Evaluating Inoculation of Two Peanut Cultivars after Long-Term Continuous Corn Production.

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To maximize N-fixation, peanuts (Arachis hypogaea L.) need to have abundant nodulation with active Rhizobium. In fields with a recent history of peanut in rotation, inoculation may not be necessary because of adequate Rhizobia survival in the soil. However, in fields that have not been planted to peanut for five years or more, inoculation may be necessary to achieve optimized production. An experiment was planted in Tifton, GA during 2008-2009 in a field that had previously been planted to 25+ years of continuous corn to evaluate peanut response (yield, grade, nodulation, foliage color, plant biomass) to inoculation. Two peanut cultivars (‘Georgia-06G’ and ‘AP-3’) were planted as a main plot effect with three inoculation treatments (untreated, Optimize Lift, and Vault Liquid) as a sub-plot effect in a split plot design. There were no treatment interactions among the assessed variables in either year. Georgia-06G yielded and graded higher than AP-3 averaged over inoculant treatments, and also had darker foliage and larger plant biomass. When averaged over cultivars, the inoculant treatments outperformed the untreated peanuts in yield, nodulation, and foliage color. Inoculated peanuts averaged 1623 lb/ac more than non-inoculated peanuts in 2008, and 492 lb/ac higher in 2009. The sharp decline is attributed to a very wet season in 2009, especially within the first week after planting, potentially washing rhizobia away from the seed and/or killing some bacteria in the anaerobic conditions of the water-logged soil. These results show inoculation of peanuts in fields without native rhizobia is imperative to maximizing peanut performance. There are also indications that genetic variation in foliage color can be nearly as drastic as differences between inoculated and non-inoculated peanuts. Therefore, it is important that growers do not misdiagnose inoculant failure from planting different peanut varieties with drastically different hues in the same field.