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Status of animal feed resources in Rwanda

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Introduction

Animal feed resources remain a major constraint for livestock development in tropical Africa. In Rwanda, grazing lands are shrinking sharply because crop cultivation is progressively encroaching on grazing areas with increasing human pressure (Mutimura and Everson 2011). Therefore, over 60% of households cultivating less than 0.7 ha, and owning livestock, practize zero-grazing, where farmers cut-and-carry forage and crop residues to feed animals that are kept exclusively under sheds (MINAGRI 2009). In general, the main feed for dairy cattle under a zero-grazing system is Napier grass (*Pennisetum purpureum*). For more than a decade, efforts to improve the feed resource base and feeding management have been based on the introduction, characterization and evaluation of exotic forage species, including grasses and legumes. The main aim of this study was to identify and document the status of improved forages as animal feed resources and for use in environmental protection in Rwanda.

Materials and Methods

Rwanda is located in central Africa, immediately south of the equator (1°4' to 2°51' S, 28°63' to 30°54' E). It has a surface area of 26,338 km^2, and is landlocked, being 1,200 km from the Indian Ocean and 2,000 km from the Atlantic Ocean.

A feed inventory survey was conducted in 19 of the 30 districts in the country including 4 districts in the Southern Province, 4 in the Eastern Province, 4 in the Western Province, 4 in the Northern Province and 3 in the Kigali peri-urban area. The structured questionnaire was administered in 8 households per sector (local administration division under the district) by a team of 5 scientists cum extension staff; three sectors per district were sampled. The key information collected included data on: feed resources (feed resource calendar depicting: types, amounts, level of use, sources; means of acquisition; costs); and stakeholders in the feed value chain.

Data analysis was of descriptive statistics (frequencies) computed using the SPSS 16.0 for Windows.

Results and Discussion

Thirty feed types were indicated as feed resources produced on farm. These included grasses, legumes, crop residues, brewers' and home wastes, and non-conventional feeds. The major feed used during the rainy season was Napier grass (*Pennisetum purpureum*), which accounted for 20% of the feeds. It was followed by roadside grass (10.5%) and maize stover (8%). The least used feed resources were groundnut haulms (1.1%) and home wastes (0.1%). The high variability of feed resources indicates the shortage of feedstuffs in the country (Mutimura and Everson 2011). Although crop residues were key feed resources, livestock owners used them opportunistically. Few households fed conserved feeds because they could not produce enough to conserve. This observation agrees with findings in central and southern plateau areas of Rwanda, where conserved feeds (silage and hay) had the lowest ranking within the common feed resource inventory in smallholder dairy households (Kamanzi and Mapiye 2012). However, in peri-urban areas on dairy farms (small or large), silage is used to feed dairy cows (Nyiransengimana and Mbarubukeye 2005). Hay from grasses, especially *Brachiaria* grasses, was used up to 3.7% by farmers. The most common ones were the hybrids Mulato II and Mulato, which have been disseminated since 2008 (Mutimura and Everson 2012).

During the rainy and wet seasons, the feeds most sourced off-farm were roadside grass (17%), banana peels (8.4%) and sweet potato vines (8.1%). Farmers also purchased forages from neighboring farmers or concentrates from the markets. The most purchased feeds were maize bran (11%), commercial concentrate (9.6%) and rice bran (8.9%). Interestingly, multi-purpose trees (MPTs) were harvested free of charge from neighboring farms and comprised up to 2.6% of feed resources.

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MPTs and grasses are planted on contour bands for erosion control and soil amendment, rather than MPTs being seen by farmers as feed resources of commercial importance. In contrast, farmers in neighboring countries consider that MPTs, especially *Calliandra calothyrsus,* are commercially viable and valuable home-grown feed resources (Kabirizi 2003).

Conclusion

Despite efforts to improve forage productivity and quality in Rwanda, farmers still experience feed shortages in both wet and dry seasons, mainly because of limited land availability. While feed from neighboring farms and feed markets helps to eke out the feed resource base, these are not long-term solutions. More innovative solutions that integrate home-grown forages, crop residues and off-farm feed resources into a complete package of interventions for sustainable household land use are needed. This should be given priority in research in Rwanda.

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