



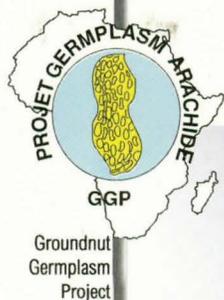
Common Fund  
for Commodities



Food and Agriculture  
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# Training Workshop

*Technical Manual  
Guidelines for groundnut seed production,  
storage and distribution  
for traditional farming systems*



Groundnut  
Germplasm  
Project



International Crops  
Research Institute  
for the Semi-Arid  
Tropics



Centre de Coopération  
Internationale  
en Recherche Agronomique  
pour le Développement



Institut Sénégalais  
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Session 2

## Seed program adapted to farmers' production

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## Introduction

**G**ood quality seed plays an important role in the genetic potential of any plant variety. Use of improved seed should be an integral part of development. The motivation of producers to use good quality seed from a specialized seed system is as important as the recommended varieties responding to the various agro-ecological constraints to production, which will guarantee the quality needed and assure short-range distribution at affordable prices to growers and different types of demand. The farmer can only adhere to this strategy if the improved seed will improve his/her production, through higher yields, reduced pest and disease risks and improved revenue. The scheme should also guard against climatic shocks or epidemics (drought, diseases, pests). It has to be appropriate to the smallholder farmer systems of seed multiplication.

In order to be set up, the seed sector requires a special organization to support regulations, specific infrastructure for production, seed handling, storage and commercialization. In most countries this system exists and can serve as a starting point for revitalization of the production of improved groundnut seed. The functioning and details of these systems will be presented during the course of this workshop.

## Multiplication Scheme

The groundnut seed is voluminous (approximately 70% of the pods). The coefficient of multiplication is low. Sometimes one needs 80-150 kg of pod to cover one hectare. Under rainfed conditions, the coefficient of multiplication is rarely more than 10 (at the moment very few producers have irrigation facilities available). In such cases, one tenth of the area cultivated should be reserved to seed multiplication. Quantities stored are also important and particular care is needed to maintain the quality of the product. Producers should not keep a large quantity of produce, which has not benefited from technical procedures to ensure the necessary quality. It is estimated that the farmers' own seed should not exceed two thirds of the total seed capital.

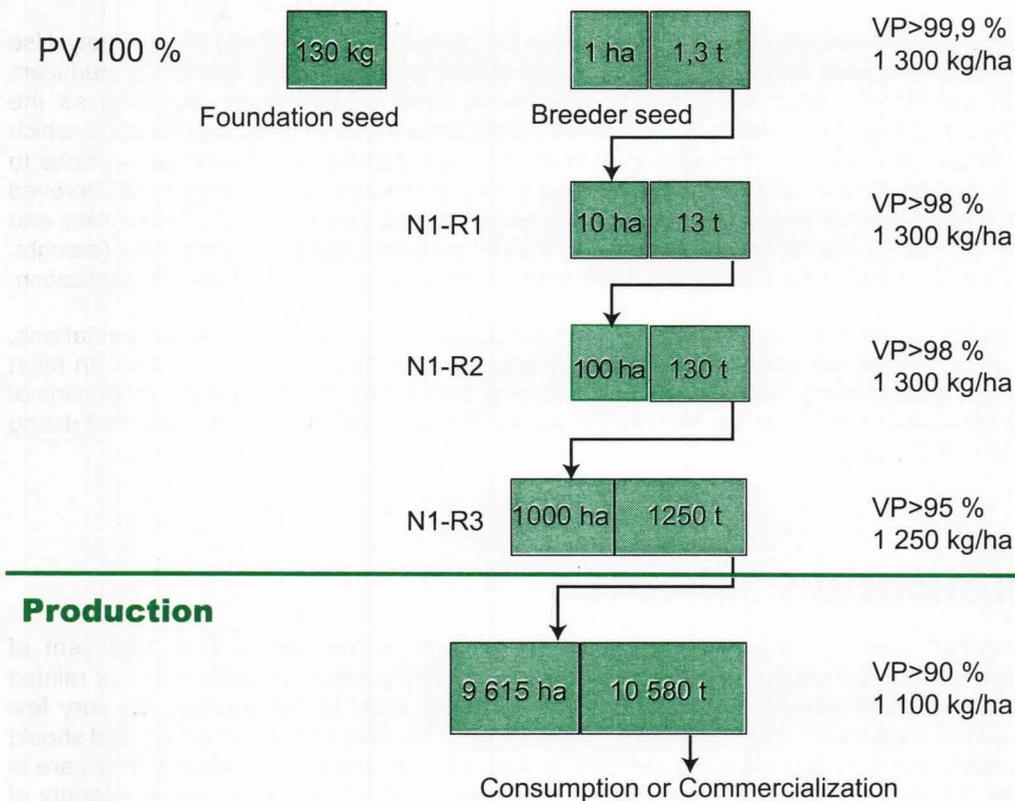
Due to the low multiplication rate, production of certified seed necessitates production at different controlled levels. Foundation seed is often produced by national agricultural research systems while successive classes are carried out by other producers to obtain the necessary quantities (Fig. 1).

