

Response of irrigated cotton (JLH-168) to different levels and sources of fertilizers

S.S. PINJARI^{1*}, M.S. TALATHI², N.J. RANSHUR³, T.S. BHONDAVE⁴ AND J.S. SURYAWANSHI⁵
Department of Agronomy, Mahatma Phule Krishi Vidyapeeth, Rahuri, AHMEDNAGAR (MS) INDIA

ABSTRACT

Present investigation was carried out at Pulses Research Unit, Dr.PDKV, Akola (M.S.) during *kharif* and *rabi* season in wilt sick plot, in which fungi population was observed more in rhizosphere of sunflower, soybean, and groundnut as compared with sorghum, mung and urid. There was a gradual increase in the propagules of *Fusarium oxysporum* f.sp. *ciceri* from sowing to harvesting of chickpea. In correlation study the inoculum range of 10.11 to 14.00 per cent was recorded and there was positive but non-significant correlation between the inoculum available and the wilt incidence in chickpea.

Key words : Cotton, Fertilizer levels, Fertilizer sources, Growth, Yield attributes

INTRODUCTION

India is one of the major cotton growing countries of the world. The most vexed problem concerning cotton, as in case of many of our agricultural crop is low levels of yield per hectare. Some of the major reasons for low yield of cotton are that the maximum cotton cultivation is under rainfed condition, poor management practices, fertilizer application and plant protection practices etc. In order to increase the cotton production the farmer should adopt the above practices critically with improved technology including use of fertilizers and also the use of balanced fertilizer *i.e.* complex fertilizers which play important role in higher crop production.

MATERIALS AND METHODS

A field experiment was conducted on different fertilizer levels and sources during *kharif* season at post graduate farm, Mahatma Phule Krishi Vidyapeeth, Rahuri. Soil was medium black clay in texture and alkaline in reaction, and was low in available nitrogen, medium in available phosphorus and high in available potassium with a pH of 8.30. Cotton was sown with the spacing of 90 x 60 cm² with different levels and sources of fertilizer. The experiment was laid out in split plot design with three replications and fertilizer levels (NPK kg ha⁻¹) as main plot treatments with five levels : F₁- 120:60:60 ; F₂- 100:50:50 ; F₃- 80:40:40 ; F₄- (60 + 20): 40: 40 ; F₅- 60:30:30 and fertilizer sources as sub plot treatments with five levels : S₁- straight fertilizer; S₂- 19:19:0 (RCF) ; S₃- 27:9:0 (RCF) ; S₄- 20:20:0 (Zuari); S₅- 23:23:0 (Deepak).

Cotton (cv. JLH-168) was sown in first week of May. All the recommended cultural practices were followed. Picking of cotton was started from second week of September to last week of October. Seed cotton yield

and stalk yield from net plot was recorded.

RESULTS AND DISCUSSION

Analysis of variance carried out for growth parameters and yield contributing attributes are presented in Table 1 and 2.

Effect of fertilizer levels :

The growth of cotton studied in terms of mean plant height, the number of monopodial and sympodial branches per plant during all the phases of observations were higher due to application of 120:60:60 Kg N, P₂O₅ and K₂O ha⁻¹ dose of fertilizer than reduced levels of fertilizer (Satao *et al.*, 1984). The magnitude of expression of yield attributes like, number of developed bolls per plant and yield of seed cotton increased significantly with every successive increase in the level of fertilizer up to 120:60:60 Kg N, P₂O₅ and K₂O ha⁻¹. Results are similar to earlier reported by Tomar and Dhyani (1995) and Patel *et al.* (1983). The fertilizer level F₂ (100:50:50) was at par with F₃ (80:40:40) and F₃ was at par with F₄ (60 +20: 40:40) in respect of number of bolls per plant and seed cotton yield (Table 1 and 2). Increased value of yield contributing characters with NPK application at higher levels resulted in the production of highest seed cotton yield and also the stalk yield with application of 120:60:60 Kg N, P₂O₅ and K₂O ha⁻¹. The mean seed cotton yield and stalk yield due to 120:60:60 Kg N, P₂O₅ and K₂O ha⁻¹ fertilizer level were 16.69 and 54.19 q ha⁻¹, respectively and which were significantly superior to the reduced levels tried.

