POTATO SEED PRODUCTION IN WEST BENGAL – A NEW HORIZON

SECTOR: This project ñ***Breede***r ***Seed Production Programme of Potato with Integration of Micro propagation System" is a seed production programme under agriculture department implemented by Economic Botanist III WB.***

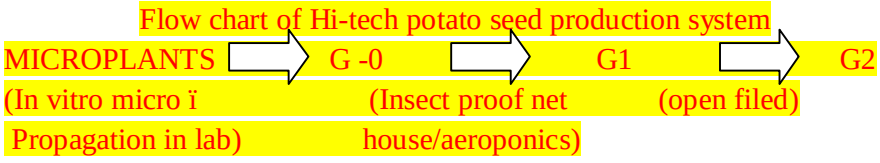
CHALLENGES:

Potato plays a very important role in the agriculture economy of West Bengal where 131 lakh MT of potato is produced in 4.1 lakh ha of land. So that 3 lakh MT seed is required every year. Potato is such a crop where 50% of the input cost is incurred towards seed which is to the tune of Rs 40000/ha. State Agriculture Department took initiative for production of potato seed since 2012, but the major technical constraint was limited availability of source material (breeder seed). This project ñ***Breede***r ***Seed Production Programme of Potato with Integration of Micro propagation System"*** has been taken under RKVY to make the state self sufficient for production of source material for subsequent production of true to the type and disease free seed for farmers. Since potato seed is mainly brought from outside of West Bengal, attaining self sufficiency by domestic production would also boost the economy of the state.

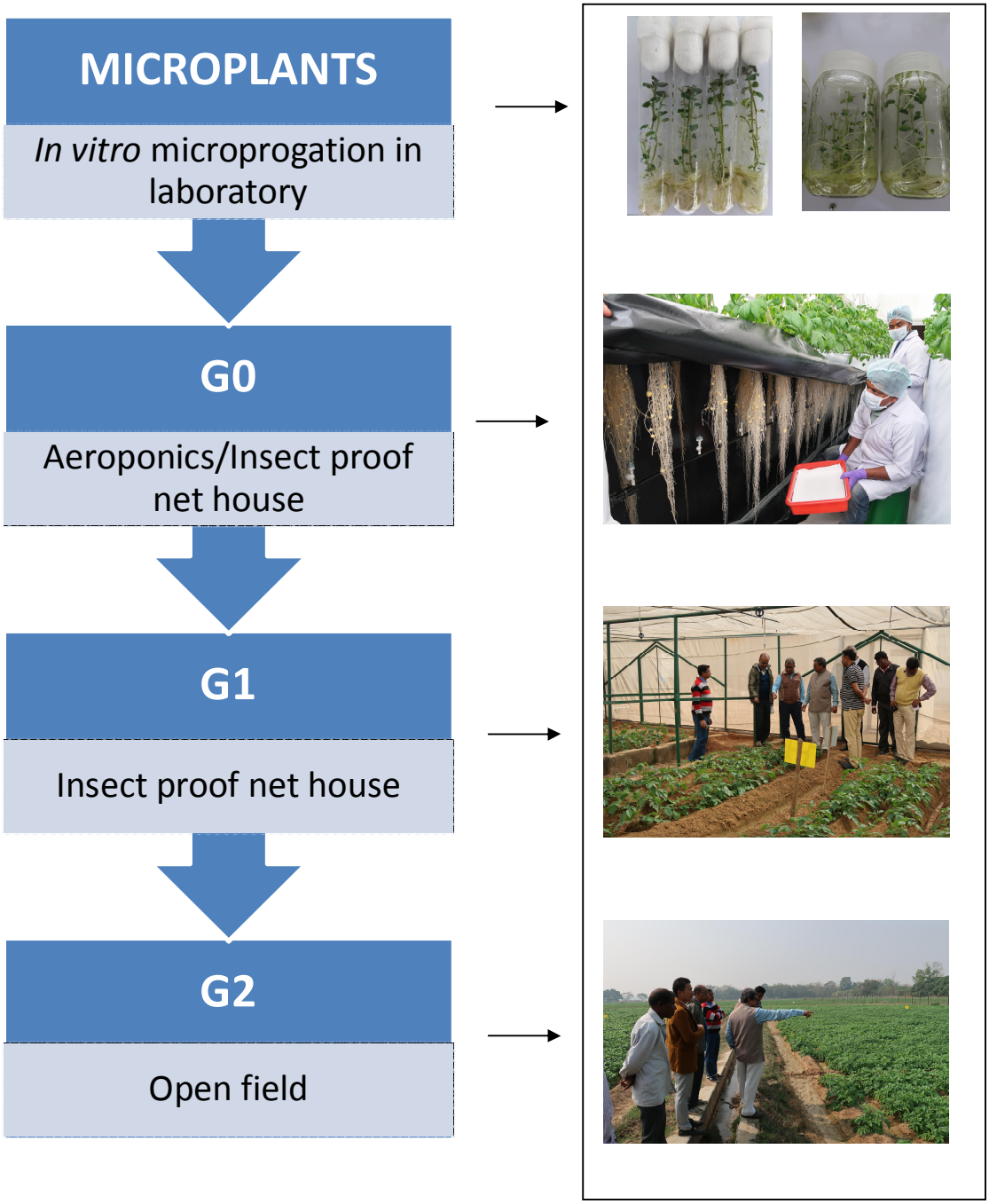
Potato being a clonally propagated crop a high rate of degeneration causes the seed to deteriorate after a few generations for progressive accumulation of viral diseases. Apart from this conventional potato seed production systems are characterized by low multiplication ratio (Max 1:6). So the only answer was to integrate conventional seed production system with Hi-tech system of production involving tissue culture and aeroponics which is being done in the project.

