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Production Constraints of Soybean in Upland Balochistan

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Abstract: This survey was conducted in Pishin district of Balochistan from ten soybean growers. The purpose of the survey was to find out the constraints in the cultivation of soybean in the area. A variety of constraints were having cumulative effect on this crop yield and return. The common general constraints on soybean cultivation prevailed in the area were divided into three categories i.e., socio-economic constraints, technical constraints and institutional constraints. Results indicated that major socio-economic constraints were, crop disposal at reasonable price (Rs. 500/mond) and shortage of capital. Major technical constraints causing low yield (400 kg acre⁻¹) were, water stress and less information about soybean agronomic practices, while the institutional constraints were, lack of monitoring of crop and lack of extension campaign about the crop.

Key words: Soybean, production, constraints, socio-economic, technical, institutions

Introduction

Soybean (*Glycine max*) is one of the most important crops in the world. It is an important source of plant protein and edible oil and containing 40-42% of plant protein and 18-22% of edible oil. Although soybean is a crop of temperate region it is also grown in Pakistan and is considered as one of the cash crop now. It can be grown successfully both under irrigated as well as "Barani" conditions. The soybean crop is grown in different regions of all the four provinces of Pakistan (Aslam *et al.*, 1993).

Edible oils have been, over years, major deficit area of Pakistan. Pakistan is the major importer of edible oil in WANA region by importing 22.55% of edible oil of the entire region (Beg, 1990). The domestic requirement of edible oil in Pakistan is 1.9 million tones and domestic production is 0.6 million tones (29%), the remaining 1.3 million tones (71%) are imported (Anonymous, 1998). There is a big gap between local production and its consumption and as a result Pakistan imports edible oil in large quantities, which the poor country like Pakistan can ill afford. The demand for vegetable oil has grown at a high rate of 9% annually. The rise in demand for vegetable oils is due to increase in population, increase income, declining real prices for vegetable ghee and its substitution for Desi ghee (Mahmood and Walters, 1990). The major contribution in edible oil comes from cotton seed (58%), rape seed and mustard (21%) and the remaining from brassica, sasame, saflower, maize, sunflower, the share of soybean is infinitesimal. Soybean is cultivated on 0.23% of the total legumes cultivated area of Pakistan (Ashakzai *et al.*, 2002).

The soybean national average yield is very low (689 kg

ha⁻¹) as compared to the potential yields i.e., 2500 kg ha⁻¹ (Anonymous, 1996). Low yield of soybean in farmers fields are due to lack of use of soybean latest recommended production technology. (Aslam *et al.*, 1993; Achakzai *et al.*, 2002). Malik *et al.* (2002), reported that the non fitness of non traditional oilseed crops in the farmers well established existing cropping pattern are problems in attaining quality crop, lack of timely technical advise and output marketing are the reasons encountered for successful cultivation of oilseed crops.

Beg, 1990 reported that constraints causing low yield in oil crops in WANA region are socio-economic, technical and institutional in nature. The socio-economic constraints were lack of stress resistant and high yielding varieties, poor production practices, lack of sound research and development. While the institutional constraints were lack of sound research and development infrastructure for oil seed crops, lack of trained man power for research and development, inadequate extension campaign. Lack of proper procurement system of the produce and lack of proper mechanism for transfer of production technology from research to farmers. Usman *et al.* (1994) reported that the agriculture production constraints in Balochistan are political and structural issues, harsh and uncertain climatic conditions, inefficient utilization of water resources, use of agriculture inputs and marketing of agriculture products. It is evident that oilseed production could be increased significantly through policy measures and technological developments.

In Balochistan soybean is grown successfully in both plains and hilly areas. The present survey was designed to view the performance of this newly introduced soybean

crop on farmers fields and highlight the farmers constraints in its cultivation. The objectives of this survey are to highlight the production constraints of soybean causing low yield and give suggestions for improvement.

Materials and Methods

Primary and secondary sources of information were used. The study consisted of an informal and a formal survey of the soybean areas. A multi-disciplinary team of scientists from Agriculture Economics Research Unit AERU and Agriculture Research Institute. ARI Sariab, Quetta conducted an informal survey followed by a formal survey during June 2002. A well designed and pre-tested questionnaire was used to collect the required information. In total 10 soybean growers were randomly selected for interview out of the entire population of 26 farmers.