An indicative scheme is based on the following principles:

- Centralized management of initial generations (N1) of multiplication and control functions, adherence to the seed polices guided by a variety map and transfer of seed stocks from excess to deficit zones.
- There should be strict control of the first two levels produced by research. This structure is composed of specialized seed farms, cooperatives, a network of contract growers and eventually irrigated farms to assure the quality and quantity of the production. For this strategy to be efficient, it must assure 10 percent of the total seed capital. The commercial sector can intervene at this stage.
- On-farm multiplication of the last generation in the genealogical sequence (N2) is assured by farmer organizations.
- Transfer of seed payable at the counter or reimbursed after harvest in cash or kind with interest, which contributes to the finance of the scheme (10 to 20% in general).

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## Seed Multiplication



## Production

N: level	1 ha: area planted
R: generation	1,3 t: total production from the area planted
VP: varietal purity	1 300 kg/ha: pod yield

Figure 1 : Multiplication of improved seed at various levels for a target of 1,000 t.

This system implies:

- A good technical level of producers and organizations
- A certain degree of state control in the organization of the seed sector and seed credits
- A strong vertical coordination between different levels of intervention and a close association between commercial sector and farmers.

The multiplication scheme is developed on the basis of precise demand, which helps fix the objectives of production. In addition, regular evaluation of seed stocks from previous years and farmers' own seed helps to correctly estimate requirements thus leading to better stock management. However the demand from producers is dependent of several factors, which can be summarized as follows:

- Demand for seed for reasons of poverty
- Demand for seed due to loss of stocks (disaster)

- Demand for seed due to lack of on-farm stocks
- Demand for seed to renew the variety
- Demand for seed to introduce a new variety

The groundnut seed sector is faced with classical problems associated with production and sale of self-pollinated crops. More importantly, the agricultural situation in many countries of the sub-region require transitional mechanisms which can help transform a market that was heavily subsidized by the state towards markets driven by commercial considerations and producers themselves. Privatization does not often take into consideration the weakness of smallholders who produce for subsistence to have access to certified seed. Faced with this situation, the informal sector has become the major source of seed without taking quality, diffusion of new varieties and agricultural training development into consideration.

Based on past experience, certain failure could be due to :

- Lack of logistics, human and financial means by public seed organizations.
- The private sector is more interested in production of hybrids, which are more profitable,
- Poor development of commercial seed at the community level with limited financial resources.
- Hoarding of seed stock by traders without regard to quality and concern for agricultural development in general,
- The existence of cheap seed stocks at the farm gate that have not been produced following technical guidelines, have not been renewed and have been poorly conserved, leading to rapid and significant genetic losses.
- Poor diffusion of new varieties adapted to production constraints
- An extension system that lacks means to function
- Lack of recognition of the role of women in agriculture (this is amplified by the rural exodus of male members of the family to urban areas to look for cash to make ends meet)
- Poor rural infrastructure (roads, electricity, telephone etc.), which is a handicap to agricultural development.
- Lack of regular access to good quality seed.

