Allometric equations for estimating above-ground biomass and carbon stock in *Faidherbia albida* under contrasting management in Malawi

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Estimation of aboveground tree biomass and carbon in mixed maize/tree parklands by nondestructive means requires the development of allometric equations from readily measurable variables such as diameter at breast height and tree height. Equations of this type have not been well developed for *Faidherbia albida* in eastern and southern Africa. In this study, *F. albida* trees were characterized in block plantings and in naturally regenerating parklands at six sites in Malawi. Allometric equations were developed for block planted and parkland management regimes. Forty-five intact trees with diameters ranging from 5 to 38 cm were sampled in the block planting while in parklands thirty-eight trees with diameters ranging from 5 to 116 cm were sampled. Destructive sampling was used to measure volumes and collect wood samples. Diameter at breast height, tree height and crown areas were used as predictors for dry weight of the above-ground biomass. Comparing the estimated equations to previously published data shows that these local species-specific equations differ slightly and that both can be used in the estimation of biomass in *F. albida* trees. Individual trees in parklands stored more biomass and carbon while block-planted trees stored more biomass per hectare. In parklands, *F. albida* crown area cover per hectare was 17.8 %, but could feasibly be increased under natural regeneration to as much as 23.1 %.