

## INTERCROPPING MAIZE WITH COWPEA AND DOLICHOS

M.N. KASTURE AND A.M. MUNGIKAR

Department of Botany, Marathwada University,

Aurangabad 431003

Intercropping is popular in tropical and subtropical countries as it creates favourable microclimate, has low labour requirement, higher stability of yield and higher productivity (Osiru, 1983). A field trial to study fodder intercropping of maize with pulses was conducted during 1981-82 at the research farm of Marathwada University, Aurangabad. The soil of experimental site was sandy loam and alkaline in reaction (pH 8.2) and had 101, 10.1 and 230 kg/ha of available N, P and K. respectively. The organic carbon content of the soil was 0.45%. Maize (*Zea mays* L.) cv. GSF-2 was intercropped with cowpea [*Vigna unguiculata* (L.) Walp] cv. Pusa Barsati and dolichos (*Lablab niger* Medicus, syn. *Dolichos lablab* L.).

The crops were sown on November 12, 1981 in rows spaced 30 cm apart. The intercropping treatments consisted of maize grown with cowpea or the dolichos in the row ratios of 2:1, 1:1 and 1:2. In addition, all the three component crops were also grown as sole crops for meaningful comparisons. These nine treatments were replicated in a randomised block design. The crops were raised under irrigation with recommended fertilizer applications. Fifty four days after sowing, the crops were harvested for green fodder. Net size of plot harvested was 16.5 m<sup>2</sup>. The yield of fresh green produce of each plot was recorded and a sample was dried in an oven at 65°C for dry matter (DM) determination. Nitrogen (N) was estimated in dried samples by micro Kjeldahl method and crude protein (CP) was expressed as N x 6.25. The yields of dry matter and crude protein were calculated considering the yield of fresh fodder per plot, its dry matter and N percentage of dry matter. Land equivalent ratio (LER) was worked out by calculating ratio of the yield of individual crop in a mixture to its yield as sole crop (Mohta and De, 1980)

The percentage of dry matter in green foliage was not affected due to intercropping. In maize, the percentage of DM ranged from 12.3-13.0, while in cowpea from 14.5-15.2 and in dolichos from 19.4-20.9. The nitrogen content in DM of maize foliage, cultivated as sole crop, was 1.47% but in 1:2 crop ratio with cowpea, it increased to 1.89%. In association with dolichos, maize foliage showed higher content of nitrogen ranging from 1.83 to 1.92% (of DM). Consequently, an increase in the crude protein content was also there. The N content varied between 2.50 to 3.43% in DM of cowpea and between 3.01 to 3.19% in dolichos; there was no appreciable effect of intercropping on the N content of legume DM.

Table 1. Dry matter and crude protein of sole crops and intercrops

Crops	Inter - cropping ratio	Dry matter (kg/ha)			Crude protein (kg/ha)		
		Maize	Legume	Total	Maize	Legume	Total
<b>Sole crops :</b>							
Maize	-	4190	-	4190	385	-	385
Cowpea	-	-	1188	1188	-	242	242
Dolichos	-	-	2933	2933	-	550	550
<b>Intercrops :</b>							
Maize : cowpea	2:1	3897 (0.93)	192 (0.16)	4089 (1.09)	350 (0.91)	29 (0.12)	379 (1.03)
	1:1	3580 (0.85)	467 (0.39)	4047 (1.24)	318 (0.82)	100 (0.41)	418 (1.23)
	1:2	2551 (0.61)	639 (0.54)	3190 (1.15)	300 (0.78)	111 (0.46)	411 (1.24)
Maize : dolichos	2:1	3731 (0.89)	816 (0.28)	4547 (1.17)	427 (1.11)	163 (0.30)	590 (1.41)
	1:1	3063 (0.79)	1370 (0.47)	4676 (1.26)	375 (0.97)	258 (0.47)	633 (1.44)
	1:2	1764 (0.42)	1722 (0.59)	3486 (1.01)	211 (0.55)	340 (0.62)	551 (1.17)
CD (p = 0.05)				1537			141

Figures in parentheses are land equivalent ratios (LER).

Maize sole crop yielded 33077 kg/ha green fodder. The yields of dry matter and crude protein from various cropping systems are given in Table 1. Maize, cowpea and dolichos sole crops yielded 4190, 1188 and 2933 kg/ha dry matter, respectively. Intercropping of maize with dolichos, though increased total dry matter production, the difference was statistically non-significant. The data, however, indicated that maize yielded more dry matter as component crop with legume, in comparison to its sole crop. Dolichos yielded maximum crude protein (550 kg/ha) when cultivated as a sole crop. The yield of crude protein from maize sole crop was 385 kg/ha. Maize-dolichos intercropping systems yielded significantly more total crude protein than maize sole crop. LER values more than 1.0 in all the intercropping systems clearly indicate increased land productivity. Higher biomass production with legume-grass intercropping has been reported also by Trenbath (1974), and Singh and Trivedi (1980). In the present investigation maize-dolichos intercropping yielded more fodder than maize-cowpea. Maximum yield advantage (26% for dry matter and 44% for crude protein) was observed when maize and dolichos were cultivated in 1:1 ratio.

We are thankful to Prof. R.M. Pai for encouragements and to Dr. R.N. Joshi for suggestions.

#### REFERENCES

- Mohta, N.K. and De, R. 1980. Intercropping maize and sorghum with soybeans. *J. agric. Sci. Camb.* 95 : 117.
- Osiru, D.S.O. 1983. Intercropping : a review of possible advantages. pp. 304-320. S.K. Roy (ed.) In *Frontiers of Research in Agriculture*. Indian Statistical Institute, Calcutta.
- Singh, V. and Trivedi, C.P. 1980. Crop sequence studies for green fodder production round the year. *Indian J. Dairy Sci.* 33 : 525.
- Trenbath, B. R. 1974. Biomass productivity of mixtures. *Adv. Agron.* 26 : 177.