

VARIATION IN EASTERN BLACK NIGHTSHADE ACCESSIONS. John B. Masiunas, Associate Professor, University of Illinois, Urbana, IL 61801.

The *Solanum nigrum* complex (*Solanum* Sect. *Solanum*) is a cosmopolitan group of approximately 30 species. Many of the species in the complex are troublesome weeds in horticultural crops, especially solanaceous vegetables such as tomatoes and peppers. In eastern North America the dominant weedy nightshade species is eastern black nightshade, *Solanum ptycanthum* Dun. ex DC. Eastern black nightshade is an annual becoming a short lived perennial in the southern portion of its range (southern IL, southern IN, KY, boot heel of MO). The plants are up to 1m erect, often freely branching. The underside of the seedling leaf is purple. Flowers are yellow-colored in clusters of up to six flowers. Mature berries are globose, shiny, purplish-black, detaching when mature, and containing 6 to 15 hard sclerotic granules. The presence of sclerotic granules are one of the key identification characteristics for mature eastern black nightshade. The plants are prolific producers of berries (over 5,000 berries on some plants) and each can contain up to 100 seed. Several related species including American black nightshade (*S. americanum* Auct.) and black nightshade (*S. nigrum*) are similar in appearance to eastern nightshade. American black nightshade is common in Florida, the Gulf coast, and California. Black nightshade is an introduced species found primarily in California. The black nightshade complex has been difficult to classify into species because of extensive morphologic variation. In eastern black nightshade we found variation in life cycle, plant size, growth habit, flower size, berry color at maturity, growth rate, and berry production. Eastern black nightshade competes with crops for resources (nitrogen, light, water), contaminates crops, increases harvest difficulty, and serves as a secondary host for crop pests. Our research found that nightshade and tomato competed for light. The critical period for competition is during flowering and fruit development. As few as 1 plant/m of row can reduce tomato yield and delay maturity. The greatest yield reductions occur when nightshade overtop the tomatoes. Staking tomatoes increases its competitiveness with nightshade. Nitrogen fertilizer applications during greenhouse production can also increase tomato competitiveness with nightshade. Our research also found that perennial eastern black nightshade serves as an overwintering host for cucumber mosaic virus. In Illinois, eastern black nightshade resistant to ALS-inhibitors has been identified. Eastern black nightshade has also been poorly controlled in glyphosate-resistant soybean systems. In this case, poor control is likely caused by nightshade growing under the soybean canopy and not being contacted by the herbicide and emergence after the glyphosate application. We evaluated glyphosate and carfentrazone susceptibility of eastern black nightshade accessions collected throughout the range. We found that accessions varied in their tolerance to low rates of glyphosate but that at full-field rates (1.12 kg/ha or above) there were no differences. Carfentrazone is a PPO-inhibitor that cause contact burn. Some accessions were killed by carfentrazone while other accessions were injured but recovered even at 46 g/ha, twice the recommended rate.