

# Pack 117

Type: Backgrounder

2021

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**Backgrounder: Good practices in production and post-harvest management. Adapting to and mitigating climate change in conventional soybean production in Togo**

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**Introduction**

The cultivation of soybeans was introduced in Togo in the 1980s, with the aim of providing a dietary supplement in protein and reducing malnutrition. But it was only in 2010 that Togolese producers adopted the crop. Since then, soybean production has grown significantly, and Togo is a leader in conventional soybean production (soybeans grown using herbicides and pesticides, usually on large plots of land) in West Africa. Soybean cultivation has become profitable not only for soybean farmers, but also for other actors in the value chain. It is a cash crop (export-oriented crop) that is competitive with cotton, which is the leading cash crop in Togo.

**Some key data on the soybean sector in Togo**

* Soybean production is an important source of income for farmers.
* Soybeans are easy to store.
* In 2019, nearly 300,000 people were working in the soybean sector in Togo.
* More than 13,350 producers were identified in Togo in 2019.
* The country produced 176,000 tons of soybeans (organic and conventional) for the 2019-2020 crop season.
* Close to 50 billion FCFA in revenue for the 2019-2020 commercial year.
* The average yield per hectare is estimated at 760 kg/hectare, while some producers in the central region can yield up to 1.8 tons/hectare for conventional soybeans.
* The production chain is well-organized and managed.
* Producers are supported by microfinance institutions and aggregators.
* The soybean sector has a good market due to local processing capacity and export demand to Asia for conventional soybeans.

**Expected impact of climate change on conventional soybean cultivation and harvesting**

* The fluctuation of conventional soybean prices in Togo and the rest of Africa is largely linked to climatic conditions.
* Togo experiences climatic risks due to marine currents that cause extreme temperatures and irregular seasons in the south of the country. This is exacerbated by climate change, one of the main consequences of which is the disruption of rainfall (sometimes early or late) throughout Togo. This reduces crop yields, as soybeans are affected by the same stresses as other rain-fed crops.
* At maturity and harvest, excessive and often late rains hamper drying and storage activities and lead to a deterioration in seed quality.
* Producers do not have the technical and financial skills and means to control water on the farm. Every year, they have to deal with the variability of the climate and seasonal production that is limited in time.

**Strategies for coping with climate hazards and changes**

Confronted with the whims of the climate, managing water is the crucial problem that producers face. Several public agencies work to address this issue and improve farmers’ resilience.

* In collaboration with the Ministry of Agriculture and other partners, the meteorological service is working to specify sowing times for soybean producers, based on variety. This helps farmers sow at the right time to benefit from the available rainfall.
* Producers are mentored to adopt climate-smart farming techniques that fit with the climatic changes they face. For example, a farmer who experiences excessive rainfall accompanied by intense winds at a time when the soybeans do not need it, can ridge the soil around the plants to strengthen them. Farmers can also create dikes or terraces to reduce damage from water erosion.

**Gender dimensions of the soybean sector in Togo**

* The soybean sector is an important source of income for women, who have a monopoly over artisanal processing.
* Men have an overwhelming monopoly on agricultural production in Togo, while women are very involved in marketing. They buy soybeans from producers and resell them either retail in local markets or to exporters. Soybeans are a home banking reserve for women through the storage and resale system.
* Artisanal production of soy cheese, soy milk, and soy mustard is an income-generating activity for women in rural, peri-urban, and urban areas.

**Key information on soybean cultivation and marketing**

**1- Choice of varieties and seeds**

*Varieties*

As recommended by the Togolese Institute of Agricultural Research and other technical organizations, soybean producers in Togo generally use improved varieties. In Togo, there are four soybean varieties adapted to the climatic conditions:

* TGX1485-1D: matures in 90-100 days.
* TGX2004-13F: matures in 90 days.
* TGX2008-2F: matures in 85 days.
* TGX 1910-14F: matures in 107 days. This variety is the most cultivated in Togo.

*Seeds*

* Togo producers do not grow genetically modified soybeans.
* There is a national network of co-operatives and producers of certified seeds supervised by the Direction des Semences et Plants.
* The emergence of soybean-exporting aggregators is one of the factors that has increased adoption of certified seed by small-scale producers. These aggregators pre-finance farmers’ purchase of certified seeds and make funds available as crop season credits.

**2- Soil selection and preparation**

*Choice of soil*

* Choose a light soil that allows water to pass through and that easily drains.
* Soybeans like flat ground rich in organic matter.
* Grow soybeans after sorghum, millet, maize, or cotton.
* Avoid growing soybeans on soils where voandzou, groundnuts, cowpeas, and pigeon peas were previously grown. It is not recommended to grow soybeans for more than two consecutive seasons on the same plot, or to produce several soybean varieties on the same plot in the same season.

