Extension Strategies for increasing Pulses Production for Evergreen Revolution

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ABSTRACT

Pulses on account of their vital role in nutritional security and soil ameliorative properties have been an integral part of sustainable agriculture since ages. Presently, the pulses are grown on around 23 million hectares area with 13 – 15 million tonnes of production. The present study was conducted with a specific objective to find out the extension strategy to increase the pulses production. Perception of farmers, extension personnel and research workers was recorded to find out the constraints in different aspects of pulse based cropping system and related technologies. Among the bio-physical constraints, lack of improved varieties of pulses has been found as the most serious of the all. Infestation of pest and diseases and no plant protection measure are another two most important constraints in pulses production. Among the socio-economic constraints, lack of knowledge and skill about improved technologies of pulses got the highest rank followed by lack of availability of input at proper time, low market price of the produce and high cost of input.

Key words: *Pulses production; Constraints; Extension strategy*

The "green revolution," a term coined by William Gaud is a process that leads to improved agricultural productivity. Exploitive agriculture offers great dangers if carried out with only an immediate profit or production motive. The rapid replacement of numerous locally adapted varieties with one or two high-yielding strains in large contiguous areas would result in the spread of serious diseases capable of wiping out entire crops. Therefore the initiation of exploitive agriculture without a proper understanding of the various consequences of every one of the changes introduced into traditional agriculture, and without first building up a proper scientific and training base to sustain it, may only lead us, in the long run, into an era of agricultural disaster rather than one of agricultural prosperity (Swaminathan, 1993).

The term "ever-green revolution" was coined to highlight the pathway of increasing production and productivity in a manner such that short and long-term goals of food production are not mutually antagonistic. The aim of this new thrust is to lift food production well above the level obtained by the green revolution of the 1960s, using technology and regulatory policies more advanced and even safer than those now in existence.

Pulses scenario in India : Pulses on account of their vital role in nutritional security and soil ameliorative properties have been an integral part of sustainable agriculture since ages. They trap atmospheric N in the root nodules of their deep root system and add substantial amounts of protein-rich biomass to the soil surface and rhizosphere and thus keep the soil productive and healthy. By including legumes in cropping systems, the heavy nitrogen needs of modern intensive cereal based cropping systems. Legumes in rotation with cereals not only improve cereal productivity but also economize on nitrogen use. Nutrient recycling in legumes cropping system could be partial or complete.

Presently, the pulses are grown on around 23 million hectares area with 13 – 15 million tonnes of production. In the past five decades, pulses production has not kept up with growth in demand calling for import to the tune of 0.5 to 1.5 million tonnes. In spite of appreciable advances in the technology front, pulses production in the country has shown only marginal increase during the past two and a half decade, because pulses have been pushed into low endowed lands with more risk prone situations. As a result, the contribution of pulses in the national food basket has drastically been reduced to 7% from 17% at the time of independence. Keeping this in view, the present study was conducted with a specific objective to find out the extension strategy to increase the pulses production.

METHODOLOGY

Hamirpur district was selected purposively for the present study. Selection of the blocks formed the first

stage of the sampling. There are seven development blocks in Hamirpur district. Out of which two blocks viz. Sumerpur and Maudha were randomly selected for the study. A list of villages where pulses grown was prepared for each block. From each block, two villages were selected on random basis. Thus, a total of four villages were selected for the purpose of drawing the sample of respondents for the study. Twenty farmers each from 4 villages were selected for the study. Total numbers of farmers selected for the study were 80. Perception of farmers, extension personnel, research workers and private input dealers was recorded to find out the constraints in different aspects of pulse based cropping system and related technologies. Ten extension personnel, ten pulse researchers and ten input dealers were also included as respondents for this purpose.

Five point scale consisted of selected items of which some were negative and some were positive were used to calculate perception score. The scores for each of the items were added up to get the perception score for an individual.

RESULTS AND DISCUSSION

Perception of farmers, extension personnel and research workers was recorded to find out the constraints in different aspects of pulse based cropping system and related technologies. The scores for each of the items were added up to get the perception score for an individual. Data were collected from the farmers about their perception regarding the bio-physical and socio-economic constraints of pulses production. The data are displayed in Table 1 and 2.

Bio-physical constraints : Among the bio-physical constraints, lack of improved varieties of pulses has been found as the most serious of the all. Infestation of pest and diseases and no plant protection measure are another two most important constraints in pulses production (Table 1).

