



## Correlation Matrix Between Temperature, Growth And Yield Of BN Hybrid During rabi Season

Kailash Chand Verma, K B Suneetha Devi, A P K Reddy

Department of Agronomy, College of Agriculture, Rajendranagar, ANGRAU, Hyderabad-500030

### ABSTRACT

Field experiment was conducted to study the seasonal influence (mean and minimum) on growth, yield and quality characters of BN hybrid at Acharya NG Ranga Agricultural University Hyderabad. The mean and minimum temperatures of 19.6, 20.9 °C and 10.7 and 12.1 °C were reported during 1 and II cut period. Negative correlation was found significant at 0.01 level between number of leaves clump<sup>-1</sup> and mean and minimum temperature thereby causing significant reduction in green and dry fodder yield of BN hybrid. It is also established that plant height and number of tillers clump<sup>-1</sup> had significant positive correlation with green and dry fodder yield of BN hybrid.

**Key words :** Bajara napier hybrid, Correlation, Mean, Minimum temperature, Seasonal variation

Perennial grasses should be harvested at an appropriate growth stage in order to obtain higher green forage with optimum dry matter content and nutrients, particularly protein (Noor Mohammed *et al.*, 1988). The recommended cutting interval for BN hybrid is 40-45 days irrespective of season, but in winter, the growth rate of BN hybrid is very less and harvesting at 40-45 days is not profitable due to less green fodder yield. Further, it was found that April to September is the best time for forage production of BN hybrid and from October to March, growth is less due to winter dormancy (Islam and Thakuria, 2002). Influence of weather on growth and quality of BN hybrid during *rabi* season was not studied so far and cutting interval need to be modified according to season.

### MATERIAL AND METHODS

The experiment was conducted at student's farm, College of Agriculture, Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad, during *rabi* 2007-08. The soil of the experimental site was sandy loam in texture, low in available N, high in P and K content with a pH of 7.2. The experiment was laid out in split plot design and replicated thrice. The treatments comprised of five cutting intervals as main plots

viz. 5, 6, 7, 8 and 9 weeks and four intercrops as sub plots viz. cowpea-var.COFC-8, berseem-var.JB-1, Lucerne-var.Anand-2 and clusterbean-var.RG-8. BN hybrid APBN-1 was planted on 26-07-2007. The recommended dose of fertilizers ie 60: 60: 30 kg N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O ha<sup>-1</sup> was applied as basal and 30 kg N ha<sup>-1</sup> after each cut. Uniform harvesting of BN hybrid was done on 9-10-2007 and intercrops were sown. Cowpea and clusterbean as they are single cut in nature were sown on 11-10-2007 and 8-1-2008 in between rows of BN hybrid at 10 cm intra row spacing and harvested on 3-1-2008 and 18-3-2008 respectively. Berseem and lucerne due to their multicut nature were sown as solid rows on 11-10-2007 and harvested on 3-1-2008, 10-2-2008 and 18-3-2008. Recommended fertilizer dose of legume crops was added. The total rainfall received during the experimental period was 99 mm in 6 rainy days. The mean maximum temperature ranged from 27.9 to 35.1 °C and the mean minimum temperature ranged from 10.7 to 20.1 °C during experimental period. Correlation between mean temperature and minimum temperature on growth, yield and quality parameters of BN hybrid was analysed as per the procedure given by Panse and Sukhatmc, (1978).

Table 1. Correlation matrix between mean temperature &amp; minimum temperature, growth, yield and quality parameters of Bajara napier hybrid .

