TOWARDS LARGE SCALE EXTENSION OF DIRECT SEEDING ON PERMANENT VEGETAL COVER IN MADAGASCAR: THE GSDM (GROUPEMENT SEMIS DIRECT MADAGASCAR)

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**Key words:** Direct seeding on permanent vegetal cover, extension, training, Madagascar

**Introduction**

Agriculture in Madagascar has to face tremendous constraints: very low investment capacity, poor infrastructure network, low availability and high prices of inputs, but also uncontrolled bush fires (linked to extensive cattle raising) and deforestation leading to severe erosion, loss of arable land and destruction of downstream infrastructures. As a consequence, yields are low and farmers’ condition very precarious. Apart from volcanic soils, covering a very limited area, most soils are derived from acid materials leading to low phosphorus and calcium availability.

In such a difficult environment, techniques of direct seeding on permanent vegetal cover can lead to solutions for sustainable and profitable agriculture.

First experiments on these techniques started in the Central Highlands of Madagascar in 1991, with very limited means. The first results, very promising, led in 1994 to the creation of a NGO, TAFA (TAny sy FAmpandrosoana: Soil and Development), aiming at developing cropping systems based on direct seeding on permanent vegetal cover (DSPVC). With the support of Cirad experts (especially L. Séguy, from Brazil) a range of cropping systems were tested first for these conditions of high altitude tropical climate as found in the Highlands of Madagascar, then to semi-arid conditions as found in the South Western Coast of the island. From 1998/1999, with the support of AFD (French Agency for Development) new research sites were opened to cover the major agro-ecological and socio-economic environments found in Madagascar.

A wide range of cropping systems adapted to various conditions

As a result of these experiments, a very large range of cropping systems can now be proposed to extension (Charpentier et al., 2001; Rakotondrambo and Razanamparany, 1998), covering:

\begin{itemize}
  \item the major agro-ecological zones, from sea level to highlands (over 1700 m), from semi-arid to humid tropical climate, etc.
  \item the major soil type: from very rich volcanic soil to poor red ferrougious tropical sandy soils and very degraded red ferralitic soils, etc.
  \item the major crops grown in each zone (esp. rice, maize, sorghum, groundnut, various beans, potato, etc.) with possibilities of forages production for integration with animal raising, and also cover cropping or inter-cropping in tree plantations, etc.
  \item the major socio-economic situations: from high population density to deserted areas, with or without developed marketing channels, etc.
\end{itemize}
a large range of intensification levels: from very limited inputs (especially fertilisation and herbicides/pesticides) or labour, to labour intensive and/or inputs intensive systems

Extension of DSPVC systems in Madagascar

Although a few activities of extension started from 1995, organized extension of these systems actually started in 1999, with very limited means (from various origins: World bank, French donors, Norwegian and Swiss Cooperation, etc.). However, within 3 years (1999/2000 to 2001/2002), several operators (such as FIFAMANOR: Centre for rural development and applied research, in the Highlands around Antsirabe, BRL Madagascar: Bas Rhône Languedoc in the Alaotra Lake and on the South East of the island, or ANAE: National Agency for Environmental Action in several zones) were all able to extend some of these systems to over a thousand farmers in each working zone, covering hundreds of hectares in the whole country. However, the lack of human resources (especially extension staff mastering these systems) made that only the simplest systems (not always the most suitable for each specific situation) were proposed to extension. This lack of human resources also made it difficult to answer a rapidly increasing demand from farmers for advises and training on these systems.

The GSDM and the “Support to extension of Agro-ecological techniques” Project

Aware of the need to strengthen their capacity and to coordinate their activities, the main organisms involved in DSPVC in Madagascar grouped themselves in an association. The GSDM (Groupement Semis Direct Madagascar) was created in 2000 by: TAFA, the NGO conducting the applied research on DSPVC; FOFIFA, the National Centre for Agricultural Research for Rural Development; FIFAMANOR, a public organism for research and rural development; ANAE, the national agency for environmental action, and FAFIALA, the Centre for experimentation and extension for farmers’ management of the tanety (hillsides)

In 2003, BRL Madagascar (involved in rural infrastructure and development programmes and working since 1999 one extension of these techniques) joined the GSDM, while several other organisations (NGOs, farmers organisations, etc) are interested in joining the group.

From its creation, the GSDM was supported by CIRAD (Centre for International Cooperation for Agricultural Research for Development, France) and received in 2002 the support of AFD (French Agency for Development) and FFEM (French Fund for World Environment) through a project: “Support to extension of Agro-ecological techniques in Madagascar.” This 5 years project aims at strengthening the GSDM and its activities, especially regarding:
Coordination of activities

Research, training and extension activities are closely linked in a continuum (Fig. 1.).

Although the first experiments are conducted in controlled environments, adaptation of cropping and farming systems by farmers is a part of the processes of creation of these systems. Applied research provides thematic researchers with research themes and, in return, is fed by results of these researchers on some specific themes (such as insects control, variety selection, etc.). Training largely relies on actual practice of these systems in the experimental sites and with farmers. These activities of various operators and farmers are coordinated at the GSDM level in order to optimise the efficiency of all partners and to avoid gap in the overall process of creation-training-extension of cropping systems based on DSPVC. Another important role of GSDM is the transfer of information (in both directions) and organisation of training.

Training and capacity building

Training and capacity building is a major objective of the project, with various target groups: Training capacity of the various organisations (especially Tafa, FAFIALA and FIFAMANOR) will be strengthened and training material will be developed. For researchers, field technicians and extension staff, the aim is to provide them with a double competency: mastering of a full range of cropping systems based on DSPVC and understanding of their rationale on the one side, and on the other side, ability to analyse farming systems in order to be able to fit the technical proposals to actual farmers conditions.

Extension

Extension will rely on trained extension staff but first of all on motivated farmers who have adopted DSPVC systems and will receive support (including training) for promoting these techniques to their neighbours. Organisation of favourable environment (especially making seeds and needed inputs available, easing access to credit, etc) also will be an important part of extension work, which requires prior analysis of farmers’ constraints.

Conclusions

The grouping of the main organisations involved in DSPVC in a single association should allow better coordination of the activities required in the long process of creation-training-extension. All GSDM members are aware of the tremendous challenge they have to face, but the potential of DSPVC systems...
demonstrated in the recent years gives great hopes. The Ministry of Agriculture, Animal husbandry and Fishery supports extension of these techniques aiming at increasing durably agricultural production, while the Ministry of Environment sees in it an efficient technique to control erosion and fight against bush fires.

The priority given to capacity building prior to extension activities, the support of the government, the interest shown by farmers and the overall approach adopted by GSDM should allow large scale extension of these systems in various regions in Madagascar.

References
