Food-Grade Soybean Evaluation Trial

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Objective

To compare several food-grade (FG) soybean varieties vs. two popular conventional (C) soybean varieties.

Background

Cooperator:	Marsh Foundation/ Farm Focus	Fertilizer:	0-0-60 fall applied, 125 lbs/A
		Herbicides:	PRE: Steel (3 pt/A)
County:	Van Wert		Canopy (2 oz/A)
Nearest Town:	Van Wert	Variety:	Garst 295
Soil Type:	Hoytville silty clay loam	Planting Date:	May 31, 2000
Previous Crop:	Corn	Planting Rate:	176,000 seeds/A
Drainage:	Tile	Row Spacing:	15 inches
Tillage:	Fall deep till/ spring cultivate	Harvest Date:	October 12, 2000
Soil Test:	pH 6.3, P 86 ppm, K 235 ppm		

Methods

This study was conducted using three replications of each soybean variety in a complete randomized block design. Plot size was 27.5-feet wide by 420-feet long, allowing for one round of the combine at harvest. Variety selection was based on local usage. Plots were planted using a John Deere MaxEmerge planter with a splitter attachment to obtain a 15-inch row spacing. The plots were evaluated for final stand populations on the harvest date, yield (weigh-wagon weights), and laboratory analysis for crude protein and oil content. Population counts were taken at three locations in each plot using a 17.5 feet distance and counting the plants in the rows on both sides of the tape. All yield, protein, and fat contents were adjusted to a 13% moisture standard.

Results

Table 1. Soybean Harvest Populations, Yields, and Laboratory Analysis.

Variety	Population (plants/A)	Yield (bu/A)	Protein (% at 13% moisture)	Fat (% at 13% moisture)	Seed Size (seeds/lb)
Pioneer 93B01 (C)	178,600 a	61.0 ab	35.79 c	19.05 a	3,488 e
Public Sandusky (C)	117,600 b	62.9 a	34.20 d	19.52 a	2,824 d
LG Seed C9275HP (FG)	109,100 bc	51.4 e	40.20 a	16.67 d	2,456 b
Agracola Farms AF271 (FG)	104,900 c	59.8 abc	40.18 a	16.61 d	2,584 c
Wellman Seed-Kohaku (FG)	102,400 c	55.9 cd	37.54 b	18.15 b	2,752 d
Ohio FG-1 (FG)	77,300 d	57.4 bcd	37.67 b	17.16 c	2,072 a
LSD (P=0.05)	9,400	4.3	0.31	0.47	98
CV (<15% is credible)	4.50%	4.10%	0.50%	1.50%	2.00%

Means with the same letter are not significantly different at P = 0.05.

Summary and Notes

This study indicated significant differences in the final stand populations for the different varieties. This is most likely caused by the wide variations in seed size, since the same seed ing rate setting was used for all varieties. Proper seeding rate settings are important when planting typically larger food-grade seed.

With the large variations experienced in the final stand populations, it is difficult to draw definite conclusions as to the differences in yield, and whether these yield differences were the result of the seeding-rate variation or the variety of soybean. This study would need to be repeated again, paying particular attention to having the same seeding rate for each individual variety for yield comparisons. Another important consideration is to account for germination rates. Despite not accounting for these factors, there appears to be little yield lag with food-grade soybeans.

Protein and fat content results for the varieties are listed because buyers of food-grade soybeans use the protein content as an indicator of the quality of product they can expect from that particular variety. High protein content is a major consideration in developing food-grade varieties. As the table indicates, all the food-grade varieties had significantly higher protein than the conventional varieties. Typically, fat content is inverse to the protein content, as can be seen in the results. Seed size is another characteristic that is often considered by the buyer, with the larger seed size usually being more desirable. There were statistically significant differences in the seed sizes. This is based on the number of seeds per pound after being screened (using a 12/64 inch x 3/4 inch slotted screen) to remove splits and foreign material.

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