by the oomycete pathogen *Aphanomyces euteiches*, can seriously impact alfalfa establishment, and is an important disease of alfalfa in poorly-drained soils in Kentucky.

Objectives:

To determine the impact of fungicide seed treatments on plant population and final yields in a field with a history of poor drainage and root rots.

STUDY DESCRIPTION

- Research plots were established at the University of Kentucky Research and Education Center (UKREC) in Caldwell County, KY in 2020.
- The experiment was a randomized complete block design with four replications. Plots were 6-ft wide and 20-ft long, and the center rows were used for evaluation. The field was poorly drained and had a history of root rot.
- The alfalfa cultivar Algonquin was drilled on a 7-in. row spacing at a rate of 15 lb seed/A on 3 Apr using a modified plot-sized drill.
- Fungicide seed treatments (Table 1) were applied using a batch seed treater prior to planting.
- Alfalfa stand was measured in each plot on 4 Jun, at the second trifoliate growth stage, by arbitrarily selecting two 1 sq ft areas within each plot and counting the total number of alfalfa plants in each square.
- Plots were harvested on 18 Aug. Subsamples were weighed and dried to determine dry matter (DM) yield. Neutral detergent fiber (NDF), and acid detergent fiber (ADF) were determined using near infrared reflectance spectroscopy.
- Data were subjected to a mixed model analysis of variance and means were separated based on least squares means test at the 0.05 significance level.

RESULTS

- The trial location experienced below average temperatures in April and May of 2020 which delayed emergence and impacted stand and plant growth. Alfalfa growth was slower than expected with only one harvest possible.
- Rizolex + Apron XL resulted in a significantly greater plant population compared to other treatments and the non-treated control.
- Treatment did not significantly affect dry matter yield, acid detergent fiber or neutral detergent fiber.

CONCLUSIONS

- Although certain fungicide seed treatments improved populations over the non-treated check, ultimately there were no differences in yield.
- Additional research may help determine if seed treatments are a good investment in fields with a history of Aphanomyces or other root rots.

Table 1. Impact of fungicide seed treatment on plant population, dry matter yield, acid detergent fiber (ADF) and neutral detergent fiber (NDF) of alfalfa in field research trials in Princeton, KY, 2020.

Treatment, formulation, and rate/cwt	Population (plants/A)[z]	Total DM yield (lb/A)	ADF	NDF
Non-treated check	368,337 c	2408.8	37.0	45.8
Apron XL, 3.0 SL, 0.64 fl oz	580,692 b	2466.7	39.6	48.6
Stamina, 1.67 FS, 1.50 fl oz	477,237 bc	2397.3	36.4	44.9
Apron XL, 3.0 SL, 0.64 fl oz + Stamina, 1.67 FS, 1.50 fl oz	406,452 bc	2030.0	35.7	44.1
Rizolex,, 4.17 FS, 0.30 fl oz	542,577 bc	1993.2	35.0	43.6
Rizolex, 4.17 FS, 0.30 fl oz + Apron XL, 3.0 SL, 0.64 fl oz	803,937 a	2595.6	37.5	46.4
P=	0.0014	0.5638	0.0910	0.1163

[z]Column numbers followed by the same letter are not significantly different according to least squares means tests at the *P*=0.05 level.

Alfalfa U.S. Alfalfa Farmer Research Initiative

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