

Success Stories for Submergence –Tolerant (Swarna Sub-1) Rice Genotype in Flood-Prone Rainfed Lowlands under Bgrei Demonstration of Jagatsinghpur District

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Abstract: Flash flood or submergence is a common phenomenon in rice growing rainfed lowland areas that seriously affects crop establishment leading to severe yield losses. A few submergence-tolerant rice varieties have been developed by introgressing SUB 1 gene into mega rice varieties of South Asia. Performance of this variety can be further enhanced through adoption of appropriate management practices. One field experiment was conducted using Swarna- sub-1 during kharif, 2015 at Erasama block of Jagatsinghpur district. Results of this experiment revealed that the use of seeding density @50kg/ha, application of balanced doses of N-P₂O₅-K₂O @ 80-40-40 Kg/ha in transplanting aged seedlings significantly improved plant survival, yield attributing trials and grain yield. An additional N-dose of 20kg/ha at 7 days after receding of flood water resulted in better post submergence recovery and maximum yield.

Keywords: Nursery management; Post flood nitrogen management; Submergence; Survival; Swarna-sub-1

I. Introduction

Swarna –sub-1 A submergence high yielding rice variety that boost the production as well as productivity in BGREI(Bringing Green Revolution in Eastern India)through line transplanting during kharif, 2015.The Jagatsinghpur district is one of the natural calamities prone areas particularly in the months of September to November resulting in the damage of wet season's rice and other field crops to varying degrees. There are also different agroecological conditions prevailing in our district and specially Erasama block of this district comes under flood prone and low land area. In such unpredictable, adverse situation (particularly on stagnant water condition), the growing of submergence tolerant varieties is the objective of producing higher yield. Keeping this in view and also with an aim of production of submergence high yielding rice in super cyclone affected areas of Erasama block in Jagatsinghpur district of Odisha a project entitled "Bringing Green Revolution in Eastern India" was initiated in June, 2015. Swarna-sub-1 has been shown to withstand floods upto 17 days in agricultural trials. Swarna is cultivated in on an estimated 30-40% of area in rainfed lowlands.Swarna-sub-1 could thus beneficially replace Swarna on 9-12% of India's rice area. Swarna-sub-1 is a flood tolerant version of popular mega variety swarna (MTU7029) in eastern India.

II. Materials and Methods

The experimental trial regarding to Swarna-sub-1 was conducted on area of Chatua village of Chatua GP of Erasama block. A total of 50 quintal seeds of this variety Swarna-sub-1 were distributed to 216 no. of farmers including progressive farmers in that area. The area choosen was 100 ha in a contiguous patch. The nursery was raised on July 17,2015 and the healthy rice seedlings of 27 days old were transplanted on Aug 11,2015.

Management Practices

- ❖ Seed rate -The seed rate used was @50kg/ha.
- ❖ Seed treatment – Before sowing in the field the seeds were treated with seed treatment chemicals likeThiram or Captan @3 gm/kg of seed.
- ❖ Seedling treatment- The 27 days old seedlings were treated with Tricel@ 1ml/1lt of H₂ O.

Intercultural Operations

- Irrigation- Rainfed condition
- Weed Management
- ✓ Chemicals: They used weedicides Pretilachlorin@1.45lt/1ha
- ✓ Manual : Use of mandwa weeder.

Integrated Nutrient Management

- Application of balanced N-P₂ O₅ -K₂ O doses @80-40-40 kg/ha (25kg N through 5t FYM/ha and remaining amounts through chemical fertilisers in nursery).
- Applying additional N-dose of 20kg/ha at 7 DAD (Days after de-submergence) when 30-35% plants would start showing at least one green leaf.
- Application of ZnSO₄ @ 25kg/ha.

- ❖ Insects and Pests management- Major pests reported were yellow stemborer and aphid at tillering and flowering stages of the crop respectively. They controlled the pests by application of monocrotophos @400ml/ac and Imidachloprid@50ml/ac respectively.

Harvest

The rice crop was harvested in the second week of December,2016. The average grain yield was 50-60 quintals/ha. The farmers were benefitted by growing Swarna-sub-1 and harvesting good quantity of rice within a period of 145 days.This strategy would help the farmers to escape the bad effects of a possible flood in the months of August to October, which occur frequently in Odisha.

