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Abstract

Multi-species allometric models to predict grass biomass may increase field study efficiency by eliminating the need for species-specific data. We used field measurements over two growing seasons to develop single- and multi-species regression models predicting current years' aboveground biomass for 8 common cespitose grass species. Simple and step-wise regression analyses were based on natural log expressions of biomass, basal diameter, and height; and a dummy variable expression of grazing history. Basal diameter had the strongest relationship with biomass among single- (adj. R^2 = 0.80–0.91) and multi-species (adj. R^2 = 0.85) models. Regression slopes (b) for diameter among single- (b = 1.01–1.49) and the multi-species (b = 1.25) models suggesting that biomass will double when diameter increases ~75%. Height and grazing history added little predictive value when diameter was already in the model. When applied to actual populations, biomass estimates from multi-species models were within 3–29% of estimates from the single-species models. Although the multi-species biomass-size relationship was robust across the cespitose life-form, users should be cautious about applying our equations to different locations, plant sizes and population size-structures.