Issues Related to Low Productivity of Maize in Haryana

V.K. Yadav[1], P. Supriya[2], Shailesh Kumar[3] and C.Y. Manikanhaiya[4]

1. Sr. Scientist (Agril. Ext.), 2. Sr. Res. Asstt., DMR, New Delhi., 3. Sr. Scientist (Agril. Ext.), CRI for Jute & Allied Fibres, Barrackpore, Kolkata, (W.B.), 4. Scientist (Agril. Ext.), ZPD, Zone IV, KVKs, Kanpur (U.P.)

Corresponding author e-mail: vkyadavdmr@rediffmail.com

ABSTRACT

In India, maize is next in importance only to rice and wheat and has acreage around 8.36 m.ha with a production of 16.72 mt during 2009-10. Haryana state grows maize in an area of 12,000 ha, with production of 27,000 tonnes. With reduction of groundwater in state, the farmers are shifting from unprofitable rice cultivation towards maize cultivation as it can be managed with 3–4 light irrigations. While cultivating the maize crop, the farmers come across various problems like less availability or non availability of the seed, improper irrigation facilities, adulteration in fertilizers, less availability of farm yard manure, etc. It is essential to understand the constraints in scientific maize cultivation practices to enhance the productivity. The study was conducted in two purposively selected progressive districts in Haryana during 2006-07. From each selected district two blocks, from each block two villages and from each village group of farmers were selected. The constraints in adoption of selected practices i.e., use of high yielding varieties (HYV), application of farm yard manure (FYM), application of synthetic nitrogenous fertilizer and irrigation were ascertained by asking open-ended questions to a group of farmer respondents using PRA tools, viz., focused group interview. These constraints were ranked by one key informant from each selected village of the study area by using preference ranking technique. The practice wise most serious constraint faced by the farmers in cultivating maize crop were less availability of quality seed at right time in use of HYV, less availability of dung due to mechanization in application of FYM, less availability of soil testing facility in nearby areas in application of synthetic nitrogenous fertilizer and less availability of electricity for operating pump set in irrigation. The suggestions given by farmers to overcome the constraints include promoting seed production of suited hybrid in selected village, supplementing dung with green manure, vermicompost, microbial culture etc for preparing FYM, providing soil testing facility in the village and to make electricity available during peak period. These suggestions will be helpful in enhancing productivity of maize in the state if due considerations would be given to it.

Key words: *Maize; Practices; Cultivation;*

Maize (*Zea mays*) is one of the most important crops in world agricultural economy grown over an area of 159 million hectares with a production of 817 million tonnes. In India, it is an important crop next only to rice and wheat and has an acreage around 8.36million ha with a production of 16.72 million tonnes. India ranks fourth in area and sixth in production of maize. As it has yield potential far higher than any other cereal, it is sometimes referred to as the miracle crop or the 'Queen of Cereals (*Anonymous, 2011*). The consumption pattern for maize produced in India at present includes poultry feed 52 per cent, human food 24 per cent, animal feed 11 per cent, starch 11 per cent, brewery 1 per cent and seed 1 per cent (*Sain Dass et.al., 2007*). In our country with the growth in demand of poultry feed the demand for maize is also going up. It is the crop with the highest per day productivity. Some estimates indicate that India may have to produce 55 million tonnes of maize to meet its requirement for human consumption, poultry, piggery, pharma industry and fodder by 2030. Haryana state has an ample scope to increase its acreage and productivity.The state has total geographical area of 4.42 million ha area out of which cultivable area is 3.8 million ha. . Maize was grown in an area of 12,000 ha, with production of 27,000 tonnes and productivity of 2.25 tonnes/ha during the year 2009-10

(*Anonymous, 2010*).At present, with reduction of groundwater in Haryana, the farmers are shifting from unprofitable rice cultivation towards maize cultivation as it can be managed with 3–4 light irrigations. Being close to the National Capital region, there is an opportunity to grow speciality corns, such as baby corn, sweet corn, popcorn, green cobs and quality protein maize for poultry feed. While cultivating the maize crop, the farmers come across various problems like less availability or non availability of the seed, improper irrigation facilities, use of fertilizers, availability of farm yard manure, etc. It is important to understand the constraints for adoption of scientific maize cultivation practices for enhancing productiviy. The present study was undertaken with specific objective to identify constraints in adoption of scientific maize cultivation practices in Haryana.

