Table 1. Effect of seeding methods, weed management and moisture regimes on nutrient uptake by groundnut

Treatments	Uptake (kg/ha)						Yield (kg/ha)	
	N		P		K			
	1990	1991	1990	1991	1990	1991	1990	1991
L_1 = Ridges and furrows	120	107	24	27	66	74	1720	1506
L_2 = Broad bed and furrows	116	101	24	26	65	74	1495	1439
L_3 = Check basin method	118	127	22	25	64	73	1313	1278
CD (P=0.05)	2.9	1.8	0.9	0.3	NS	NS	82	83
W_1 = Fluchloralin fb.HW.30 DAS	134	129	25	29	85	45	1858	1786
W_2 = Hand weeding on 30 DAS	97	75	22	23	97	50	1150	1096
CD (P=0.05)	3.3	3.2	0.9	0.7	2.1	2.4	91	73
I_1 = 4.78 cm through line source	113	103	23	25	63	65	1453	1434
I_2 = 4.00 cm through line source	141	129	25	29	76	88	1898	1899
I_3 = 3.18 cm through line source	77	63	22	21	53	63	1056	915
I_4 = 4.00 cm by surface flow	131	114	24	28	69	77	1631	1518
CD P=0.05)	3.9	6.9	2.5	1.6	3.5	3.6	121	155

caused considerable reduction in the uptake of N, P and K by the corp. Maximum uptake of N, P and K was noticed under 4.00 cm water through line source sprinkler irrigation system. This might be due to better efficiency of the applied fluchloralin, less competition for nutrient by weeds and extensive crop root volume. But Muthuvel and Krishnamoorthy (1981) reported that the soil moisture level did not influence the K uptake by ragi. However, Raveendran and Mayalagu (1983) reported that high moisture regime increased the p uptake by *ragi*.

From the study, it could be inferred that pre em. application of fluchloralin @ of 1 kg/ha fb. HW 30 DAS under ridges and furrows method of seeding and applying 4.00 cm water through line soruce sprinkler provides better environment for groundnut crop for higher uptake and better yield.

REFERENCES

KULANDAIVELU, R. and MORACHAN, Y.B. (1981). Effect of different weed free regimes on weed growth, growth and yield of bunch groundnut. **Madras agric. J., 86**: 241-245.

MUTHUVEL, P. and KRISHNAMOORTHY, K.K (1981) Influence of soil moisture regimes and N levels on the content and uptake of K by ragi. **Madras Agric.J., 68**: 274-280.

RAVENNDRAN, T. and MAYALAGU, K. (1983). Influence of different irrigation regimes on the uptake of phosphorus by finger miller and its distribution in soil. **Madras agric. J., 70**: 732-735.

(Received : August 1995 Revised : September 1995).

Madras Agric. J., 83(10): 647-650 October 1996
https://doi.org/10.29321/MAJ.10.A01076

EFFECT OF LAND MANAGEMENT, IRRIGATION REGIMES AND ORGANIC AMENDMENTS ON GROWTH, YIELD ATTRIBUTES AND YIELD OF IRRIGATED SOYBEAN

P.JAYAPAUL, B.UTHAYAKUMAR AND A.PALCHAMY

Agricultural College and Research Institute
Tamil Nadu Agricultural University
Madurai 625 104

ABSTRACT

Field experiments were carried out to study the influence of land management methods, irrigation regimes and moisture conservation amendments on growth, yield attributes and seed yield of irrigated soybean (CO 1) during summer (1992-93) and *kharif* (1993-94) at Agricultural College and Research Institute, Madurai, Tamil Nadu. There was a progressive in number of pods per plant and seed yield due to BBF, irrigation at 66 mm of CPE and coir pith application at 10 t/ha. By using this method, the highest economic returns in terms of net returns and B-C ratios were obtained during both seasons.