Effect of fertilizer sources :

The variation in the mean values of growth attributes like periodical plant height, number of sympodial branches

Table 1 : Growth and yield attributes of cotton as influenced by different levels and sources of fertilizers

Treatments	Plant height (cm)	Number of branches		Number of bolls per plant (DAS)			
		Monopodial	Sympodial	90	120	150	180
Main plot treatments (fertilizer levels)							
F ₁ (120:60:60)	97.31	2.57	33.27	16.29	26.67	23.37	12.81
F ₂ (100:50:50)	95.35	2.41	30.24	15.10	25.79	22.31	11.43
F ₃ (80:40:40)	94.13	2.32	29.48	13.31	23.45	18.47	8.16
F ₄ (60+20:40:40)	92.81	2.27	24.81	12.32	22.51	18.10	7.69
F ₅ (60:30:30)	81.17	1.92	24.10	11.80	21.29	16.16	5.65
S.E. ±	3.32	0.07	1.56	0.82	0.86	0.71	0.70
C.D. (P=0.05)	NS	0.23	5.10	2.68	2.79	2.31	2.28
Sub-plot treatments (fertilizer sources)							
S ₁ (Straight ferti.)	94.03	2.20	28.77	14.00	24.45	19.57	9.22
S ₂ (19:19:0)	89.47	2.17	26.16	13.10	22.58	18.92	8.45
S ₃ (27:9:0)	93.63	2.30	28.30	14.39	24.74	20.61	9.94
S ₄ (20:20:0)	93.12	2.69	30.38	13.73	23.93	18.85	9.10
S ₅ (23:23:0)	90.53	2.12	28.27	13.59	23.81	19.45	9.10
S.E. ±	1.75	0.11	1.42	0.70	0.81	0.75	0.63
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS
C. Interaction (A x B)							
S.E. ±	3.91	0.25	3.17	1.56	1.81	1.68	1.40
C.D. (P=0.05)	NS	NS	NS	NS	NS	NS	NS

NS-Non significant

Table 2 : Seed cotton yield and stalk yield of cotton as influenced by different levels and sources of fertilizers

Treatments	Seed cotton yield (q ha ⁻¹)	Stalk yield (q ha ⁻¹)
Main plot treatments (fertilizer levels)		
F ₁ (120:60:60)	16.69	54.19
F ₂ (100:50:50)	15.88	52.69
F ₃ (80:40:40)	15.13	48.96
F ₄ (60+20:40:40)	14.00	47.45
F ₅ (60:30:30)	13.20	44.75
S.E. ±	0.04	0.02
C.D. (P=0.05)	0.14	0.31
Sub-plot treatments (fertilizer sources)		
S ₁ (Straight fertilizer)	15.27	51.12
S ₂ (19:19:0)	14.58	48.82
S ₃ (27:9:0)	15.19	48.99
S ₄ (20:20:0)	15.56	49.85
S ₅ (23:23:0)	14.29	49.16
S.E. ±	0.05	0.13
C.D. (P=0.05)	NS	NS
C. Interaction (A x B)		
S.E. ±	0.11	0.31
C.D. (P=0.05)	NS	NS

NS-Non significant

per plant at various growth phases and also yield contributory characters like number of developed bolls per plant, seed cotton yield and stalk yield were not influenced significantly due to various sources of fertilizers tried. Similar results were also reported by Pol *et al.*

(1991) and Wankhede *et al.* (1994).

Effect of interactions :

Interaction effects between levels and sources of fertilizers in respect of any of the variable under study were not significant indicating the effect of individual factor on the growth and yield contributing characters and yield than in combination.

REFERENCES

- Patel, M.S., Sanandia, C.J., Mehta, N.P., Patel, M.N. and Patel, P.G. (1983). production potential of medium staple rainfed cotton under different levels of fertility and plant density. *J. ISCI*, **8** (2) : 124-126.
- Pol, P.S., Nikam, B.T. and Shinde, S.S. (1991). Yield, quality parameters and nutrient removal of wheat as influenced by levels and sources of fertilizers. *J. Maharashtra Agric. Univ.*, **16** (2) : 273-274.
- Satao, R.N., Khedkar, P.K. and Patil, M.B. (1984). Studies on effect of levels and time of nitrogen application on growth parameters in cotton varieties SRT-1 and AC-738. *PKV Res. J.*, **8** (1) : 25-28.
- Tomar, S.K. and Dhyani, B.P. (1995). Response of desi cotton (*Gossipium arborium*) to nitrogen, phosphorus and potassium fertilization. *Indian J. Agron.*, **40** (1) : 151-153
- Wankhede S.T., Deshpande, R.M. and Kene, H.K. (1994). Effect of different forms of fertilizers on yield of cotton. *PKV Res. J.*, **18** (1) : 33-34.

Received : March, 2009; Accepted : May, 2009