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Northern Iowa Evaluation of Soybean Varieties Resistant to Soybean Cyst Nematode—2003

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Abstract

Each year, public and private SCN-resistant soybean varieties are evaluated in SCN-infested 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 numbers or population densities.

Keywords

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Disciplines

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Introduction

Each year, public and private SCN-resistant soybean varieties are evaluated in SCN-infested 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 numbers or population densities.

Materials and Methods

Eight conventional (non-Roundup Ready®) and 48 Roundup Ready® SCN-resistant soybean varieties were evaluated in a SCN-infested field (HG Type 2.5.7, Race 5) at the Northern Research and Demonstration Farm near Kanawha, Iowa. Three conventional and four Roundup Ready®, SCN-susceptible varieties also were planted in the experiments. Plots were four 17-foot long rows spaced 30 inches apart and were planted at a rate of 10 seeds/foot, with four replications per variety. Preplant herbicide was applied and conventional post-emergent herbicides were applied to the conventional varieties, and Roundup® herbicide was applied to the Roundup Ready® varieties. Plots were planted on May 17 and harvested on October 1.

Plant stand (number of plants/foot) was assessed in each plot 35 to 40 days after planting. All plots were end trimmed to a length of 14 feet on September 3. The maturity date of each variety also was noted. A variety was considered mature when 95% of the pods had turned brown. Just prior to harvest, average plant height and lodging (1=all plants fully erect, 5=all plants flat) were assessed in each plot. The center two rows of each four-row plot were harvested with a plot combine. Total seed weight/plot and seed moisture were determined, and total plot seed weights subsequently were converted to bushels/acre.

At the beginning of the growing season, all plots 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 14 feet of the center two rows of each plot immediately after planting. SCN cysts were extracted from each soil sample, and SCN eggs were extracted from the cysts and counted. SCN egg population densities also were determined for each plot at the end of the growing season in an identical manner.

Because of the consistent relationship between higher soil pH and SCN population densities, all varieties also were field tested for tolerance to iron deficiency chlorosis (IDC). Each variety was planted in a hill plot consisting of five seeds/hill, with two replications/variety, at two high pH field locations. Prior to planting the experiments, the soybeans growing at each location were removed. Notes were taken for IDC symptoms at each location approximately four weeks after planting and again at five weeks after planting. Varieties were rated on a scale of "1" to "5" with a "1" indicating no symptoms of IDC present and a "5" indicating plant death due to IDC. The scores from each location then were averaged together and an overall rating was assigned to each variety. One variety highly resistant to IDC and one variety highly susceptible to IDC also were included in the experiments as checks. The highly resistant variety scored an average of 1.1, and the highly susceptible variety scored an average of 3.0. The scores from these IDC field tests are listed in Tables 1 and 2.