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"Resilience of agricultural systems against crises"

Forage Production with Limited Water and Nutrient Resources in Pakistan

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Abstract

The Agriculture sector has key importance in Pakistan's economy. It is one of the largest sectors, accounting for more than 20 % of national GDP. Livestock, the most important contributor, shares more or less 55 % of the agriculture value added. Green forage is the most valued and economical source of feed for livestock. Sustainable availability of sufficient feed for livestock is critical to smallholders who rely on animals for their livelihood. In Pakistan forage production is facing the problems of water and fertiliser shortage. An experiment was conducted to evaluate different forage types for water and nutrient efficiency at University of Agriculture Faisalabad in 2010–11. Three factorial completely randomised design was used for the experiment. Three fertiliser levels (control, farm yard manure and chemical fertiliser), two irrigation levels (recommended irrigation and half than recommended irrigation) and two forage species (*Trifolium alexandrinum* and *Avena sativa*) were used in the experiment. Data obtained was analysed by using statistical software package R. In both crops fresh matter and dry matter yield showed highly significant differences for all the treatments while interaction of fertiliser treatment with irrigation and forage type was significant, also interaction of irrigation with forage types was highly significant. Regarding quality traits (acid detergent fiber, crude protein and metabolisable energy) all treatments showed non-significant differences except forage type where highly significant differences were observed. Differences for neutral detergent fiber were significant for both fertiliser and forage type. For fresh matter yield, dry matter yield, acid detergent fiber, neutral detergent fiber and metabolisable energy *Avena sativa* showed higher mean values than *Trifolium alexandrinum* while regarding crude protein contents *Trifolium alexandrinum* showed higher mean values than *Avena sativa* in all treatments. It is concluded from the results that by using *Avena sativa* as forage crop we can get higher yields even in limited resources of water and fertiliser to fulfil the needs of the livestock.

Keywords: Forage production, quality traits, water and nutrient efficiency, yield

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