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Studies on seed quality used by rice and wheat growers in Udham Singh Nagar district of Uttarakhand

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Abstract

The present study comprised of choice of farmers for the generation of rice and wheat seeds by the farmers of Udham Singh Nagar district of Uttarakhand. The highest share of farmers using foundation seeds of wheat crops was 46.4 percent. It was followed by the category of farmers using certified seeds which was 26.8 per cent of the total farmers. Breeder seeds have the smallest share of 7.2 per cent. The share of self-seed was 19.6 per cent. In case of rice seeds, farmers using certified seeds have a maximum share of 43.6 per cent followed by farmers using self-seeds having a share of 26.8 per cent. Remaining farmers use foundation and breeder seeds with a share of 25.2 percent and 4.4 per cent respectively. Orientation of the farmers towards the use of high quality wheat seed was due to large number of seed companies in farm vicinity and availability of quality seeds. Seed firms run the seed program and therefore farmers used better quality seeds. Seeds can be easily sourced from private retailers, Tarai Development Corporation and GB Pant University. The farmers preferred to use certified and self retained seeds as very less number of firms runs seed program for rice crop. The quantity of seed required was also very less so the farmers preferred to purchase the seeds from local retailers, other farmers or stored seed from the previous seasons.

Keywords: Wheat- rice, breeder seed, foundation seed, farmers

Introduction

Seed is the unit of reproduction of a flowering plant, capable of developing into another such plant. It is any plant part which is capable of generating a new plant. Seed may vary from crop to crop. Seed are central to crop production, human nutrition, and food security (Finch-Savage and Bassel, 2016) [2]. Quality seeds are inevitable to meet the challenges of ever increasing population and food security (Prasad *et al.*, 2017) [5].

The complexity in Indian agriculture was changed by key inputs such as HYV (High Yielding Variety) seeds, irrigation, pesticides, chemical fertilizers, farm machinery and equipments, credit and labour. Among these, seed is the most important agricultural input and is a basic unit for distribution and maintenance of plant, a population that carries genetic potential of the crop plant. (Mugonozza, 2001) [4]. It thus dictate the ultimate productivity of other input such as fertilizer, pesticide irrigation water etc., which builds the environment that enable the plant to perform. Progress of agriculture depends on production and availability of good quality seeds of best yielding varieties. It is estimated that the direct contribution of quality seed alone to the total production is about 15 to 20% depending upon the crop (Gaikwad *et al.*, 2015) [3]. Therefore, enhancing agricultural productivity depends on increasing the seed potential and realization by farmers. From a pre-dominantly public sector until the 1980's, the Indian seed sector has evolved gradually into a multifaceted industry with involvement of about 500 seed companies/firms and increasing emphasis on research and development activities because of rapid growth under liberalized government policies (Chauhan *et al.*, 2016) [1].

The seed business is highly seasonal and the demand is unpredictable as the farmers purchase the seeds only in particular season of the crop. The changes in the weather, price of crop, price of competing crop may change the prospects of demand for seed of particular variety at the commencement of sowing seasons. Timely availability of certified quality seeds of high yielding varieties is still a major concern. Concerted and coordinated efforts are imperative in ensuring timely availability of seeds as well as increasing the seed replacement rate. Certain norms are followed for the production of pure seeds and seeds are multiplied through a well defined seed chain, viz. nucleus, breeder, foundation and certified/truthful labelled seed (Trivedi and Gunasekaran, 2013) [6].

Specifications of quality standards are given in Indian Minimum Seeds Certification Standards, 1988 for different generation of seeds. Breeder seed is the progeny of nucleus seed

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of a variety and is produced by the originating breeder or by a sponsored breeder. Foundation seed is the progeny of breeder seed and is required to be produced from breeder seed or from foundation seed which can be clearly traced to breeder seed. Certified seed is the progeny of foundation seed and must meet the standards of seed certification prescribed in minimum certification standards. In case of self-pollinated crops, certified seeds can also be produced from certified seeds provided it does not go beyond three generations from foundation seed stage-I.

Profile of the study area

Udham Singh Nagar is situated in the Himalayan and sub-Himalayan region of Uttarakhand. Rudrapur is the district headquarters and comes under Kumaon region. The district is comprised of eight *tehsil* (sub-divisions) viz. Rudrapur, Kashipur, Gadarpur, Kiccha, Jaspur, Khatima, Sitarganj and Bazpur. The total geographical area of Udham Singh Nagar is about 281.8 thousand hectares. Out of which, the net sown area was about 139.12 thousand hectare, which was almost 49.36 per cent of the total geographical area. The acreage of rice and wheat crop in Udham Singh Nagar was about 115.61 thousand hectare and 99.58 thousand hectare. The production of rice and wheat was 398.61 thousand metric tonnes and 391.100 thousand metric tonnes.

