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Farmer Participatory Seed Production in Paddy - A Success Story

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Abstract

Seed is the basic input in Agriculture and good quality seed is the primary requisite for obtaining optimum crop stand, healthy crop and productivity. Many farmers are running behind the various government and non-government organizations every season in search of good quality seed. However, in view of large gap between production and supply, some of the farmers are resorting to locally available poor quality seed thus less productivity and income. Hence, adoption of on-farm seed production under the supervision of scientists through farmer participatory approach can improve farmers' income besides ensuring the availability of good quality seed. This article narrates how ARS, Tornala helped the farmer to produce 74.6 q/ha of quality seed of JGL-18047 variety of paddy and doubled the farmer's income as compared to that of normal paddy cultivation.

Background Information

Rice is the most important cereal crop and is the staple food for more than half of the world's population. In India, rice is cultivated in an area of 42.95 million ha (India stat, 2018-19) which means 2.15-2.56 million tonnes of good quality seed at an average seed rate of 50-60 kg/ha is required per annum. Similarly, rice is grown in an area of 9.6 lakh ha in *Kharif* and 6.8 lakh ha in *Rabi* season in the state of Telangana. However, due to enormous increase in irrigation potential due to commissioning of irrigation projects such as Kaleshwaram, the area under rice increased to 16.47 lakh ha during *Kharif* and 15.72 lakh ha during *Rabi*, thus taking the total to 32.19 lakh ha during 2019-20 in the state (DOA-T, 2020). So, the state of Telangana needs to produce 1.61 to 1.93 lakh tonnes of good quality seed. Furthermore, the rice area and demand for seed may increase in the days to come due to availability of abundant water in irrigation projects, tanks, bore wells etc. Though public and private organizations have been producing the seed, it is difficult to meet the ever increasing demand. Hence, there is a dire need to take up seed production in farmers' fields through farmer participatory approach (FPA) so as to bridge the gap between demand and supply and also improve farmers' income.

In order to address the above issue, the scientists of Agricultural Research Station (PJ TSAU), Tornala have been encouraging farmers to take up seed production of three paddy varieties viz., JGL-18047, KNM-118 and RNR-15048 released from Professor Jayashankar Telangana State Agricultural University (PJ TSAU), Telangana state. One of the success stories has been narrated hereunder.

Sri Surabhi Sareen Gandhi, a farmer from Badnakal Village, Mustabad mandal of Rajanna Siricilla district, Telangana was selected under FPA for seed production during *Rabi* 2019-

20. An agreement was made between Agricultural Research Station, Tornala and the farmer for production of foundation seed of paddy coarse grain variety JGL-18047 (Bathukamma) in an area of 2.5 acres.

Institutional Involvement/ Intervention

Following interventions were made by the scientists of ARS, Tornala-

- One training programme was organized for 65 local farmers from 17 different villages, Siddipet district on 27-11-2019 at ARS, Tornala involving scientists from Seed Research and Technology Center (SRTC), Hyderabad and ARS, Tornala.
- Good quality breeder seed of JGL-18047 from RARS, Jagtial was supplied to the beneficiary farmer on cost basis.
- Isolation distance of 3.0 m was followed scrupulously.
- Alleyways of 20 cm width at 2.0 m interval were formed

throughout 2.5 acres seed production field.

- Rouging was done two times *i.e.*, before flowering and after flowering in the presence of scientists to weed out off types and avoid contamination thus good quality seed.

- Need based plant protection measures were taken up such as application of carbofuron granules 3G @ 25/ha, spraying of Chlorpyrifos @ 2.5 ml/lit and Isoprothiolane @ 1.2 ml/lit against stem borer, leaf folder and blast, respectively. Though the incidence of stem borer, whorl maggot and neck blast was rampant in this rice growing belt, but, the same was very less in this seed production field due to adoption of good agricultural practices (GAPs) and timely plant protection measures under the supervision of scientists of ARS, Tornala since beginning.

- Harvesting was done by mechanical paddy combiner (KS combine) to reduce harvesting/ threshing cost and timely completion.

The details of cost of cultivation for normal paddy and seed production paddy were given in Table 1.

Table 1: Details of cost of cultivation for Paddy

Particulars	Cost/ha (Rs.)	
	Normal Paddy	Seed production Paddy
1. Input Cost		
Seed	1625	4406
Fertilizers (kg)		
N (120 kg)	1440	1440
P (60 kg)	2625	2625
K (40 kg)	1140	1140
FYM (7.5 tonnes)	18750	18750
Zn SO ₄ (50 g) (Chelamin) (Nursery only)	175	175
Plant protection chemical		
a. Herbicides	1150	1150
b. Insecticides	2500	2500
c. Fungicides	2000	2000
Total Input costs (A)	31405	34186
2. Operational Cost		
Land preparation		
FYM - loading, unloading and spreading	8000	8000
Ploughing (1 time)	4500	4500
Puddling (nursery and main field) 2 times	6250	6250
Rotavator (1 time)	3000	3000
Formation/correction of bunds	2500	2500
Sowing		
Sowing in nursery	1250	1250

Table : Continue...