Plant Characters:	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
<b>I cut (oct. –dec.)</b>										
X1 Mean temperature (°C)	1.0									
X2 Minimum temperature		1.0								
X3 Plant height (cm)	-0.25	-0.15	1.0							
X4 Number of tillers clump <sup>-1</sup>	-0.12	-0.17	-0.17	1.0						
X5 Number of leaves clump <sup>-1</sup>	-0.40*	-0.40*	0.17	-0.22	1.0					
X6 Leaf stem ratio	0.26	0.27	-0.26	-0.40*	-0.10	1.0				
X7 Green fodder yield (q ha <sup>-1</sup> )	-0.14	-0.01	0.78**	0.22	0.05	-0.40*	1.0			
X8 Dry fodder yield (q ha <sup>-1</sup> )	-0.23	-0.25	0.12	0.44*	0.08	-0.07	0.30	1.0		
X9 Crude protein yield (q ha <sup>-1</sup> )	0.11	0.11	0.37	-0.13	-0.21	-0.21	0.66**	0.26	1.0	
X10 Crude fibre (%)	-0.26	-0.27	0.44*	0.11	0.22	-0.40*	0.54**	0.22	0.50*	1.0
<b>II cut (Jan.-Mar.)</b>										
X1 mean temperature (°C)	1.0									
X2 Minimum temperature	-0.21	1.0								
X3 Plant height (cm)	-0.37	-0.15	1.0							
X4 Number of tillers clump <sup>-1</sup>	-0.33	-0.05	0.09	1.0						
X5 Number of leaves clump <sup>-1</sup>	-0.21	-0.18	-0.09	0.47*	1.0					
X6 Leaf stem ratio	-0.06	-0.30	-0.50*	-0.04	0.22	-0.37	1.0			
X7 Green fodder yield (q ha <sup>-1</sup> )	-0.43*	0.01	0.32	0.59**	0.25	0.23	0.29	1.0		
X8 Dry fodder yield (q ha <sup>-1</sup> )	0.08	-0.52*	0.34	-0.17	0.17	-0.44*	0.97**	0.16	1.0	
X9 Crude protein yield (q ha <sup>-1</sup> )	-0.09	0.14	0.76**	0.06	0.19	-0.15	0.55**	0.41*	0.42*	1.0
X10 Crude fibre (%)	-0.09	-0.09	0.76**	0.06	0.19	-0.15	0.55**	0.41*	0.42*	1.0

'r' value at p = 0.05 level = 0.38

'r' value at p = 0.01 level = 0.54

## RESULTS AND DISCUSSION

Influence of seasonal variation (mean and minimum temperature) on growth, yield and quality characters of BN hybrid (Table-1) indicated that both mean and minimum temperatures had negative correlation with all growth characters of BN hybrid except leaf stem ratio and crude protein yield during first cut (October to December) period. The mean and minimum temperatures of 19.6 °C and 10.7 °C were reported during this period. Negative correlation was found significant at 0.01 level between number of leaves clump<sup>-1</sup> and mean and minimum temperature. This clearly shows that yield of perennial grasses are reduced by reducing the number of leaves clump<sup>-1</sup>. During second cut period (January to March), all

parameters of BN hybrid were negatively correlated with mean and minimum temperature except crude protein yield. Correlation between dry fodder yield of BN hybrid and the mean and minimum temperature was negatively significant at 0.01 level. The mean and minimum temperatures of 20.9 °C and 12.1 °C were reported during this period. Influence of seasonal variation on green fodder production of perennial grasses (BN hybrid and guinea grass) was studied by Islam and Thakuria (2002) who reported drastically reduction on yield during winter months (October to March) due to winter dormancy nature of perennial grasses

Correlation matrix between growth parameters and yield of BN hybrid revealed that

green fodder yield positively correlated with plant height at 0.01 and 0.05 levels of significance during first and second cut respectively. Dry fodder yield of BN hybrid was positively correlatively with number of tillers clump<sup>-1</sup> at 0.05 and 0.01 levels during first and second cuts respectively. Paroda (1975) reported that plant height and number of tillers clump<sup>-1</sup> were positively correlated with leafyness and important components of green and dry fodder yield in fodder crops.

Hence, it can be inferred that mean and minimum temperature had significant negative correlation with number of leaves clump<sup>-1</sup> at both the cuts. There by causing reduction in green fodder yield of BN hybrid. It is also concluded that green and dry fodder yield of BN hybrid was positively correlated with plant height and number of tillers clump<sup>-1</sup>.

#### LITERATURE CITED

- Islam M and Thakuria K 2002.** Seasonal variation in green fodder production of important perennial grasses and legumes intercropping system. *Journal of Agriculture Science*, 15(2): pp. 192-195.
- Noor Mohammad, Bhutt N M and Qamar I-A 1988.** Effect of nitrogen fertilization and harvesting intervals on the yield and nutritional value of Napier grass. *Pakistan Journal of Agricultural Research* 9(4): pp. 478-482.
- Paroda R S 1975.** Leafiness – An important criterion for improvement in yield and quality of forages. *Forage research* 1: pp. 145 – 149.
- Panes V G and Sukhatmc P V 1978.** Statistical methods for agricultural workers: *Indian Council of Agricultural Research*. p p. 197-202.

(Received on 08.02.2011 and revised on 16.03.2011)