



Multiple Regression Models to Predict Biomass of Purple Threeawn and Blue Grama: A Non-Destructive Method to Measure Plant Response to Fire

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Plant response to fire is often measured by its effects on biomass production. Biomass sampling in fire ecology is usually conducted by clipping quadrats of target species pre- and post-fire. However, to measure individual plant biomass response to fire, one cannot introduce clipping onto individual target plants. We used multiple regression to develop a model to non-destructively predict aboveground biomass of purple threeawn (*Aristida purpurea*) and blue grama (*Bouteloua gracilis*). Independent variables included longest leaf length and area measurements (basal area and cross-sectional area at a 7.5-cm plant height and at 50% of total plant height). One-hundred randomly selected plants of each species were measured in June. Coefficients of determination were 0.96 and 0.92 for purple threeawn and blue grama, respectively. For both species, cross-sectional area at 7.5 cm was the most important single predictor variable. Overall, these regression models were successful at predicting biomass of purple threeawn and blue grama grass. These models will allow the non-destructive monitoring of post-fire individual target plant biomass response.

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