

## Evaluation of GUSTO

### 2004

A series of experiments was begun in 2002 to evaluate new products being marketed as controls for the soybean cyst nematode (SCN). In 2004, the bacterial spore seed treatment GUSTO was added to the experiments. Seeds of the SCN-susceptible variety DEKALB 26-51 were treated by ISU personnel and then planted in six replications as part of a randomized complete block experiment at the ISU Hinds research farm in which SCN-resistant soybean varieties also were evaluated. Individual plots consisted of four rows, 17 feet (5.2 m) long spaced 30 inches (76 cm) apart.

Soil samples consisting of ten 1-inch-diameter (2.5-cm-diameter), 6- to 8-inch-deep (15- to 20-cm-deep) soil cores were collected from the center two rows of each plot immediately following planting. Soybean cyst nematode cysts were extracted from a subsample of each soil sample using a semi-automatic elutriator and were recovered on a 250- $\mu$ m-pore sieve. Then the cysts were crushed with a motorized rubber stopper. The eggs that were released from the cysts were recovered on a 25- $\mu$ m-pore sieve and subsequently were stained with acid fuchsin and counted with a dissecting microscope. Soil samples were collected from each plot again immediately after harvest. Soybean cyst nematode egg population densities were determined from these samples in the same manner as samples collected in the spring, following planting.

Several weeks after planting, the number of plants per linear foot (emergence) was assessed in each plot, and average plant height and lodging (1=all plants fully erect, 5=all plants flat) were assessed just prior to harvest. The center two rows of each plot were mechanically harvested with a plot combine. The collected seed was returned to the lab where seed weight and seed moisture were determined, and plot yields were calculated.

Data were analyzed by analysis of variance (ANOVA) for a treatment main effect. If a significant difference among the treatments was detected with ANOVA at  $P \leq 0.05$ , Fisher's least-significant-difference (LSD) test was performed ( $\alpha = 0.05$ ) to discern specific differences among treatment means.

For simplicity, only yield and fall SCN population densities are presented here. The LSD values given are from the overall analysis of the larger experiment.

#### Results:

<i>Treatment</i>	<i>Yield (bu/acre)</i>	<i>Fall SCN (eggs/100cc soil)</i>
Untreated	63.9	4,467
GUSTO	63.9	2,366
LSD	4.8	3,720

#### Conclusions:

There were no significant differences in plant growth or yield between the GUSTO treated plots and the untreated control plots. While the fall SCN population density was lower in the GUSTO treated plots, this difference was not statically meaningful.