INITIATIVE:

The present project has been sanctioned under RKVY with total outlay of 359.4 lakh for 3 years 2017-18 to 2019-20. To avail the technology needed MOU was signed between Director of ICAR-CPRI, Shimla, Govt. of India and Agriculture Department, Government of West Bengal. As per MOU, CPRI Shimla would give technological support & supply the basic material, i.e. virus free micro plants which would be further propagated in the tissue culture laboratory for subsequent production of G0 tuber (in insect proof net house or aeroponics unit), G1 & G2 tuber .



Flow chart of Hi-tech potato seed production system:



For successful implementation of the project an advisory committee involving scientists from Bose Institute, Kolkata, Bidhan Chandra Krishi Viswavidlaya & experts from seed industry was constituted. .A team of selected scientists of the research wing of the Directorate of Agriculture was transferred to the office of Economic Botanist III WB for implementing the project. All protocols were followed as per guideline of National Certification System of Tissue Culture Raised Plants under Dept of Bio-Technology, Govt. of India. For taking the laboratory generated materials to the fields, the 6 nos. of net houses with sprinkler irrigation facility have been created to accommodate 25000 micro-plants/G0 tubers along with an aeroponics which was first of its kind in the state. It was designed and made operational by the scientists of the state department involved in the project. For quality control infrastructure; the virus testing through ELISA and Genetic Fidelity testing through molecular techniques, were also created.

Virus Testing Laboratory

Genetic Fidelity Testing Laboratory

INVOLVING STAKE HOLDERS:

From the very beginning the stake holders of the project i.e. farmers, seed producers and seed sellers were involved in the project through exposure visit, training programme, workshops for sensitizing & getting their feedback. The seed sellers association has assured for the marketing of the entire produce from Rabi 2019-20. The seed producers were convinced that aeroponics is cost effective & produces highest quality seed. The farmers visiting the farm was happy to see that in the G1 to G 2 seed production in the open field no symptom of virus infestation was observed.

Stake holder's participation

KEY RESULT:

The main output of this project is G2 potato seed tuber which is akin to breeder seed. Production of G2 tuber from micro plant takes 3 seasons. There was also the issue of

establishing the laboratory and determining the Standard operating procedure of the laboratory. So to expedite the matter instead of starting from the beginning of the chain only the procedure was initiated at all stages .As a result the following output has been achieved within a very limited time span .

