SOYBEAN: Glycine max (L.) Merrill, ‘LD05-16060’, ‘SD01-76R’

EFFICACY OF FOLIAR INSECTICIDES AND HOST PLANT RESISTANCE ON SOYBEAN APHID MANAGEMENT, 2009

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Soybean aphid (SBA): Aphis glycines Matsumura

Soybean aphid is a major economic pest of Midwest soybean. Foliar insecticides are the most frequently utilized management option for this pest. The objective of this study was to compare efficacy of five different management options for management of soybean aphid (SBA). The study was conducted at UMORE Park, University of Minnesota, Rosemount, MN during summer 2009. Soybeans were planted 26 May at 150,000 seeds per acre in 30-inch rows using cultivar SD01-76R except the Rag1 treatment that was an experimental line from the University of Illinois (LD05-16060). Plots were 12 rows wide by 60 ft long and were sampled on a weekly basis from 16 Jun to 1 Sep to estimate aphid density based on SBA/plant. Sampling intensity per plot varied from 20 plants/plot early season to 5 plants/plot late season as SBA density increased over time. Cumulative aphid-days (CAD) (1 CAD = 1 SBA/plant/day) were calculated using weekly aphid counts to provide a measure of seasonal aphid abundance. The five treatments included three foliar insecticide treatments (Movento, Knack, and Warrior with Zeon Technology), a soybean cultivar resistant to soybean aphid (Rag1) with no foliar insecticide application, and an untreated control arranged in a RCB design with four replications per treatment. Foliar insecticides were applied on 23 July when the mean density exceeded the economic threshold of 250 aphid/plant. Insecticides were mixed with water and applied using ground equipment at 20 gpa. Yield estimates were obtained from two central rows of each plot on 3 Nov. Data was analyzed using ANOVA, and all data except yield data was log (x+1) transformed. Means were separated using Tukey’s test (P<0.05).

Aphid pressure in 2009 was high, and all treatments exceeded the economic threshold (250 aphids per plant). During peak aphid pressure in August, Warrior and Movento exhibited a significant difference in aphid numbers from the untreated control three times (3 Aug, 10 Aug, and 17 Aug), and the Rag1 resistance treatment significantly differed from the untreated control two times (10 Aug and 17 Aug). CAD in the untreated control was significantly higher than all other treatments except Knack. Yield was not significantly affected by treatment except in the Rag1 resistance treatment where reduced yield was due to planting a maturity group 3 soybean where the appropriate maturity group is a 1.9 for Rosemount, MN.
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1 Cumulative aphid day (1 CAD = 1 SBA/plant/day).

Means within a column followed by a different letter are significantly different (Tukey’s test; P<0.05).