Rate and Timing of Ammonium Sulfate Application on Peanut After an Inoculant Failure.

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Peanut (Arachis hypogaea L.) is a legume and will fix N when nodules are present and active. However, when biological N-fixation is not occurring, the best method for supplying N to the plant is through surface applications of fertilizer. Ammonium sulfate is widely considered the best N fertilizer source for peanut for in-season N supplementation. To test the most optimum rate and timing of N-fertilization, experiments were conducted in Tifton, GA in 2010 (one location), 2011 (two locations), and 2013 (one location). The field sites had low native Bradyrhizobia populations (minimum of 15 years since last peanut planting), which simulated an inoculant failure. A commercial liquid inoculant was used as a control, and the other treatments did not include an inoculant but had soil applications of 0, 67, 135, or 202 kg N/ha at first bloom, or split applications of either 67 kg N/ha at first bloom followed by an additional 67 kg N/ha at early pod fill, or 135 kg N/ha at first bloom followed by an additional 67 kg N/ha at early pod fill. There were few statistical differences in yield, but inclusion of inoculant provided positive net revenue over the untreated in several site-year locations. Also, there were no instances where N fertilizer provided an economic advantage compared to the untreated plots. Based on these results, rescuing an inoculant failure with N fertilizer is not cost-effective, although more research is needed to evaluate additional management conditions.