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Yield and Nutritive Value of Maize-amaranth Mixtures for West African Dwarf Sheep

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Abstract

Inadequate supply of quality forage during the dry season is a major cause of low productivity among ruminants in Nigeria. Conserved maize and amaranth fodders have great potentials to bridge the gap in forage supply during this period.

In an agronomic study, the effects of intercropping and fertiliser application on yield and quality of maize and amaranth fodders, and land use efficiency were evaluated in two growing seasons. Nutritive value of conserved maize, amaranth or maize-amaranth fodders for ruminants were estimated in a digestibility and animal growth study using male West African dwarf (WAD) sheep. Fertiliser application improved the dry matter yield of sole crops and intercrop mixtures. In the two seasons, maize crop showed a higher response to fertiliser application than amaranth or maize-amaranth mixtures. With fertiliser application, dry matter yield varied significantly ($p < 0.05$) between sole crops and intercropped mixtures. Fodder yield varied from 7.1 to 12.6 t ha^{-1} during the first season and 6.9 to 11.3 t ha^{-1} in the second season. Crude protein content of whole plant fodder varied from 9.9 to 22.7 %. Fodder yield reduced with increasing proportion of amaranth in the mixture while protein content of total forage increased. Dry matter digestibility of sun-dried maize (SDM), sun-dried maize-amaranth (SDMA), sun-dried amaranth (SDA), ensiled maize (EM), ensiled maize-amaranth (EMA) and ensiled amaranth (EA) was 71.8, 60.7, 57.3, 73.7, 55.3 and 52.6 % respectively. Daily weight gain of WAD sheep fed SDM, SDMA, SDA, EM, EMA and EA was 82.6, 71.3, 65.3, 83.8, 52.2 and 44.1 g day^{-1} respectively.

Although intercropping improved fodder yield and land use efficiency compared to sole amaranth, it had no yield advantage over sole maize. Protein content of total forage increased when maize was intercropped with amaranth but this did not translate to improved digestibility or improved performance of sheep fed the mixed fodders. The superior yield and nutritive value of fodder maize in this study suggests that sole maize is a better option than maize-amaranth mixtures as dry season fodder for ruminants in southwest Nigeria.

Keywords: Amaranth, dry season, fodder, maize, sheep

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