Materials and methods

The survey area of district Udham Singh Nagar of Uttarakhand state was selected purposively as it has a large area under rice and wheat crops. Share of the net sown area of Udham Singh Nagar was around 19.86 per cent of the total net sown area of Uttarakhand. A sample of 250 farmers was selected randomly from all the *tehsil* of the district. These farmers were selected from the universe of farmers who cultivate both rice and wheat crop. Farmers were interviewed personally on the generation of seed chosen by them. Information was also taken on the source of seeds, use of cultivated grains and reasons for preferences through open ended questionnaires.

Results and Discussion

Rice

Farmers taking rice crops have a different pattern of choice of generation of seeds as compared to wheat. The major difference between seeds of rice and wheat crop is the difference in sowing method. While wheat is a directly sown, the rice crop is both directly sown and transplanted through nursery. But transplantation method is mostly followed in the survey area. Breeder seed is taken by 11 farmers; all of them were enrolled in seed program for TDC. It is found that no farmer was using breeder seed for cultivation for non-seed program. Even no private seed plant was also taking seed program of foundation seeds (breeder-foundation).

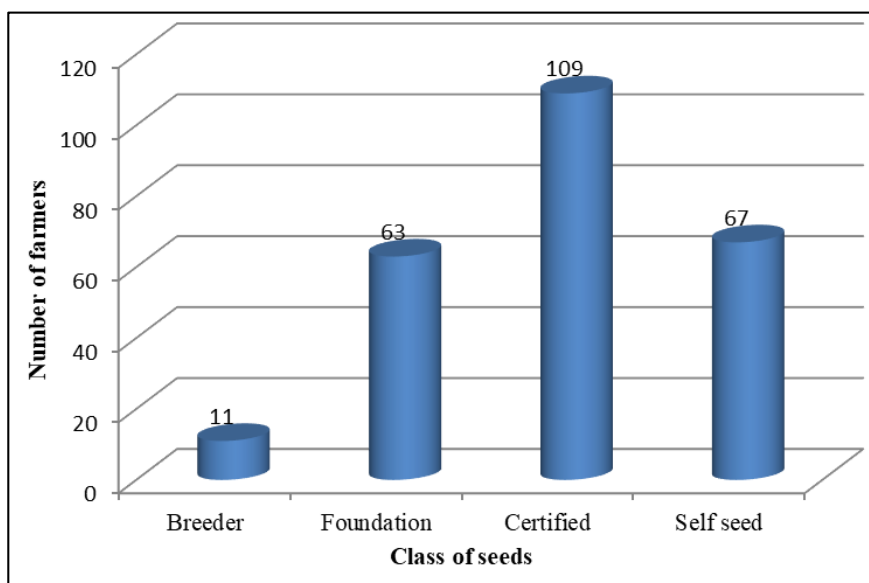


Fig 1: Farmer's preference for the different class of seeds in rice crops.

Foundation seeds were used by 63 farmers out of the total sampled farmers which was 25.2 per cent of the total sampled farmers. Most of the farmers have found to be taking seed program of seed companies for production of certified seeds. The source of foundation seeds was public seed agencies and private retailers who have been supplying foundation seeds. A larger chunk of this was held by public seed agencies who have been supplying seeds in ample quantities.

The next category is of farmers using certified seeds. The number of farmers using certified seed was 109 which was largest amongst all. Seeds were purchased from local retailers present in the vicinity of the farms. Seed was also purchased from directly from the plant of private seed companies. The last category of the farmer was using self seeds. This group also contained the farmers who were using seeds sourced from other farmers. The number of farmers who were using

self seeds was much higher than the other categories of wheat farmers. Number of the farmers using certified and self retained seeds was 176 which were 70.4 per cent of the total sampled farmers. It is also due to the fact that the major focus of the companies was on the seed production program of wheat seeds. The requirement of seed was very low in case of rice crops. Thus, farmers used seeds having a lower cost and with easy availability.

Wheat

Farmers in *tarai* region of Uttarakhand preferred to use quality seeds for crop production. Quality seeds are easily available in the survey area. There was an extensively high penetration of private seed retailers in Udham Singh Nagar. Also, the district is home to various government and private seed firms. Tarai Development Corporation, a state controlled

firm, pioneer in the field of seed production and marketing has a large number of shareholders from the district who carry on the seed program. Along with it, plenty of seed firms were present in the vicinity of farmers who carry out both seed program and make available quality seeds to farmers. Eighteen farmers out of the total sample size have taken breeder seeds in wheat crops during *rabi* season. Farmers

opined that their choice for the breeder seeds which was based on the facts that the seed produced could be used in successive seasons. Breeder seed available in Pantnagar University sold and distributed to the farmers. Farmers also try to maintain the quality of seed through practices of rouging and weeding in order to maintain the genetic and physical purity of seeds.

