A-139

Nitrogen fertilizer for soybean

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Concern about soybean's ability to provide energy to fix adequate N while still producing high yields has led to renewed interest in in-season use of N fertilizer. We conducted a series of fertilizer N timing experiments in Illinois, in different soil types with a range of yield potential. There were few responses to N in silt loam soils, with unfertilized check yields ranging from 4,108 to 6,125 kg/ha, though applying the same N increment four times increased yield significantly at three of five sites. At one site with loam soil, however, we found large yield responses to urea applied at planting time, with an increase of 1,506 kg/ha (35%) in 2015 and 1,325 kg/ha (39%) in 2016. Applying N once, at R1, R3, or R5, produced modest yield increases at this site, while N applications in addition to the one at planting did not improve yield compared the planting-time treatment alone. We expanded the treatments to include N rate at planting at this site in 2016, and found a quadratic yield response to N rate, with maximum yield requiring more than 100 kg N/ha. We conclude that routine application of N in many soils is not economically justifiable, but that in soils where N at planting might provide an initial boost in growth, N might increase yields economically, and should be further investigated.