Yield and Quality Characteristics of Food-Type Soybeans

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Objective

To determine yield, protein, and oil characteristics of food-type soybean varieties.

Background

Cooperator:	Bill Shininger	Tillage:	Chisel plow (fall)
County:	Fulton		field cultivate (spring)
Soil Type:	Mermill loam	Herbicide:	Dual 2 pts/A, Raptor 4 oz/A,
Previous Crop:	Corn		Fusion 12 oz/A
Drainage:	Subsurface	Variety:	See Methods
Soil Test:	pH 7.1, P 53 ppm,	Planting Date:	May 11, 2001
	K 230 ppm, OM 2.2%,	Planting Rate:	200,000 seeds/A
	CEC 8.1 meq/100g	Harvest Pop.:	165,000 plants/A (avg.)
Fertilizer:	None	Harvest Date:	October 29, 2001

Methods

The plot design was a randomized complete block with four replications. Plots were 10 ft. x 120 ft. with a harvest area of 7.5 ft. x 100 ft. The plots were planted with a Great Plains no-till drill with 10-inch row spacing. Varieties were solicited with clear or yellow hilum from several companies who donated the seed. The growing season started wet in May after planting and was dry during July and August and then wet in October. Samples were collected at harvest for analysis of protein, oil, and seed size with analysis performed by the USDA Federal Grain Inspection Service, Maumee, Ohio, using standard analytical procedures defined under the United States Grain Standards Act.

Table 1. Variety Characteristics.

Variety	Maturity	Hilum Color	Company Providing Seed
Pioneer 9305	3	Yellow	Pioneer Hybrid International Inc., Des Moines, Iowa
Pioneer 93B45	3.4	Black	Pioneer Hybrid International Inc., Des Moines, Iowa
Pioneer 93B82	3.8	Black	Pioneer Hybrid International Inc., Des Moines, Iowa
OFG1	3.2	Yellow	Utz Seed Farm, New Washington, Ohio
Beeson	2.6	Yellow	NOSCO Seed/The Andersons, Maumee, Ohio
DFFood+	2.2	Yellow	DF Seeds, Danville, Michigan
Rupp RXP 2702	2.8	Yellow	Rupp Seeds, Inc., Wauseon, Ohio
IA2041	2.4	Yellow	Shininger Quality Seeds, Delta, Ohio
SQC 2900F	3.1	Yellow	Shininger Quality Seeds, Delta, Ohio
Rupp RXP 2704	2.8	Yellow	Rupp Seeds, Inc., Wauseon, Ohio
DF222	2.2	Yellow	DF Seeds, Danville, Michigan

Results

Table 2. Soybean Yield.*

Variety	Yield (bu/A)
Pioneer 93B82	43.7a
Pioneer 93B45	41.8a
SQC 2900F	36.7b
Rupp 2702	36.4b
DF 222	35.4b
Pioneer 9305	34.9b
Rupp 2704	34.6b
OFG1	33.2bc
IA2041	29.8c
Beeson	29.7cd
DF Food+	28.4d
LSD (0.05)	3.8
CV	7.60%

* Yields followed by the same letter are not significantly different from each other.

Table 2. Soybean Percent Oil.*

Variety	Oil Content (%)
DF 222	19.8a
DF Food+	19.0b
Beeson	18.8b
Pioneer 9305	18.8b
Pioneer 93B82	18.3c
Pioneer 93B45	18.0cd
SQC 2900F	18.0d
IA 2041	17.9d
OFG1	17.8de
Rupp 2702	17.5ef
Rupp 2704	17.3f
LSD (0.05)	0.3
CV	1.20%

* Percent oil followed by the same letter are not significantly different from each other.

Table 4. Soybean Percent Protein.*

Variety	Protein %
IA 2041	38.4a
Rupp 2702	37.5b
OFG1	37.3bc
Rupp 2704	36.9cd
Pioneer 93B82	36.7d
Beeson	35.8e
SQC 2900F	35.8e
Pioneer 9305	35.8e
DF 222	35.5ef
Pioneer 93B45	35.1f
DF Food+	34.2g
LSD (0.05)	0.5
CV	1.00%

* Percent protein followed by the same letter are not significantly different from each other.

Table 4. Soybean Seed Size.*

Variety	Seeds/pound
DF Food+	2993a
DF 222	2656b
Pioneer 93B82	2501c
Pioneer 93B45	2417cd
Beeson	2383de
IA2041	2290ef
Pioneer 9305	2285ef
Rupp 2704	2188fg
SQC 2900F	2125g
Rupp 2702	1920h
OFG1	1693i
LSD (0.05)	112.8
CV	3.40%

* Seed sizes of varieties followed by the same letter are not significantly different from each other.

Summary and Notes

The two black hilum Pioneer varieties are conventional varieties and were included for comparison of yields. Desirable food type beans for export markets have a higher protein and larger seed characteristics. Varieties that were higher in protein tended to be lower in oil content. The variety with the highest protein was the IA 2041 followed by Rupp 2702 and OFG1. The variety with the largest seed size was OFG1 followed by Rupp 2702.

A wide range of maturities existed in this field trial. As it turned out for 2001, no problems existed with shatter or harvest loss due to a wet October. Moldy beans were starting to appear in the harvested beans but did not affect the test for quality or yield. Food type soybeans have the general characteristics of having a yellow or clear hilum, larger seed size, and higher protein contents. Premiums for varieties are often based on yield differentials with standard varieties. Yield information such as this can be used to judge the value of contracts to growers.

Weed control for the plots was good, with just a few scattered weeds that did not influence plot yield.

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