METHODOLOGY

The study was conducted in Haryana during 2006-07. Two progressive districts, in terms of maize cultivation were purposively selected. Then, two blocks from each district; and from each block, two villages; and from each village, group of homogenous farmers were selected by using multi-stage random sampling technique.Based on review of literature and experts' advice four important scientific cultivation practices, namely; adoption of high yielding varieties, application of farmyard manure, adoption of synthetic nitrogenous fertilizers and constraints in irrigation were selected. Data was collected by using PRA tools i.e. focussed group interview and preference ranking.Constraints in the present study have been operationalized as problems perceived by the farmers as well as the reasons for non-adoption or partial adoption of scientific cultivation practices. It was ascertained by asking open-ended questions to a group of farmer respondents using focused group interview technique.Focused group interview can be defined as small group of people brought to a central location for an intensive discussion with a moderator who focuses discussion on various issues in accordance with a general outline of question areas. Steps used for focused group interview are as follows:

i) Few homogenous groups were prepared.
ii) They asked to discuss about a specific problem.
iii) When needed, the researcher facilitated the discussion.
iv) Views expressed were noted down by the researcher.

Constraints in adoption of selected practices were ascertained from group of farmers and subsequently ranked by key informant in each village. It involved ranking of a set of constraints by an individual on the basis of severity. If any constraint ranked by Key informants of less than two villages, it is not considered as constraint in whole state.

RESULTS AND DISCUSSION

Constraints in Adoption of Scientific Maize Cultivation Practices: Constraints in adoption of selected practices, i.e., use of HYV, application of FYM, application of synthetic nitrogenous fertilizer and irrigation were ascertained from group of farmers in each selected village, and subsequently these were ranked by key informants (V1 to V8) on the basis of severity of problem by assigning a score of 6 for the most severe constraint and 1 score for the least severe constraint. Constraints found in three or more than three villages were considered as major constraints of state. Similar constraints were stated by the farmers for all selected crops, i.e., paddy, wheat and maize. Practice-wise constraints have been described as below:

Constraints in adoption of high yielding varieties (HYV) : Results presented in Table 1 revealed that five constraints were reported in adoption of high yielding varieties (HYV) in Haryana; and the most severe constraint was less availability of quality seed at right time, followed by high cost of seeds, more incidence of pest, lack of knowledge about improved seed, seed treatment, etc. and not getting remunerative price of produce, respectively.More incidence of pest was experienced as a constraint in few villages of Haryana. However, it was third important constraint in severity. It might be due to the fact that application of more nitrogenous fertilizer in the field crops invites more pest incidence.Findings of *Singh, et. al., (1995)* and *Jha (1998),* who also reported high cost of HYV seed, non-availability of quality seed at proper time, lack of knowledge about improved seed, low marketing price of produce, etc. as important constraints support the present study. Similarly, the findings of *Chand and Haque (1997)* also reported lack of quality seed being as an important, which further supports the present study.

Table 1. Constraints in adoption of HYV

PRA: Preference Ranking (N=8)

S.No.	Constraints	Score Given by Key Informants								Total Score	Rank
		V1	V2	V3	V4	V5	V6	V7	V8		
1.	High cost of seeds	5	6	6	6	3	2	2	3	33	II
2.	Less availability of quality seed at right time	6	5	3	3	5	4	6	6	38	I
3.	Lack of knowledge about improved seed, seed treatment, etc.	3	4	4	4	2	5	4	5	31	IV
4.	More incidence of pest	4	2	5	5	6	3	5	2	32	III
5.	Not getting remunerative price of produce	2	3	2	2	4	6	3	4	26	V

6 : Most severe.
1 : Least severe

Table 2. Constraints in application of FYM

PRA: Preference Ranking (N=8)

S.No.	Constraints	Score Given by Key Informants								Total Score	Rank
		V1	V2	V3	V4	V5	V6	V7	V8		
1.	Less availability of dung due to mechanization	6	6	6	6	6	6	6	6	48	I
2.	Less scientific knowledge of FYM preparation	5	5	5	5	5	5	5	5	40	II
3.	Less knowledge of schedule of application of FYM	3	2	4	4	2	4	4	3	26	IV
4.	Use of dung for fuel purpose	4	4	3	3	3	3	3	4	27	III

6 : Most severe.
1 : Least severe

Constraints in application of farm yard manure (FYM) : The constraints as experienced by the farmer respondents of Haryana regarding application of FYM in field crops were presented in Table 2. Four constraints were encountered by farmers in Haryana. Less availability of dung due to mechanization, less scientific knowledge of FYM preparation, use of dung for fuel purpose and less knowledge of schedule of FYM application got ranks I, II, III and IV, respectively, in Haryana.The less availability of dung was perhaps the reason for low adoption level of FYM in field crops. Generally, FYM was not applied in maize crop. Many farmers were applying it in same field after a gap of 3 to 10 years.

Constraints in adoption of synthetic nitrogenous fertilizer : Most of the farmers were using urea as synthetic nitrogenous fertilizer. Problems related to adoption of this fertilizer are presented in Table 3. Less availability of soil testing facility in nearby areas, less knowledge of balance dose of fertilizers, high cost of fertilizer, loss of nitrogen in the field, adulteration in fertilizer and increase in soil salinity got ranks I, II, III, IV, V and VI, respectively.Few farmers reported about salinity problem. Adulteration in fertilizer was perceived as a constraint in only three villages of the study area. Normally, the recommended NPK ratio is 4:2:1; but in the above case, less availability of soil testing facility in nearby areas and less knowledge of balanced application of fertilizer might be the reasons for imbalance in NPK ratio.

