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"Development on the margin"

Factors Affecting the Seasonal Pattern of Grazing Distribution in a Mixed Grazing System

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Abstract

Uneven grazing distribution can cause production inefficiencies and local grassland degradation. Our objective was to analyse seasonal variations in an area explored by cattle and sheep in a mixed grazing system, elucidating which factors control it. Seven Braford cows and Ideal ewes kept in a 130 ha paddock of INTA's Mercedes Experimental Station were fitted with GPS collars during 6 consecutive days in each season for two years (2009–2010). Grassland is constituted by a mosaic of tall and short grasses. Stocking rate was 0.67 AU ha^{-1} (cattle = 0.5; sheep = 0.17). Grazing locations were defined as those which were outside a 20 m radius from water points, mineral supplement and shade trees, and when animals walked with speeds > 0.5 and < 10 m min^{-1}. When animals moved less than 3 m in 10 min were considered as resting. Selection ratios (Ivlev´s index) for grazing and resting sites were computed. The area explored (ha) per species per week was estimated through the kernel method. Temperature, relative humidity, precipitation and vegetation availability were also assessed. ANOVA´s results showed that both herbivores differed seasonally in the area explored ($p = 0.02$), cattle exploring larger areas than sheep. Herbivores together reached an almost complete exploration of the paddock in each season (except in winter 2010). Cattle explored larger areas during warmer seasons (r = 0.78; $p = 0.02$), and when tall grasses availability decreased (r = -0.88, $p = 0.01$). Sheep explored larger areas in fall and spring 2009, associated negatively with the relative humidity (r = -0.70; $p = 0.05$), and positively with selection of shade trees as resting sites (r = 0.82; $p < 0.01$). Cattle selected shade trees to rest in summer ($p < 0.01$), which were located at one corner of the paddock. The location of shade trees seems to explain the higher areas explored by both cattle and sheep, but this was not related to the sites selected to graze. Despite the need for shade, herbivores can also reach farther places to graze, implying that location of shade trees didn´t constrained grazing distribution.

Keywords: Cattle, GPS collars, management facilities placement, precision grazing, sheep

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