

AN APPROACH FOR CREATION, TRAINING AND EXTENSION OF SYSTEMS BASED ON DIRECT SEEDING ON PERMANENT SOIL COVER IN MADAGASCAR

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Introduction

Experiments conducted in the 1990's in various ecological zones of Madagascar allowed to propose a large range of cropping systems based on direct seeding on permanent soil cover (DSPSC). To propose solutions and face the many constraints of Malagasy farmers, a unique set of references was developed, for various agro-ecological and socio-economic conditions, with different levels of intensification and risk (Séguy, 2005).

However, although the proposed systems had demonstrated their high agronomic, environmental and economic performances, and proved to be sustainable, their extension remained limited until the beginning of the 21st century.

Main reasons identified to explain this situation, apart from the limited financial resources consecrated to this task, were the very limited human resources and the lack of an approach for extension of knowledge intensive systems, in a difficult environment: subsistence agriculture, smallholders with limited investment means, degraded soils, poor infrastructures, etc. (GSDM, 2004)

Developing an approach for extension of DSPSC in difficult environment

From 2000/2001, TAFA, CIRAD and partners from the Direct Seeding Group of Madagascar (GSDM) developed a holistic approach for training and extension of these systems, at large scale.

Using the experience gained by each of GSDM members working in the fields, with farmers, the approach progressively integrated:

- Various scales: from plots, land units and farms to watershed, villages and communes
- Technical, economic and social aspects
- Cropping systems, animal husbandry systems and natural resources management
- Adaptation of cropping systems and practices to actual farmers needs, training, extension and monitoring/evaluation in an integrated process
- Indigenous and scientific knowledge
- Theory and practice
- Monitoring and evaluation

Main principles of the “hinterland approach” (“approche terroirs”)

In this “hinterland approach”, extension is based on individualised advices at farm level, with close and permanent interactions between farmers, extension agents and researchers. The guarantee for farmers to be able to ask for advice whenever they face problems, and strong technical and practical background of the extension agents helps creating trust and confidence between actors, which is at the core of the process.

For this, a wide basket of options is available and a set of systems can be proposed according to specific farmers' constraints.

In this process, some options are simply demonstrated in the village the first year, before progressive adoption and application by farmers the following seasons.

Farmers can base their choice on visual appreciation of the results, but also on technical and economical information provided by the extension team: costs, risks, constraints and expected performances of the various systems, for the different land units found in a village, etc.

This information is the basis for a sound decision, which is made by farmers themselves. With such an approach, "tailor-made" systems have high chances to be well adapted to their own individual situation and objectives.

The first year, inputs and credit are provided by the extension organisation.

Social organisation is developed at village or commune level to progressively transfer these tasks to farmers themselves (farmers groups for provision of inputs, purchase of equipments, access to bank system credit) but also to develop marketing channels, change social rules when needed, etc..

Monitoring and evaluation allows permanent adjustment of the proposals to fit farmers' needs and feedback to research.

Human resources and training

As DSPSC systems are knowledge intensive, this approach requires an important phase of training (extension agents and farmers). Learning is done by doing, in the villages, over a one year period at least for extension staff, and assistance is given to farmers for 3 to 4 years as DSPSC implies crop rotations, over several year periods.

The best farmers also can be used as relay for multiplication of extension operations, from farmers to farmers.

Results

The positive results obtained during the phase of development and test of this approach led GSDM to propose this approach in the framework of the "Agroecological" project in Madagascar (funded by the French Agency for Development) and intensive work of training has been done in 2004/2005, with 30 technicians and engineers trained over a one year period, 50 regional and national decision makers and ministry staff trained for one week, etc..

Extension at large scale can be done at two different "speed":

- * Rapid, on some specific situations such as poly-aptitude rice varieties in paddy fields with poor water control (Charpentier et al, this congress) in which systems are simple to identify and extend
- * Slower when difficult cropping and economic situations makes the choice of systems and their application more difficult, thus requiring better trained staff and time for farmers to get used to such original practices.

Using this approach, extension of systems based on DSPSC started in 2001/2002 or 2002/2003 (according to agro-ecological areas) with demonstrations and training of the extension teams.

After a progressive increase in areas and number of farmers using DSPSC systems, a real break through has been achieved in 2004/2005 cropping season (Table 1), with an increase of 350% of the areas cultivated with these techniques, and of 270 % of the number of farmers (showing that farmers are increasing individually their areas cultivated with agro-ecological techniques).

Table 1: Evolution of areas (ha) and number of farmers having adopted DSPSC systems in Madagascar

Regions	Area (ha)			Number of farmers		
	2003/2004	2004/2005	% increase	2003/2004	2004/2005	% increase
Alaotra	121.9	570.1	467.7	703.0	1269.0	180.5
Highlands	45.5	108.5	238.5	60.0	299.0	498.3
South-Est	42.7	114.1	267.2	377.0	1302.0	345.4
South-West	30.0	51.0	170.0	29.0	276.0	951.7
TOTAL	240.1	843.7	351.4	1169.0	3146.0	269.1

Conclusions

The strong interest of these agro-ecological techniques for Madagascar agriculture and farmers, their high agronomic, economic and environmental performances made it possible to propose them for extension at large scale.

However, their wide extension in a difficult bio-physical and socio-economic environment required a specific approach, all the more that these knowledge intensive techniques could not be proposed for extension as a "simple" technological package.

To be successful, extension requires qualified extension staff, frequent and intense exchanges with farmers and a progressive intensification of the activities, while trust and confidence between actors is gained. It should also combine close technical support to farmers with improvement of the socio-environmental context, through organisation of farmers to insure timely and cost-efficient purchase of the needed inputs, improve the marketing conditions and make the social environment more favourable

A national strategy for creation, training and extension of these techniques has been designed for Madagascar (GSDM, 2005), and this "hinterland" approach is now recommended for several projects of rural development being prepared or already active in various regions of Madagascar.

References

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