The present finding is supported by earlier study of *Singh et. al., (1995)* who reported high cost of fertilizer as an important constraint. Some of the above-mentioned constraints are in compliance with those

Table 3. Constraints in adoption of synthetic nitrogenous fertilizer

PRA : Preference Ranking (N=8)

S. No.	Constraints	Score Given by Key Informants								Total Score	Rank
		V1	V2	V3	V4	V5	V6	V7	V8		
1.	Less knowledge of balance dose of fertilizers	1	1	4	3	6	6	6	6	33	II
2.	Less availability of soil testing facility in nearby areas	5	6	5	4	5	4	5	5	39	I
3.	Adulteration in fertilizer	–	5	–	5	–	–	4	–	14	V
4.	Increase in soil salinity	3	3	–	–	–	–	2	–	8	VI
5.	High cost of fertilizer	6	1	6	6	3	2	3	4	31	III
6.	Loss of nitrogen in the field	2	2	3	2	2	3	1	3	18	IV

6 : Most severe.
1 : Least severe

Table 4. Constraints in irrigation

PRA: Preference Ranking (N=8)

S.No.	Constraints	Score Given by Key Informants								Total Score	Rank
		V1	V2	V3	V4	V5	V6	V7	V8		
1.	High cost of irrigation	4	5	5	3	5	2	3	2	29	III
2.	Less availability of electricity for operating pump-set	5	6	6	4	6	5	4	5	41	I
3.	High cost of installation / repairing of electricity operated pump-set	2	2	4	6	4	6	5	6	35	II
4.	Lack of knowledge of CS of irrigation, amount of irrigation water, etc.	3	3	3	2	3	4	2	3	23	IV
5.	Lack of facility of canal water	–	4	–	5	–	3	6	4	22	V
6.	Salty irrigation water	6	–	–	–	–	–	–	–	6	–

6 : Most severe.
1 : Least severe

reported by *Jha (1998)* who also found high cost of fertilizer, poor quality of fertilizer available in local market and untimely availability of fertilizer being perceived as important constraints.

1.4 Constraints in irrigation ; From Table 4, it was observed that out of six major constraints, the most severe constraint was less availability of electricity for operating pump-set, followed by high cost of installation / repairing of electricity operated pump-set, high cost of irrigation, lack of knowledge of critical stages of irrigation, amount of irrigation water, etc. and lack of facility of canal irrigation water, respectively. A good network of canal irrigation was observed in Haryana, but farmers of few villages were not able to use canal irrigation water.

CONCLUSION

Most severe constraint in adoption of HYV of maize in Haryana was less availability of quality seed at right time, followed by high cost of seeds, more incidence of pest, lack of knowledge about improved seed, seed treatment, etc. and not getting remunerative price of produce, respectively. Regarding application of FYM, less availability of dung due to mechanization, less scientific knowledge of FYM preparation, use of dung for fuel purpose and less knowledge of schedule of FYM application got rank I, II, III and IV, respectively. As far as constraints in adoption of synthetic fertilizers are concerned, no soil testing facility in nearby areas, less knowledge of balance dose of fertilizers, high cost of fertilizer, loss of nitrogen in the field, adulteration in

fertilizer and increase in soil salinity got rank I, II, III, IV, V and VI, respectively. Most severe constraint in irrigation was less availability of electricity in operating pump-set, followed by high cost of installation / repairing of electricity operated pump-set, high cost of irrigation, lack of knowledge of critical stages of irrigation, amount of irrigation water, etc. and lack of facility of canal irrigation water, respectively.

Paper received on : July 23, 2011
Accepted on : August 21, 2011

REFERENCES

1. Anonymous (2010). Department of Economics and Statistics, Department of Agriculture and Co-operation, Krishi Bhawan, New Delhi
2. Anonymous (2011). Vision 2030. Directorate of Maize Research, Pusa, New Delhi
3. Chand, R. and Haque, T. (1997). Sustainability of rice-wheat crops system in Indo-Gengetic region. *Economic and Political Weekly*. **32** (13): 26-30.
4. Jha, P.K. (1998). A comprehensive study on crop and dairy farming practices in North Bihar. Ph.D. Thesis (Unpub.), National Dairy Research Institute , Karnal, India.
5. Singh, J., Singh, J.P. and Singh, J. (1995). Land degradation and economic sustainability. *Eco. Econ. Amsterdam.* **15** (1) : 77-86.
6. Sain Dass, Singh , K.P. and Yadav, V.K. (2007). Present status and potential of maize hybrids in enhancing the productivity. National Conference on “Doubling Maize Production” organized by IFFCO Foundation, ICAR, DMR, DAC & IFFCL at New Delhi from May 08-09, 2007. pp 13-19.