

Evaluation of Production Technologies under Sriram Sagar Project Command

Key words : Cost of cultivation, IPM, Production technology.

Application of balanced fertilizers is the key for getting higher production. Farmers are applying higher doses of fertilizers through complex forms which are causing imbalance in micronutrients showing deficiency symptoms. Similarly, higher proportion of nitrogenous fertilizers makes the plant succulent for higher pest incidence. Indiscriminate pesticide sprayings adopted in commercial crops like cotton and chillies, could not able to control the targeted pests, but increased the cost on plant protection. Hence, production technology comprising application of recommended quantity of fertilizers along with IPM technology and other management practices were demonstrated in increasing yield of different crops.

The on farm trials on production technologies in maize, rice, cotton and chillies were under taken under Sriram Sagar Project Command area in Warangal district, Andhra Pradesh under three reaches-upper, middle and lower reaches of selected distributory (DBM 26). In maize 28, in rice 39, in cotton 107, in chillies 46 demonstrations were conducted on sandy loam and clay loam type of soils. The soils were low in N, high in P and medium in K status. The soil reaction was slightly alkaline with organic carbon content of 0.2 to 4.0%. The production technologies under different crops include-application of recommended fertilizer, IPM practices and other management practices.

In maize, cultivar 'Pro-agro-4046'/poioneer 8' was sown in June second fortnight, N, P₂O₅ and K₂O @ 120, 60 and 40 Kg ha⁻¹ + Atrazine @ 1.0 kg a.i ha⁻¹ as Pre-emergence+ Hand Weeding (HW) at 30 DAS, were given and the recommended spacing of 60 cm x 20 cm was adopted as demonstration practice, whereas, application N, P₂O₅ and K₂O @ 155-175, 70-80 and 10-20 kg ha⁻¹ through complex form without chemical weed control (2 HW on 25 and 40 DAS) and closer spacing of 45 cm x 20 cm was adopted in maize as the farmers' practice.

In rice, varieties 'Polasa Prabha' / 'Samba Mahsuri' Nurseries during second fortnight of July and transplanted with 40-45 days aged seedlings. The green manuring crop was sown with onset of monsoon during second fortnight of June. The crop was raised with rain water and after 40 DAS the

biomass was incorporated. Application of N, P₂O₅ and K₂O @ 80, 60, 40 kg ha⁻¹ + green manuring with sesbania was adopted as demonstration practice. N, P₂O₅ and K₂O @ 140-150, 65-75, 10-20 kg ha⁻¹ through complex form were applied without green manuring as farmers' practice.

In cotton, hybrids- Brahma /Bunny/ Sigma were sown during second fortnight of June/first fortnight of July. N, P₂O₅ and K₂O @ 150, 60 and 40 Kg ha⁻¹ along with IPM practices - stem application of monocrotophos (1:10), growing of trap crops (castor and marygold), erection of bird perches, monitoring adult insects through pheromone traps and spraying neem kernel extract and need based pesticide application was adopted in demonstration plots. N, P₂O₅ and K₂O @ 180-220, 75-90 and 10-20 Kg ha⁻¹ through complex form were applied without IPM practices and indiscriminate pesticide spraying was followed as farmers' practice.

In chilli crop, varieties (Wonder hot / Red Sun / LCA 306), were sown during first fortnight of July and transplanted during second fortnight of August. N, P₂O₅ and K₂O @ 120, 60 and 80 Kg ha⁻¹ along with IPM practices like growing trap crops (marygold), bird perches, monitoring adults through pheromone traps, neem kernel extract with need based pesticide spraying, micronutrient spraying of Zn (0.5%), Fe (0.5%), Mg (0.5%), B-0 (1%) twice during December / January months was adopted in demonstration plots. N, P₂O₅ and K₂O @ 300-340, 70-85 and 20-30 Kg ha⁻¹ through complex form were applied without IPM practices and indiscriminate spraying of pesticides was followed as farmers' practice.

The data on economic yield, cost of cultivation and net returns, were recorded for all the crops. The yield data was analysed with paired 't' test.

a)Maize

In maize, application of recommended quantity of fertilizers, i.e., N, P₂O₅ and K₂O @ 120, 60 and 40 Kg ha⁻¹ + chemical weed control with atrazine 1.0 kg ha⁻¹ as pre-emergence + recommended spacing of 60 cm x 20 cm recorded significantly higher yield (4.63, 5.59 and 5.05 t ha⁻¹)

Table 1. Mean yield, net returns in maize as influenced by different production practices under three reaches (mean of 28 demonstrations) 1999-2004

Reach	Yield (t ha ⁻¹)		% increase over FP	Net returns (t ha ⁻¹)		Additional income over FP (Rs ha ⁻¹)
	DP	EP		DP	EP	
I (Upper)	4.63* (T cal = 3.18) (T Tab = 2.4)	4.20	9.3	11788* (T cal = 3.18) (T Tab = 2.34)	8895	2893
II (Middle)	5.59* (T cal = 5.93) (T Tab = 2.20)	5.21	7.3	16288* (T cal = 6.07) (T Tab = 2.20)	10875	2913
III (Lower)	5.05* (T cal = 5.50) (T Tab = 2.30)	4.75	9.5	11925* (T cal = 5.50) (T Tab = 2.30)	9830	2095

Table 2. Mean yield, net returns in rice as influenced by different production practices under three reaches (mean of 39 demonstrations) 1999-2004

