

Changes in herbaceous vegetation attributes and nutritional quality as influenced by cutting frequencies in the enclosure of Borana rangelands, southern Ethiopia

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Abstract

Herbaceous vegetation species' responses to different frequencies of cutting regimes have not been evaluated in the Borana rangelands of southern Ethiopia. The present study was aimed to determine the grass and non-grass species' yield responses to four cutting frequencies over two years (2019 and 2020). The four cutting frequencies were cutting once after the end of the main growing season (T1), cutting every week (T2), cutting every two weeks (T3), and cutting every three weeks (T4). Treatments were arranged in a randomized complete block design with four replications. In total, 37 different herbaceous species comprising 15 grass and 22 non-grass species were sampled. Cutting frequencies had a significant effect ($P < 0.01$) on herbaceous biomass with yield decreasing as cutting frequencies increased. Herbaceous species richness and both non-grass species richness and diversity were significantly ($P < 0.05$) high for T4 while T3 significantly ($P < 0.05$) promoted non-grass density. Grass dried biomass was significantly ($P < 0.001$) high for T1. Subsequent cutting over years significantly ($P < 0.05$) affected grass species composition and biomass. Continuous application of T3 over years significantly ($P < 0.05$) favored non-grass species composition and density. Only herbaceous biomass was significantly ($P < 0.05$) affected by subsequent application of cutting frequencies over years being high for T1. T1 enhanced the percentages dry matter, neutral detergent fiber, acid detergent fiber, and acid detergent lignin of both grass and non-grass species. T2 favored the percentages of crude protein and true in-vitro organic matter digestibility for grass and non-grass species. For short-term rangeland management in terms of plant yield and better quality, T4 (intermediate cutting frequency) will be suggested when applied subsequently over years.

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