

INDEPENDENT RESPONSES OF SOYBEAN EARLY GROWTH TO STRESSES CAUSED BY SOYBEAN CYST NEMATODE AND POST-EMERGENCE HERBICIDE APPLICATIONS. Ramon G. Leon and Micheal D. K. Owen, Graduate Research Assistant and Professor, Department of Agronomy, Iowa State University, Ames, IA 50011.

Soybean cyst nematode (SCN; *Heterodera glycines* Ichinoche) causes great yield losses in soybeans across the Midwest United States. Although it is not well understood what influences SCN infection, several studies and farmers reports suggested that stressed soybean plants are more susceptible to SCN infection. Also, it has been proposed that post-emergence herbicides (POST) are among the stress causing agents responsible for increased soybean susceptibility to SCN. However, researchers also showed that some POST herbicides, such as acifluorfen, besides causing transient stress to the soybean, can induce defense mechanisms that might minimize SCN infection. Therefore, it is not known if SCN and POST effects interact to increase or diminish soybean growth. The objective of this study was to determine the existence of interactive responses of soybean growth to stresses caused by SCN and POST applications. In order to precisely isolate the effect of those stresses and reduce the variability due to environmental conditions, the experiments were conducted in controlled greenhouse conditions. Soybean plants were grown in pots with soil infested with either low (10 eggs cm⁻³ soil) or high (100 eggs cm⁻³ soil) SCN egg population density. Soybeans were sprayed at V3 growth stage with acifluorfen at 421 g a.i. ha⁻¹, imazethapyr at 70 g a.i. ha⁻¹, and glyphosate at 840 g a.e. ha⁻¹. Also, a non-treated control was included in the experiment. Visual injury was determined at different times after POST application, and the plants were harvest 65 days after planting and growth parameters were measured. The experiment had four replications and was conducted three times. No interactions between SCN and POST were observed, and only SCN main effect explained reductions in soybean growth. Plants grown in soil with high SCN had less leaf area and lower biomass than plants grown in soil with low SCN. However, the reduction of those soybean parameters was only around 10%. Although some visual injury was observed in soybeans sprayed with acifluorfen and imazethapyr, none of the POST treatments differed from the non-treated control regarding soybean growth parameters. In general, acifluorfen caused 20% visual injury in the first 14 days after application (DAA), but when the plants were harvested, the results from the injury were negligible. In the case of imazethapyr, the highest injury observed was 2% at 7-14 DAA. Glyphosate did not cause any visual injury. The results of the study showed that POST did not affected SCN susceptibility, and the reductions in soybean growth were due to SCN and not to POST. Therefore, the observations made by farmers and from previous field studies suggesting a possible interaction between SCN and POST are not supported. Instead, it is possible that other factors present in the field are likely important to increase soybean susceptibility to SCN.