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Scaling-up biological and organic inputs with regional participation: Technological and social development model for cassava production systems

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RECURSOS BIOFÍSICOS

INTRODUCTION

The biofertilizer application is a valuable alternative for increasing sustainability in many important tropical crops, as cassava, and makes necessary the scale up of innovative technologies

Fundamental changes in agricultural development involve rapid expansion of participative approaches which are based on interactive learning between researchers and farmers (1) This project evaluates in a participative approach, the potential use of biological inputs such as mycorrhizal arbuscular (MA) fungi and organic inputs such as earthworm compost, in order to improve productivity under low fertility soil conditions. On this way, we hope reduce the high dependence on chemical fertilizers and provide good quality seeds to the farmers.

MATERIALS AND METHODS

It was used inoculum of native strains of AM (*Acaulospora mellea*, *Entrophospora colombiana* y *Glomus* sp) produced in up-scaled quantities in pilot and local plants, as well as the production of earthworm compost using Californian red worm.

The participative investigation on biological and organic inputs is summarized in the following stages (see photos) :

1. Participative training activities.
2. Massive production of biological and organic inputs in pilot plants.
3. Construction of local plants for massive production in a participative way with the farmers
4. Interchanges of experience between farmers and investigators
5. Application and evaluation of biological and organic inputs in the ex vitro hardening stage of cassava plantlets, rooting sand banks, breeding ground and field.

RESULTS AND DISCUSSION

To contribute to the solution of these limiting factors , two pilot plants for the scaled production of MA and earthworm compost were established at the regional research centers of Caribia (Santa Marta) and Turipaná (Cereté -Montería) with a capacity of 90 ton/year for MA and 35 t/year for earthworm compost each on.

The use of MA inoculum enhanced the survivor of cassava plantlets in the acclimatation stage up to 22%.

These plants were designed to provide the initial biological and organic inputs to six local plants (management by local farmers), with production capacity of 30 t/year, placed strategically to give access to 54 local participative groups (LPG) from the Colombian Caribbean region. A group of 140 farmers were trained about the use and production of biological and organic inputs.

These products were evaluated under field conditions (Gamarra, Cesar), resulting in a yield increase of 38% for a cassava production system (CM 3606-4), when the plants where inoculated with 20 g of *A. mellea* AM inoculum. Also there was a reduction in the production cost of U.S.$125.5/ha.

CONCLUSIONS

The activities developed have allowed design a model for the scaling-up of biological and organic inputs as a fundamental alternative for a sustainable research handling practice. The direct participation and involvement of small farmers throughout the participative process and technology development contributes to the sustainable innovation model. These activities have an important impact in the production systems, in the community organization and generate new employment opportunity at the regional level without a negative impact on natural resources and environment.

In this way, the formation of entrepreneurial initiatives will have an effect on the social and economic development of the region.

In order to avoid the problem of the low availability of enough amounts of inoculum, the participative process (researchers-farmers) permits the farmers to produce the biological and organic inputs in their own farms.

It is important to emphasize that this participative model allows farmers throughout their active participation to make their own decisions and to learn by doing. This above stages contribute to develop the sense of ownership and empowerment of the grover's communities.

REFERENCES

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Photos: G. Corredor, C. Baquero, D. Suárez.