Table 1. Bio-physical constraints of pulses production

Constraints	Perception score	Mean score	Rank
Lack of improved varieties	406	36.9	I
Lack of resistant varieties against pests and diseases	379	34.6	II
Lack of soil-testing facilities	246	22.4	X
Infestation of pest and diseases.	364	33.1	III
Imbalanced use of chemical fertilizers	326	29.6	V
No seed treatment.	278	25.3	VIII
No use of bio-fertiliser.	286	26.0	VII
Less or no application of herbicide at proper time.	224	20.4	XI
No use of pesticides/Pesticide application not being cost effective.	349	31.7	IV
Heavy post-harvest losses.	293	26.6	VI
Lack of proper storage facilities at harvesting time.	253	23.0	IX

Socio-economic constraints : Among the socio-economic constraints, lack of knowledge and skill about improved technologies of pulses got the highest rank followed by lack of availability of input at proper time, low market price of the produce and high cost of input (Table 2).

Table 2 Socio-economic constraints of pulses production

Constraints	Perception score	Mean score	Rank
Poor economic condition of the farmers	281	25.5	VI
High cost of inputs.	326	29.6	IV
Lack of education.	220	20.0	XI
Lack of knowledge and skill about improved practices of pulses.	389	35.4	I
Small size of land and fragmented holdings.	276	25.1	VII
Lack of labour.	260	23.6	IX
Lack of availability of inputs at proper time.	367	33.4	II
Lack of proper marketing facilities.	294	26.7	V
Lack of loan facilities and corruption in sanctioning loan	248	22.5	X
The new generation do not want to do work in agriculture.	268	24.4	VIII
Low price of the produce.	358	32.5	III

One of the most important constraints to legumes production is lack of adequate output markets. Markets for legumes were thin and fragmented in comparison with the cereals, which have assured markets. It has been observed that government procurement of legumes was not effective as it was for the cereals and other crops. Farmers on many occasions did not get the minimum prices announced by the government. The price spread or the market margin for legumes was much higher than that of rice and wheat due to higher post harvest costs. The share of farmers' returns in consumers' price was much lower for legumes than for rice and wheat. The farmers are not really benefited by higher market prices of pulses. To encourage pulses production similar mechanisms of their procurement as for rice and wheat need to be evolved. Production of pulse crops is relatively more risky than that of cereals. The price and yield risks for pulses were much higher than those of rice and wheat. Pulses were more prone to risk due to crop failure in comparison to rice and wheat. Similarly price fluctuations were also higher in pulses.

Constraints in pulses production

Kharif Pulses :

- Lack of well-developed markets for pigeonpea, especially in non-traditional pigeonpea areas where long distance movement could be involved.
- Inadequate processing units, for dal in the study area.
- Lack of policy support, in the way rice and wheat are supported.

- High risk in production, and its unpredictability, due to vulnerability to weather and biotic stress, and consequent price fluctuations.
- Limited availability of key inputs, such as quality seed and effective insecticides.
- Limited use of non-grain value of pigeonpea, e.g., sustainability contribution, household fuel, and building materials.
- Limited knowledge of farmers on the latest production technologies for the crop.

The yield and area expansion of mungbean and urdbean are widely limited by inadequate availability of improved seed and knowledge of optimum cultivation practices, limited policy and marketing support, and inadequate storage and processing facilities. The primary reason for the uncertainty of yield harvested at the end of the crop season is aberrant weather conditions, which cause extremes of soil water stress, ranging from drought to excessive soil moisture and high atmospheric humidity. When protracted wet period *i.e.* high humidity coincides with flowering and podding stages, it often encourages development of diseases in chickpea and lentil. For chickpea, Fusarium wilt is the most critical disease which reduces its yield substantially. The same is applicable in lentil in Hamirpur. Different variants and varieties of root rot disease also limit the production of chickpea and lentil. Among the insect, pod borer is very much detrimental in reducing the yield of chickpea in Hamirpur.

Mostly legumes are grown on marginal lands, generally not preferred for the cultivation of cereal crops. These lands are often poor in soil physical properties and fertility status. Poor and non-uniform plant stand seems to be more severe in pulses. Farmers generally use seed rates below the recommended dose. Also the seed viability is often very poor. These factors result in poor plant stand establishment and ultimately lower yields. The broadcast method of sowing in case of kharif pulses also contribute to the poor and non-uniform plant stand because of random distribution of seeds and some seed may fall in dry surface soil layers. Also soil borne diseases and insect pests reduce initial plant stand even after the seeds have germinated and seedlings have emerged.

