Field Pea Inoculation Trial, 2005

Bob Henson

A field pea inoculation trial was conducted at the NDSU Carrington Research Extension Center to compare inoculant treatments submitted by commercial manufacturers / distributors to an absolute control (no inoculum, no N fertilizer) and a treatment with 60 lbs. total N (soil test + fertilizer) / acre. The experiment was installed on a Heimdal loam soil with a loose history of field pea production. A soil test the previous fall indicated 20 lbs NO_3 -N / acre in the top 24 inches.

Cultivar 'DS Admiral' (yellow-cotyledon) was sown at the rate of 300,000 live seeds / acre on 3 May in a randomized complete block design with six replicates. Individual plots were 7 (7") rows wide x 25' long. Weeds were effectively controlled with a preplant application of Sonalan and post-emergence hand rouging. Disease and insect pests were not detected.

Early stand counts indicated plant emergence near the target population, but no significant (P < 0.05) differences among treatments (Table 1). Nitrogen fertilizer tended to delay crop development, but the difference was minimal. Numerically, N fertilizer reduced nodulation and 13 of the 18 inoculation treatments improved nodulation compared to the control. Although significant (P < 0.05) yield differences were not detected, 16 inoculation treatments resulted in numerically higher yields than the control. Six of these resulted in a greater than 15% yield increase over the control. However, these differences were not translated into significant differences in days to end bloom or physiological maturity, plant height, lodging, test weight, seed weight, or grain protein concentration. Minimal rainfall after 3 July probably limited the expression of treatment differences.

Table 1. Field pea per	formance in the inc	culant evalu	ation trial	(6 reps), N	IDSU Ca	arrington, 200	5.					
				Beginning	End	Physiological	Visual		Grain	Test	Seed	Grain
Treatment	Company	Formulation	Stand	Bloom	Bloom	Maturity	Nodulation	Height	Yield	Weight	Weight	Protein
			(plants/ac)	(DAP) ¹	(DAP)	(DAP)	$(1-9)^2$	(cm)	(bu/ac)	(lb/bu)	(g/250)	(%)
Control			228,000	63.8	77.3	92.3	5.8	69.5	52.3	64.5	57.6	20.1
N Fertilizer 60lbs			264,000	64.7	77.5	93.0	7.0	67.3	57.9	64.5	59.1	20.4
Soil Implant	Nitragin	Granular	288,000	63.5	77.2	92.3	5.2	69.3	59.2	63.3	57.7	20.1
RhizoFlo	Becker U.	Granular	262,000	64.0	77.2	92.2	4.2	69.0	53.4	64.5	57.2	19.5
Cell-Tech C	Nitragin	Liquid	267,000	63.7	77.0	91.8	5.3	68.5	52.8	64.6	57.2	20.3
Cell-Tech PCI	Nitragin	Liquid	255,000	63.8	77.3	92.5	5.0	71.8	60.8	64.6	58.6	20.6
NitraStik	Nitragin	Peat	282,000	63.8	77.3	92.2	6.0	71.7	57.8	64.5	59.0	20.4
BioRhiz	Becker Underwood	Liquid	322,000	64.0	77.3	92.2	5.3	72.2	61.0	64.4	58.2	20.8
TagTeam	PhilomBios	Peat	276,000	63.8	77.2	91.7	6.0	66.2	52.0	64.3	56.9	20.3
PhBios Exptl	PhilomBios	Peat	285,000	63.8	77.0	92.3	5.2	70.8	54.6	64.5	57.3	20.2
So-Fast	UAP	Liquid	276,000	64.0	77.0	93.0	4.3	71.5	56.4	64.7	58.8	19.6
PulseR	Agribiotics	Peat	274,000	64.0	77.2	92.0	5.7	68.3	60.3	64.7	58.2	20.4
Apex	Agribiotics	Liquid	281,000	63.8	77.2	92.2	4.7	68.2	51.2	64.6	58.8	20.1
AgribioticsExptIPSC-A	Agribiotics	Liquid	286,000	63.8	77.3	92.8	5.0	69.3	56.2	64.7	59.5	20.7
Exptl INTX	INTX Microbials	Liquid	286,000	63.8	77.2	92.3	6.2	69.3	55.8	64.3	57.9	20.2
N-Row	INTX Microbials	Granular	249,000	64.3	77.5	92.8	6.0	72.0	61.3	64.5	59.2	20.4
Nature's Aid	INTX Microbials	Granular	262,000	63.8	77.5	92.7	5.2	71.8	60.3	64.1	58.5	20.6
Neoliquid	Millborn Seeds	Liquid	262,000	64.2	77.3	93.0	5.3	71.8	59.8	64.6	59.2	20.5
BUExp-PL6	Becker U.	Liquid	283,000	63.8	77.5	92.8	4.5	72.5	59.5	64.6	59.0	20.6
Protec+NitraStik	Biocoat	Peat	298,000	64.0	77.8	92.2	5.8	73.2	61.9	64.3	57.9	20.9
Mean			274,000	64.0	77.3	92.5	5.4	70.2	57.2	64.4	58.3	20.3
C.V. (%)			17.4	0.7	0.6	0.8	23.9	9.9	12.1	1.2	3.3	3.7
P-value			0.449	<0.001	0.267	0.028	0.041	0.967	0.088	0.463	0.466	0.131
LSD (0.05)			NS	0.6	NS	0.9	1.5	NS	NS	NS	NS	NS
LSD (0.01)			NS	0.7	NS	NS	NS	NS	NS	NS	NS	NS
4												
¹ Days after planting		² 1 = profuse	9 = none									