Tropentag, September 14-16, 2022, hybrid conference

"Can agroecological farming feed the world?
Farmers' and academia's views"

Effects of agroforestry on rangeland conditions and animal performance

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Abstract

The present study was initiated with the objective to investigate the effect of agroforestry and seasonality (during two successive years) on five range species using *moringa* tree in the model. The study utilised an enclosure located in a peri-urban area in Khartoum state. Measured parameters included days to germination, flowering and seed setting as well as productivity expresssed in dry matter yields (ton hectare^{-1}). The nutritive value was analysed for pre- and post-flowering physiological status. Soil sampling was done before and after plantation. 9 rams were divided into 3 groups, one fed *moringa* alone, the other fed *moringa* together with a mixture of range species (50:50), the third a mixture of range species alone.

Within the agroforestry model, the highest yields were obtained in 2014 by *Dactyloctnium aegyptium* (90 t ha^{-1}), followed by *Farsetia longisiliqua* (21 t ha^{-1}), then *Lasiurus scindicus* (14 t ha^{-1}), *Clitoria ternatae* (7 t ha^{-1}) and finally *Alysicerpus monilifer* (2.1 t ha^{-1}). During the year 2015, the highest yield was obtained by *Lasiurus scindicus* (248 t ha^{-1}) followed by *Clitoria ternatae* (289 t ha^{-1}), then *Dactyloctnium aegyptium* (92 t ha^{-1}) then *Alysicerpus monilifer* (91 t ha^{-1}) and *Farsetia longisiliqua* (90 t ha^{-1}). For both control and agroforestry treatments, year effect was significant (P $\leq$ 0.001) where year 2015 gave better yields,

Crude protein and dry matter contents increased in post-compared to pre-flowering whereas ether extract and ash content decreased with post-flowering for all plant species. Soil anaylsis showed significant improvement after plantation as compared to before, however, soil salinity and phosphours was significantly (P $\leq$ 0.01) reduced due to plantation. The mean gain in body weight was the highest (7.1 kg) for rams given the mixture of range species and *moringa*followed by those given range species alone (4.7 kg) and those given *moringa*alone (3.3 kg), the differences were significant ((P $\leq$ 0.05). However, the feed conversion ratio was better for rams fed *moringa* alone (0.039), then those fed range species alone (0.044), then those fed *moringa* plus range species (0.082). It could be concluded that agroferstry could improve both range condition and animal preformance.

Keywords: Agroforestry, animals' performance, rangelands