*Soil preparation*

* After deforestation (for new farms) and land clearing (for existing farmland), small and medium-sized producers plow the soil with a hoe or with animal traction. Using tractors for land preparation is beginning to spread, thanks to the system of renting tractors by the hectare in some areas.
* The distance between ridges or rows is 50 to 70 cm, depending on whether land is plowed by hoe or animal traction.
* Soybean cultivation does not require nitrogen-rich fertilizers. But when soils are poor, organic fertilizer is used, ranging from 3-5 tons per hectare, depending on how poor soils are. If manure has been applied to the previous crop, it should not be applied again.

**3 - Sowing**

* Use certified improved seed at 40 kg per hectare.
* Sow in rows, preferably after a rainfall (15 -20 mm rainfall).
* Sow in rows, placing two seeds in 3-4 cm deep holes with 20 cm between holes.
* Within six days of sowing in rows, sow again in pits where seeds have not germinated, maintaining 20 cm between planting pits.
* Choose sowing dates to ensure that maturity coincides with the end of the rainy season to facilitate good drying of the soybeans. This will vary by variety.
* It is recommended to inoculate soybean seeds to promote biological fixation of atmospheric nitrogen in root nodules. Inoculation improves soil fertility and, in turn, yield. In Togo, farmers use Mycotri and Mycoplus (inoculant brand names) or NoduMax.
* Flat and in-line seeding are preferred to ridge seeding because density on ridge seeding is always lower than the recommended standard (250,000 plants/ha).

**4- Weed management**

It is recommended to remove weed competition for nutrients, which favours root and seedling development. Two weedings are recommended:

* The first weeding should take place 15-20 days after sowing.
* The second weeding should occur 35-40 days after planting. During this period, hilling, earthing up, or ridging (piling soil up around the base of a plant) reinforce root development and maintain soil moisture and pod filling.

**5- Pest and disease management**

* The varieties recommended to farmers in Togo are resistant to nematodes (roundworms often called the scourge of soybean) and to soybean diseases. Other pests include defoliating caterpillars and pod bugs.
* In caterpillar and bug attacks, use an insecticide.
* In both organic or conventional soybeans, it is very rare for Togolese producers to observe serious disease or pest outbreaks. In the case of a severe infection or outbreak, farmers should discuss the situation with an agricultural expert in order to choose an appropriate pest control product.

**6 - Harvesting and storage techniques**

You can recognize a mature soybean plant by the yellowing and falling leaves. The pods also turn brown and make a rattling noise when the plant is shaken.

*Harvesting*

Although it is easier to uproot the plants during harvest, it is better to harvest the soybeans by cutting the stems at ground level. The roots left in the ground help to fertilize the soil.

Then, dry the cut plants with their pods in a clean area or on a tarpaulin. The pods should be shaken to see how dry they are. When the soybeans rattle inside the pods and crackle under the teeth, this indicates that the soybeans are ready for threshing.

*Threshing, winnowing, and sorting*

Threshing is done in a large, clean, clear area to pick up seeds that are thrown far outside the threshing area.

Winnowing and sorting is done to separate debris from seeds.

*Drying*

Some buyers consider soybeans to be dry when they reach 9% moisture content. It is recommended to expose the seeds after threshing to the sun before packaging them for storage in the warehouse.

*Storage*

After winnowing, sorting, and drying, the soybeans can be stored in bags. It is important to place these bags on pallets or on waterproof material that separates the soybeans from the soil to avoid contact with moisture as this can lead to an increased incidence of fungal diseases and rot. The beans should be stored in a dry and ventilated place.

**6- Organization and marketing of conventional soybeans in Togo**

Most soybean producers in Togo are organized into groups and co-operatives. They receive technical support from aggregators, associations, and the Institute of Support and Advice (ICAT), and decentralized financial systems (DFS).

This organization makes it possible for farmers to benefit from a stable market, which motivates them to increase the area they dedicate to soybean cultivation each year, replacing crops such as maize and cotton.

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**Definitions of key words**

*Soybean seed inoculation*: Promotes increased biological fixation of atmospheric nitrogen in root nodules.

*Voandzou:* A legume also called a ground pea, native to West Africa (Burkina Faso, Chad, Mali, Niger and Senegal), where it is widely grown for its seeds.

**Acknowledgements**

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*This resource was supported with the aid of a grant from The Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) implementing the Green Innovation Centre project.*