

Seedling Disease and Root Rot Control in Field Pea

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Field pea acreage in North Dakota has dramatically increased in recent year. The increased frequency of field pea in crop rotations, combined with cool, wet spring weather, has resulted in suspected instances of seedling diseases in grower fields. As field pea continues to be a popular production crop, increases in the occurrence of seedling and root rot diseases are anticipated. Field evaluations of seed treatments at the North Dakota State University research extension centers in Carrington, Minot, and Langdon during the 2003 and 2004 growing seasons resulted in minimal infection by disease organisms. However, established field pea growers continue to report problems. This research project was conducted to collect and identify seedling disease and root rot organisms and evaluate labeled chemical and biological seed treatments at two on-farm sites where diseases have been reported.

Field experiments were established at two on-farm sites with reported instances of seedling diseases near Newburg and Churchs Ferry, North Dakota. Both trials were planted within field pea production fields on 4 May at the rate of 300,000 live seeds / acre. Varieties included DS Admiral in Newburg and Carneval in Churchs Ferry. Fertility and weeds were managed by the growers. Plots of 5' x 25' were sown in a randomized complete block design with four replicates. Seed treatments included:

Untreated check,
Tachigaren (a sugarbeet fungicide) 3 oz. rate,
Tachigaren 6 oz. rate,
Tachigaren 9 oz. rate,
ApronMaxx,
ApronMaxx + Dynasty,
ApronXL,
ApronXL + Dynasty,
ApronXL + YieldShield (a biological fungicide),
ApronXL + QuikRoots (a biological fungicide), and
ApronXL + Integral (a biological fungicide).

The 2005 growing season was considerably less than ideal at both sites. In Newburg, a good plant stand was established (Table 1), but subsequent heavy rains (including 14" during a 10-day period in June) resulted in very high levels of foliar diseases (*Ascochyta* blight). Some root rot was observed, but none of the parameters measured were significantly affected by the seed treatments. The trial was disked under before yield samples were taken.

Table 1. Field pea root rot response to seed treatments, NDSU, 2005.

Treatment	Product Rate (per 100 lbs seed)	Stand (plants/acre)	Root Length (mm)	Lesion Length (mm)	Root Infected (%)	Nodules (number per plant)
----- <i>Newburg</i> -----						
Tachigaren	3 fl oz	308,000	145	24	17	12
Tachigaren	6 fl oz	267,000	168	23	15	18
Tachigaren	9 fl oz	308,000	155	24	15	7
ApronMaxx	5 fl oz	312,000	159	18	12	15
ApronMaxx + Dynasty	5 fl oz + 0.5 fl oz	271,000	150	24	16	11
Apron XL	0.16 fl oz	295,000	187	19	11	18
Apron XL + Dynasty	0.16 fl oz + 0.5 fl oz	316,000	174	20	12	19
Apron XL + Yield Shield	0.16 fl oz + 0.1 oz	308,000	179	20	11	16
Apron XL + QuickRoots	0.16 fl oz + 75 g	295,000	159	27	17	17
Apron XL + Integral	0.16 fl oz + 2.7 g	291,000	168	22	14	17
Untreated	---	299,000	174	26	15	15
Mean		297,000	165	22	14	15
C.V. (%)		9.4	13.1	28.2	28.5	42.8
P-value		0.2730	0.2378	0.6378	0.2182	0.2352
LSD (0.05)		NS	NS	NS	NS	NS
----- <i>Churchs Ferry</i> -----						
Tachigaren	3 fl oz	259,000	113	2	2	46
Tachigaren	6 fl oz	255,000	115	2	2	43
Tachigaren	9 fl oz	251,000	140	1	1	81
ApronMaxx	5 fl oz	263,000	120	1	1	43
ApronMaxx + Dynasty	5 fl oz + 0.5 fl oz	295,000	144	3	3	58
Apron XL	0.16 fl oz	259,000	109	2	2	46
Apron XL + Dynasty	0.16 fl oz + 0.5 fl oz	263,000	138	1	1	56
Apron XL + Yield Shield	0.16 fl oz + 0.1 oz	287,000	122	9	10	60
Apron XL + QuickRoots	0.16 fl oz + 75 g	263,000	120	2	2	56
Apron XL + Integral	0.16 fl oz + 2.7 g	239,000	141	8	5	55
Untreated	---	227,000	130	15	11	61
Mean		260,000	127	4	4	55
C.V. (%)		11.8	19.3	206	203	36
P-value		0.1674	0.6322	0.6255	0.6310	0.5256
LSD (0.05)		NS	NS	NS	NS	NS

In Churchs Ferry, an acceptable plant stand was established and root samples collected during the vegetative growth phase showed low levels of infection. Subsequently, the plot area and surrounding field suffered from flooding, hail, 100 mph winds, and poor weed control. As in Newburg, no significant differences were detected in response to the seed treatments under study. The entire field was disked under for lack of yield.

Comments

Root rot disease was observed at both sites. A companion project to survey root rot in North Dakota pea fields, led by Carl Bradley, found *Fusarium* spp. to be widespread, but not at economically damaging levels. However, we still suspect that, at least in some instances, root rots and seedling diseases limit production. Unfortunately, no data was obtained to determine if the levels of disease measured or the seed treatments influenced yield. A proposal has been submitted to the Cool Season Food Legume Program to repeat this trial at the same two sites and a third location near Minot. Since foliar diseases were rampant in some 2005 production fields, an additional experiment to evaluate foliar fungicides at the same three sites was included in the Cool Season Food Legume proposal.