

ALLOMETRY AND BIOMASS OF POLLARDED BLACK LOCUST

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POSTER SUMMARY

Climatic constraints can cause forage deficits in the summer in west-central Arkansas, necessitating expensive, supplemental hay feeding. Black locust could be used for summer browse, but the temporal distribution of foliar biomass has not been adequately tested. Our objective was to determine effects of harvest date, fertilization (0 and 600 kg P ha⁻¹ yr⁻¹), and pollard height (stems cut at 5, 50, and 100 cm above ground) on foliar and shoot allometry of black locust. The test was conducted on a naturally regenerated 2-year-old black locust stand (15,000 trees ha⁻¹). Basal shoot diameter and foliar yield were measured monthly in June to October 2002 and 2003. Yield (Y) of foliar and shoot dry matter was estimated from basal shoot diameter (D) by the function $Y=aD^b$, with regression explaining at least 95 percent of variance.

Allometry of foliar yield was affected by harvest date (fig. 1), increasing at a significantly ($P<0.05$) greater rate with D in September ($Y=0.0126D^{3.0142}$) than in June ($Y=9.4976D^{0.6638}$) or July ($Y=0.5769D^{1.9305}$), but not by pollard height or P fertilization. Allometry of shoot dry matter was unaffected by cultural practice, $Y=0.0427D^{2.8709}$. Biomass was greater when trees were pollarded at 50 or 100 cm, with or without P, than at 5 cm. Foliar biomass in August was 5.3 Mg dry matter ha⁻¹, a competitive yield compared to herbaceous forage. Allometry of shoot dry matter was unaffected by harvest date, pollard height, or P fertilization. Black locust should be considered for rotational livestock browse in summer when climatic stresses induce semi-dormancy of herbaceous forages. Yield of black locust pollards can be estimated from basal shoot diameter with reasonable accuracy.

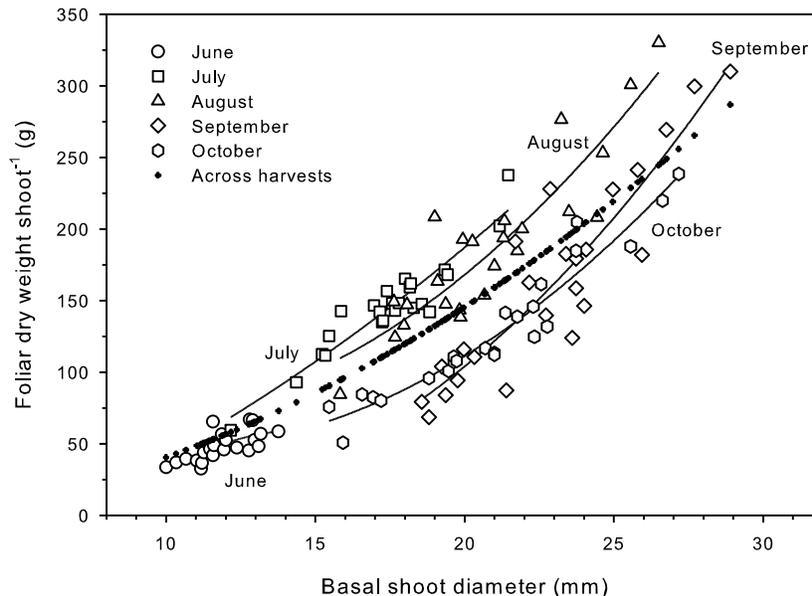


Figure 1—Relationship of foliar dry weight to basal shoot diameter for June through October harvests, and combined across harvests, for black locust in Arkansas, U.S.A.

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