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~~Annual~~ Progress Report + Summary

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**Project Title:** Agronomic Practices & Strategies for Organic Management and Production of Peanuts

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Impact of crop rotation and peanut rotation partners on leaf spot intensity, stem rot incidence, root knot nematode damage, and the yield of two peanut varieties was assessed in 2016. Peanut plots will be split to include the peanut root knot (*Meloidogyne arenaria* Race 2) resistant Tifguard and Georgia-14N along with the root knot susceptible Georgia-06G peanut cultivars to assess the interaction between peanut cropping frequency and value of a root knot resistant peanut cultivar. Peanut rotation sequences will include 27 years of continuous peanut production as well as peanut behind 1 year of corn, bahiagrass, corn, cotton, pearl millet, soybean, and summer fallow as well as peanut behind two years of pearl millet, cotton, and corn. Cotton plots will be split into four subplots of two cotton root knot resistant (*Meloidogyne incognita* race 4) cotton varieties (Phytogen 487 and Deltapine 1558 RN) and two cotton root knot susceptible varieties (Phytogen 499 and Deltapine 1252) to assess the interaction between cotton cropping frequency and cotton variety selection as well as differential variety reaction to the disease target spot. Overall, TSW pressure was slow and no difference in disease incidence were noted on the basis of peanut rotation frequency. While the incidence of TSW was higher in Georgia-06G than Tifguard or Georgia-14N, impact of this difference in disease on yield was negligible. Defoliation from leaf spot diseases was low regardless of peanut cropping frequency or peanut variety. Defoliation levels were marginally but significantly higher for the continuous peanuts as compared with all other peanut cropping frequencies. Again, leaf spot pressure was so low that reductions in yield were unlikely. Stem rot incidence was impacted by peanut cropping frequency. Greater stem rot damage was noted were peanut were cropped for two consecutive years as compared with all other cropping frequencies except for the one year out rotation patterns. Similarly low stem rot indices were recorded for the two, three, and five year out rotation patterns. While overall stem rot incidence was low, less disease damage was noted on Georgia-14N compared with Tifguard and Georgia-06G. Greater root knot damage to the pegs and pods was recorded for the three year-out rotations than continuous peanuts and the one year out peanut rotations. Stem rot incidence was higher in Georgia-06G compared with Tifguard and Georgia-14N, which had similarly lower root knot indices. Similarly high yields were obtained for the four, three, and two year out cropping patterns along with two consecutive years of peanut, while the lowest yields were recorded for the continuous peanuts. Similar yields were recorded for all three peanut varieties.