Year	Infrastructure Developed	Output
First Year 2017-18 (Implemented)	Inspection Bunglow Civil work for office & laboratory Cold Chamber Chain Linked Fencing for high value materials Instruments for the laboratory 3 Net houses	60000- G1 tuber
Second Year 2018-19 (Implemented)	State of art tissue culture laboratory One aeroponics unit 3 more net houses	32000 microplants 12000 G0 tuber 120000 G1 tuber 8 MT G2 tuber Testing of viruses by ELISA .
Third Year 2019-20 (Target)	---	70000 microplants 16000 G0 tuber 150000 G1 tuber 20 MT G2 tuber Virus Testing DNA Fingerprinting

Another important aspect is women from local self help group has been engaged and trained in the job of efficiently on all the steps of *in vitro* propagation.



Plant Tissue Culture Laboratory, at Krishi Bhawan, Abash



Aeroponics unit at P&VSM Farm, Anandapur


Insect proof net house G1 seed production Farm visit

IMPACT:

The most positive impact of the project is change in perception of the seed sector that **yes it is possible to produce quality seed of potato in West Bengal.**

The farmers visiting the farm was happy to see that in the G1 to G 2 seed production in the open field no symptom of virus infestation was observed . An aeroponics unit in private domain has already been set up and it is expected that few more will be added. It is expected that there will be huge up scaling in the downstream after the quality is validated by the farmers when they start growing this seed in their field from Rabi 2019-20.The positive response achieved so far if channelized properly potato seed production is going to flourish in West Bengal . Already there is demand from the stakeholders that this Research Institute act as a testing centre for quality control and training centre for skill development **.**

SUPPORTING QUOTES

 **Mr. Kartick Ghosh Seed Producer**	**I am overwhelmed to see my own eyes that good quality virus free potato seed can be produced in the agro climatic condition of West Bengal. With support from my Govt. I hope I will also be able to start similar project very soon.**
 **Mr. Nisith Kr Ghosh Farmer**	**I have observed that potato seed produced in the project cultivated in the open field does not contain any symptom of disease. I have requested the authorities to provide us some seed so that we can cultivate this from the next season.**
 **Mr.Jyotirmoy Guha Director ,G.M.S Agritech Seed Company**	**It was our long cherished desire to produce good quality disease free potato seed tuber in West Bengal. The proactive role of the Dept of Agriculture, and success of the project has also given us confidence. We have signed MOU with CPRI, set up a aeroponics unit of 2000 plants capacity, net house for (G-0) production. A moderately large capacity tissue culture is also getting ready."**

 **Mr Bishal Kochar Potato Seed Seller**	**The infrastructure created is a state of art. Beautiful well maintained complex. In future it will be a great source for us to buy foundation seed for our seed production programme.**
 **Mr Sukhbindar Singh Scientist,CPRS, Jalandhar, Pioneer in aeroponics in India**	**The aeroponics unit I visited is wonderful. I am confident that within next two or three years there will be great progress with combination of arts and science associated with aeroponics in West Bengal.**

LESSON LEARNED

The project demanded creation of huge infrastructure viz. Tissue culture laboratory with primary & secondary hardening chamber , cold chamber and aeroponics unit which was being done first time in West Bengal .The most challenging task was to set up the infra structure within stipulated time frame . Utmost care was taken so that no error was made in the design or protocol .For this number of experts was consulted, exposure visit was made to learn about other laboratories both in public and private domain.

To make the state self sufficient in potato seed the journey has just began .Now at the downstream the seed producers, seed sellers and farmers mobilization is the top most priority. The project is able to cater the demand of a sizeable proportion of basic materials if at all levels the output of the project is utilized at all levels i.e. microplants ,G0.G1& G2 seed tubers in the downstream. This will be done with highest priority by the state department of agriculture.

LIST OF PROJECT PARTNERS WHO SUPPORTED THE WORK:

For Project Implementation;

1. **Scientists & Staffs of Section of Economic Botanist III ,WB**
2. **(Potato & Maize Research Station ,Directorate of Agriculture , WB)**
3. **Supporting Partners**
4. Department & Directorate of Agriculture , Govt. of West Bengal
5. ICAR- Central Potato Research Institute ï Shimla
6. Dept of Genetics & Plant Breeding B.C.K.V.
7. Seed Certification Agency, Govt of West Bengal
8. AICRP on Tuber Crops ï BCKV Centre
9. GMS Agritech , Pallyshree Seeds

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