Reach	Yield (t ha ⁻¹)		% increase over FP	Net returns (t ha ⁻¹)		Additional income over FP (Rs ha ⁻¹)
	DP	EP		DP	EP	
I (Upper)	6.38* (T cal = 6.02) (T Tab = 2.09)	5.98	6.4	24904* (T cal = 7.13) (T Tab = 2.09)	21611	3294
II (Middle)	6.12 NS (T cal = 1.09) (T Tab = 2.16)	570	7.3	24780* (T cal = 5.87) (T Tab = 2.16)	19988	4292
III (Lower)	5.76* (T cal = 9.49) (T Tab = 2.09)	5.43	6.0	24780* (T cal = 6.82) (T Tab = 2.09)	18500	3008

Table 3. Mean kapas yield, net returns in cotton as influenced by different production practices under three reaches (mean of 107 demonstrations) 1999-2004

Reach	Yield (t ha ⁻¹)		% increase over FP	Net returns (t ha ⁻¹)		Additional income over FP (Rs ha ⁻¹)
	DP	EP		DP	EP	
I (Upper)	2.81* (T cal = 6.31) (T Tab = 2.03)	2.47	9.2	40442* (T cal = 13.92) (T Tab = 2.03)	24696	7418
II (Middle)	2.61* (T cal = 7.3) (T Tab = 2.02)	2.37	8.3	39876* (T cal = 9.09) (T Tab = 2.02)	29023	7521
III (Lower)	2.54* (T cal = 8.88) (T Tab = 2.04)	2.27	11.0	34591* (T cal = 11.64) (T Tab = 2.04)	24677	9914

Table 4. Mean pod yield, net returns in chilli as influenced by different production practices under three reaches (mean of 46 demonstrations) 1999-2004

Reach	Yield (t ha ⁻¹)		% increase over FP	Net returns (t ha ⁻¹)		Additional income over FP (Rs ha ⁻¹)
	DP	EP		DP	EP	
I (Upper)	2.68* (T cal = 5.03) (T Tab =3.18)	2.34	14.5	38502* (T cal = 3.18) (T Tab =1.30)	21487	17015
II (Middle)	3.09* (T cal =2.61) (T Tab = 3.18)	2.79	10.8	44872* (T cal =8.44) (T Tab = 3.18)	34140	10732
III (Lower)	2.88* (T cal = 4.29) (T Tab = 3.18)	2.54	13.4	42626* (T cal = 3.74) (T Tab = 3.18)	32449	10177

and net returns (Rs. 11788, 16288, 11925 ha⁻¹) at three reaches over farmers' practice (Table -1). Higher yield and net returns at second reach might be due to optimum availability of critical input like irrigation water under canal irrigation. The application of recommended fertilizer with recommended population and chemical weed control has produced balanced nutrition for plant growth and increased yields. Higher quantity of fertilizers than the recommended level was not useful and increased the cost of cultivation without any additional income. By adopting recommended production technology, an additional income of Rs.2893, 2913, 2095 per hectare was realised at three reaches over farmers' practice.

b) Rice

In rice, application of recommended quantity of fertilizer N, P₂O₅ and K₂O @ 80, 60 and 40 Kg ha⁻¹ and green manuring with Sesbania @ 5 t ha⁻¹) recorded significantly higher yield (6.38 t ha⁻¹ and 5.76 t ha⁻¹ at reaches I & III respectively). These results confirm the finding of Mahapatra and Sharma (1995). Similarly, net returns were also significantly higher (Rs. 24904, 24780, 24780 per hectare at 3 reaches respectively). This shows that *insitu* cultivation of green manuring with sesbania and application of N, P₂O₅ and K₂O @ 80, 60 and 40 kg ha⁻¹ increased yields over that of the recommended application of N, P₂O₅ and K₂O @ 100, 60 and 40 Kg ha⁻¹ with out green manuring. In the demonstrations there was application of N, P₂O₅ and K₂O @ 80, 60 and 40 Kg ha⁻¹. There was saving of N @ 20 kg ha⁻¹ by using green manuring. Similar N saving was reported by Thakur *et al* (1995).

c) Cotton

In cotton, application of recommended quantity of fertilizers N, P₂O₅ and K₂O @ 150, 60

and 40 Kg ha⁻¹ + IPM practices recorded significantly higher kapas yield (2.81, 2.61 and 2.54 t ha⁻¹ at three reaches) with net returns (Rs. 40442, 39876, 34591 ha⁻¹ at I, II and III reaches respectively) over farmers practice. Higher yield in the demonstration practice might be due to application of balanced nutrition and adoption of IPM practices. The higher percent increase in yield at reach I and II was due to clayey soil, which is suitable for cotton. Similar higher yield was also reported by Nalayini *et al* (2001). The demonstration practice has reduced cost on inputs with higher additional income (Rs. 7418 to 9914 ha⁻¹ at I, II and III reaches respectively) than that of farmers' practice.

d) Chilli

In chilli, application of recommended quantity of fertilizer of N, P₂O₅ and K₂O @ 200, 60 and 80 Kg ha⁻¹ + IPM practices and micronutrient spraying produced higher pod yield (2.68, 309 and 2.88 t ha⁻¹ at I, II and III reach respectively) and net returns (Rs. 38502, 44872 and 42626 ha⁻¹ at I, II and III reach respectively) than that of farmers practice. Higher quantity of N fertilizer makes the plant succulent for the attack of pest and diseases. Shrivastava (1996) also recorded higher yield with Nitrogen upto 250 kg ha⁻¹. Adoption of recommended practice has reduced cost on inputs with additional income. (Rs. 10177 to 17015 ha⁻¹ at 3 reaches) than farmers practice.

These demonstrations have shown that adoption of production technology comprising application of recommended quantity of fertilizers along with other management practices with IPM produced higher yield, net returns and additional income in maize, rice, cotton and chill crops.

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