

Chapter **14**

**Seed Collection at the
National Tree Seed
Centre of Burkina Faso**



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Summary

Following the drought of the 1970s, Burkina Faso has carried out various reforestation projects in order to satisfy the energy needs of the population. The realisation of these projects has made the supply of quality seed more essential. Thus, the National Forest Seed Centre (CNSF) was created in 1983 with the main assignment of providing development agencies and research structures with well sampled, viable and healthy seeds. To fulfill this mission, CNSF works particularly on:

- seed collecting, through regional tree seed offices (named ARSF) and village participation;
- controlling seed provenance, through the establishment of six so-called seed zones and identifying criteria for seed sources; and
- improving harvesting techniques, e.g., in relation to phenology, processing methods and nursery skills.

A detailed prospection undertaken throughout Burkina Faso has enabled CNSF to select thousands of natural and planted stands (populations) for about 110 species from which specific mother trees of each species can be chosen. Observations on the phenology of the different species have also enabled the identification of appropriate harvesting periods for each species. As a result, CNSF has become one of the first West African Centres to specialise in all aspects of tree seed handling in the Sahelian and North Sudanian phytogeographic zones. CNSF aims to join the Organization for Economic Co-operation and Development (OECD) system as a certified supplier of seed from these designated stands.

Introduction

The Centre National de Semences Forestières (CNSF) is an Etablissement Public à caractère Administratif (EPA), i.e., a public institution of an administrative nature. Created in 1983, its main assignment is to provide producers, development and research structures with forest tree seeds that are well sampled, viable and healthy. Activities within the CNSF are divided into three areas: (1) seed production; (2) applied research; and (3) training and extension.

CNSF is represented within the country by four regional extension offices, named ARSF (Antennes Régionales de Semences Forestières). They carry out field experiments and are equipped with seed technology laboratories. They are also in charge of collecting seeds in their designated area.

Seed Collection Strategy

Seed production is a process including many steps, starting from the collection of seeds from defined seed zones (Figure 14.1), transportation and handling of the seeds and their subsequent storage for conservation and sustainable use. The seed collection step is particularly important, as harvesting time affects seed quality and thus subsequent conservation performance and the quantity of harvest should be sustainable. Therefore CNSF has developed a seed collection strategy which more and more includes the participation of the local population. It is aimed at better protection and conservation of the natural seed resource. This strategy is outlined in Box 14.1. In summary, CNSF can directly collect seeds at higher cost or purchase seeds collected by local people at lower cost. In return, the villagers not only receive payment but are also supported technically through training. As a consequence of this arrangement, there is better protection of the seed stands and improved sustainable use.

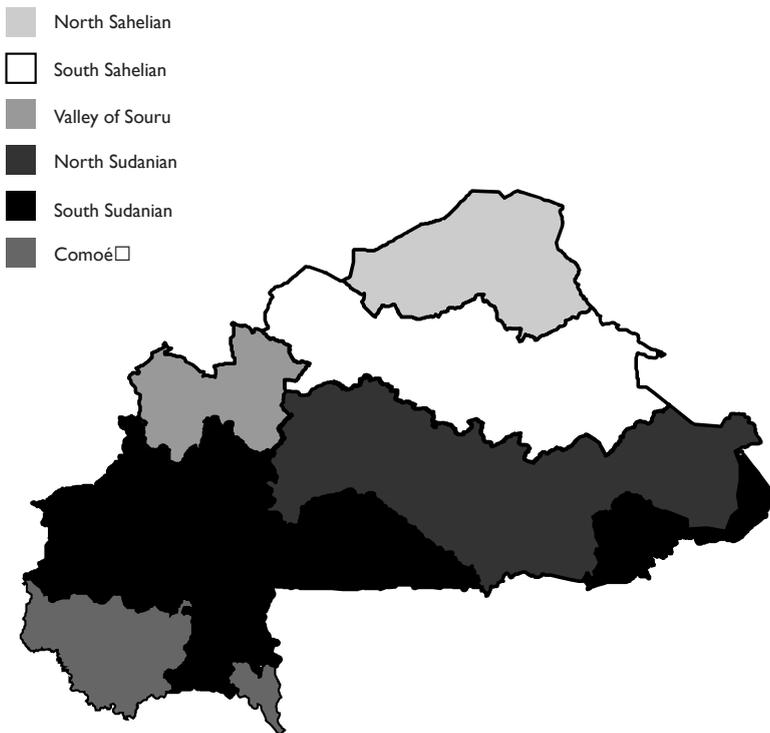
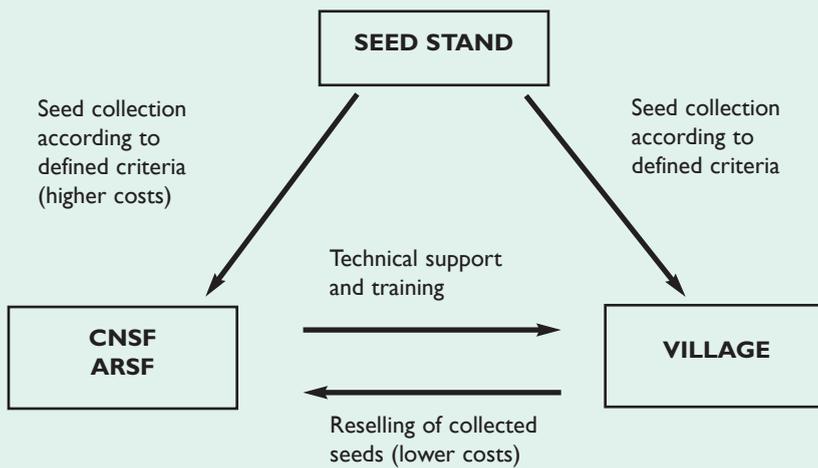


Figure 14.1 Seed zones in Burkina Faso.