It is important to develop realistic strategies for future development of the seed sector in the sub-region. Seed production by public organizations, supported by donors, cannot be a sustainable system. Seed production by producers themselves appears to be the most appropriate under current socio-economic conditions in the sub-region. Community based seed production schemes will permit production at reasonable cost in the production zone. This will facilitate their promotion, adoption and distribution. This participatory methodology, along with the use of good quality seed and other inputs will also be a means of enhancing the technical capacity of rural communities. In order to be efficient, the intervention of farmers has to be under the auspices of a structure associating other stakeholders in the seed sector.

In Senegal for example, up until 1985, groundnut seed was entirely produced by state-owned organizations (extension and inspection services). Seed was multiplied each year using foundation seed provided by research, the state was responsible for further multiplication and distribution to producers. After 1985, the state disengaged itself from the process leaving it to development and agriculture credit organizations with preference to buy seed over the counter.

An organization was created to handle seed multiplication contracts, buying of seed and management of security stocks. Later with a new agricultural policy it was decided to transfer part of the seed stock to producers to constitute their proper personal reserves. Individual means of storage were put in place (village stores). These stocks were subject to inspection by the technical services. It was also decided that the stock would be renewed every three years, which considerably reduced the production of controlled seed with consequences on seed quality and

quantity. This policy has led to a reduction in certified seed bought by producers in preference for their saved seed or from the parallel market. At present the sector is based on three components:

- Research, which is the repository of breeder seed, will assure the promotion of improved varieties
- The National Inter-professional Seed Union (UNIS) which is an association of private operators, has the objective to organize producer groups, coordinate production and commercialization activities of foundation and certified seed and facilitate relations between the state and eventual donors (annex 3).
- The seed division, a state structure that regulates seed production and certification

The case of Senegal shows the basis for a national system that merits existence. However, it can be different in other countries. Each country has to identify a system that responds to the needs of the producers and the capacity of state structures and private investors.

## Role of Stakeholders

The seed sector must represent a framework of dynamic harmony between different stakeholders and a coordination of activities that will offer to producers good quality seed and other inputs that are essential for the best production.

### Role of the public sector

The public sector must manage a functional seed sector ensuring:

- Respect and application of seed regulations and quality control of products. Quality standards must be defined in relation to the Inter-professional organization. There has to be a compromise between seed produced to meet international standards, but priced beyond the reach of most producers and seed from markets which do not ensure the genetic potential of the variety. The seeds must be of sufficient quality (varietal purity, specific weight, rate of germination) to ensure excellent crop establishment and performance.
- Production, maintenance and periodic renewal of seed capital (emergency situations)
- Research support to assure development of new varieties and production of breeder seed. Research services have to be in perfect harmony with farmers in variety development, as sometimes food security supercedes high yield. On-farm evaluation of varieties is primordial considering the gap that exists between on-station and on-farm yields.
- Groundnut germplasm conservation.
- Registration of new varieties in national catalogs.
- Promotion of new varieties (extension services, press, radio etc)
- Access to credit (especially women's groups)
- Financing agricultural training
- Making available unused facilities (stores, laboratories, shed etc) to NGOs and private enterprises (emergence of private structures subsidized by the state)
- Development of rural transport and communication to make production zones accessible.

### Role of producers and associations

Producers occupy center stage of the organization ensuring a larger part of seed production on their farms. This is appropriate for groundnut seed production as already described. Because of its low multiplication rate this crop requires production of substantial quantities of seed (10 percent of the total production), which requires a larger number of producers. However, the notion of producers has to be clearly defined and can even be considered as a specialization. In this

business of seed producers which includes certain farmers, agricultural groups and other private organizations, there is a need to establish rules to be followed by stakeholders who will guarantee quality seed and a climate of confidence among producers and users of seed. Certain rules and principles are presented in session III -seed regulation-standards and techniques. Outside of the role of seed producers, farmers and other concerned associations could:

- Contribute to evaluation of new varieties on their farms in collaboration with research. Increase improved crop development by applying techniques can serve as an example to other farmers in the rural community.
- Contribute to technology transfer
- Reinforce distribution channels of seed and inputs

On the basis of the examples from Senegal (annex 2) a seed producer intervenes within the limit of a contract associated with a national seed union. This union supports producers, interfaces with producers, the political powers and industrial sector and manages seed quality. No doubt there may be independent seed producers who handle and sell their own seed, but on one hand groundnut seed represents large volumes with associated procedures (cleaning, storage, phytosanitary protection), which are rarely applied by smallholder producers. On the other hand the Inter-profession does follow and respect a minimum of regulations (initial seed origin, technical procedures), which are fundamental to assuring quality production. The producer association has negotiating power for credits and loans.

