

**CAN LEGUMINOUS COVER CROPS REPLACE NITROGEN FERTILIZATION IN MISSISSIPPI
DELTA COTTON PRODUCTION?****Robert M. Zablotowicz****Krishna N. Reddy****L. Jason Krutz****USDA-ARS, Crop Production Systems Research Unit****Stoneville, MS****Ryan Jackson****Les Price****USDA-ARS, Southern Insect Management Research Unit****Stoneville, MS****R. Earl Gordon****USDA-ARS, Crop Production Systems Research Unit****Stoneville, MS****Abstract**

Unstable petroleum supplies have impacted nitrogen fertilization costs. A three year field study was conducted in Stoneville, MS to assess effects of Austrian pea or hairy vetch cover crops on nitrogen availability and cotton yield grown under reduced-tillage. Cover crops were seeded in October, killed with paraquat in early April and nitrogen fertilizer (0, 60, or 120 lb/acre) was applied at planting. Plant residues averaged 3600, 7400, and 7100 lb/acre in no-cover crop, Austrian pea, and hairy vetch plots, respectively with 158 lb N/acre in Austrian pea and 136 lb N/acre in hairy vetch attributed to nitrogen fixation. In the first year, both cover crops decreased cotton yield, with no effect of fertilizer N. In the second year, cover crop had no effect on cotton yield but the highest yield was with 120 lb N. In the third year (2007), in no-N plots, cotton yields were 65% higher in both cover crops than no-cover crop. However the highest yield was achieved in no cover crop with the highest N rate. Lack of synchrony between N release and plant uptake can depress cotton yield in fertile Mississippi Delta soils. In 2007, no-cover crop plots had a net return of 322, 481, and 619 \$/acre receiving 0, 60, and 120 lb N/acre, respectively, while Austrian pea plots, had a net return of 474, 501, and 450 \$/acre with the same N levels. Despite leguminous cover crops benefits, extra seed cost challenges the development of sustainable low-input cotton production systems.