298
AL-5
1260
2013

Final Report - Summary
AU Fund 367402 (APPA-RIA03-PID 298 BID 1260)
July 25, 2014

Project Title: Cropping Systems, Organic Production, and Rotation Research Project

Project Leader (Alabama):
Austin Hagan, Department of Entomology and Plant Pathology

Results: A long-term rotation study has been with approximately 34 different cropping patterns that include peanut, bahiagrass, corn, cotton, pearl millet, grain sorghum, and clean fallow has been maintained on an irrigated site for 25 years at the Wiregrass Research and Extension Center in Headland, AL. In 2013, peanut cropping frequency significantly impacted the incidence of leaf spot diseases, stem rot, and yield of peanut but not root knot pod damage. A significant rotation x peanut variety interaction showed that yield of the two peanut varieties varied by cropping frequency. Corn yield was also influenced by cropping frequency. For cotton, cropping frequency and variety selection significantly influenced target spot severity but neither variable impacted cotton yield. While highest leaf spot ratings were noted when peanuts followed peanuts, equally lower disease ratings were recorded for the 1, 2, 3, and 4 year out peanut rotations. Highest stem rot indices occurred where peanuts followed a minimum of one year of peanut, while the two and four year out rotation sequences suffered the least damage. Root knot pod damage on peanut pods was not impacted by cropping frequency. Across all cropping frequencies, the Tifguard peanut variety yielded higher than the Georgia-06G industry-standard peanut variety. Yields were higher for peanut cropped behind a minimum of one year of bahiagrass, corn, cotton, or sorghum as compared with peanut behind a minimum of one year of peanut. No significant yield gains were observed with the interval between peanut crops was exceeded one year. In 2013, bahiagrass, corn, and grain sorghum proved to be better rotation partners with peanut than cotton. Lowest yields and highest leaf spot levels were seen when peanut followed peanut. While target spot indices for Phytogen 499 were higher than Deltapine 1252, yield for the two cotton varieties were similar. Target spot indices as were yields were higher for the one year out than other cropping sequences. Overall, yield for cotton behind cotton matches those for cotton following at least one year of peanut. While no differences in disease levels were seen across corn cropping patterns, lowest yields were noted where corn followed a minimum of one year of corn. Similarly high yields were obtained for corn cropped behind one or two years of peanut. Peanut pod grades are not yet available for the 2013 study year. In 2012, however, peanut cropping frequency and peanut variety selection significantly impacted pod grade. Higher grades were obtained for Georgia-06G than for Tifguard, while the latter produced higher yields. Generally, pod grades improved as peanut cropping frequency lengthened to two or more years.

Publications:

Campbell, H. L., A. K. Hagan, K. L. Bowen, and B. Gamble. 2013. Influence of crop rotation on diseases, nematode activity, and yield of peanut and cotton in southeast Alabama. Phytopathology 103 (6):S2.23. http://apsjournals.apsnet.org/doi/pdf/10.1094/PHYTO-103-6-S2.1