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Success Story

Farmer Participatory Seed Production of Wheat - A Success Story

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Abstract

Seed is a vital input in agriculture and high-quality seed is crucial for ensuring a strong crop stand, a healthy harvest, and optimal output. In Bihar, there are two options available to farmers: either they rely on their own farm seeds for crop production, saving and preserving some of the grains for use as seeds for the following season, or they follow various public and private organizations. This farming method might not meet the standards for the seed's quality, which could result in a weak field stand, and ultimately, a low yield. However, some farmers are turning to locally accessible, poor-quality seed as a result of this widening disparity, which lowers productivity and profitability. The production of wheat seeds under the participatory program resulted in a B:C ratio of 1.80-2.35, gross income between Rs. 1.25 and Rs. 1.50 lakh ha^{-1} and net income between Rs. 0.80 and Rs. 1.05 lakh ha^{-1}.

Keywords: Bihar, Participatory seed production, Seed, Wheat

Background Information

The most frequently cultivated crop in the world in terms of area and productivity is wheat (*Triticum aestivum*), which is India's second-most significant crop after rice. Wheat is grown in India on an area of 31.61 mha with 109.52 mt of production and an average productivity of 3.46 t ha^{-1}, an outstanding achievement that attributed to the country's record production over the past few decades (Anonymous, 2021). Out of this, the contribution of Bihar state with report to the area, production and productivity is 2.22 mha (7.02% to all India), 6.34 mt (5.79% to all India) and 2.86 t ha^{-1}, respectively (Anonymous, 2021).

Along with ensuring the supply of high-quality seed, the adoption of on-farm seed production through a farmer-participatory strategy can increase farmers' revenue. A total of five progressive farmers were doing wheat seed production under Farmer's Participatory programme of IARI, RS Pusa Bihar. One of the success stories of Mr. Anil Kumar Sahni has been narrated here.

Mr. Anil Kumar Sahni, a progressive farmer from Village: Sakri kothi (man), P.O.: Sakri Chandpura of Muzaffarpur district, Bihar was selected for seed production under farmers' participatory seed production programme of IARI, RS Pusa Bihar during *Rabi* 2018-19. For Efficient and effective implementation of seed production activity and for maintaining the seed quality on farmers' field under strict vigilance of IARI Scientist and technical staff, an agreement was made between IARI, RS Pusa Bihar and the farmer before seed sowing for defining terms and conditions on procurement rate and other modalities. Agreement was made for production of truthful level seed (IARI T/L Seed) of wheat variety HD-2967 in an area of 10.0 acres. Seed produced by the participatory farmer was procured by the Institute as per the agreement. Later this seed material was processed at the seed processing unit of IARI, RS Pusa and sold to the farmers.

The basic information of the farmer are mentioned below.

Name: Mr. Anil Kumar Sahni

Father's name: Jaynarayan Sahni

Educational Qualification: Graduate and Diploma in Agriculture

Age: 35 years

Size of land holding: 40.0 acre

Address: Village: Sakri kothi (man), P.O.: Sakri Chandpura, Distt. Muzaffarpur, Bihar (848 125), India

Mobile Number: 9955384020

Article History

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Institutional Involvement/ Intervention

IARI, Regional Station Pusa Bihar was directly and indirectly involved in the participatory seed production programme and the following interventions were made by the Institute as well as Scientist of the Institute.

• Six days training programme on "Seed production of major *rabi* crops, processing and storage techniques" was organized for 25 local farmers from different villages, of Samastipur and Muzaffarpur district on 15-20, March 2019 at IARI, RS Pusa Bihar involving scientists from IARI RS Pusa, Dr. RPCAU, Pusa and Borlaug Institute of South Asia, Pusa.

• Good quality breeder seed of HD-2967 Variety was supplied to the participatory farmer from the Institute on cash basis.

• Seed sowing was done mechanically with the help of seed drill and sowing was done at a spacing of 22 cm from row to row. A standard minimum isolation distance of 3.0 m was followed between two varieties.