KEY WORDS: Soybean, yield, Land Management, Irrigation Regimes, Organic

ble 1. Effect of land management, irrigation regimes and organic amendements on growth, yield attributes and yield of irrigated soyabean

	Number of pods per plant		Number of seeds per pod		Test weight (g)		Seed yield (kg/ha)		Net return (Rs/ha)		B-C ratio	
	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*	Summer	*Kharif*
d management system												
ad bed and furrow (BBF)	58.71	51.25	2.64	2.65	10.60	10.58	1350	1284	6672	6460	1.58	1.66
ges and furrow	55.17	47.33	2.63	2.64	10.58	10.56	1259	1196	5879	5698	1.38	1.45
:ck basin	50.54	43.77	2.62	2.64	10.56	10.53	1169	1107	5321	5141	1.30	1.36
(P=0.05)	2.21	1.80	NS	NS	NS	NS	-	-	-	-		
ation regimes												
ation at 66 mm of CPE	56.11	49.04	2.63	2.65	10.59	10.56	1290	1226	6162	5964	1.45	1.53
ation at 83 mm of CPE	53.19	45.85	2.62	2.63	10.56	10.55	1225	1165	5753	5568	4.39	1.46
(P=0.05)	1.80	1.47	NS	NS	NS	NS	36	36	-	-	-	-
sture conservation amendments												
trol	47.35	40.57	2.62	2.63	10.53	10.53	1092	1035	4852	4707	1.22	1.30
arcane trash (5 t/ha)	51.57	44.67	2.63	2.63	10.56	10.54	1186	1127	5140	4950	1.51	1.20
sumud (5 t/ha)	57.32	50.05	2.63	2.65	10.59	1319	1256	6460	6275	1.55	1.63	
pith (10 t/ha)	62.38	54.51	2.63	2.66	10.62	10.59	1434	1364	7378	7132	1.76	1.85
P=0.05)	2.80	2.60	NS	NS	NS	NS	52	51	-	-	-	

Not significant

Table 1. Initial soil charactistics

Available nutrients	Summer 1992-93	*Kharif* 1993-94
N (kg/ha)	296.8	316.4
P_2O_5 (kg/ha)	16.7	15.9
K_2O (kg/ha)	380.0	390.0
EC (dsm-1)	0.39	0.40
pH	7.5	7.4

Land management systems plays a major role in maximising the infiltration, minimising soil erosion and improving water use efficiency. The growth of irrigated soybean is highly influenced by moisture requirement at specific critical growth stages. Efficient utilisation of water by the crop decides the growth and yield. Moisture conservation amendments are essential in conserving soil moisture, besides improving the physico-chemical properties of soil. In view of this, the present experiments were planned to study the effect of land management system, irrigation regimes and organic amendments on growth, yield attributes and seed yield of irrigated soybean.

MATERIALS AND METHODS

Field experiments were conduced at the Agricultural College and Research Institute, Madurai during summer (1992-93) and *kharif* (1993-94) in split plot design with three replications. Three land management system of broad bed and furrow (BBF), ridges and furrow, and check basin and two irrigation regimes (irrigation at 66 and 83 mm of cumulative pan evaporation (CPE)) together assigned to main plots and four moisture conservation amendments (sugarcane trash at 5 t/ha, pressmud at 5 t/ha and coirpith at 10 t/ha) were allotted to the sub-plots. The soil of the experimental field was Mudukkur series, a member of fine loamy, kaolinitic, hyperthermic family of Udic haplustalfs. The chemical analysis of the initial soil is as follows (Table 1).

The crop (CV. CO 1) was fertilized with recommended dose of N, P_2O_5 and K_2O at 20, 80 and 40 kg/ha, respectively, as basal. Yield parameters and yield were recorded and economics (net returns and benefit-cost ratio) was worked with the prevailing market rates. Both the crops were raised with the recommended package of practices.

RESULTS AND DISCUSSION

Different land management systems, irrigation regimes and organic amendments brought about significant variations on yield attributes and seed yield. BBF system scheduling irrigation at 66 mm of CPE and coir pith application at 10 t/ha enhanced the number of pods per plant and it ultimately reflected on higher seed yield over rest of the treatments (Table 1). The number of seeds per pod and test weight were not affected by land management system, irrigation regimes and moisture conservation amendments and this might be attributed to the fact that these parameters are least influenced by agronomic management as reported by Gopalasundaram (1976). The well aerated and friable condition of the soil might be the primary reason for a commendable increase in number of pods per plant and seed yield. Better conservation of soil moisture (Jagatap *et al.*, 1986) and efficient utilisation of stored soil moisture (Sankara Reddy *et al.*, 1991) in BBF favourably influenced the pod number per plant as well as seed yield. Scheduling irrigation at 66 mm of CPE resulted in higher number of pods probably due to better accumulation and translocation of assimilate due to prolonged seed filling period. Similar observations were also reported by Thompson (1984). The increased number of pods per plant and seed yield obtained due to coir pith application at 10 t/ha might be attributed to improved soil physical condition which might have facilitated vigorous crop growth through higher availability of soil moisture. Higher water holding ability of the soil in combination with improved soil moisture status ultimately resulted in better seed development in soybean and coir pith application at 10 t/ha recorded the higher net return and benefit-cost ratio.