Particulars	Cost/ha (Rs.)	
	Normal Paddy	Seed production Paddy
Pulling of nursery	2250	2250
Transplanting	9000	9000
<u>Nutrient management</u>		
Fertilizer application in nursery	625	625
Fertilizer application in main field (3 times)	3750	3750
<u>Weed management</u>		
Main field: Herbicide application	1250	1250
Main field: Manual weeding (1 time)	6000	6000
Irrigation and its maintenance	5000	5000
Plant protection (5 times)	6250	6250
Rouging	-	1500
Mechanical harvesting and Threshing	6250	6250
Drying	4500	4500
Total Operational Costs (B)	70375	71875
Yield (q) (Un processed seed)	70	81.6
Yield (q) (Processed seed)	-	74.6
Procurement price (Rs./q)	1860	2300
Processing loss (q)	-	7
Sale of remnant seed (Rs)	-	5220
Gross Returns (Rs.)	130200	176800
Cost of cultivation (Rs./ha)	102405	106061
Additional cost (Rs./ha)	-	3656
Net Returns (Rs./ha.)	27795	70739
Additional net returns (Rs/ha)	-	42944
Benefit : Cost Ratio	1.3	1.7

Note: The transport and processing charges were borne by ARS, Tornala, hence, not included in the cost of cultivation.

Success Point/ Results

From seed production of paddy variety Bathukamma farmer received 74.6 q/ha of processed seed, from which he could able to realize gross returns of Rs. 1,76,800.00 per ha and net returns of Rs. 70,739.00 per ha. Cost of cultivation was Rs. 1,06,061.00 per ha. Hence, benefit cost ratio was 1.7.

Outcomes

The above on-farm experience revealed that seed production of paddy is beneficial as it helped to double the farmer's income (Rs. 70,739.00 /ha) over that of normal paddy (Rs. 27,795.00 /ha). Though additional cost of Rs. 3,656.00 /ha was incurred towards purchase of breeder seed and performing rouging operations, the additional net

returns were also high (Rs. 42,944.00 /ha) from foundation seed production compared to normal paddy. The farmer produced 74.6 q/ha of seeds with which he can supply the good quality seed for an area of 119 ha. So, if all the 250 ha of paddy in *Rabi* season is converted to seed production, the farmers of Badnakal village can supply the seed to other villages within the mandal or district, thus, they can get at less cost and depend less on seed producing organizations.

Farmers' Response

The farmers were impressed with the pre-seasonal training programme organized on seed production and many expressed their willingness to come forward for taking up the activity in near future. The beneficiary farmer was extremely happy about the technical guidance provided from ARS, Tornala, yield and returns obtained from paddy

seed production; however, he expressed risk involved in timely rouging and loss of seed during processing.



Figure 1: Pre-seasonal training on Improved seed production technology in field crops on 27-11-19 at ARS, Tornala



Figure 2: Scientists inspecting seed production plot of Sri Surabhi Sareen Gandhi at nursery stage



Figure 3: Formation of alley ways in Seed production plot of Batukamma variety in Badnakal



Figure 4: Attending rouging by Scientist of ARS, Tornala



Figure 5: An overview of paddy seed production plot (JGL-18047) at grain filling stage at Badnakal village

Future Perspectives

Seed production has to be taken up under complete mechanization so as to further reduce cost of cultivation and improve farm income. Green manuring proceeding to *Kharif* paddy must be taken up so as to sustain the soil fertility and productivity in the long run. Seed production has to be up scaled and out scaled by motivating more no. of farmers. The small and marginal farmers due to their weak economic background and less risk bearing ability may not come for seed production, hence, such farmers must be educated through capacity building programmes and

encouraged to take up on-farm seed production.

Conclusion

Seed is the niche product that fetches a premium price. This initiative of ARS, Tornala has been extremely beneficial to the farmers from economic, social and professional point of view. The farmer participatory foundation seed production is profitable and the same is going to be implemented for other crops like pigeon pea and mung bean during the ensuing years under the supervision of the organization. At the first instance, we could mobilize farmers

from four different villages of Siddipet district covering an area of about 8.0 ha by showcasing the success story of Sri Surabhi Sareen Gandhi.

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