Microclimate of Pine Alleys Differentially Constrains Productivity of Two Cool Season Grasses. (C03-burner081701-Oral)

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Abstract:

Microclimate can limit the productivity of alley crops in agroforestry systems. The objective was to compare yield, quality, botanical composition, and gas exchange of two shade tolerant grasses grown as alley crops. The study was conducted for 3 yr in swards of Potomac orchardgrass, Kentucky 31 tall fescue, and a binary mixture of the two grasses in three environments: loblolly pine and shortleaf pine alleys (8-10 yrs post-planting), and unshaded (open). Shortleaf pine alleys received 61% solar reception compared to 45% for loblolly pine. Total herbage yield in alleys was about 25% less than in the open. The mixture was higher yielding than either grass in the open and under shortleaf pine. Orchardgrass yielded more than tall fescue in alleys. Herbage crude protein and IVDMD followed the order orchardgrass > mixture > tall fescue, and increased with increasing shade. Lower stomatal conductance of orchardgrass in the shade might have contributed to its competitive advantage compared to tall fescue. Orchardgrass, singly or mixed with tall fescue, should be considered for pine alleys in the mid-south.

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