Progressive Research – An International Journal
Vol. 7 (Special Issue) : 511-513 (2012), ISSN : 0973-6417

Society for Scientific Development in Agriculture and Technology, Meerut (U.P.) INDIA

EFFECT OF HYBRID AND NON-HYBRID OKRA (*ABELMOSCHUS ESCULENTUS* (L.) MOENCH) TO FERTILIZER LEVELS ON YIELD, ECONOMICS AND SOIL FERTILITY

Umakant Singh, Ashwini Choudhary*, Diwakar Paswan and R.R. Singh
Bihar Agricultural University, Sabour, Bhagalpur, Bihar 813 210
***Corresponding author** (Ashwini Choudhary) **Email :** ashwini_doll85@yahoo.co.in*

ABSTRACT

A field experiment was carried out during rainy season of 2007 at B.A.C., Sabour to observe the response of hybrid and non-hybrid okra to various levels of fertilizers in RBD replicated four times. At lower levels of fertilizers (60:40:20 and 90: 60:40 N, P_2O_5, K_2O kg ha^{-1}), the hybrid (Mahyco-12) and non-hybrid (Parbhani Kranti) were equally goodwith regard to fruit yield. But at higher fertilizer doses (120:80:60 and 150:100:80 N, P_2O_5, K_2O kg ha^{-1}) the hybrid convincingly out-yielded the non-hybrid. In respect of net returns and B:C ratio the non-hybrid performed better than the hybrid Mahyco-12 at the lower fertilizer doses, but at the higher doses the hybrid Mahyco-12 surpassed Parbhani Kranti the non-hybrid, both in terms of net returns and B:C ratio. The varieties did not differ significantly in their effect on residual fertility status but the plots receiving higher doses exhibited marginally higher nutrient contents in the soil after harvest. The hybrid Mahyco-12 showed better resistance to yellow vein mosaic virus (YVMV) than the non-hybrid and the incidence was observed to increase with increasing doses of fertilizers.

Key words : *Hybrid and non-hybrid okra, fertilizer levels, yield, economics, soil fertility and residual effect.*

Hybrid vigour prevailing in F_1 and F_2 generations of hybridization has been utilized favourably in most of the crops leading to revolutionary waves in production, but its most profound thrust has been felt in vegetable crops. Today's entire vegetable seed market is flooded with hybrids. A craze is there amongst the vegetable growers to opt for hybrids instead of established varieties. However, it warrants a careful approach in discarding a variety and going in favour of a hybrid. While selecting hybrids their production potential is the primary consideration, but it is equally important to assess economics of production, reaction to important diseases and pest and impact of the fertility status of the soil in terms of major nutrients. Opting for hybrids blindly may put vegetable production in wilderness causing immense harm to vegetable production itself in times ahead.

MATERIALS AND METHODS

A field experiment was conducted at Bihar Agricultural College, Sabour, farm during rainy season of 2007. The soil of the experimental plot analysed before experimentation exhibited medium fertility as envisaged through available nitrogen (295 kg ha^{-1}), available P_2O_5 (36 kg ha^{-1}) and available K_2O (215 kg ha^{-1}). The soil was medium textured falling in the class of sandy loam and having soil reaction in the neutral range (pH 7.3). The experiment was laid down in randomized block design (Factorial) wherein a hybrid (Mahyco-12) and a non-hybrid (Parbhani Kranti) were tested at four levels of fertilizers (F_1- 60:40:20, F_2- 90:60:40, F_3- 120:80:60 and F_4- 150:100:80 N, P_2O_5, K_2O kg ha^{-1}) in four replications sowing of seed was done on 5th July, 2007.

