

SOYBEAN ROW SPACING AND PLANT POPULATION AFFECT EMERGENCE AND GROWTH OF EASTERN BLACK NIGHTSHADE. Adrienne M. Rich* and Karen A. Renner, Graduate Research Assistant and Professor, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824.

Eastern black nightshade (*Solanum ptycanthum*) is a weed problem in soybean fields in the north central region of the U.S., including Michigan. Eastern black nightshade competes with soybean for moisture, nutrients, and light, and reduces crop yield and quality. Eastern black nightshade is considered to be a shade tolerant weed, implying that emergence and growth may not be influenced by shade beneath the soybean canopy. In 2001, eastern black nightshade emerged only during the first six weeks after soybean planting and emergence was not affected by row spacing or soybean population. Eastern black nightshade densities of 37/ m² did not reduce soybean yield in 2001. Research was continued in 2002 to determine if soybeans planted in narrow rows at higher plant populations would reduce eastern black nightshade emergence, biomass, and reproduction and to determine if eastern black nightshade would reduce soybean yield.

Research was conducted at Clarksville and East Lansing, Michigan. The experiment was arranged in a split plot design with row spacing as the main plot and soybean population as the subplot. Soybeans were planted at East Lansing on May 15 and at Clarksville on May 22, 2002 in 76 cm rows with a seeding rate of 185,000, 308,000, and 432,000 seeds/ha and in 19 cm rows with a seeding rate of 308,000, 432,000, and 556,000 seeds/ha. Eastern black nightshade seed was spread across the fields to insure a uniform population. Emergence of nightshade was recorded weekly throughout the growing season. Light measurements were taken every 7-14 days perpendicular to the soybean row to estimate soybean LAI. Micro-plots were established at both locations to study the effect of soybean population and row spacing on nightshade growth and development. Soybeans were thinned to exact populations and nightshade biomass measurements were taken on July 10, August 8, and September 27 at Clarksville and July 9, August 6, and October 1 at East Lansing. Soybeans were harvested on October 1st at both locations following the removal of all eastern black nightshade plants prior to harvest.

Eastern black nightshade emergence in May and June was not influenced by soybean row spacing or population. However, planting soybean in 19 cm rows reduced eastern black nightshade density and dry weight throughout the growing season, regardless of soybean population. Furthermore, berry dry weight in August and October was significantly reduced in 19 cm compared to 76 cm rows at Clarksville and East Lansing.

Fifty five percent of eastern black nightshade biomass was allocated to berry production in the 76 cm row spacing compared to 14% in the 19 cm rows in October. Eastern black nightshade densities of 4 plants/ m² did not reduce soybean yield, regardless of row spacing or soybean population at East Lansing. Soybean yields were reduced by nightshade densities of 5/ m² at Clarksville where soybeans were planted at 185,000 seeds/ha in 76 cm rows and at 308,000 and 556,000 seeds/ha in 19 cm rows. Soybeans should be planted in 19 cm rows to reduce eastern black nightshade biomass and seed production.