



Extension FactSheet

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Adjusting a Grain Drill for Planting Soybeans

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Research work in Ohio and throughout the Midwest indicates that soybean yields are highest when the rows are spaced seven inches to 10 inches apart. In order to obtain an ideal plant stand for optimum yields, the seed must be uniformly spaced within the row and planted at a uniform depth of 3/4 inches to 1-1/4 inches. Fluted feed-metering mechanisms on grain drills generally do not space soybean seed uniformly in the row and may split or damage large seed. Drills with vacuum-operated seed-metering or other seed-singulating mechanisms distribute the seed more uniformly than a fluted feed system. Improved uniformity of spacing is important for yields above 55 bushels per acre. When seeds are spaced five inches apart in rows seven inches apart, the seeding rate is about 180,000 seeds per acre.

The depth of seed placement by most grain drills is usually erratic, unless they are equipped with depth control wheels or depth bands. Commonly, seed is placed too shallow in overly firm or cloddy soils and too deep in loose, fluffy soil. If soybeans are drilled at a shallow depth, and depth control is not precise, the seed is less likely to have good contact with the soil and may be damaged by some soil-applied herbicides. To improve the operation of the grain drill, the following adjustments should be considered.

1. Tractor wheel tracks should be removed ahead of the drill when planting in tilled soil. This can be accomplished with a cultimulcher, springtooth harrow, or similar tool. A leveling-firming tool between the tractor and drill will firm the seedbed and enable a more uniform planting depth when changing from one soil type to another or when planting through cloddy areas. Uniform depth placement can be improved if double-disk openers are equipped with depth bands or depth gauge wheels. When depth bands are used, maximum down-pressure should be applied to assure adequate depth of placement in hard spots and where cloddy conditions exist. The drill should always be equipped with press wheels capable of exerting enough down-pressure to develop good seed-soil contact to help ensure rapid emergence. For no-tillage, apply adequate down pressure to place the seed at the desired depth. As travel speed increases, the planting depth decreases.

2. Adjust the metering mechanism to drop the correct number of viable seeds per foot of row. Fluted seeding mechanisms usually have two adjustments to accomplish the desired seeding rate and to accommodate different size crop seeds. The seeding rate is changed by exposing more of the metering flute to the seed. Different size seed is accommodated by opening or closing the gate under the flute. Various combinations of these two adjustments will deliver the correct number of seeds per acre, but relatively few combinations will produce a uniform distribution of undamaged seeds. Always calibrate drills on the basis of seeds per foot of row and never on the basis of pounds of seed per acre. Check the seeding rate and depth of placement in the field in real-world conditions.

3. For drilling soybeans, large seed should be avoided whenever possible since seed damage increases as seed size increases. Using small seed improves accuracy of the seeding rate and seed spacing, and also reduces seed cost per acre. Seeding rates per acre for various row spacings and seed spacings within the row are shown in the following table.

Expected Soybean Plant Populations for Various Row Widths and Seeding Rates.

Row width inches	Seeding Rate		Population for	# seed needed when there are 2500 seeds/# lbs./acre
	seeds/ft	seeds/acre	90% emergence of 90% germ. seed plants/ac	
15	5.0	174,240	141,134	70
	5.5	191,664	155,248	77
	6.0	209,088	169,361	84
10	3.0	156,816	127,020	63
	3.5	179,218	145,166	72
	4.0	209,088	169,361	84
7.5	2.5	171,740	139,109	69
	2.75	181,702	147,178	73
	3.0	209,088	169,361	84

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