Certain interventions such as shelling and sorting can be handled by seed producers themselves to allow them to better improve their work provided that it is controlled.

## Role of private/industrial sector

The industrial sector is less attracted to handling and commercialization of self-pollinated crops such as groundnut. However, there are opportunities, particularly under irrigated systems where revenues justify the use of improved seed. Another opportunity is to create small storage and handling units (cleaning, sorting and treatment) within the production zones. The state can play a facilitating role in credit, taxes and other means to allow emergence of small enterprises.

## Discussion

After the states disengaged from production and distribution of seeds each country has tried to put replacement mechanisms into place. In Senegal for example the national union (UNIS) produces 20% of the national needs, which represents 100% of the certified seed distributed to producers. The seed sector in Senegal is relatively well organized but still fragile. A number of constraints have been identified:

- For political reasons, the state can buy and distribute seed to farmers, which can destabilize the emerging private sector involved in seed multiplication and distribution schemes.
- The existence of an informal sector, which has imposed reduced margins on seed producers in order to remain competitive even when the products are not the same.
- Multiplication of first generation stages in secure areas (irrigated farms for example to ensure high seed quality)
- Occasional free distribution of seed by NGOs or at a reduced price can disturb the system. These organizations should be more involved in providing credit, technical assistance and training.

From the system described in this session, discussion focused on types of services put in place in the different countries in the sub-region and possible ways to improve them to respond to the

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## Session

## Seed program adapted to farmers' production

needs of edible groundnut producers, small, medium and large producers and exceptional situations (e.g. emergencies). **The situation in Mali, Niger and Nigeria were explored in greater detail.**

**In Mali,** privatization of seed production has not yet been implemented. This is currently the responsibility of the national seed service which multiplies seed of type R1 with contract farmers and R2 by village seed producers. This production is based on the demand by farmers. The information is taken to village associations who express their demand through the extension services which then places orders with the seed service. The latter produces and distributes R1 seeds with support of contractual farmers. This state managed system functions with small quantities (several tons) and due to lack of financial and human resources, cannot meet seed requirements.

**In Niger,** following the structural adjustment program, the state completely disengaged itself from producing and distributing seed without putting a replacement structure into place thus creating a vacuum. Farmers currently procure seed from their own saved seed or from local markets. It is important to note that farmers are conscious of using improved seed and this has been the trend in the last two or three years. Private producers are beginning to form associations capable of satisfying the demand for certified seed. They wish to develop into "seed professionals". The Institut National de Recherche Agronomique du Niger (INRAN) has taken the initiative by setting up a seed unit to ensure excellent quality of breeder and foundation seed upstream of the emerging private sector. This active association of private producers has become the brokers of the government in seed production, despite the fact that it continues to encourage the supply of ungraded seed (grain) to producers. There are similarities between this emerging system in Niger and that of Senegal based on the initiative of private seed producers.

**In Nigeria,** as stakeholders in the groundnut seed sector, the research services recommend new varieties and completely fulfils its role. Other stakeholders include the national seed service, which is a government agency and private operators. Nevertheless, the organizational structure remains theoretical because apart from the work of researchers, the informal sector dominates seed distribution. There is a real vacuum between research and seed users. This is due to policies that do not encourage private sector initiatives. To reverse this trend, there is a need for the state to encourage private seed producers to invest in the groundnut seed sector as well as that of other crops, such as maize and rice.

**In conclusion,** the upstream areas of the groundnut seed production chain must be liberalized , preferably after the research level, which produces breeder seeds, in order for the stakeholders to organize themselves and invest in the industry. There could be an intermediate phase (similar to Senegal's Seed Autonomy Project), which will allow an emerging private seed sector to position itself as a veritable stakeholder in the industry. There is a need to progressively transfer responsibilities from public to private sector. A clear national policy on seed production is important so that stakeholders will have clearly defined roles.