Extension strategies for increasing pulses production : On-farm evaluation and demonstration of existing technologies may be attempted to narrow the gap between yields realised on farmers' fields and those on research stations. Special attention needs to be given to overcome seed production and distribution problems. Even for small farmers, the concept of product planning and value addition *i.e.* the careful selection of crops and varieties to be grown with market acceptability is an important starting point. Providing this basic advice to the farmers is very essential (enable them to withstand the competition in the market). The extension personnel need to be updated on product planning. The farmers have to be educated about direct marketing, Government support price scheme, selling at nearly rural periodic markets, contract marketing arrangements with processors, wholesale traders or other bulk buyers. The individual marketable surplus being small in quantity and uneconomic to take to longer distance for better process, it is necessary that the informal groups of SHGs are promoted to market the produce. These self-help groups can be educated on product planning so that the similar variety or the similar quality can be produced by all members of group and would improve marketability of the product as well as bargaining power of the farmers.

Farmers' organizations or groups could set up direct markets and provide consumers different products at prices profitable to the farmers and the same time cheaper than the city markets to consumers. Farmers need education of improved harvesting methods, standardization and grading, improved packaging and handling proper storage methods, etc. for profitable marketing of this produce. Extension system needs to be updated. Farmers need to be educated of various issues leading to value addition through primary processing or other tips, which, if followed, can secure better prices for him in the background of local realities. The farmers themselves need to be oriented to certain problem solving methods.

Implementation of new international trade agreements (GATT and formation of WTO) has caused lot of apprehensions and concerns in the country. Extension personnel should thoroughly be trained in various trade agreements and subsequent changes in this to provide 'Correct' information about such agreements to farmers. Extension system should help in systematic documentation and recording of traditional knowledge, bio-resources and their issues. This would require effective interface among numerous agencies representing research, trade, industry and producers.

Extension personnel should have access to internet and should be provided with addresses of concerned sites to explore the possibilities of contracts between buyers and client groups of farmers. This may look too elite at the moment, but, it seems, future extension agents have to use internet and E-agriculture as a major tool in their sphere of work. The rural periodic markets and wholesale assembling markets where farmers visit frequently need to be provided with extension units to undertake regular activity to educate farmers in various issues. E-technology revolutions are taking place day to day in the field of information technology. Many private companies have taken lead to make available such facilities to the remotest

places mainly for surveillance of disease and insect outbreaks and also to monitor specific products being continuously eyed by private purchaser at cheaper rates and supply to other parts for financial gains.

In order to summarise the strategy for increased practice of pulse based cropping system and increasing pulses production, the following points deem to be important:

- Incorporation of short duration pulse crops like urdbean, mungbean to make the different production system profitable and improve soil health.
- Intensification of production system through popularising mungbean cultivation during spring/ summer season under irrigated condition.
- Easy and timely availability of critical input at nearby market.
- Creation of informal seed village system, where farmer to farmer seed production and distribution chain will ensure easy availability of quality seed.
- Production of quality seed of improved pulse varieties by private agencies needs to be encouraged to meet the demand of the farmers. Improved seed should be made available to the farmers at his doorstep at reasonable rate.
- Research efforts to develop drought tolerant high yielding varieties of pulses with pest resistance should be undertaken.
- It would be profitable to have Dal milling industry instituted between groups of villagers so that proper milling is done soon after harvesting and storage is made of split pulses (Dal) rather than whole seed.
- Transfer of technology in relation to pulses should be strengthened in farmer participatory mode with active involvement of multidisciplinary team of scientists.
- Necessary efforts should be made to popularise the rural storage of pulses by the farmers under optimum conditions so as to preserve the produce without damage.
- Private sector may also consider new industries in rural areas like village bakeries, seed agencies, seed village and post harvest technology.
- Price structure in the market will have to be derived by the Government much in advance to ensure reasonable profits to the pulse growing farmers to encourage them to take up pulses cultivation on a large scale.

CONCLUSION

Importance of pulses in maintaining food security as well as nutritional security has been felt since long. The production of pulses definitely needs to be increased manifold to meet the demand in coming years. Farmers grow pulses in the marginal lands with marginal input. But pulses can also be very remunerative. There is tremendous potential of pulses in irrigated areas. The incorporation of pulses in the existing cropping systems will enrich the soil health. Lack of improved varieties and quality seed is the most important bio-physical constraint while reluctance in adopting the improved practices is the most important socio-economic constraint in pulses production. The adoption of improved varieties of pulses should be emphasised and transfer of technology in relation to pulses should be strengthened in farmer participatory mode with active involvement of multidisciplinary team of scientists in order to increase the productivity of pulses. Creation of Informal Seed village system is required, where farmer to farmer seed production and distribution chain will ensure easy availability of quality seed. Farmers need training in improved harvesting methods, standardization and grading, improved packaging and handling proper storage methods, etc. for profitable marketing of this produce.

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