

Farmers Producing Seed for Farmers

SEED PRODUCTION and distribution are notorious bottlenecks to the dissemination of new crop varieties. National seed systems are all too often under-resourced in terms of staff, equipment and funding, and therefore unable to meet production needs. Côte d'Ivoire, with help from WARDA, is putting farmers in a position to do the job themselves.

It is very frustrating for crop breeders to see the results of many years' work take so long to reach the farmers. It can take up to 10 years for a breeder to develop an improved variety, but it may then take another seven years after release by the national program for enough seed to be produced so that farmers can grow it! And this is not just a problem for rice—it is a well-known phenomenon in countries where the seed service is in the public sector.

This was exactly the problem in Senegal some years ago, so the Institut sénégalais de recherches agricoles (ISRA) set about finding a solution to the problem. Dr Amadou Moustapha Bèye has developed an open system whereby farmers are encouraged to take a small quantity of seed and to multiply it for themselves and their neighbors, which he details in a booklet, *Training Manual on Standards and Techniques of Rice Seed Production*. In May 1998, when he joined WARDA as a Visiting Scientist, he proposed to promote farmer seed production throughout the West Africa region, and especially in Côte d'Ivoire. Here, the rate of certified seed utilization is low and is restricted to irrigated zones, where conventional seed multiplication is implemented.

The problem

The national seed system is market-oriented and is based on the production of certified seeds to European

standards, while the majority of farmers regularly use farm-saved seeds of local varieties. For some years now, the use of improved varieties has been decreasing. The reasons for this are many, including the following:

- lack of Certified seeds of improved varieties
- weak system of variety release and registration
- high costs of inputs
- lack of, or non-functional, seed quality control system
- limited role of the private sector in seed production
- limited supply of Breeder seeds.

The conventional (or 'formal') system for seed multiplication current in Côte d'Ivoire is typical of many developing countries (see Figure 8). Once a variety has been released, the breeder provides 'Breeder' seeds from which three classes of seeds are maintained:

- Foundation or Basic seed (G0, G1 and G2)
- Registered seed (G3)
- Certified seed (R1 and R2).

The seed system is organized by the Sous-Direction des semences et plants of the Ministry of Agriculture. The Laboratoire national d'appui au développement agricole (LANADA) controls each variety's genetic identity and purity during the whole process of seed multiplication. The extension agencies, Projet national riz (PNR) and Agence nationale d'appui au développement rural (ANADER), are responsible for the seed production and distribution to farmers. The system requires about six years from release of a variety to produce sufficient seed for distribution to a large number of farmers. Usually, it's only in the seventh year that any farmer who needs seeds can actually buy them!

The solution

In response to the decline in the use of improved rice varieties, the Ivorian Ministry of Agriculture initiated a special seed revival program in 1998. The program is aiming to change the seed capital in one year for irrigated rice and two years for rainfed rice.

A new scheme of seed production, based on an optimization of farmers' practices and indigenous knowledge, has been proposed as an alternative seed supply mechanism for small-holder farmers (Figure 9). This is being implemented on a trial basis by WARDA with the collaboration of ANADER and Projet BAD-Ouest (a project in western Côte d'Ivoire, financed by the African Development Bank).

