Production and Nutritive Value of Orchardgrass Along a Gradient From Open Pasture to Woodland. (C03-belesky130130-Poster)

Authors:

- D.P.Belesky* - *USDA-ARS, Beaver, WV*
- J.J.Halvorson - *USDA-ARS, Beaver, WV*
- C.M.Feldhake - *USDA-ARS, Beaver, WV*
- J.M.Ruckle - *USDA-ARS, Beaver, WV*

Abstract:

Growing forages in wooded areas could extend the spatial and temporal boundaries of forage production. Microsite conditions influence plant morphology, physiology and rate of development, so production and composition may differ between open and shaded sites. We quantified growth and nutritive value of orchardgrass (Dactylis glomerata L.) grown in pots in unobstructed canopy (open grassland), forest edge (partial shade transition) and oak (Quercus sp.) woodland (heavy shading) to develop management practices for components of silvopastoral systems in the humid eastern US. Orchardgrass plants were clipped each time canopies reached 20 cm. Shoot and root mass declined as shading increased; however, the shoot:root ratio of plants in open and wooded (90% light attenuation) sites were similar. Plants from transitional sites (30 to 60% light attenuation) had greater shoot:root ratios, relative to open or wooded sites, but varied little with time. Tiller appearance was 14% greater in transition and 18% less in wooded compared to the open site. Relative growth rate was 55% greater, nitrates six times greater and nonstructural carbohydrates five times less in plants grown in the wooded compared to open site. Shifting resource allocation and use efficiency in plants grown in heavily shaded conditions compromises production and ultimately persistence. Energy and protein content of the shade-grown forage may not satisfy the nutritional needs of grazing livestock; however, partial shade might sustain persistence suggesting partial clearing of wooded areas will be beneficial.

Corresponding Author Information:

David Belesky
USDA-ARS, AFSRC
1224 Airport Road

phone: 304.256.2841
fax: 304.256.2921
e-mail: dbelesky@afsrc.ars.usda.gov

Beaver, WV 25813

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