

Soybean Replant Study

RFR-A1380

Jim Fawcett, extension field agronomist
Myron Rees, farm superintendent

Introduction

Every spring, some farmers are faced with the decision of whether to keep or replant soybeans because of stand losses due to such things as hailstorms, 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 vegetative: unifoliate leaves plus cotyledons (VC) and at vegetative: two unrolled trifoliate leaves (V2). Soybeans also were 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.

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.

All 2011 treatments were repeated in 2013. See Table 1 for the details on the seeding rates. The three planting dates for 2011 were May 12, June 1, and June 7. In 2012 the planting dates were May 21, June 6, and June 14. In 2013, the planting dates were June 13, June 24, and July 2.

All treatments were planted no-till in 30-in. rows in plots 20 ft (8 rows) wide × 60 ft long and arranged in a randomized complete block design with four 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 2011 and 2012 (group 3.4 maturity), and Pioneer 92Y80 (group 2.8 maturity) in 2013. 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 were machine harvested for yield.

Results and Discussion

Soybeans showed their amazing ability to compensate for reduced stand. The treatments with a harvest population of 35,000 plants/acre yielded the same as treatments with harvest populations of over 100,000 plants/acre in 2011. Soybeans with a harvest population of only 16,000 plants/acre yielded 36 bushels/acre in 2012 (Table 1). No significant difference in yield was seen with any of the treatments in 2011. In 2012, the 40,000 and 20,000 planting populations yielded significantly less than the 110,000 and 140,000 planting populations.

In 2013, a greater loss in soybean yield was seen with the lower populations as well as with the later planting dates. The harvest

population of 158,000 plants/acre yielded significantly more than the 96,000 plants/acre. However, the full stand of soybeans planted later yielded the same or significantly less than all of the low stands at the original planting date. Because of the very wet spring, the first planting was not made until mid-June, so it is not too surprising there was a significant yield loss with the later plantings in 2013.

The very wet spring and dry summer in 2011 and 2013 and drought in 2012 likely reduced the soybean yields, with most treatments yielding about 50 bushels/acre or less in all years. The original planting date also was somewhat later than ideal in all years, which may have reduced yields. If yield potentials had been greater it is possible we would have seen a greater advantage for the higher populations in 2011 and 2012. 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 40,000 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 other than the extra costs involved, and there 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 and also when an additional 70,000 seeds were inter-seeded at the V2 stage into the 40,000 seeding rate in 2013. Replanting also improved yields versus leaving the 20,000 population in 2012. One instance when 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.

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

Trt no. ^a	Seeding rate (seeds/A)	Harvest population (1000's plants/A)			Yield (bushels/A)		
		2011	2012	2013	2011	2012	2013
1	140,000	118	101	158	53	52	51
2	110,000	96	84	96	51	50	44
3	70,000	61	55	73	53	47	41
4	40,000	36	32	42	50	43	35
5	20,000	--	16	--	--	36	--
6	140,000	71	115	95	49	45	36
7	140,000	92	109	123	47	42	38
8	70,000 + 40,000	82 (55+27) ^b	81(48+33)	74 (57+17)	53	49	43
9	70,000 + 40,000	84 (54+30)	74(46+28)	99 (63+36)	56	50	40
10	40,000 + 70,000	83 (34+48)	76(22+54)	76 (44+32)	54	47	35
11	40,000 + 70,000	75 (37+38)	89(32+57)	102 (42+60)	52	46	40
12	20,000 + 90,000	--	87(15+72)	--	--	47	--
13	20,000 + 90,000	--	78(15+63)	--	--	41	--
LSD (0.05) =					NS	6	4

^aTreatment 6 and the second planting of treatments 8, 10, and 12 were planted when the first planting of soybeans were at VC. Treatment 7 and the second planting of treatments 9, 11, and 13 were planted when the first planting was at V2. First plantings were made on 5/12/11, 5/21/12, and 6/13/13.

^bTotal population (first planting population+ second planting population).