Adopting land configuration of BBF and providing irrigation at 66 mm of CPE and application of coir pith amendment at 10 t/ha resulted in higher seed yield (1325 kg/ha), net return (Rs. 6561/ha) and benefit-cost ratio (1.62).

REFERENCES

GOPALASUNDARAM, P. (1976). Studies on The Mixed Cropping of Groundnut and Sunflower in Different Proportions and the Split Application of Nitrogen Under Irrigated Cotton. M.Sc(Ag) Thesis, Tamil Nadu

JAGATAP, S.M., BOSALE, A.N., SHINDE, P.B. and KADAM, K.S (1986). Effect of different land treatment and cropping systems on the soil and water conservation and the biomass production in different micro watersheds. **Abstr. No. 2242 (Soil technology). 51st Annual Convention. Indian Society of Soil Science held at Tamil Nadu 23-25 September 1986. Agric. Univ., Coimbatore.**

SANKARA REDDY, K., SELVAM, V SOUNDARARAJAN, M.S. and SRIDHAR, V. (19 Effect of land treatments on productivity of rainfed span groundnut. **J. Res. APAU 19:** 1-4.

THOMPSON, J.A. (1984). Irrigation management of soybean a semi arid environment. **I. Inst. Agric. Sci. 52:** 174-17

(Received : August 1995 Revised : September 19

Madras Agric J., 83(10): 650-652 October 1996

ORGANIC CARBON AND TOTAL NUTRIENT CONTENTS OF INCEPTISOL UNDER LONG-TERM FERTILISATION

S. SHEEBA AND S. CHELLAMUTHU

Department of Soil Science and Agricultural Chemistry
Agricultural College and Research Institute
Tamil Nadu Agricultural University
Coimbatore 641 003

ABSTRACT

Beneficial role of FYM in increasing the organic carbon content and total nutrients of the soil was evidenced when applied with inorganics (NPK). Application of NP fertilisers increased the nutrient status when compared to application of N alone. Regarding depth all the nutrients got decreased as the depth increased.

KEY WORDS : Long Term Effect, Organic Carbon, Total Nutrients, Inceptisol

High cropping intensity involving high yielding varieties accelerated the removal of plant nutrients and this added dimensions to the dynamics of soil ferility. Continuous application of fertilisers for a long term may result in the build up of soil nutrients, a part of which may be used by the crops grown in subsequent years. Such changes have been studied in a long term experiment carried out from 1972 and the resutls are presented here.

MATERIALS AND METHODS

A long term field experiment was started in the year 1972 at the Tamil Nadu Agricultural University with maize - cowpea - ragi rotation. The soil of experimental site represents clay loam. It was medium in organic C and P, low in N and high in available K.

The experiment was conducted during 1994 in a randomised block design, replicated four times with a plot size of 10 $m.^2$ The treatments were (1) 50% NPK (2) 100% NPK (3) 150% NPK (4) 100% NPK + hand weeding (5) 100% NPK + $ZnSO_4$ (6) 100% NP (7) 100% N (8) 100% NPK + FYM (9) 100% NPK (-S) (10) control. The fertiliser doses were based on initial soil test values. The sources of N, P_2O_5 and K_2O were urea, single super phosphate and muriate of potash for all the treatments except treatment 9 where it was supplie through sulphur free source of di-ammoniu phosphate and FYM added at the rate of 10 t ha. Recommended herbicide was applied to control th weeds in all the treatments except treatmen number 4.

Soil samples were collected at three depth *viz.*, 0-15, 15- 30 and 30-45 cm. The contents of organic carbon and total N (Piper, 1966), total P (Pemberton, 1945) and totalK (Jackson, 1973) were determined following standard methods.

RESULTS AND DISCUSSION

Organic carbon

There was a build up in soil organic C due to continuous application of manures and fertilisers. Among the treatments, FYM application conjointly with 100 per cent NPK registered the highest organic C content of soil (Table 1). The influence of FYM on the organic C status is universal and its application along with NPK might have influenced favourably the root growth and bio-mass yield thus consequently enhancing the organic C content in the soil. Similar observations have earlier been made by Mathan *et al.* (1979). The comparison made between 100 per cent N alone and 100 per