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Northwest Iowa On-Farm Research Soybean Population Comparisons

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Abstract
Rising costs of soybean seed combined with herbicide resistant technology fees have caused a re-evaluation of current seeding recommendations. Research conducted by Palle Pedersen, ISU soybean agronomist, has shown there is not a statistical yield difference in yield when there is a final fall stand of 100,000 evenly distributed soybean plants. To evaluate this research on several different locations, cooperators from Sioux, Lyon, and Osceola counties, in northwest Iowa, participated in comparing two populations of soybean seeding rates. A study looking at three populations was also conducted at the Northwest Research Farm.

Disciplines
Agricultural Science | Agriculture

Northwest Iowa On-Farm Research
Soybean Population Comparisons

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Introduction

Rising costs of soybean seed combined with herbicide resistant technology fees have caused a re-evaluation of current seeding recommendations. Research conducted by Palle Pedersen, ISU soybean agronomist, has shown there is not a statistical yield difference in yield when there is a final fall stand of 100,000 evenly distributed soybean plants. To evaluate this research on several different locations, cooperators from Sioux, Lyon, and Osceola counties, in northwest Iowa, participated in comparing two populations of soybean seeding rates. A study looking at three populations was also conducted at the Northwest Research Farm.

Materials and Methods

Cooperators used conventional planters to plant populations of 125,000 and 175,000. In some experiments, additional population levels were compared. Row widths used by producers varied between 15, 22, 30, and 36 inches. Row lengths varied with the length of their fields. Each experiment consisted of a minimum of three replications. Stand counts were taken in June following emergence and again in early September prior to harvest. Data was collected using a yield monitor, if available, or a weigh wagon. All yields were adjusted to 13% moisture. At the Northwest Research Farm, populations of 125,000, 150,000, and 175,000 were established in 30-in. rows with a John Deere 7000 planter. Row length was 135 ft.

Results and Discussion

A summary of the nine on-farm studies conducted in northwest Iowa did not show a significant yield response to a higher planting population at any site. Fall stand counts for 175,000 target seeding rate averaged 139,239 plants/acre, while the 125,000 target rate averaged 100,890. Table 1 details average stand counts by row spacing, in both spring and fall. As the table will indicate, regardless of row spacing and location used for this study, the critical element is an evenly distributed final stand of 100,000 plants. In this study, some final stands fell below the 100,000 mark and a yield difference was still not observed. One site appeared to have had planter issues, with all stands at or below expected levels. However yields at this site still remained relatively high.

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Table 1. Soybean planting populations by yield and stand.

Location	Row spacing (in.)	Population	June (plants/acre)	September (plants/acre)	Average yield (bushels/acre)
Lyon 1	22	125,000	107,938	101,376	55.6
		175,000	149,391	140,712	55.6
Lyon 2	22	125,000	N/A	N/A	46.9
		175,000	N/A	N/A	49.2
Lyon 3	22	125,000	106,920	105,072	68.3
		175,000	142,164	142,824	68.4
Lyon 4	22	125,000	114,576	103,752	60.1
		140,000	116,952	112,464	61.5
		175,000	149,424	136,224	61.6
Lyon 5	15	125,000	111,360	104,835	64.7
		175,000	146,450	151,380	65.6
Lyon 6	30	125,000	77,865	69,890	67.0
		175,000	102,660	100,630	67.0
Osceola 1	30	125,000	95,120	98,020	63.8
		175,000	142,293	154,570	65.4
Osceola 2	30	125,000	125,573	100,920	57.0
		175,000	142,680	138,427	57.0
Sioux	36	125,000	105,173	96,183	65.6
		150,000	117,643	117,643	66.1
		175,000	134,270	135,623	65.6
NWRF	30	125,000	107,612	96,570	61.0
		150,000	123,138	112,665	62.3
		175,000	141,743	136,590	62.6
Overall		125,000	107,378	100,890	60.8
		175,000	140,184	139,239	61.5