RESULTS AND DISCUSSION

Fruit yield : Under the conditions of the plots supplicated with the lower doses of fertilizers i.e., F_1(60:40:20 N, P_2O_5, K_2O kg ha^{-1}) and F_2 (90:60:40 N, P_2O_5, K_2O kg ha^{-1}) the hybrid Mahyco-12 and the non-hybrid Parbhani Kranti were statistically compared in respect of fruit yield (Table-1). However, when the dose of fertilizer was raised beyond these levels to F_3 (120:80:60 N, P_2O_5, K_2O kg ha^{-1}) and F_4 (150:100:80 N, P_2O_5, K_2O kg ha^{-1}) the hybrid Mahyco-12 significantly out-yielded the non-hybrid Parbhani Kranti with respect to fruit yield. At the same time it was also observed that while the fruit yield of Mahyco-12 went on increasing significantly with successive increments in the dose of fertilizers up to the highest dose under test i.e., F_4 (150:100:80 N, P_2O_5, K_2O kg ha^{-1}), whereas, in the case of non-hybrid Parbhani Kranti the trend of significant increase in fruit yield could be traced only uptoF_3 level (120:80:60 N, P_2O_5, K_2Okg ha^{-1}). The

Table-1 : Yield and economics of hybrid non-hybrid okra production at graded levels of fertilizers. Fruit yield (q/ha)

Fertilizers N : P_2O_5 : K_2O kg/ha	F_1 (60:40:20)	F_2 (90:60:40)	F_3 (120:80:60)	F_4 (150:100:80)	Mean
Variety					
Mahyco-12	54.49	86.77	113.25	128.50	95.75
Parbhani Kranti	58.37	83.75	99.54	106.12	86.95
Mean	56.43	85.26	106.46	117.31	
Net Returns (Rs./ha)					
Mahyco-12	2471	19304	32946	40413	23783
Parbhani Kranti	7605	20643	28406	31104	21939
Mean	5038	19973	30676	35759	
B:C Ratio					
Mahyco-12	0.09	0.68	1.12	1.34	0.81
Parbhani Kranti	0.31	0.81	1.08	1.14	0.84
Mean	0.20	0.75	1.10	1.24	

Comparison between means of	Yield		Net Return		B:C Ratio	
	SEd	CD at 5%	SEd	CD at 5%	SEd	CD at 5%
Varieties (V)	2.312	4.808	561.6	1168.2	0.023	NS
Fertilizer levels (F)	3.269	6.800	784.3	1852.1	0.032	0.067
Interaction (VxF)	4.623	9.616	1123.3	2336.4	0.046	0.095

highest fruit yield of 128.50 q $ha^{-1}$was realised under treatment combination V_1F_4 (Mahyco-12 with 150:100:80 N, P_2O_5, K_2O kg ha^{-1}). The treatment combination next in order was V_1F_3 (Mahyco-12 with 120:80:60 N, P_2O_5, K_2Okg ha^{-1}). The higher response of hybrid to applied fertilizer level in their higher doses may be attributed to the hybrid vigour present in the hybrid. Availability of greater bulk of building blocks through increased cell division, cell elongation, production of enzymes and co-enzymes, amino acids and Cytokinin due to availability of higher amounts of nutrients at higher levels of fertilizers might explain for yield increments at higher levels of fertilizers. The results of the present investigation are in close conformity with those reported earlier by Natraj *et al*. (1993), Anjum and Anjad (1999) and Singh (2001).

Economics : When the plots received 60 kg N, 40 kg P_2O_5 and 20 kg $K_2O$$ha^{-1}$ (F_1), the lowest dose under investigation, the non-hybrid fetched significantly higher net return (Rs. 7605/-) than the hybrid Mahyco-12 (Rs. 2471) (Table-1). When the fertilizer level was raised to F_2 (90:60:40 N, P_2O_5, K_2Okg ha^{-1}) both hybrid and non-hybrid were equally well in respect of net returns. However, at the two higher levels of fertilizers *i.e.,* $F_3$and F_4 the hybrid Mahyco-12 fetched significantly higher net return of Rs. 32, 946 and Rs. 40,413 per hectare, respectively as compared to Parbhani Kranti having the corresponding net returns of Rs. 28,406 ha^{-1} and Rs. 31,104 ha^{-1}. It was also observed that irrespective of the varieties, the net return of okra increased significantly with successive increments in the dose of fertilizers up to the highest level under test (F_4).

