Evaluation of MicroCN

A series of experiments was begun in 2002 to test products marketed as, or having promise for, reducing SCN (soybean cyst nematode) reproduction and/or increasing the growth and productivity of SCN-infested soybeans. Each year, several different products have been tested in a randomized complete block experiment containing both SCN-susceptible and SCN-resistant soybean varieties. For simplicity, only the results of MicroCN and the appropriate control treatments are described in this report. The LSD values given however, are from the overall analysis of the larger experiment.

2002

An experiment was established in a field infested with the soybean cyst nematode at the Iowa State University Woodruff Research Farm located approximately 5 miles (8 km) southwest of Ames, Iowa. The average initial soybean cyst nematode population density was 4,440 eggs per 100 cm^3 of soil. Individual plots consisted of four rows, 17 feet (5.2 m) long spaced 30 inches (76 cm) apart. All treatments were replicated six times in the experiment.

Plots were measured and marked off with wooden stakes prior to planting. MicroCN was applied according to the manufacturer provided instructions on 6 June 2002, and then incorporated using a field cultivator. The varieties Asgrow 2301 (susceptible to SCN), and Asgrow 2201 (resistant to SCN) were planted at a rate of 10 seeds per foot (33 seeds per m) later the same day.

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.

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-µm-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-µm-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.

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:

Treatment	***Yield (bu/acre)***	***Fall SCN (eggs/100cc soil)***
Untreated SCN-susceptible	35.6	5,883
MicroCN treated SCN-susceptible	37.3	15,500
LSD	5.8	9,098

Conclusions:

While the yield in the MicroCN-treated plots is numerically greater than in the untreated plots, this difference was not statistically meaningful. The fall SCN population density however, was statistically greater in the MicroCN-treated plots than in the untreated plots.

2003

An experiment was established in a field infested with the soybean cyst nematode at the Iowa State University Woodruff Research Farm located approximately 5 miles (8 km) southwest of Ames, Iowa. The average initial soybean cyst nematode population density was 10,079 eggs per 100 cm^3 of soil. Individual plots consisted of four rows, 17 feet (5.2 m) long spaced 30 inches (76 cm) apart. All treatments were replicated six times in the experiment.

Plots were measured and marked off with wooden stakes prior to planting. MicroCN was applied according to the manufacturer provided instructions on 5 June 2003, and then incorporated using a field cultivator. The varieties DEKALB 26-51 (susceptible to SCN), and DEKALB 26-52 (resistant to SCN) were planted at a rate of 10 seeds per foot (33 seeds per m) later the same day.

All plant growth measurements were taken as in 2002. Similarly, soil samples were taken and processed in the same way that they were in 2002.

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:

Treatment	***Yield (bu/acre)***	***Fall SCN (eggs/100cc soil)***
Untreated SCN-susceptible	32.7	6,450
MicroCN treated SCN-susceptible	31.7	6,450
LSD	5.3	3,306

Conclusions:

There were no differences between yield or final SCN population densities between the MicroCN-treated plots and the untreated control plots.

2004

An experiment was established in a field infested with the soybean cyst nematode at the Iowa State University Hinds Research Farm located approximately 2 miles (8 km) north of Ames, Iowa. The average initial soybean cyst nematode population density was 3,130 eggs per 100 cm^3 of soil. Individual plots consisted of four rows, 17 feet (5.2 m) long spaced 30 inches (76 cm) apart. All treatments were replicated six times in the experiment.

Plots were measured and marked off with wooden stakes prior to planting. MicroCN was applied according to the

manufacturer provided instructions on 28 May 2004, and then incorporated using a field cultivator. The varieties DEKALB 26-51 (susceptible to SCN), and DEKALB 26-52 (resistant to SCN) were planted at a rate of 10 seeds per foot (33 seeds per m) later the same day. Weeds were removed from plots of all treatments by hand throughout the growing season.

All plant growth measurements were taken as in 2002 and 2003. Similarly, soil samples were taken and processed in the same way that they were in 2002 and 2003.

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:

Treatment	***Yield (bu/acre)***	***Fall SCN (eggs/100cc soil)***
Untreated SCN-susceptible	63.9	4,467
MicroCN treated SCN-susceptible	58.9	6,217
LSD	4.8	3,720

Conclusions:

The yield in the untreated plots was statistically greater than in the Micro-CN treated plots. The fall SCN population densities however, were not different from one another.