

Evaluation of Soybean Varieties for Certified Organic Production-Allee Research Farm-2000

Dr. Kathleen Delate, assistant professor, Depts. Of Horticulture & Agronomy
Dr. Cynthia Cambardella, soil scientist, USDA National Soil Tilth Lab
Heather Friedrich, graduate student, Depts. Of Horticulture

METHODS

Field Operations

The Allee site was laid out in a completely randomized block design with 4 varieties of soybean and 4 replications. Sixteen plots were established, each plot being 30 X 200 ft., for a total of 1.6 acres. The treatments consisted of four varieties of soybeans: IA 2034, IA 2041, IA 2042, and NC+2FG62.

The 2000 variety trial plots were prepared by plowing, discing, harrowing and cultivating on May 1 and 2, 2000. The area was again cultivated and harrowed on May 15, 2000 and all soybean varieties were planted on May 16, 2000, at a rate of 175,950. Plots were rotary hoed three times on May 16, 2000 and cultivated on June 21, 2000 and June 27, 2000. Plots were walked on July 7 and 19, 2000 to remove large weeds.

Sampling

Weed count sampling and stand count sampling took place on June 13, 2000 (28 days after planting). Three square meter quadrates per plot were taken for the weed counts. Plots were swept for bean leaf beetles on July 10, 2000 and tissue sampling took place on July 19, 2000, for analyzation of the bean pod mottle virus, via ELIZA testing. Plots were harvested on October 7, 2000, with all plots of the same variety being harvested together. Grain quality analysis was completed by Dr. Charles Hurburg, from the Center for Crops Utilization Research (CCUR).

RESULTS

There were no significant differences among the varieties for grasses but variety IA 2042 had significantly more broadleaves than IA 2034 and IA 2041. IA 2042 was statistically equal to the NC+ variety (Table 1). Tillage operations decrease plant populations but there were no significant differences for soybean stand (Table 2). Yield was greatest for variety IA 2034 (Table 3). Staining, of varying degree, occurred on all of the harvested soybeans. IA 2034 had the lowest percentage of staining, 16.96%. IA 2041 was 17.07% stained and IA 2042 was 24.12% stained (Table 4). The NC+ variety had the most staining with 54.2% of the bean being stained. This correlates the tissue sampling for bean pod mottle virus (Table 4). IA 2034 was not infected with the virus. IA 2041 was 50% infected, and both IA 2042 and NC+ were 75% infected. All varieties were comparable for moisture, protein, oil, fiber, and carbohydrates in the grain quality analysis (Table 5).

Variety	Grasses		Broadleaves	
	Mean	se	Mean	se
IA 2034	.714	.286	4.57	1.63
IA 2041	4.75	2.07	5.50	2.20

IA 2042	2.875	1.75	14.25	2.59
NC+ 2FG262	1.75	.526	10.12	2.00

Table 1. Mean grasses and broadleaves.

Variety	Stand (17.5')	
	Mean	se
IA 2034	102.57	5.56
IA 2041	94.11	3.90
IA 2042	93.71	6.79
NC+ 2FG262	98.00	8.67

Table 2. Mean soybean stand counts.

Variety	Bushels/acre
IA 2034	44.88
IA 2041	40.71
IA 2042	41.92
NC+ 2FG262	38.14

Table 3. Soybean yields.

Variety	% Infected	% Stained
IA 2034	0	16.96
IA 2041	50	17.07
IA 2042	75	24.12
NC+ 2FG262	75	54.20

Table 4. Percentage of soybeans plants infected with the bean pod mottle virus and percentage of soybean stained.

Variety	% Moisture	% Protein	% oil	% Fiber	% carbohydrate
IA 2034	12.45	39.75	16.95	4.55	20.75
IA 2041	12.3	40.15	17.4	4.4	20.05
IA 2042	12.0	40.45	16.8	4.35	20.40
NC+ 2FG262	13.1	40.25	16.5	4.8	20.45

Table 5. Grain quality analysis.