So far as Benefit: Cost ratio was concerned it was also more or less close on the lines observed in case of net returns. At the two lower levels of fertilizers ($F_1$and F_2) the B:C ratio under the non-hybrid Parbhani Kranti was significantly superior to the hybrid Mahyco-12. At F_3 level both the hybrid and non-hybrid fared equally well. But the highest level of fertilizers i.e., F_4 (150N+ 100 P_2O_5+ 80K_2O kg ha^{-1}) the hybrid Mahyco-12 gave significantly higher B:C ratio (1.34) as against only 1.14 noted in favour of Parbhani Kranti the non-hybrid. The findings of the present investigation as regards economic aspects find support in the work of Pandey *et.al.* (1989) and Sharma and Bulla (1995).

Fertility status after harvest : The plots getting higher doses of N, P_2O_5 and K_2O had higher levels of these nutrients in the soil after harvest (Table 1). The varieties did not show any significant effect on the fertility status of soil with the exception that P_2O_5content of soil in

Table-2 : N, P_2O_5 and K_2O status of soil after harvest and incidence of YVMV under the treatments investigated.

Treatments	Available nutrients in Kg/ha			YVMV (%)
	N	P_2O_5	K_2O	
Varieties				
V_1-Mahyco-12	293.37	35.43	186.12	3.13
V_2-Parbhani Kranti	296.02	36.50	187.03	5.39
SEd	2.143	0.241	1.745	0.099
C.D. at 5%	NS	0.501	NS	0.306
Levels of fertilizers (N, P_2O_5, K_2O Kg/ha)				
F_1-(60:40:20)	288.32	34.95	181.88	3.35
F_2-(90:60:40)	293.75	34.95	185.26	3.85
F_3-(120:80:60)	295.27	36.15	187.21	4.50
F_4-(150:100:80)	301.45	36.75	191.96	5.33
SEd	03.031	0.341	1.745	0.140
C.D. at 5%	6.303	0.709	5.133	0.292

variety Parbhani Kranti was marginally higher than that noted in plots raised with the hybrid Mahyco-12. This finding gets support in the works of Asif and Grieg, 1972 and Pandey *et.al*. (1996).

Incidence of Yellow vein mosaic virus : Incidence of Yellow vein mosaic virus the most dreaded disease of okra (Table-2) was significantly higher in Parbhani Kranti, the non-hybrid (5.39%), than the hybrid Mahyco-12 (3.13%). With increase in the dose of fertilizer there had been a corresponding significant increase in the incidence of YVMV. However, the incidence of YVMV was restricted below 6 per cent which in itself shows resistance in both the varieties to this disease up to a greater extent.

REFERENCES

1. Anjum, M. A., and Amjad (1999). Research of okra (*Abelmoschus esculentus*(L.) Moench) to different levels of N,P, and K fertilizers. *Pakistan Journal of Biological-Science (Pakistan),* 2 (3): 794-796.
2. Asif, M. I., J. K. Grieg (1972). Effect of N, P and K fertilization on fruit yield, macro and Micronutrient levels and nitrate accumulation in okra (*Abelmoschus esculentus* (L.) Moench). *Journal of the American Society for Horticultural Science, 97 (4):* 440-442 (En, 10 ref.) (c.f. Hort. Abst. 43(4): 2091-1973).
3. Natraj, S. E., G. N. Kulkarni, B. S. Vyokaranahal; S. D. Shashidhara (1993). Effect of nitrogen levels and picking of fresh fruits on seed quality of okra (*Abelmoschus esculentus (L.) Moench). Karnataka Journal of Agricultural Science,* 5(1): 51-53.
4. Pandey, B. R., R. K. Rana and R. S. Sharma (1996). Influence of Plant Spacing and nitrogen levels on growth, yield attributes and seed yield of okra (*Abelmoschus esculentus* (L.) Moench) during Spring Season. *Vegetable Science,* 21(1): 12-15.
5. Pandey, U. C., V. P. Monacho (1989). Economic aspect of okra seed production. *Agricultural Science Digest Karnal,*9 (2): 91-93.
6. Sharma, N. K., and P. L. Bhulla(1995). Influence of integrated nutrient management on okra. *Vegetable Science,* 22 (1): 1-4.
7. Singh, R. V. (2001). Effect of Intercrop and N, P fertilization on performance of okra (*Abelmoschus esculentus* (L.) Moench). *Journal of Research, Birsa Agricultural University,*13 (1): 41-44.