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Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode in Northern Iowa, 2000

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Abstract
Use of resistant soybean varieties is a very effective strategy for managing soybean cyst nematode (SCN), and numerous SCN-resistant soybean varieties are available for Iowa soybean growers. Each year, public and private SCN-resistant soybean varieties are evaluated in SCN-infested and noninfested fields throughout Iowa by Iowa State University personnel. The research described in this report was performed to assess the agronomic performance of maturity group (MG) I and II SCN-resistant soybean varieties and to determine the effects of the varieties on SCN population densities.

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Introduction

Use of resistant soybean varieties is a very effective strategy for managing soybean cyst nematode (SCN), and numerous SCN-resistant soybean varieties are available for Iowa soybean growers. Each year, public and private SCN-resistant soybean varieties are evaluated in SCN-infested and noninfested fields throughout Iowa by Iowa State University personnel. The research described in this report was performed to assess the agronomic performance of maturity group (MG) I and II SCN-resistant soybean varieties and to determine the effects of the varieties on SCN population densities.

Materials and Methods

In northern Iowa, 8 MG I and 33 MG II SCN-resistant soybean varieties were evaluated in a SCN-infested (race 3) field at the Iowa State University Northern Research and Demonstration Farm at Kanawha, Iowa, and in a noninfested field near Algona, Iowa. Two MG I and 5 MG II SCN-susceptible varieties also were planted in the experiments. Plots were four 17-foot-long rows spaced 30 inches apart planted at a rate of 10 seeds per foot. The infested plots were planted on 1 May 2000, and the noninfested plots were planted on 13 May 2000.

Plant stand (number of plants per foot) was assessed in each plot 35 to 40 days after planting. Just prior to harvest, average plant height and lodging (1=all plants fully erect, 5=all plants flat) were assessed in each plot. Plots in the infested and noninfested fields were harvested on 28 September and 12 October 2000, respectively. Total seed weight per plot and seed moisture were determined, and total plot seed weights subsequently were converted to bushels per acre.

At the beginning of the growing season, plots in both infested and noninfested fields were sampled for the presence of SCN. Soil samples, consisting of ten 1-inch-diameter, 6- to 8-inch-deep soil cores, were collected from the center 12 feet of the center two rows of each plot either immediately prior to planting or within a week after planting. SCN cysts were extracted from each soil sample, and SCN eggs were extracted from the cysts and counted. Plots in both fields were sampled again immediately prior to harvest or within a week after harvest.

Data collected from plots planted with MG I and II varieties were sorted and analyzed separately.

Summary

The results of the experiments described in this report were consistent and dramatic. The data convincingly illustrate the benefits of using SCN-resistant soybean varieties for management of this important soybean pest. Throughout the experiments, most of the soybean varieties with SCN resistance had greater yields than susceptible varieties in fields infested with SCN, although some resistant varieties had greater yields than others. In noninfested fields, the average yields of the resistant varieties evaluated were within a few bushels per acre of the susceptible varieties evaluated. Furthermore, several SCN-resistant varieties actually had greater yields than the best-yielding susceptible varieties in noninfested fields. End-of-season SCN population densities were significantly greater in plots where susceptible varieties were grown relative to plots planted with resistant varieties.