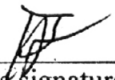


Tesfaye Alemu Aredo 2006: Studies on the Utilization of Crop Residues and the Potential of Urea Treated Maize Stover for Cattle Performances in East Shoa Zone, Ethiopia. Doctor of Philosophy (Tropical Agriculture), Major Field: Tropical Agriculture, Interdisciplinary Graduate Program.
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A survey in which 300 households were interviewed using semi-structured questionnaire was conducted to study the production, management and utilization of crop residues in three AEZs of the East Shoa Zone, Oromiya Regional State, Ethiopia. Simultaneously, the potential of urea treatment in improving the feeding value of maize stover and the performance of weaned crossbred calves and Borana bulls fed on such stover was investigated. The survey results revealed that total annual production of the major crop residues (tef, barley and wheat straws, and maize and sorghum stovers, and haricot bean haulms) did not vary ($p>0.05$) among households in the three AEZs. With regard to utilization, respondents in all the AEZs tended to use their crop residues primarily for animal feeding, and in most cases, without any attempt to improve their feeding values through some types of processing and/or treatment. Although 30 to 40% of the respondents indicated that some of their crop residues were wasted mainly because of improper storage and inability to collect, it was estimated that, with an annual average production of about 0.67 to 1.01 ton DM per TLU of a household, crop residues could contribute 26 to 40% to the total annual maintenance feed requirement of ruminants in the study areas. To further increase their contribution, a coordinated effort of government and expertise is essential in availing to farmers improved technologies and inputs that boost both grain and residue yields, and in advising them as to how best and economical they can manage their crop residues.

Results of the study on the effects of urea levels and treatment durations on chemical composition and IVDMD of maize stover revealed that treatment with 5% urea for a period of 2 weeks was more ideal than treatment with either 4 or 6% urea in terms of improving nutritive value of the stover. Besides improving IVDMD of maize stover by 9%, urea treatment markedly increased CP content of the treated stover compared with that of the untreated maize stover (UNMS) and the natural pasture hay (NPH). By feeding *ad libitum* amounts of either UNMS or urea treated maize stover (UTMS) or NPH plus 1.0 kg concentrate mixture per head per day to weaned crossbred calves, an improvement of 22% in DM intake of the stover was achieved due to urea treatment. In feeding Borana bulls with similar types and levels of these roughage feeds plus 1.5 kg concentrate mixture per head per day, urea treatment brought an improvement of 37% in DM intake of the stover. Animals those fed the diet containing UTMS out-gained ($p<0.05$) the animals fed the diet containing UNMS. However, there was no difference ($p>0.05$) in daily weight gain between animals fed the UTMS diet and those fed the NPH diet. With regard to carcass characteristics, no appreciable differences were noted among the Borana bulls fed the three experimental diets. Generally, with the added advantage of being more cost effective than feeding hay, feeding urea treated maize stover may be considered as one of the strategies that bring about the efficient utilization of crop residues for livestock feeding especially in arid and semi-arid areas where crop residues constitute the bulk of ruminant feeds and the grass hay is not easily available. However, its economic advantage over other alternatives must carefully be examined under the prevailing price conditions before it is implemented.


Student's Signature


Thesis Advisor's signature