

A Note on the Performance of Maize + Sunflower System in the Northern Transitional Tract of Karnataka

Northern transitional tract of Karnataka provides an opportunity to raise variety of crops under mixed cropping. Maize, an important cereal in the tract, with its adoptability for wider row spacing (De *et al.*, 1978 and Mohta and De, 1980) is particularly suitable for increasing productivity over time by way of intercropping. Among, intercrops, oilseeds need emphasis due to shortage of vegetable oil in the country. Sunflower is a popular oilseed crop of rainfed regions raised under mixed cropping with number of crops without much idea about productivity of the system. An experiment, was therefore, carried out during rainy season of 1988 to find out the suitability of sunflower (Cv. KBSH 1) as a intercrop with maize (Cv. Deccan-103) on black clay loams of Agriculture College Farm, Dharwad. In all, there were 12 treatments comprising of population levels and planting patterns of sunflower, soybean (Cv. monetta) and maize apart from sole crops. The experiment was conducted in a simple RBD. Crops were sown as per after applying recommended fertilizers based on population levels of component crops. A rainfall of 731 mm was received during the year which was well distributed throughout the growing period.

Grain maize yield varied significantly due to inter-cropping. Sole maize recorded higher grain yield (48.0 q/ha). Maize yields intercropped with soybean were on par with sole maize yields in all planting patterns. The results are in agreement with Mohta and DE, (1980). On the other hand, yield decreased significantly with sunflower intercropping and more so when maize population was reduced to half the recommended level and with corresponding increase in sunflower population. Kachapur (1990) reported

similar yield reduction in grain sorghum. The reductions in yield may be attributed to inter-crop competition apart from change in population. Among various planting patterns with sunflower, yields of maize were marginally superior (42.9 q/ha) in paired row technique.

Component crops also recorded lower yields on intercropping with maize compared to their sole performance. Obviously, the reductions seem to be originated from variation in plant stand (50% of sole). In sunflower, reductions also seem to be due to intercrop competition as observed under similar sunflower stands.

Maize yield equivalent was significantly higher with soybean intercropping irrespective of planting patterns. On the other hand yield equivalents in sunflower intercropping were comparable to sole maize yields with 100 and 50 per cent population stands of component crops. Paired row planting recorded fairly higher yield (52.69 q/ha). Maize yield equivalents drastically reduced with reduction in maize stand to half the sole level. Gross returns followed similar trend as that of equivalent yield. Among sunflower treatments gross returns were higher with paired row planting technique (Rs. 10,538 per ha).

Unlike maize equivalent yield, observations on land equivalent ratio (LER) were more than one with all intercropping systems. Soybean intercropping recorded higher land use efficiency (1.52 to 1.53) compared to sunflower. In sunflower intercropping, paired row planting technique recorded higher LER (1.35) than other treatments.

From the results, it is clear that sunflower would not be as compatible as soybean with maize under rainfed conditions.

Table 1. Grain yield of maize and intercrops, maize yield equivalent, gross returns and land equivalent ratios as influenced by sunflower and soybean intercropping with maize

Treatment	Maize grain (q/ha)	Intercrop grain yield (q/ha)	Maize yield equivalent (q/ha)	Gross returns (Rs/ha)	Land equivalent ratio (LER)
1. Sole maize (Deccon-103)	48.00	—	48.00	9,600	1.00
2. Sole sunflower (KHSB1)	—	7.24	27.73	4,296	1.00
3. Sole soybean (Monetta)	—	9.24	20.78	4,158	1.00
4. Maize + Sunflower (100:50) 1:1 (45 cm rows)	38.48	3.46	48.50	9,777	1.27
5. Maize + Sunflower (100 : 50) 1:1 (60 cm roww)	40.62	3.02	49.68	9,785	1.27
6. Maize + Sunflower (100 : 50) 2 : 1 (30/90 cm paired rows)	42.90	3.26	52.69	10,538	1.35
7. Maize + Sunflower (100 : 50) 1 : 1 (45 cm rows)	42.90	3.26	52.69	10,538	1.35
8. Maize + Sunflower (50 : 100) 1 : 1 (60 cm rows)	24.06	5.23	39.82	7,813	1.23
9. Maize + Sunflower (50 : 100) 1 : 2 (90/30 paired rows)	22.58	6.03	40.67	8,134	1.31
10. Maize + Soybean (100 : 50) 1 : 1 (30 cm rows)	45.55	5.28	57.43	11,486	1.53
11. Maize + Soybean (100 : 50) 1 : 1 (45 cm roww)	46.22	5.14	57.75	11,586	1.52
12. Maize + Soybean (100 : 50) 2 : 2 (30/90 paired rows)	44.46	5.02	57.72	11,551	1.52
S.E.m. ±	1.81		1.73	233	0.07
C.D. (0.05)	5.38		5.12	1,155	0.22

Prices : Maize Rs. 200/— per q; Sunflower Rs. 600/— per q.; and Soybean Rs. 450/— per q.

Dept. of Agronomy B. M. CHITTAPUR
College of Agri. V. C. PATIL
Dharwad-580 005 V. V. ANGADI
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