### 2005

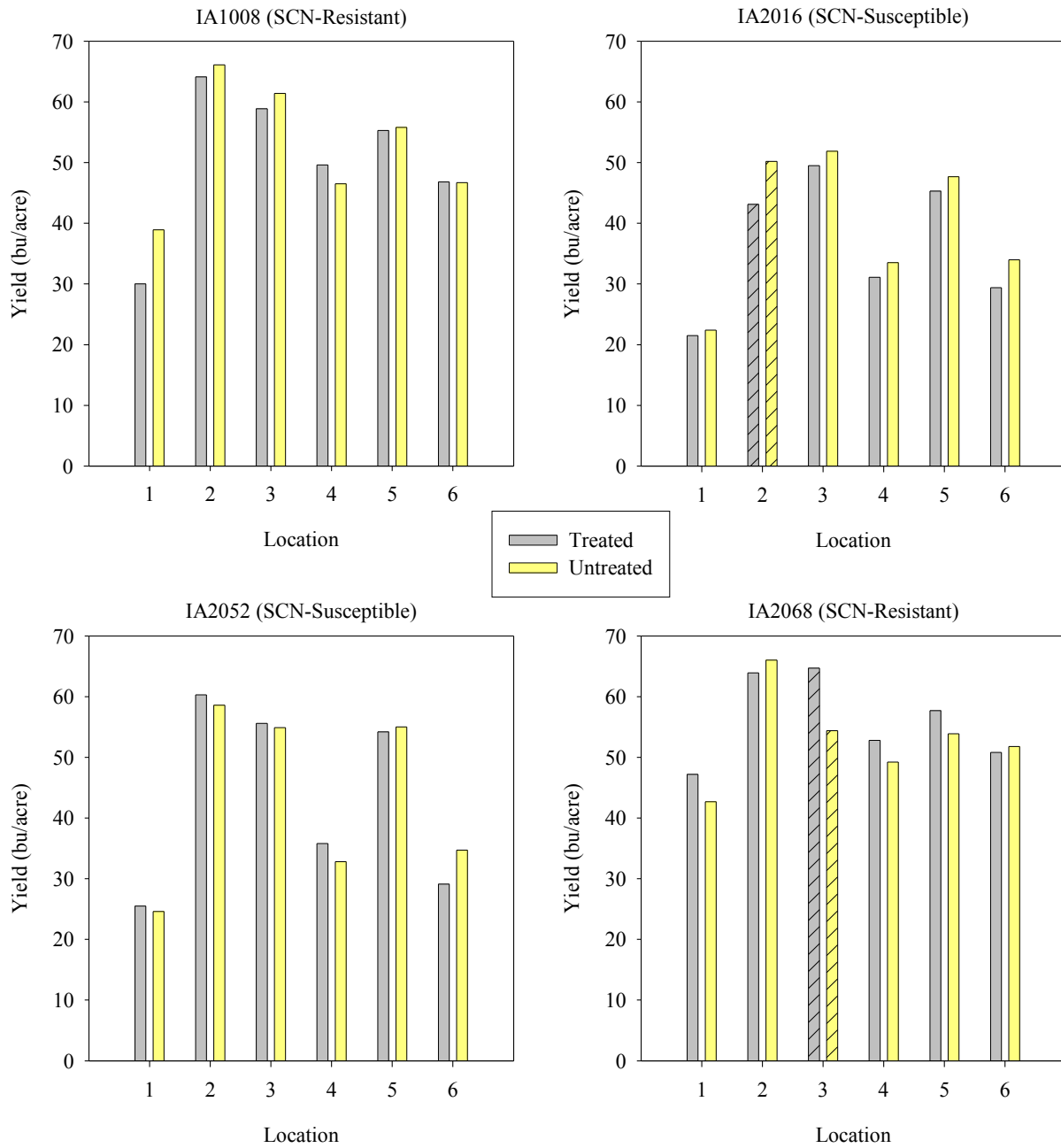
In 2005, GUSTO-treated seeds were planted in six locations in the state. Four public varieties were treated with GUSTO by ISU personnel and then planted in 4 replications. Individual plot details as well as sampling procedures are the same as in 2004.

Data were analyzed by analysis of variance (ANOVA) for a treatment main effect. If a significant difference among the treatments was detected with ANOVA at  $P \leq 0.05$ , Fisher's least-significant-difference test was performed ( $\alpha = 0.05$ ) to discern specific differences among treatment means. For simplicity, only yield and final SCN population densities are presented here.

Location 1: Albert City, IA. Planted 5-24-05, harvested 10-14-2005.  
 Location 2: Mason City, IA. Planted 5-10-05, harvested 10-7-2005.  
 Location 3: Fredericksburg, IA. Planted 5-3-05, harvested 10-6-05.  
 Location 4: Jefferson, IA. Planted 5-9-05, harvested 9-30-05.  
 Location 5: Cambridge, IA. Planted 5-17-05, harvested 10-11-05.  
 Location 6: Shellsburg, IA. Planted 5-5-05, harvested 9-23-05.

