

## **Yield and nutritive quality of four napier (*Pennisetum purpureum* Schumach.) cultivars harvested at different ages as fresh and ensiled fodder**

### **Abstract**

Studies were conducted to evaluate the yield and nutritive quality of four Napier (*Pennisetum purpureum*) cultivars namely Common, Silver, Red and Dwarf Napier harvested at 4, 6 and 8 weeks age as fresh and ensiled fodder. Common, Silver and Red Napier were classified as tall cultivars while Dwarf Napier is a short cultivar. The harvesting ages selected were within of the range of optimum cutting age for Napier grass. Study 1 was conducted to determine the dry matter yield and leaf to stem ratio of fresh Napier cultivars at 4, 6 and 8 weeks old. The dry matter yield of Common Napier reached a peak of 6 tonnes ha<sup>-1</sup> cut<sup>-1</sup> at 6-week old. The dry matter yield of Red Napier gradually increased and peaked 6 tonnes ha<sup>-1</sup> cut<sup>-1</sup> at 8 weeks old. Silver Napier yielded a similar dry matter production as Dwarf Napier as well as the lowest yield throughout the study. The leaf to stem ratio of Napier cultivars declined significantly from 3.24 at 4 weeks to 1.94 at 6 weeks. Dwarf Napier had the highest leaf to stem ratio (3.93) among the cultivars. The nutritional composition and digestibility of fresh Napier cultivars at 4, 6 and 8 weeks were evaluated in Study 2. Dwarf Napier had the highest nutritive quality among the cultivars throughout the harvesting ages (12 to 20% CP). Overall, tall cultivars have higher NDF, ADF and ADL content than Dwarf Napier. Interestingly, the crude protein content of Red Napier (11%) remained unchanged throughout the harvesting ages. In terms of digestibility, Dwarf Napier and 6-week old Red Napier were classified as high quality feed (> 70% IVDMD and > 65% IVOMD). Study 3 was conducted to evaluate and compare the nutritional composition and digestibility of fresh and ensiled cultivars at 6 and 8 weeks harvesting age. The crude protein of Common Napier increased significantly after ensiling process from 8 to 9%. In contrast, a significant loss in crude protein content was observed in ensiled Silver Napier (9% CP) compared to the fresh forage (10% CP). A significant loss in cell wall constituent of Napier grass was observed in ensiled cultivars regardless of the harvesting ages. All cultivars have similar IVDMD, and the IVDMD declined from 68 to 60% after ensilation. Nevertheless the improvement in IVOMD from

52 to 58% in silage might derive from the bacteria population. In conclusion, Common Napier is recommended to be harvested at 6 weeks age to obtain highest dry matter yield as well as minimizing loss of nutritive value. Red Napier could be harvested at 6 and 8 weeks age since there were no change in crude protein content. Dwarf Napier had superior quality and could be harvested at 6 weeks since the crude protein was able to fulfill the requirement for growing and lactating animals. The dry matter yield of Dwarf Napier could be maximized by harvesting at 8 weeks age. Silver Napier had similar dry matter yield and no advantage in nutritive quality compared to Dwarf Napier. Nevertheless, Silver Napier is suggested to be harvested at 6 weeks since significant loss in nutritive value was observed especially crude protein at 8 weeks.