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Selecting Rhodes and Napier Grass Genotypes for Dry Areas

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Abstract

The aim of this research was to assess drought resistance in the collections of Rhodes (*Chloris gayana*) and Napier grass (*Pennisetum purpureum*) held in the genebank of the International Livestock Research Institute (ILRI) in Ethiopia. This would allow selection of better genotypes for use as livestock feeds in dairy or fattening systems in dry areas.

Separate trials were planted for each grass during the dry season at the ILRI Zwai research site in the Ethiopian Rift Valley, where both grasses are well adapted under irrigation. The area has an annual average precipitation of 600 mm. For each species, 60 accessions were planted in 3 replicates in a split-plot design with irrigated and non-irrigated treatments. The irrigated plots were watered weekly with flood irrigation and the non-irrigated plots received less than 20 mm of rainfall over the trial period. Gravimetric soil moisture content was determined weekly in the two treatments. Plants were established from cuttings during the wet season and cut back to 10 cm at the start of the experiment. Biomass yield was measured after 5 weeks of re-growth for Rhodes grass and after 8 weeks of re-growth for Napier grass. Drought resistance was measured as the ability of a genotype to be relatively more productive than others under water deficit conditions.

Although the trial was limited to one site and one season, split-plot ANOVA showed significant differences between irrigation treatments and among accessions for biomass yield ($p < 0.01$) in both species indicating the possibility to select from the germplasm collection. Rhodes grass showed better adaptation to drought than Napier grass. Better adapted accessions of more productive grasses will support demand for feeds for dairy and fattening systems in dry areas and could provide solutions for smallholders to adapt to changing environments in sub-Saharan Africa.

Keywords: *Chloris gayana*, drought resistance, dry areas, forage, genotype, livestock feed, Napier grass, *Pennisetum purpureum*, rhodes grass, selection

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