



Bio-pesticide Innovations for Bio-enhancement of Seeds and Seedlings

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Background

Peri-urban agriculture constitutes one of the fastest growing markets in the humid tropics, supplying income to producers and food to urban populations. Farmers regularly use chemical inputs to battle with pests and diseases with negative effects on producers, consumers and the environment. Consequently researchers need to reconcile the competing demands of increasing crop productivity and protection of the environment.

This competing demand is for example evident in the rapidly growing vegetable agriculture, especially the intensive, high input peri-urban systems such as those for tomato and egg plants. Out-dated, and sometimes ineffective and highly toxic chemical inputs are regularly used by peri-urban farmers with negative effects. At a global level the European Union has recently introduced stringent quality control measures to check the presence of pests and for conformity with pesticide residue limits on horticultural produce imported from Africa. This has particularly impacted negatively on the horticultural industry, a key foreign exchange earner in eastern Africa due to the high cost of testing.

Microbial biological control methods using bio-pesticides offer a much-needed alternative to chemical pesticide abuse in crops. However, bio-pesticides, if applied the same way as conventional chemical pesticides face hurdles that hamper their commercial use. An



alternative approach is seed treatment with bio-pesticides, a method that is now practiced commercially in Europe, USA and Israel against common pests and diseases. However, little use has been made of this technology in sub-Saharan Africa in spite of its great potential for vegetable and cereal crops grown especially by smallholder farmers. Adoption and application of this technology would be beneficial to the smallholder farmer, consumers and environment.

“Alpha Seed Company Limited expressed its interest and support for this project because the company focuses on the acquisition, development, production and delivery of high quality vegetable seeds to Tanzania farmers. The goals of the project goals are addressing an important aspect in relation to establishment of healthy seedlings in vegetable nurseries and opens up new avenues for the company to serve farmers with new and safe technology.”

Dr. Wilson Marandu *Alpha Seed Company, Tanzania*



Project goal

This project is developing bio-enhanced seeds and seedlings within a regional commercial setting to reduce the impact of biotic and abiotic production constraints in crops, for the ultimate benefit of resource-poor farmers.

The Innovation

A seed coating formula with effective bio control agents and procedure for producing bio-enhanced seeds for maize, tomato and eggplant dressed with bio-pesticides.

Milestones achieved and expected outputs

- The consortium has produced protocols for the application of bacterial and fungal-based bio-control on maize, tomato and eggplant seeds.
- Efficacy test at experimental fields have also been conducted and are currently being validated at famers' fields.

Future prospects

The current methodology that Real IPM – the private sector partner in the consortium – will commercialize involves the farmers acquiring the bio-pesticide in powder form with instructions on how to dress the seeds planting. However this will require that the farmer follows the application protocols carefully for maximal effectiveness. The consortium will continue researching on easier and more effective application technologies to improve the scalability and sustainable utilization and potency of the bio-pesticides.

Participating Countries, institutions and organizations

Research organizations

Jomo Kenyatta University of Agricultural Technology, Kenya

Private sector Stakeholders

The Real IPM Company (K) Ltd, Kenya

Alpha Seed Company Ltd, Tanzania

“The Bio-innovate project is of great interest as it offers an exciting way to deliver biological control agents to the plant in an efficient and simple way. The opportunities to use this technology on many different seed raised crops gives this technology huge potential. For Real IPM to work with bio-innovate reduces the business risks associated with the costs of research to a Kenyan SME like Real IPM. Also the opportunity to access research partners like JKUAT through the Bio-innovate project is invaluable.” **Dr. Henry Wainwright**, Real IPM, Kenya



For more details contact:
Bio-Innovate Program

International Livestock Research Institute | P.O. Box 30709 Nairobi, Kenya
Email: bioinnovate@cgiar.org | Telephone: +254 (0) 20 422 0000 | Fax: +254 (0) 20 422 3001