Figure 8. Conventional scheme

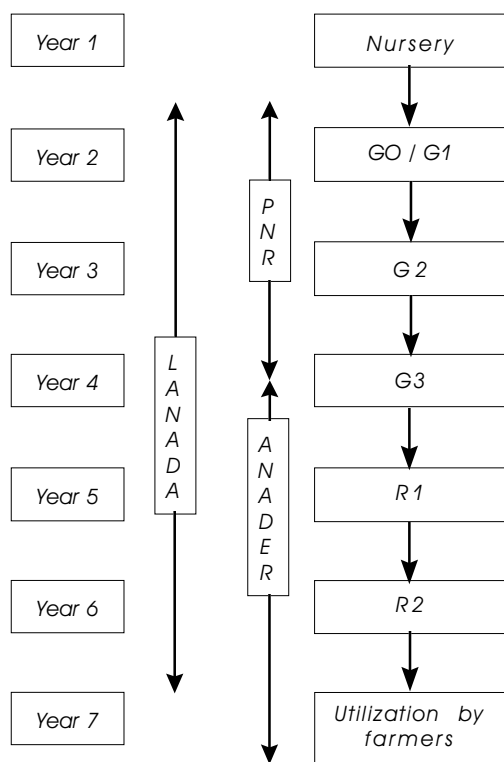
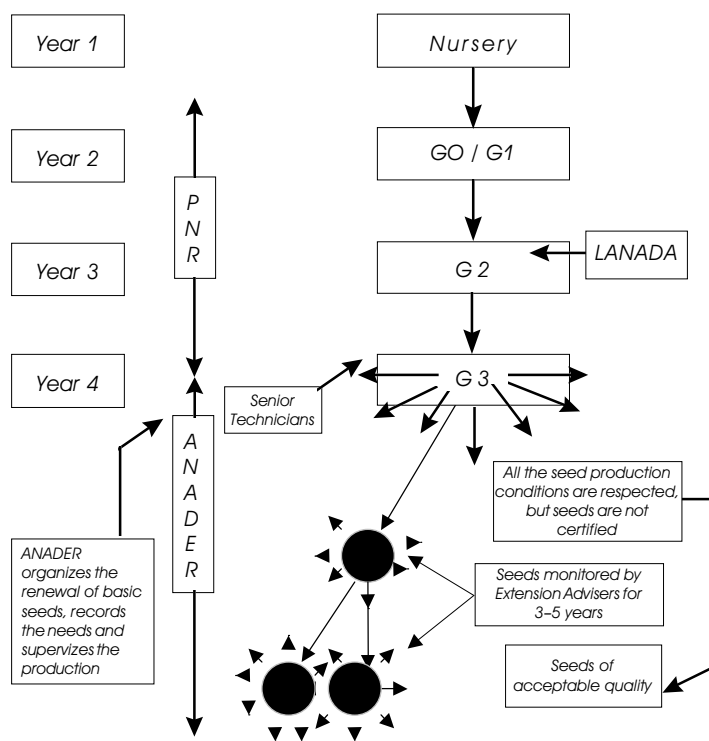


Figure 9. Community-based seed production scheme





Yeo Zana produced 3 tonnes of seed of 'acceptable quality' at Niofouin in the forest zone

It targets subsistence agriculture farmers, who produce about 90% of the national rice production.

A major premise of the new system is that farmers should be able to use seed of 'acceptable quality,' rather than having officially Certified seed. In this system (Figure 9), LANADA certifies only the Foundation seed (G2). The extension services (ANADER and PNR) make small quantities of this seed available to various 'informal' seed-multipliers—for example, farmers' cooperatives, entrepreneurial seed-producers, non-governmental organizations. These will then produce seeds for their communities by using their usual practices. In this way, seed can be provided to (at least some) farmers within four years of variety release—three years earlier than under the purely 'formal' system. At the same time, national seed service resources are not overstretched trying to meet the whole country's seed requirements.

The seed production and distribution is done according to farmers' practices and capabilities. Some simple guidance is given to help farmers maintain the seed purity during a period of 3 to 5 years (see box).

What farmers must do to maintain seed quality

Successful application of this model of community-based seed multiplication is not simply a matter of handing over a few seeds to a few farmers, however select they may be. First, farmers must be willing to produce their own seeds. Those that are willing receive advice on:

- purification of seed, by the removal of 'off-types' (that is grains which do not conform to the standards of the variety);
- choosing the best panicles (the plant heads bearing the seeds) before harvesting for food;
- careful handling of seeds during harvesting, threshing, winnowing and storing;
- proper drying of seed;
- germination testing of seed.

Rice is a self-pollinated crop, which means that the vast majority of the seeds harvested are genetically the same as those sown, so farmers do not have to replace their seed stocks every season. The major concerns of deterioration of seed quality over time—that is, reduced germination ability and purity—are monitored at the farm level by the extension services.

Does it work?

The model has been successfully tested in 1998 in collaboration with ANADER in five localities—Man, Danané, Odienné, Korhogo and Boundiali—where several on-field workshops were organized with farmers. Discussions were held on seed purification, drying, germination testing, storage, and the conservation of landraces.

With sponsorship from the BAD-Ouest Project, two seed production booklets have been written, one for farmers with limited education and the other for the ANADER extension agents who work directly with the farmers. These booklets are being prepared for use in the next farmers' and extension workers' training sessions to be held within the region.

From 26 to 31 October 1998, a training workshop entitled *Improvement of Farmer-saved Seed: A New Approach for Sustainable Subsistence Agriculture* was held in Man (western Côte d'Ivoire). The meeting brought together WARDA researchers, officials from the target region and organizing institutions, ANADER and BAD-Ouest Project extension agents and farmers, to discuss on how to ensure a better application of the model in Côte d'Ivoire.