• Two roughing was done *i.e.*, before flowering and after flowering in the presence of IARI scientists and technical staffs to remove the off types plants and other varieties grown in the field. This practice help to reduce contamination and thus good quality seed was produced.

• Need based plant protection measures were taken up under the supervision of scientists of IARI, RS Pusa, since beginning.

• Harvesting was done by mechanical combine harvester to reduce harvesting and threshing cost.

Success Point/ Results

He had taken seed production activity of wheat crop var. HD-2967 and produced a total of 228.85 q unprocessed and 207.0 q processed seed. The cut grain obtained after processing had given back to the participatory farmer and only processed seed was procured by the Institute at the rate fixed by IARI, New Delhi. Before involved in participatory seed production, Mr. Sahni used to get less annual income from general grain production of different crops. From general grain production he had not only faced problems like low income but also fluctuation in market price for their produce. With his involvement in farmers' participatory seed production he got more net annual income without facing any marketing problems.

Mr. Sahni has been registering gross income between Rs. 1.25-1.50 lakh ha^{-1} and net income between Rs. 0.80-1.05 lakh ha^{-1} and a B:C ratio of 1.80-2.35 was obtained from wheat seed production under participatory seed production programme. Previously his gross income was between Rs. 0.80-0.85 lakh ha^{-1} and net income was Rs. 0.40-0.45 lakh ha^{-1} from wheat grain production. He also earns extra income from selling straw and earns about Rs. 0.50 lakh ha^{-1}. Umarani and Ramanjaneyulu (2020) also found the similar results.

Outcomes

Based on the on-farm experience of seed production it is revealed that participatory seed production of wheat is beneficial for doubling the farmer's income (Rs. 0.80-1.05 lakh ha^{-1}) over that of normal wheat grain production (Rs. 0.40-0.45 lakh ha^{-1}). Though additional cost of Rs. 6,000.00 ha^{-1} was incurred for purchase of breeder seed from IARI and rouging operations, the additional net returns were also high (Rs. 0.40-0.60 lakh ha^{-1}) from truthful level seed production compared to normal wheat grain production. This kind of activity was also helpful for employment generation as activity of wheat seed production involves rouging, other agriculture operations, drying, cleaning, packing, *etc*. Umarani and Ramanjaneyulu (2020) also reported the same results.

Figure 1: Performance of wheat crop under farmers' participatory seed production programme and training programme and Kisan Gosthi organized by ICAR-IARI, RS Pusa Bihar

Farmers' Response

The farmers of Samastipur and Muzaffarpur districts of Bihar (Figure 1) were impressed with the training programme organized by the Institute on seed production. Many farmers expressed their willingness to come forward for taking up the activity in near future. Mr. Anil Kumar Sahni (beneficiary farmer) was very happy about the technical guidance provided from IARI, RS Pusa Bihar, yield and benefits obtained from wheat seed production. However, Mr. Sahni expressed risk involved in loss of seed during processing. Looking at the success of this farmer, some neighboring farmers are interested in seed production activity and want to collaborate with IARI seed production programme for sustainable income.

Future Perspectives

Wheat seed production in participatory mode should be taken up under complete mechanization to reduce the cost of production and enhance the farm income. Farmers should motivate about seed production. Majority of the Indian farmers are small and marginal farmers having poor economic background and less risk bearing ability. For this reason, they may not ready and come forward for seed production. Therefore, such farmers must be trained and educated through capacity building programmes and encouraged for on-farm seed production.

Conclusion

Seed producing Institutes have limited area for seed production to fulfill the requirement of seed. A participatory seed production programme satisfies the need and is a highly effective strategy for addressing the seed deficit. From a social and economic perspective, the farmer has benefited greatly from the IARI, RS Pusa initiative. The farmer demonstrated his willingness to join a seed production programme and recorded high adoption rates for improved varieties when compared to local ones. In order to facilitate the production and prompt delivery of high-quality seeds to the farmers, this concept, a revolutionary approach needs to be promoted.

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