

Impact of selected establishment factors and foliar fungicide on soybean production, Carrington, 2011.

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The field study was initiated at the NDSU Carrington Research Extension Center to examine soybean response to individual or combinations of selected establishment factors and foliar fungicide that may increase net return for producers. Experimental design was a randomized complete block with split-plot arrangement with four replications. Whole plots were planting dates (early and normal), split plots were tillage systems (conventional till and direct seed into standing wheat stubble), and starter fertilizer (untreated check, broadcast applied, 0x2-inch band, and mid-row band). The study was established on a Heimdal-Emrick loam soil with spring soil analysis indicating 38 lb/A (0-24") nitrate-N, 8 ppm P, 216 ppm K, 3.4% organic matter, and 7.3 pH. Conventional-till plots were cultivated twice at a 3-inch depth with a field cultivator plus harrow on May 4. Inoculated, fungicide-treated Dairyland Seed DSR0401 was planted on May 5 and 19 in 22-inch rows. Gavilon liquid 6-24-6 was band applied during planting at 10 gpa or broadcast applied after planting at 14.5 gpa. Hail damaged the trial on July 24 with early-planted soybean in the R2-3 stages and later-planted soybean in the R1-2 stages. Headline fungicide at 6 fl oz/A + NIS at 0.125% v/v was applied across 2 of 4 reps on July 27. A killing frost occurred on September 14. The trial was harvested with a plot combine on October 4.

Visual assessment of seedling plant disease occurred on June 2-3 but notes were not taken due to very low disease incidence. Early-planted soybean emerged 10 days earlier, flowered 5 days earlier, and yielded 2.8 bu/A (6.5%) higher with larger seed size and higher oil but lower test weight and protein compared to the later-planted soybean (Table 1). Direct-seeded soybean had a higher stand density and 1.9 bu/A (6%) higher yield compared to the conventional-till soybean. Response to fertilizer treatments was similar. However, plant density tended to be higher with broadcast and 0x2-inch band applied fertilizer compared to the untreated check. Also, seed yield tended to be higher with broadcast-applied fertilizer compared to banded fertilizer and the untreated check. Factor interactions were not statistically significant for all plant and seed data.

Soybean seed yield increased 6.5 bu/A (14.5%) with fungicide (Table 2). Also, seed size was larger but protein was less with fungicide compared to the untreated check.

Table 1. Soybean response to main factors in establishment study, CREC, 2011.

Main factor	Description	Plant						Seed				
		Emergence	Stand	Canopy closure	Flowering	Height	Lodge	Yield	Test weight	Number /lb	Oil	Protein
		date	plt/A	———— Jday ————	cm	0-9	bu/A	lb/bu		%	%	
Planting date	5-May	25-May	145065	230	193	51	1	43.5	56.4	3409	20.7	31.8
	19-May	4-Jun	148490	230	198	53	1	40.7	56.7	3627	20.3	32.1
Tillage system	conventional	30-May	141755	231	195	51	1	40.8	56.5	3523	20.5	32.0
	direct-seed	30-May	151795	230	196	53	1	43.4	56.6	3514	20.5	31.9
Starter fertilizer placement	check	30-May	144500	231	196	52	1.5	40.4	56.6	3516	20.5	32.0
	broadcast	30-May	152195	229	196	52	1	43.9	56.6	3509	20.5	32.0
	0x2 inch band	30-May	150330	231	196	53	1	42.0	56.6	3514	20.4	31.9
	midrow band	30-May	140085	230	195	51	1	41.9	56.5	3533	20.5	31.9
Mean		150	146775	230	196	52	1	42.1	56.5	3518	20.5	31.9
CV %		0.3	9.8	1.7	0.6	5.2	80.0	8.7	0.4	2.7	1.3	1.4
LSD (0.05): bold-typed number pairs within columns for each factor are statistically different.												

Table 2. Soybean response to foliar fungicide, Carrington, 2011.

Treatment ¹	Yield	Test weight	Seeds/lb	Oil	Protein
	bu/A	lb/bu		%	%
foliar fungicide	45.4	56.6	3427	20.5	31.7
untreated check	38.9	56.5	3605	20.5	32.2
C.V. (%)	8.8	0.3	3.0	1.4	1.4
LSD (0.05)	** ²	NS	**	NS	**
¹ Headline = 6 fl oz/A + NIS (Induce) at 0.125% v/v to R2-3 stage. soybean.					
² Statistically significant at 0.01.					