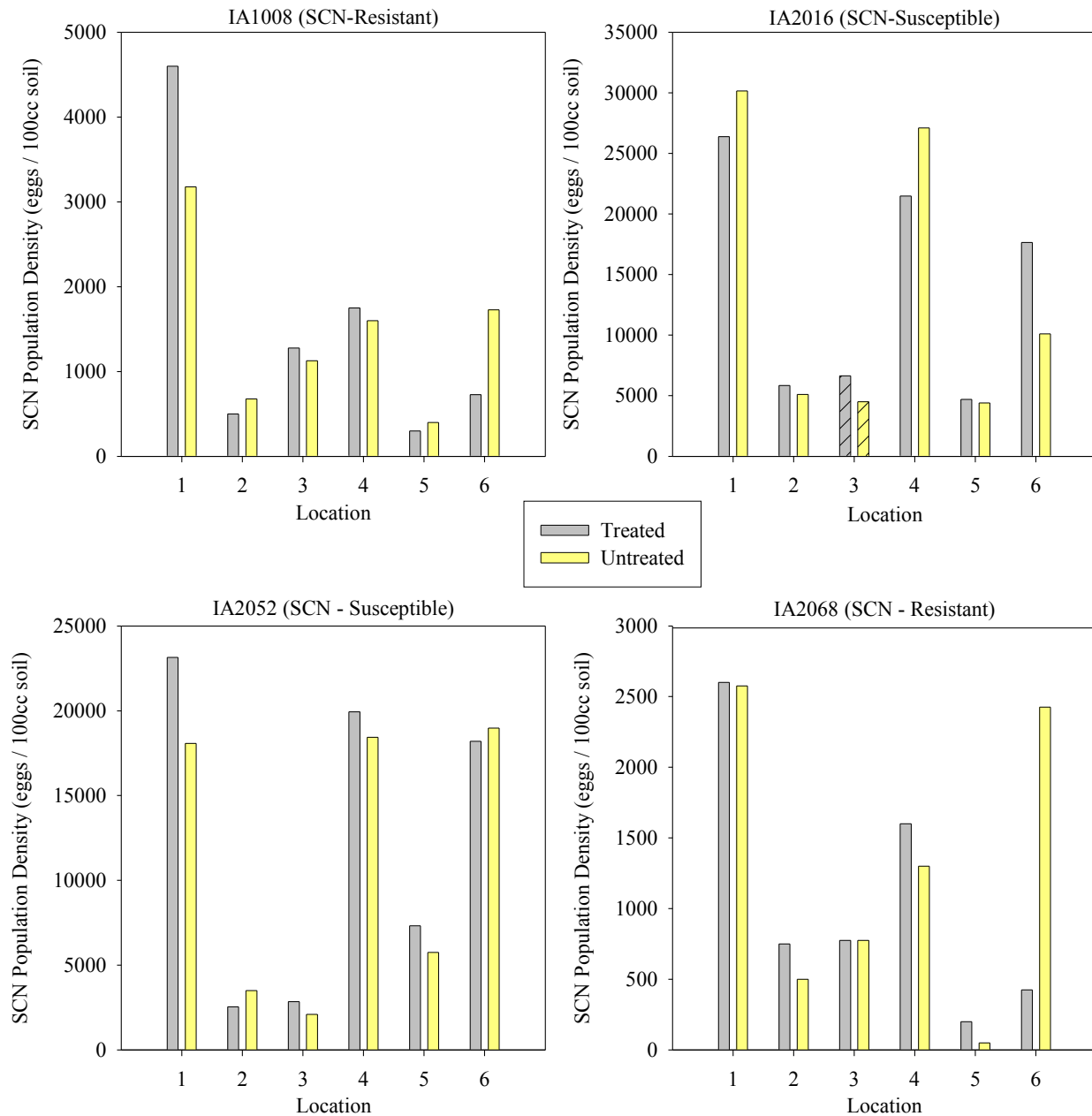
**Results:**

Yield comparisons by variety.



Cross-hatched bars represent statistically significant comparisons.

Final SCN population density by variety.



Cross-hatched bars represent statistically significant comparisons.

**Conclusions:**

Overall, there were no differences in yield between the GUSTO-treated plots and the untreated control plots. In only two of the 24 treatment/variety combinations was there a significant difference in yield between the treated and untreated plots. In one of those two instances, the treated plots yielded more, while in the other instance, the untreated plots yielded more.

Overall, there were no differences in final SCN population densities between the GUSTO treated plots and the untreated control plots. In only one of the the 24 treatment/variety combinations was there a significant difference in SCN population densities between the treated and untreated plots, and in that instance the untreated plots had a lower final population.