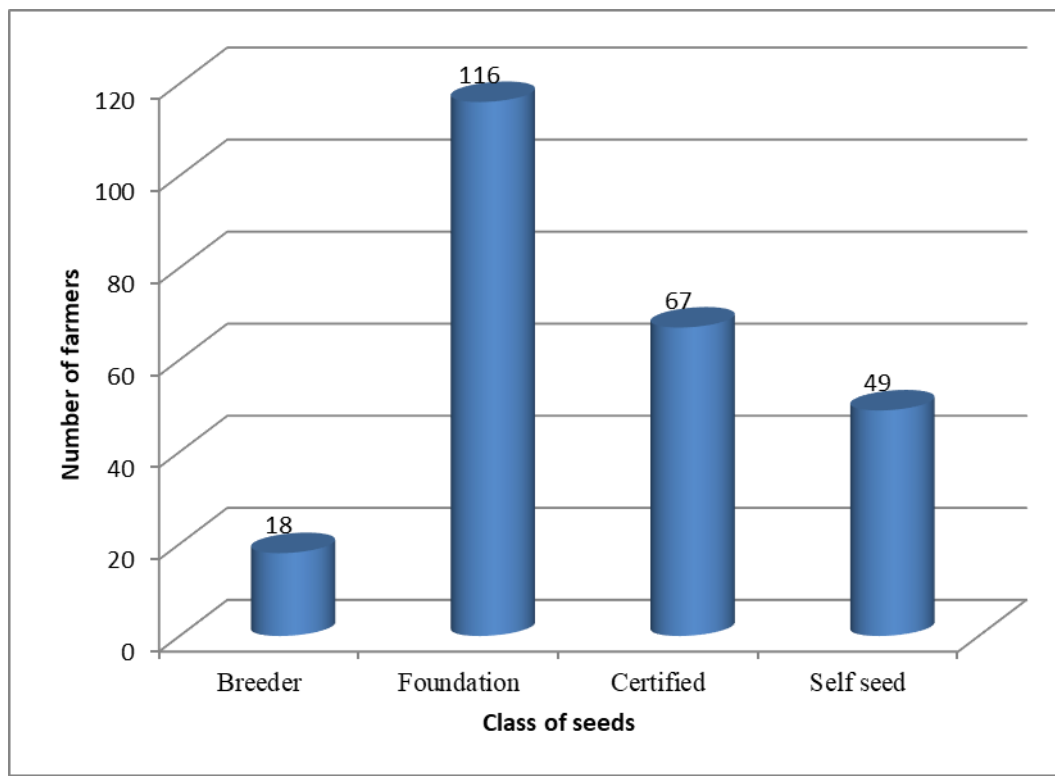


Fig 2: Farmer's preference for the different class of seeds in wheat crops.

Foundation seeds are adopted by 116 farmers out of the total sampled population. Share of foundation seeds stands highest at 46.4 per cent in the sampled population. Udham Singh Nagar has many seed firms which are catering to the needs of the farmers in other distance wheat growing states also. Foundation seeds are easily available to farmers through these private seed companies and public firms. Most of the farmers have also been involved in the seed program of one or other seed company. Thus, foundation seeds are available in sufficient quantity and optimal rates from these institutions. Farmers also take both seed and non-seed crops. The harvested crop is either sold to local traders or used as seed by farmers.

Certified seeds have been adopted by 67 farmers out of the total sampled farmers. Certified seeds are easily available to farmers through private seed plant owners and private retailer present in the survey area. Certified seeds have comparatively lower prices than foundation seeds. It was adopted by farmers who have not been involved in the seed program for any firms. Certified seed was adopted for crop production where the harvested produce is mostly sold in markets. Few farmers also used the progeny of the certified seed as the seed in the consecutive seasons. Self-seed was also used by farmers for sowing. Forty-nine farmers out of the total sampled farmers have used self-seed for wheat crops. Farmers stored the grains from previous cropping season which was used as seed in next season. The seeds are stored in a cool and dry climate with appropriate precautions in order to maintain the quality of seeds.

Conclusion

Seed is a major crop grown in Udham Singh Nagar district. It is a hub of seed production activities of various public and private seed agencies. Around 75 per cent of the farmers of total sampled farmers used quality seeds. Out of which, share of foundation seeds was maximum. This was primarily due to two reasons. First is the presence of large number of seed companies in survey area. Thus, farmers could easily enrol themselves in seed program of these firms. The private seed companies also provided services like free delivery of seeds at farm, credit services, rouging and assured buy back of grains. No separation of undersized grain was done by these seed companies which was other-wise seen in seed industry. Second reason was the easy availability of quality foundations seeds through private seed plants and private dealers/retailers. In case of rice crop, the extent certified seeds used by the farmers was highest. It was followed by the category of farmers using self seed. The share of breeder and foundation seeds amongst the choice of the farmers for seed selection was very low. In comparison with wheat seeds, rice farmers to use locally available rice seeds which were available easily at lower cost. This was primarily due to less focus of seed companies on rice seed program as compared to wheat seeds. The farmers in the survey area were found to be inquisitive about the new technologies in agriculture. Farmers were eager to adopt new varieties of seeds released for crop production. Also, farmers preferred to source seeds from established private and public institutions and sale points so as to obtain better yield.

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