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S. Katuromunda
Makerere University, Uganda

Elly N. Sabiiti
Makerere University, Uganda

F. B. Bareeba
Makerere University, Uganda

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Integrating forage legumes in crop/livestock systems for sustainable food production in peri-urban agriculture in Uganda

S . Katuromunda¹ , E . N . Sabiiti² and F . B . Bareeba³

¹Department of Crop Science . ²Department of Crop Science , Faculty of Agriculture , Makerere University , P . O . Box 7062 , Kampala , Uganda . E-mail : elly_sabiiti@gmail.com ³Department of Animal Science , Faculty of Agriculture

Key words : dry matter yield , fat-corrected milk yield , *Pennisetum purpureum* .

Introduction *Pennisetum purpureum* constitutes the major feed resource for stall-fed dairy cattle , but has low levels of crude protein (CP) , minerals and vitamins . Supplementation with forage legumes improves *P. purpureum* intake , which in turn increases livestock productivity (Mpairwe *et al.* , 2003) . However , in peri-urban areas there is no land for legume production (Mugisa *et al.* , 1999) . Possible alternative is to incorporate them into already existing farming systems . This study was to establish the productivity of forage legumes with *P. purpureum* and their contribution to milk production in the peri-urban areas .

Materials and methods Field experiment was a randomized complete block design with four treatments , comprising intercrops of *P. purpureum* with Centro (*Centrosema pubescens*) , Green leaf desmodium (*Desmodium intortum*) , Siratro (*Macroptilium atropurpureum*) and sole *P. purpureum* as a control . For the feeding experiment , treatments comprised three diets ; namely *P. purpureum* fodder fed *ad-lib* (P) ; *P. purpureum* fed *ad-lib* + 4kg of Siratro herbage (PS) ; and *P. purpureum* fed *ad-lib* + 4kg of Siratro herbage + 2kg of maize bran (PSM) . Cows were hand-milked daily at 07 .00 hrs and at 16 .30 hrs .

Results and discussion There were no differences ($P > 0.05$) between fodder DM yields from sole *P. purpureum* and the *P. purpureum*/legume mixtures (Table 1) . Crude protein (N content x 6.25) contents in fodder from *P. purpureum*/Siratro and *P. purpureum*/Centro mixtures were higher ($P < 0.01$) than that in sole *P. purpureum* fodder . Supplementation with Siratro alone (PS) and in combination with maize bran (PSM) increased ($P < 0.05$) the fat-corrected milk yields (Table 2) .

Table 1 Effect of intercropping *Pennisetum purpureum* with forage legumes on fodder dry matter yields and nutrient composition of fodder .

Cropping system	Total fodder DMY ^b (ton ha ⁻¹)	N P Ca		
		Contents in fodder (g kg ⁻¹ DM)		
<i>Pennisetum purpureum</i> + Centro	18.33	22.5 ^b	2.3	3.6
<i>Pennisetum purpureum</i> + Desmodium	17.91	21.5 ^{ab}	2.1	3.8
<i>Pennisetum purpureum</i> + Siratro	18.83	24.4 ^b	2.0	4.0
Sole <i>Pennisetum purpureum</i>	16.79	16.1 ^a	2.1	2.9
F-test Prob .	ns	**	ns	ns

Table 2 Daily milk yield and butterfat content of crossbred lactating cows fed *ad libitum* *Pennisetum purpureum* basal diet supplemented with Siratro and maize bran .

Parameter	Treatments			Mean	SEM	F-test Prob
	P	PS	PSM			
FCM milk output (kg day ⁻¹)	5.5 ^a	7.3 ^b	7.2 ^b	6.7	0.31	*
Butter fat Content (%)	4.1	4.3	3.9	4.1	0.32	ns

Conclusion Integrating forage legumes into *Pennisetum purpureum* plots in the peri-urban areas is necessary for sustenance and productivity of peri-urban dairy farming .

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