Miller, J.H.; Zutter, B.R.; Zedaker, S.M; Edwards, M.B.; Newbold, R.A. 2002. A regional study of loblolly pine plantation development through 15 years after early complete woody and herbaceous plant control (COMP). In: New century: new opportunities: 55th annual southern weed science society meeting; 2002 January 28-30; Atlanta, GA. Champaign, IL: Southern Weed Science Society: 75 [Abstract].



**A REGIONAL STUDY OF LOBLOLLY PINE PLANTATION DEVELOPMENT THROUGH 15 YEARS AFTER EARLY COMPLETE WOODY AND/OR HERBACEOUS PLANT CONTROL (COMP).** J.H. Miller, B.R. Zutter, S.M. Zedaker, M.B. Edwards, and R.A. Newbold, US Forest Service and School of Forestry, Auburn, AL, Virginia Tech Univ., Blacksburg, VA, US Forest Service, Athens, GA, Louisiana Tech Univ. Ruston LA.

## ABSTRACT

Pine plantations are increasingly cultured using early woody and/or herbaceous plant control. Developments in sustainable cultural practices are hindered by the absence of long-term data on productivity gains relative to competition levels, crop-competition dynamics, and compositional succession. To gain baseline data, this study examined loblolly pine *(Pinus taeda* L.) plantations, across 13 southeastern sites, grown with near-complete control of woody and/or herbaceous competitors for the first 3-5 years. Each site used the same study design and uniform procedures. After 15 years, pine and competition dynamics remained significantly altered by early control treatments and were most influenced by the amounts of hardwoods and shrubs present or controlled. Early woody control significantly increased 15-year pine merchantable volume on 11 sites by 14-118%, while early herbaceous control significantly increased volume on 10 sites by 4-50%. Gains with the control of both components were generally additive. Pine volume was decreased by about 1% for each 1 $ft^2$/ac of hardwood basal area (BA) present at age 15 as determined by regression analysis. Culmination of current annual increment (CAI) with complete control occurred in years 8-11 at 250-480 $ft^3$/ac/yr. CAI's for pine height, BA, and volume were decreased by about 5-27% when growing season rainfall (Mar-Nov) was less than 36 in. Culmination of mean annual increment (MAI) had not been reached by year 15 for any treatment at any location, with Total Control MAI's averaging 195-250 $ft^3$/ac. Fusiform rust mainstem galls *(Cronartium quercuum* [Berk.] Miyabe *ex* Shirai *f. sp. fusiforme)* in high severity areas increased with control of both components, more so with herb control, and their effects were additive. Associated flora in these plantations included 140 genera of herbaceous plants, 34 genera/species of shrubs, and 71 species of trees.