Limitations of study: This study was based on the primary data, collected from the field through the survey. Data collection from the illiterate, traditional and conservative respondents was not an easy work, because they don't had any record in written form, moreover, hesitation to provide information about their income and expenditure was a common phenomenon. The information collected in this survey was based on memories and estimates of the respondents. Therefore, the respondent might have under-reported their incomes and over-reported their production expenses and losses. However to minimize the error, at the beginning of each interview detailed explanation was given to the respondents about the primary aims and objectives of the study, so great care was taken to collect reliable information regarding the study.

Results and Discussions

Soybean variety (Wahad 93) was grown by the farmers. Seed of this variety was provided by Pakistan Oilseed Development Board Quetta (PODB) @ Rs. 15/kg. Average seed rate was 40 kg per acre. The PODB staff sown soybean crop on majority of the farmers fields in April, in some farms sowing was done after wheat harvesting i.e., in the month of June. Sowing was done by drill and by dibbling method. Generally farmers applied one bag of DAP at the time of sowing and half bag of urea fertilizer was applied per acre later on.

The estimated average yield per acre of sample farmers was 400 kg., with minimum 200 kg and maximum 600. Price offered to farmers by (PODB) was Rs. 500 per 40 kg. Cost of production per mound was Rs. 560 with land rent and Rs. 480 without land rent. Net income per acre of soybean

was Rs. 199 with land rent and Rs. 799 without land rent. As the soybean was cultivated by the farmers of uplands Balochistan for the first time, therefore, they were not aware for all required agronomic practices and the yield was much below the potential yield at research stations. The common general constraints on soybean cultivation prevailed in the area faced by the growers had been divided into three categories i.e., socio-economic constraints, technical constraints and Institutional constraints.

Socio-economic Constraints

Crop disposal a reasonable prices: the procurement price offered by (PODB) to farmers was Rs. 500/40 kg of soybean seed. During the survey it was observed that due to less output price offered by PODB and lack of other alternate source availability for crop disposal at reasonable price, soybean seed was still laying in the farmer stores. As most of the farmers were not agree to sell their produce at this price, they prefer to either fed it to animals as feed or store it, because according to farmers this price was not enough even to cover its production costs. This situation discouraged the farming community to grow soybean in future. It is proposes that procurement centers may be established through private or public partnership in the soybean growing area to procure the crop from farmers.

Shortage of capital: Due to lack of credit facilities the farmers of the area were not able to apply inputs to their crop with optimum doses and hence resulted in low yield (400 kg acre⁻¹).

Lack of government support price: The price support was not provided by government to soybean crop, therefore, farmers consider it risky, rather they prefer other crops like, vegetable and maize more beneficial than soybean. The soybean growers demanded that government may fix support price for soybean.

Technical constraints Yield: The farmers actual output of soybean per acre was far below than the potential yield. Average yield was 400 kg per acre. Following are the other reasons for low productivity.

Planting time: The soybean crop was sown in month of April. To the majority of the farmers however, in some cases it was sown after the harvest of wheat crop i.e., in mid June, which caused yield losses. It is often observed that yield losses due to this parameter especially incase of soybean are about 20-35% in the study area. Planting date was considered to be one of the critical agro-climatic

factor for maximum crop yield. Late planting may result in significant decrease in seed yield. (Aslam *et al.*, 1993). Planting time is the basic need of every crop because of the fact that until the soil temperature is not favorable for the seed germination the plant will never grow. Because both soil moisture and the heat for the chemical synthesis and break up of the endo sperm is needed for germination of hypocotyle. Every crop has its own requirements for soil temperature. It could not be lowered nor at higher temperature the seed germinate that is why the kharif crop could not be grown in rabi seasons the temperature is not optimum, the plant germinated are not often to the buried seed, thus the crop yield is adversely affected, so planting plays a vital role in crop production.

Seed inoculation: Although seed inoculation with *Rhizobium japonicum* was practiced but some farmers of the study area reported that nodules were not formed on their crop. It may be due to the inviability of inoculum. Aslam *et al.* (1993), concluded that *Rhizobium japonicum* exhibited positive change in terms of enhanced growth and seed yield. The satisfactory results would be achieved if, the soybean seed will be treated with 25 ml of *Rhizobium japonicum* inoculum.

