

Effect of nitrogen fertilisation and cutting frequency on the yield and regrowth of *Panicum maximum* Jacq in West Cameroon

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Introduction Ruminant production in most tropical countries relies heavily on the availability of grazing land. However, with the high population densities in some of these regions and the emergence of out of season cropping on riparian areas, all arable lands are occupied throughout the year. The alternative left for the animal farmers, is forage cropping and appropriate management techniques. The present work was designed to evaluate the effect of nitrogen fertilisation and the cutting frequency on the yield and regrowth of *Panicum maximum* in West Cameroon.

Materials and methods The study was carried out at the Animal Experimental Farm of Dschang University from March 2006 to January 2007. Rainfall in this zone varies between 1500 and 2000 mm. The soil is classified as ferralitic. A 3×3 factorial design with 3 doses (0, 60, 80 kg/ha) of nitrogen in the form of Ammonium Sulphate at 21% N and 3 cutting frequencies (F1=30 days, F2=45 days, F3=60 days) at a height of 20 cm in 3 replicates was used. Seventy (70) tillers of *P. maximum* bearing one to two tall were planted on each plot in April 2006 with a spacing of 25 cm by 25 cm. A single dose (100 kg/ha) of simple super phosphate at 21% P was applied in all plots. The ammonium sulphate was fractioned in two parts. The first one-third was applied in equal quantity one month after planting. The remaining two-thirds were divided according to the number of cuts to be done excluding the last one. Two months after planting, the plots were zero timed at 20 cm above the soil and the harvest of regrowth started one month later. 500 g sample were taken after each cutting and oven dried at 60°C for dry matter (DM) estimate. The average height obtained from 3 measurements was used to evaluate the rhythm of regrowth. Two factors Analysis of variance was carried out on the data and significant differences among treatments were tested with Duncan's multiple range tests.

Results and discussion Independently of nitrogen fertilization cutting frequency had significant effect ($P > 0.05$) on the biomass production with the highest yield (13.77 t DM/ha) obtained at 60 days cutting frequency (Table 1). Increased DM yields with extended cutting intervals are consequences of additional tiller and leaf formation, leaf elongation and stem development. It was observed that nitrogen fertilization did not have a significant effect on the Dry Matter Yield (DMY) of *P. maximum*. This could be due to losses through leaching and volatilisation. Nitrogen fertilization at higher rates may yield lower dry matter (DM) due to nitrogen toxicity or nutrient imbalances (Maurice *et al.*, 1985).

Table 1 : Effect of nitrogen fertilization and cutting frequency on biomass production of *P. maximum*.

Cutting frequency (days)	Nitrogen fertilization (kg/ha)			Mean±SD
	0	60	80	
F1 :30	12.06a	11.08a	12.63a	11.92±0.78c
F2 :45	12.74a	13.44a	12.45a	12.88±0.51b
F3 :60	14.68a	14.08a	12.55a	13.77±1.09a
Mean±SD	13.16±1.36a	12.87±1.57a	12.55±0.09a	

a, b, c: Means with same letter in one row are not significantly different ($P > 0.05$)

Table 2 : Effect of nitrogen fertilization and cutting frequency on the RR of *P. maximum*.

Cutting frequency (days)	Nitrogen fertilization (kg/ha)		
	0	60	80
F1 :30	102.44c	109.93c	111.02c
F2 :45	121.53b	134.72b	137.94b
F3 :60	145.70a	150.96a	160.04a

a, b, c: Means with the same letters in one row are not significantly different ($P > 0.05$)

Both cutting frequency and level of nitrogen fertilization had significant effect ($P < 0.05$) on RR (Table 2). Nitrogen fertilization effect could be related to the fact that N stimulates meristematic and retards leaf senescence (Andrew and Johansen, 1978). Cutting frequency effect could be related to the fact that infrequent and light defoliation maintains balanced growth of roots and shoots of plants (Chapman and Lemaire, 1993).

Conclusion Nitrogen fertilization had no significant effect on the biomass production of *P. maximum*. Cutting frequency significantly influenced biomass production with the highest forage yield obtained from plots cut at 60 days frequency. Nitrogen fertilization significantly influenced the RR of *P. maximum*. Cutting frequency had significant effect on the RR with the highest RR obtained at 60 days cutting frequency.

References

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