

**USING WINTER ANNUAL COVER CROPS
IN A VIRGINIA NO-TILL COTTON
PRODUCTION SYSTEM**

**PART I. BIOMASS PRODUCTION,
PERCENT GROUND COVER,
AND NITROGEN ASSIMILATION**

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Abstract

Cotton (*Gossypium hirsutum* L.) is a low residue crop, that may not provide sufficient surface residue to reduce erosion and protect the soil. A winter annual cover crop could alleviate erosion between cotton crops. This experiment was conducted to evaluate selected winter annual cover crops for biomass production, percent ground cover, and N assimilation. Six cover crop treatments, crimson clover (*Trifolium incarnatum* L.), hairy vetch (*Vicia villosa* L.), hairy vetch and rye (*Secale cereale* L.), rye, wheat (*Triticum aestivum* L. emend. Thell.), and white lupin (*Lupinus albus* L.), and two tillage systems (conventional and no-till) were arranged in a split plot design with four replications. Percent ground cover estimation measurements were taken in spring before cover crop desiccation, immediately after cotton planting, and 50 d after cotton planting. Hairy vetch and rye, rye, and wheat consistently provided the most ground cover after cotton planting, while lupin consistently provided the least ground cover. All cover crop treatments, with the exception of lupin, provided enough ground cover (>30%) after cotton planting to comply with Natural Resource Conservation Service conservation standards, except during years with below normal winter temperatures. Fifty d after cotton planting the small grain residues provided more ($P<0.05$) ground cover compared to the legume residues. Averaged over the three experimental years, biomass production from the different cover crop treatments ranged from 845 to 2,721 lb/acre. The average amount of N assimilated by cover crops ranged from 29 to 70 lb N/acre, and was closely related to the amount of cover crop biomass produced. Growth and biomass production of cover crops was greatly affected by the climate conditions during each season.