Water stress: Low water table and constant drought in the area resulted in water shortage for irrigating crops and cause less yield in soybean crop. Shah *et al.* (2001) reported that in highland Balochistan due to prolonged drought and indiscriminate pumping of underground water the water table is declining @ 7 meter annually, a large number of tubewell have been dried. Besides water shortage, the soybean farmers were not aware about the proper timings of irrigations. Kakar *et al.*, 1999; suggested that for getting highest seed yield, oil content, dry matter accumulation soybean should preferably be given six irrigations. No. of irrigations with proper timing plays important role in the yield of soybean crop. The irrigation requirements of crop were not met properly. The farmers were in struggle to first save their orchards therefore, less irrigation were given to the crop and the ultimate result was low yield by 5-10%.

Cultivation methods: Soybean crop was newly introduced in some areas of upland. Being unawareness of the methods of crop cultivation and less technical support from PODB department, resulted in low yield and with less income. Moreover, farmers of the area are not properly trained about the cultivation of crop.

Use of fertilizer: Urea and DAP were applied, mostly below the recommended dose i.e., urea @ 61 kg ha⁻¹. The

recommended rate of fertilizer for soybean was N (60-80 kg ha⁻¹) and K (40-60 kg ha⁻¹) as reported by Singh (1988). The fertilizer deficient use effected yield badly, but often with the failure of the crop. It is mainly because the farmers were not aware about the fertilizer optimum dose and its application time.

Use of pesticides: Soybean crop was affected by insect (*Heliothis armegeria*) and disease (Yellow Mosaic virus) in some areas. The farmers had no idea of using proper pesticide against this menace. This resulted in crop losses by about 10-15%.

Weed control: Proper weed control was not reported in the area causing yield losses. Weeds compete with soybean for nutrients, moisture and sunlight thus, reduce yield Aslam *et al.* (1993).

Crop harvesting: Late harvesting was reported in the area by some respondents which caused shattering and hence resulted in yield losses by about 5-7%. Aslam *et al.* (1993) reported that delay in harvesting not only reduces seed quality but also reduces the harvesting efficiency and increases the shattering losses.

Institutional Constraints

Lack of proper monitoring of soybean crop: The soybean crop was sown by PODB staff in the farmers fields. As the farmers were not well trained for the crop growing habits. Thus lack of proper crop monitoring resulted in low yield by about 1-2%.

Extension campaign: Soybean crop was first time introduced in some districts of upland Balochistan, so it was a new crop for farmers, they had no information regarding its growing habits etc. No campaign was launched to make the farmers aware about soybean crop.

Lack of proper procurement system of produce at reasonable prices: There was no procurement system found in the area to purchase of farmers produce at reasonable prices. Price offered to them by PODB was Rs. 500/40 kg. But most of the farmers were not ready to sell their produce at this price, because they argued that the price offered was too low.

Conclusion, policy implications and recommendations: without a significant change in government policies regarding producer and consumer price the domestic price of oilseeds cannot be changed. It is essential that the production and processing of oilseeds be given adequate protection, to stop the outflow of large

quantities of foreign exchange outside the country.

For increasing oilseed cultivation in the country, besides attractive output prices, a blend of credit and improved technological package should be extended to the oilseed growers. Some allied measures such as enhancement of import duties and taxes both on imported oil seed and oil may also be adopted in this regard. (Malik *et al.*, 2000). The yield constraints of soybean were mainly socio-economical, technical and institutional in nature. To remove these constraints different measures are to be taken into account to get high yield.

Soybean is a new crop for the farmers of upland Balochistan, it needs and evaluation of suitability for adoption to the farmers. There is need to conduct research to identify the potential areas for soybean through studies of growth conditions and cropping pattern.

- 1) In the study area lack of technical know how about this crop was reported. Farmers were not aware about proper agronomic practices required for soybean crop which include, use of fertilizer at proper dose, sowing and harvesting time, use of pesticides, irrigation timings etc., which cause low yield. Through arrangement of field days and demonstration plots, the farmers of the area may be trained about the agronomic practices of soybean crop.
- 2) Disposal of produce at reasonable price was the major problem to the soybean growers. The price offered to soybean growers by (PODB) was Rs. 500/40 kg. Were not attractive to them. Therefore, there is a need to create market before production so that the growers may not be discouraged. Moreover, soybean crop can be successful in the area only if it is utilized at prices attractive to its growers. Hence, the farmers may be offered good price for their produce. Besides this, coordination between production and marketing is important. Its support price needs to be fixed. It is proposed that procurement centers may be established through private or public partnership in the soybean growing area to procure the crop from farmers.
- 3) More environmentally suitable variety of soybean may be provided to farmers. Knowledge about new varieties needs to be transferred to farmers through proper extension service.
- 4) extension services may be made more effective to transfer technical know how about cultivation of soybean crop.

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