

15. SEED PRODUCTION, DRY MATTER YIELD AND NUTRITIVE VALUE OF TWO *STYLOSANTES* SPECIES AS AFFECTED BY FERTILIZER APPLICATION AND TIME OF HARVEST AT MOROGORO

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A study comprising two field experiments was conducted to examine the effects of nitrogen (N) and phosphorus (P) fertilizer application and time of harvest on seed production, dry matter (DM) yield and nutritive value of *Stylisanthes hamata* and *Staylosanthes guianensis* at Morogoro. Split-plot experimental design was used in the study. In experiment I, two levels of N (0 and 30 kg/ha) and two levels of P (0 and 30 kg/ha) were arranged factorially as a main-plot treatment.. In experiment II, four levels of P(0, 30, 60, and 90 kg/ha) were applied with 30 kg N/ha as a main-plot treatment. In both experiments sub-plots were harvested at 50% flowering stage, 4th, 5th, 6th and 7th week post 50% flowering stage. The results showed that N application increased seed yield, DM yield and crude protein (CP) % of *S. hamata* by 67.3, 45.68 and 9.63 percent as compared to the control, respectively. N application also increased CP %, in vitro dry matter digestibility (IVDMD) %, in vitro organic matter digestibility (IVOMD) % and metabolizable energy (ME) content of *S. guianensis* by 4.44, 5.92, 3.64 and 3.59 percent over the control, respectively. However, the DM and seed yield of *S. guianensis* tended to decline with N application, Phosphorus fertilizer application on the other hand did not affect seed yield and DM yield of *S. hamata* . However, it increased the leaf: stem ratio, harvesting index and seed yield of *S. guianensis*. The over all quality of herbage produced declined in both species with p application in terms of digestibility and subsequently the ME content as compared to the control. Maximum return per Tanzanian shilling (Tsh) invested on N was obtained from *S. hamata* kept for both seed and fodder production (12.02 Tsh), followed by the same species kept for seed production alone (9.75 Tsh), followed by the same species kept for both seed and fodder production (5.05 Tsh). In both *S. hamata* and *S. guianensis* increasing time of harvest

increased harvesting index, seed yield and herbage DM yield. However, peak seed yield was not yet attained within the range of harvesting time considered for *S. hamata* while it was at the 6th week for *S. guineansis*. In both *Stylosanthes* species ash %, CP % and DCP content declined with increasing time of harvest. However, the acid detergent fibre (ADF) %, and acid detergent lignin (ADF) % in DM of the two species responded to increasing time of harvest differently. Both SDF and ADL % in DM increased in *S. hamata* and declined in *S. guianensis* with increasing age of the plant. This trend was reflected on the in vitro digestibility value of the feed which declined continuously in *S. hamata* and increased after the 5th week in *S. guianensis*. It was concluded that starter dose of N application enhanced seed production, DM yield and quality of the forage in *S. hamata*; where as *S. guianensis* benefited only in terms of quality improvement of the forage. Application of P was not beneficial under Morogoro condition for *S. hamata* while for *S. guianensis*, P application at the rate of 60 kg P/ha gave higher seed yield and quality forage than the rest of P level tested. Large yield differences were observed between early Vs. late harvesting time in both *S. hamata* and *S. guianensis* in terms of seed yield, DM yield and quality of herbage produced. This preliminary work, therefore, suggested that harvesting time for optimum seed production should be at the 7th and 6th week post 50% flowering for *S. hamata* and *S. guianensis*, respectively.