Box 14.1 Seed collection strategy and implementation

- 1 Prospecting in the national geographical range of the species in question in order to localise and select high quality seed stands. Thousands of natural stands of 110 species have now been selected.
- 2 Definition of seed zones, which takes into account the administrative, climatic and ecological parameters for area. Six zones have been identified for that purpose (see Figure 14.1).
- 3 Participation of the local population in management of the local seed stands as well as seed collection. Local people are trained in seed harvesting and seed handling techniques. Seed quantities thus produced are then purchased by CNSF on the basis of a contract signed by both parties. As they become aware of the financial benefits of these stands, the local people develop an interest in protecting and preserving them. This ensures durability of the seed sources, as follows:



Criteria for Seed Source Selection

There are eight criteria for stand selection for tree species. These are based on the method of Nanson and Jacques (1999), as follows:

- pureness (homogeneity) by nature;
- isolation from poor stands of the same species or other species able to form hybrids with the chosen species;
- uniformity;
- stand size – the stand should have at least 25 to 30 individuals with a minimal spacing of 100 m between the mother trees in order to avoid collecting seeds from trees of the same parent;
- age of the stands – the stand should be neither too young nor too old;
- morphology – the stand should have a good shape;
- health/resistance – most of the trees must be free from disease and must thrive in the physical conditions of the environment; and
- silvicultural qualities – the stand should be good in all aspects.

Within the selected stands, individual "plus" trees are chosen. They have to be healthy in appearance, have a well developed canopy, good fruit production and good silvicultural qualities.

Period and Harvesting Techniques

1. Harvesting Period

The stage at which seeds are harvested has an important impact on seed germination capacity. Seeds harvested too early will be immature, fragile during handling and storage, and will give low germination (Masse, 1992). When harvesting is too late, there may be seed loss through dehiscence, predation by birds, and attack by insects and fungi. It is therefore very important to determine when fruits first become mature so that better collections can be made with respect to the amount of well sampled, viable and healthy seeds. Details of the optimum time for seed collection is presented in Table 14.1 for 17 species, in relation to particular seed zones.

Table 14.1 Optimum month of harvest and seed zones for 17 important forest species based on information from Axel (2000) and Balima et al. (1997)

Species	Harvesting period	Seed zones
<i>Acacia nilotica</i>	February to March	1, 2, 4, 5
<i>Acacia senegal</i>	October to November	2, 3, 4
<i>Adansonia digitata</i>	March to April	1, 4, 5
<i>Anacardium occidentale</i>	February to March	5, 6
<i>Bauhinia rufescens</i>	February to March	1, 2, 4
<i>Combretum micranthum</i>	November to December	3, 4
<i>Faidherbia albida</i>	January to February	1, 2, 4, 5, 6
<i>Guiera senegalensis</i>	February to March	4
<i>Khaya senegalensis</i>	February to April	4, 5
<i>Lannea microcarpa</i>	May to June	2, 3, 4
<i>Parkia biglobosa</i>	March to May	2, 4, 5
<i>Piliostigma reticulatum</i>	November to December	2
<i>Pterocarpus lucens</i>	November to December	1, 4, 5
<i>Saba senegalensis</i>	June to August	2
<i>Tamarandus indica</i>	January to February	2, 4
<i>Vitellaria paradoxa</i>	June to August	2, 3, 4, 5, 6
<i>Ziziphus mauritiana</i>	December to January	1, 2, 3, 4, 5, 6

2. Harvesting Techniques

There are many harvesting techniques. These range from simple ones, such as picking seeds up from the ground after natural seed fall, to advanced ones, involving sophisticated and expensive equipment such as elevated platforms, mechanical shakers or even balloons or helicopters (Schmidt, 2000). At the Seed Centre in Burkina Faso, the following techniques are normally used: (1) harvesting by climbing inside the tree canopy; (2) harvesting with a pole; or (3) harvesting from the ground by catching/collecting the falling seeds on a sheet underneath.

Conclusion and Outlook

The statute of CNSF as a public institution, allows an administrative structure that is flexible and efficient. This means that the institute can strongly support the development of the country through the production and distribution of improved forest seeds.

In the future, CNSF aims to improve seed production in collaboration with local people and to join the Organisation for Economic Co-operation and Development (OECD) system as a certified producer of tree seeds.

References

- Axel, M.J. (2000). *Stratégie nationale intégrée de production et diffusion des semences des espèces ligneuses du Burkina Faso*. Danida report for CNSF. Danida, Forest Seed Centre, Humlebaek, Denmark. 55 pp.
- Balima, R., Yaméogo/Gaméné, C.S., Belem, B. and Nikiéma, A. (1997). *Manuel de récolte, préparation et conservation des semences forestières (aide-mémoire)*. Internal report of CNSF. 26 pp.
- Masse, L. (1992). La récolte des cônes dans l'opération d'approvisionnement en semences, pp. 91-101. In: *Comptes rendus du Colloque sur "Les semences forestières" tenu au Québec, 12-13 Février 1992*. Ministère des Forêts du Québec. Québec, Canada.
- Nanson, A. and Jacques, D. (1999). *Stratégie d'amélioration des essences forestières au Burkina Faso. Rapport de mission d'évaluation*. 93 pp.
- Schmidt, L. (2000). *Guide to handling of tropical and subtropical forest seed*. Danida Forest Seed Centre, Humlebaek, Denmark. 511 pp.