

Cultivar Tolerance, Fungicide, and Application Timing as Management Strategies for Control of *Ascochyta* sp. On Field Pea at Langdon 2005.

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INTRODUCTION

Disease caused by *Ascochyta* spp. on field pea (*Pisum sativum*) appears to be more problematic than other field pea diseases in northeast North Dakota. Three causal organisms make up the complex. *Phoma medicaginis* var *pinodella* (L.K.Jones) Boerema causes foot rot. *A. pisi* Lib. causes leaf and pod spot and is found on plant parts below ground. *Mycosphaerella pinodes* (Berk.& Bloxam) causes blight which is the most common and damaging of the complex. Initial symptoms are small dark flecks often irregular in shape. These lesions form a concentric ring like a cut tree trunk with a very dark brown color in the center and lighter brown on the outer rings. Stem lesions may be longer and wider than leaf lesions and turn blue black or purplish eventually girdling the stem. The complex has been evident since field pea pathology research was initiated in 2001 at the Langdon Research Extension Center at varying levels increasing when environmental conditions favor disease development. Losses are likely to increase as field pea acreages increase and rotations are shortened. Management alternatives should be evaluated to minimize these losses. A study conducted in 2004 found no differences among fungicide rates for control of *Ascochyta* spp. but significant differences among cultivars.

MATERIALS AND METHODS

A study was conducted in 2005 at the Langdon Research Extension Center to evaluate cultivars 'Eclipse and SW Salute' for tolerance to *Ascochyta* spp. The study was designed as a randomized complete block arranged as a 2x3x2 factorial with four replicates. The trial was planted with a plot type double disk drill with rows spaced 6-inches on 25 May to an area previously cropped small grains. Additional plots were planted between the treated plots to minimize spray drift movement to adjacent plots. Endura (boscalid), Headline (pyraclostrobin), and Sulfur, were applied at bloom, one week after bloom, or two weeks after bloom growth stages. An untreated for each cultivar was included in the design but not the statistical analysis due to incompatibility with the factorial arrangement. Endura was applied at 8 oz/acre, Headline at 5.5 fl oz/acre (both BASF), and sulfur at 1 lb/acre with a CO₂ backpack spray boom with XR8002 nozzles spaced 20 inches at 18.4 GPA. The applications were made on 11, 17, and 23 July respectively. Disease assessments were made visually on a scale of 0-9 with nine having infected throughout the canopy and unto the pods. The plots were harvested with a Hege plot combined and samples processed to determine yield, test weight, and protein. North Dakota State University Extension recommended production practices for Northeast North Dakota were followed. Data was analyzed with the general linear model (GLM) in SAS. Least significant differences (LSD) were used to compare means at the 5% probability level Table 1.

RESULTS

'Eclipse' cultivar was much more resistant to *A. spp.* than 'SW Salute' and produced greater yield and protein (Table 2). Similar results were found in 2004 between these cultivars. The fungicide Headline significantly reduced *Ascochyta* severity over the other fungicides and also significantly increased yields. No differences were measured between the Endura and sulfur fungicide treatments. No other differences were measured.

Table 1. Source of variation and confidence levels for significant differences among disease severity, yield, test weight, and protein on field pea Langdon, 2005.

Source of Variation	Ascochyta Severity	Yield	Test Weight	Protein
Cultivar	<0.0001	0.1120	0.7083	0.0488
Fungicide	0.0655	0.0003	0.7172	0.5418
Cult*Fung	0.6568	0.4873	0.3146	0.2189
Timing	0.7495	0.3898	0.6725	0.9911
Cult*Tim	0.9780	0.5395	0.1885	0.2214
Fung*Tim	0.3700	0.3781	0.7942	0.7552
Cult*Fung*Tim	0.4260	0.8550	0.7767	0.5210

Table 2. *Ascochyta* severity, yield, test weight, and protein by cultivar, fungicide, and application timing on field pea Langdon, 2005.

Cultivar	Fungicide	Application Timing	Ascochyta Severity (0-9)	Yield (Bu/a)	Test Weight (Lb/bu)	Protein (%)
Eclipse	Untreated		4.0	63.1	62.4	23.5
SW Salute	Untreated		8.5	53.0	62.3	23.1
Eclipse			4.7	63.5	62.5	23.44
SW Salute			7.4	60.8	62.5	23.08
LSD (0.05)			0.6	NS	NS	0.35
	Endura		6.4	61.5	62.4	23.1
	Headline		5.5	67.0	62.5	23.4
	Sulfur		6.3	58.0	62.5	23.3
LSD (0.05)			0.8	4.2	NS	NS
		Bloom	6.2	60.7	62.5	23.3
		Bloom + 1 week	6.0	63.6	62.4	23.3
		Bloom + 2 weeks	5.9	62.2	62.5	23.3
LSD (0.05)			NS	NS	NS	NS
% C.V.			23	12	1	3