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Soybean Replant Study

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Abstract
Every spring farmers are faced with the decision of whether to keep or replant soybeans because of stand losses due to such things as hail storms, soil crusting, and damping off. A common practice when faced with this decision is to "thicken-up" the stand by planting additional seed into the existing stand. Although this practice is usually discouraged by agronomists, there has been little research done to compare this practice with keeping the existing stand or destroying the stand and replanting.

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Introduction

Every spring farmers are faced with the decision of whether to keep or replant soybeans because of stand losses due to such things as hail storms, soil crusting, and damping off. A common practice when faced with this decision is to "thicken-up" the stand by planting additional seed into the existing stand. Although this practice is usually discouraged by agronomists, there has been little research done to compare this practice with keeping the existing stand or destroying the stand and replanting.

Materials and Methods

Soybeans were planted at four plant populations of 40,000, 70,000, 110,000, and 140,000 seeds/acre in mid-May 2011. In addition, soybeans were planted at 40,000 seeds/acre in mid-May 2011, followed by an additional 70,000 seeds/acre inter-seeded when the original planting was at VC and at V2. Soybeans were also planted at 70,000 seeds/acre in mid-May 2011, and an additional 40,000 seeds/acre inter-seeded when the original planting was at VC and at V2. These treatments simulated "thickening up" reduced stands of soybeans. These treatments were compared with soybeans planted at 140,000 seeds/acre on the same dates when the inter-seeded treatments were made. The 40,000 seeds/acre seeding rate was achieved on each planting date in 2011 by planting 60,000 and removing by hand every third plant because of the limitations of the planter to plant low seeding rates.

All treatments were repeated in 2012, with the addition of a lower population of 20,000 seeds/acre seeding rate and inter-seeding 90,000 seeds/acre into this stand at VC and V2. See Table 1 for the details on the seeding rates and planting dates.

All treatments were planted no-till with 30-in. rows in plots 20 ft (8 rows) wide by 60 ft long that were arranged in a randomized complete block design with 4 replications. The "thickened-up" seedings were planted 3-4 in. to the side of the existing rows. The soybean variety for all planting dates and rates was Pioneer 93Y40 in both years, a group 3.4 soybean. All plots were sprayed with glyphosate plus metolachor prior to planting followed by glyphosate or clethodim as needed for weed control. Final stand counts were taken and the plots machine harvested for yield.

Results and Discussion

Soybeans showed their amazing ability to compensate for reduced stand, with treatments with a harvest population of 35,000 plants/acre yielding the same as treatments with harvest populations of over 100,000 plants/acre in 2011 and soybeans with a harvest population of only 16,000 plants/acre yielding 36 bushels/acre in 2012 (Table 1). No significant difference in yield was seen with any of the treatments in 2011, although in 2012 the 40,000 and 20,000 planting populations did yield significantly less than the 110,000 and 140,000 planting populations. The 70,000 planting population in 2012, which had a harvest population of 55,000 plants/acre, also yielded less than the higher populations, although not significantly.

The very wet spring and dry summer in 2011 and drought in 2012 likely reduced the soybean yields, with most treatments yielding about 50 bushels/acre or less in both years. The original planting date was also somewhat

later than ideal, which may have reduced the yields in both years. If yield potentials had been greater, it is possible we would have seen a greater advantage to the higher populations. Plants had very thick stems and extensive branching in the low population plots. Soybeans inter-seeded into the existing stand at the VC stage contributed more to the yield than soybeans inter-seeded at the V2 stage. Although populations with the second planting were similar on both dates, there were many more pods with the VC planting.

Based on this trial, the best decision when faced with a reduced soybean stand is to not replant stands of about 35,000 plants/acre or more. The "re-planted" soybeans (soybeans planted at 140,000 seeds/acre in June) yielded about the same as the 40,000 seeding rate planted in May, and would involve the extra expense of destroying the existing stand (probably by tilling) and planting the new seeding. There did not appear to be a disadvantage to "thickening up" the stand in either year other than the extra costs involved, and was a yield advantage to inter-seeding an additional 90,000 seeds into the 20,000 seeding rate when the original planting was at VC in 2012. Replanting also improved yields versus leaving the 20,000 population. One place where thickening the existing stand may be beneficial is in fields where there are numerous areas with no stand. Even though thickening the reduced stand may not be needed, some stand would certainly be better than none in the blank areas. Also the increased stand would help in reducing weed problems later in the season. The trial will be repeated in 2013.

Table 1. Harvest populations and yield of soybeans at various seeding rates and dates.

Treatment number	Seeding rate (seeds/acre) and date	Planting dates		Harvest population[a] (1000/acre)		Yield (bu/acre)	
		2011	2012	2011	2012	2011	2012
1	140,000	5/12	5/21	118	101	53	52
2	110,000	5/12	5/21	96	84	51	50
3	70,000	5/12	5/21	61	55	53	47
4	40,000	5/12	5/21	36	32	50	43
5	20,000	--	5/21	--	16	--	36
6	140,000	6/1	6/6	71	115	49	45
7	140,000	6/7	6/14	92	109	47	42
8	70,000 + 40,000	5/12+6/1	5/21+6/6	82 (55+27)[a]	81(48+33)	53	49
9	70,000 + 40,000	5/12+6/7	5/21+6/14	84 (54+30)	74(46+28)	56	50
10	40,000 + 70,000	5/12+6/1	5/21+6/6	83 (34+48)	76(22+54)	54	47
11	40,000 + 70,000	5/12+6/7	5/21+6/14	75 (37+38)	89(32+57)	52	46
12	20,000 + 90,000	--	5/21+6/6	--	87(15+72)	--	47
13	20,000 + 90,000	--	5/21+6/14	--	78(15+63)	--	41
		LSD (0.05) =		16	11	NS	6

[a]Total population (first planting population+ second planting population).