Farmers who participated in the meeting, especially women, displayed a good knowledge of on-farm seed production, proving that seed multiplication based on local practices and indigenous knowledge is a viable option. At the end of the workshop, the Head of the Seed Production Service of ANADER decided to adopt and implement the model (as a complement to the formal system) as soon as possible, and has asked WARDA to provide technical assistance by training their technicians in the necessary techniques (on-farm monitoring and training of farmers).

Training constitutes a major activity of the model. It has three components. First, field-workshops, in which farmers share experience and discuss progress with

extension agents and researchers on how to improve the seed quality at farm level. Two or three such workshops are organized during the rainy season.

Second, a training session which focuses on:

- how to organize harvesting and postharvest activities better
- how to set-up a network at the village level
- the maintenance of variety purity
- the maintenance of seed germination ability
- seed testing.

Finally, an awareness and evaluation workshop at the end of the season, which discusses:

- seed distribution at the village level
- evaluation of the impact of the seed system at the regional level
- assessment of farmers' needs for the next season.

Through the training, farmers are encouraged to store every year about 50 kg of seeds of acceptable quality of improved, as well as traditional, varieties. Training is also a good opportunity to teach technicians on how to optimize farmers' practices and indigenous knowledge in seed production.

Training workshop in Man (Côte d'Ivoire): diplomas were presented to the farmers by the Mayor of Man, and ANADER and BAD-Ouest officials



Traditional seed storage in the savanna (above) and humid forest (right) zones: these systems are well adapted to farmers' realities



The results are exciting. A recent case study in Korhogo showed that many farmers involved in the farmer-saved seed program have established their own reserves. For example, in N’Ganon and Niofouin, the farmers’ groups have delivered to their respective ‘Village Unions,’ 2 tonnes of seeds of each of WITA 1 and WITA 3, and 2.5 tonnes of WAB 56-50. These seeds will be disseminated throughout the villages in the Prefectures of Niofouin and Sirasso. Support has been also given to farmers who have requested seed of newly released varieties (Table 3).

Table 3. Recently released rice varieties distributed to farmer seed producers in Côte d’Ivoire

Region	No. locations	Varieties†
Danané	14	WITA 1, WITA 3, WITA 7, WITA 9
Man	50	WAB 56-50, WAB 56-125, WAB 96-1-1, WITA 1, WITA 3, WITA 9
Korhogo	20	WAB 56-50, WAB 96-1-1, WAB 56-125, WAB C 165, WITA 1, WITA 3, Bouaké 189
Boundiali	5	WAB 56-50, WAB 56-125, WAB C 165

† Bouaké 189 is an Indonesian variety introduced through an IRRI international nursery; WAB 56-50, WAB 56-125, WAB 96-1-1 are WARDA upland varieties; WAB C 165 is an upland variety introduced from Brazil; WITAs are WARDA/IITA lowland varieties—1, 3 and 7 are for irrigated or rainfed farming, 9 is for irrigated only.

The benefits

The model is simple to run, because it can be merely a matter of selecting the best panicles—to be used for seed, rather than grain (food)—at harvest time. Thus, seed ‘production’ begins at the on-set of the harvesting campaign, whereas the conventional model runs from before sowing when the producer has to declare an intention to produce seeds.



For farmers to become seed producers, they need merely select the best panicles at harvest time and harvest them separately

The model has several advantages over the conventional system.

- It is an open system, utilizing the farmers’ cultural practices and their channels for seed distribution, and it encourages the full promotion of traditional varieties. The conventional system is ‘top-down,’ with complete control by the seed authorities.
- It reduces the seed production costs, which are similar to the costs of producing paddy.
- It reduces the time for a newly released variety to reach to the farmers, from 7 to 4 years.
- It helps any farmer who is interested to produce seeds with ‘acceptable quality.’
- It facilitates the rapid dissemination of improved varieties and incorporates traditional varieties into an official seed system.
- It encourages the availability of seeds of ‘acceptable quality’ at the village level and a consequent improvement in production.

This new scheme offers a further avenue for the dissemination of the interspecific progenies (*Oryza sativa* × *O. glaberrima*) into the agricultural subsistence system; helps farmers to become more self-sufficient in seeds, and helps them to better handle local indigenous diversity. With the high level of adoption of the interspecific progenies in Côte d’Ivoire, Ghana, Guinea, Nigeria and Togo, farmers will need a better targeted approach to help them ensure good maintenance of, as well as access to, seeds of improved varieties as well as from traditional ones. This model is one such approach.