III. Conclusion

Salient features

- Raising of healthy and vigorous seedlings using seeding@ 50kg/ha.
- Application of balanced N-P₂O₅-K₂O doses @80-40-40 kg/ha (25kg N through 5t FYM/ha and remaining amounts through chemical fertilisers in nursery.
- Applying additional N-dose of 20kg/ha at 7 DAD (Days after de-submergence) when 30-35% plants would start showing at least one green leaf.

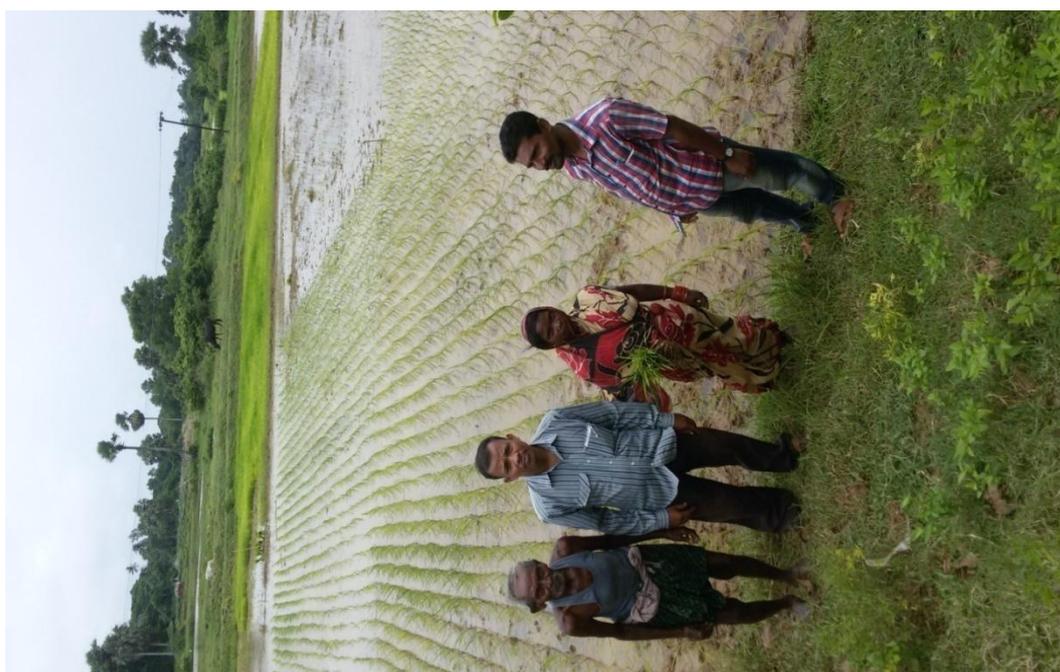
These results clearly indicate that proper seed bed management can contribute considerably to maximizing submergence tolerance and grain yield in the rice crop in the main field.

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Details of some progressive farmers who adopted this technique in their field:

Sno.	Name of farmer	GP	Village	Plot No.	Area (ha)	Mobile No.
1.	Sudhakar Swain	Chatua	Manapur	327	1.0	8596858929
2.	Babaji Nayak	Chatua	Manapur	32,168	0.2	9777364255
3.	Fakir Rout	Chatua	Manapur	174	1.0	9583439790
4.	Pravakar Rout	Chatua	Manapur	342	0.6	9937691563
5.	Dharanidhar Lenka	Chatua	Manapur	63	0.4	9583357331
6.	Bipin ku Nayak	Chatua	Manapur	113	0.8	9777459410
7.	Prasant Rout	Chatua	Manapur	869	1.0	7381607272
8.	Satrughan Swain	Chatua	Manapur	485/627	0.4	7894364575
9.	Gopabandhu Sethy	Chatua	Manapur	324	0.1	9556217574
10.	Rashmi Ranjan Mohanty	Chatua	Manapur	281	0.8	9778492681





1. Transplanting Stage of Swarna-Sub-1 At Chatua Village of Erasama Block



2. Tillering Stage of Swarna-Sub-1 at Chatua Village of Erasama Block



3. Harvesting Stage of Swarna-Sub-1 at Chatua Village of Erasama Block

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