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REPUBLIC OF CAMEROON  
Peace-Work-Fatherland

MINISTRY OF AGRICULTURE  
AND RURAL DEVELOPMENT

SECRETARIAT GENERAL

DEPARTMENT OF PROFESSIONAL  
AGRICULTURAL ORGANISATIONS  
AND SUPPORT TO FARM ENTERPRISES

SUB-DEPARTMENT OF AGRICULTURAL  
EXTENSION

# TECHNICAL AND ECONOMIC DATA SHEET FOR SOYA BEAN PRODUCTION AND POST-PRODUCTION



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## **OBJECTIVE**

This technical data sheet is designed to help producers acquire the technical skills needed to increase soya bean productivity and production. At national level, this tool will help to mitigate the effects of food crisis and limit imports. It is also a support and reference tool for extension workers and rural advisers in terms of producer capacity-building.

### **I- GENERAL INFORMATION**

Soya bean (*Glycine max*) is a legume grown mainly for its protein and oil rich seeds. It is also grown for its stems and leaves, which are used as green manure and fodder for livestock. Soya bean is grown in the Far North, particularly in Mogode (Mayo-Tsanaga Division), in the North (Mayo-Rey Division), in Adamawa (Vina Division), and in the High Plateaux of the West Region under the same conditions as other legumes (cowpeas, voandzou, groundnuts, etc.). However, soya bean can be grown in all agro-ecological zones of Cameroon. Good soya bean yields in the field can only be achieved through the correct technical itineraries. Soya bean farming is best suited in areas with annual rainfall of around 900 to 200 mm, temperatures ranging from 20 to 40°C, and a soil ph of around 5.5 to 6.1.

### **II - TECHNICAL ITINERARY**

The following stages must be respected:

#### **II.1. Field selection**

It is recommended that the soil be well drained, but not gravelly. Soya bean grows better on deep, sandy soil with good water retention capacity. It is a fragile plant that does not like too wet soils. It can grow in light, very poor or acidic soils.

#### **II.2. Seed quantity and treatment**

60 to 70 kg of seeds should be provided per hectare. They should be treated (if they have not yet been treated) with an insecticide-fungicide (such as Calthio, Caiman, Momtaz, etc.) to protect them against soil insects, damping-off and seed-eating birds.

#### **II.3. Soil preparation**

For a new farm, soil preparation begins in April, and in May/June for old farms where this crop has already been grown.

Table 1: Agro-ecological zone and soil preparation period

<b>Agro-ecological zone</b>	<b>Preparation period</b>
<b>Sudano-Sahelian zone</b>	May - June
<b>High Plateaux Zone</b>	Season 1: February – March Season 2: July – August
<b>Guinea High Savannah Zone</b>	May - June
<b>Bimodal rainfall forest zone</b>	Season 1: February – March Season 2: July – August
<b>Monomodal rainfall forest zone</b>	February – March

### **1<sup>st</sup> option**

Clear the plot and cut small shrubs;

Plough with a (donkey or cattle) plough or tractor after a heavy rain. This applies to all agro-ecological zones;

Organic manure can be applied before ploughing to the tune of 3 tonnes/hectare.

### **2<sup>nd</sup> option**

Cut small shrubs on the plot;

Use herbicides (Round up + Diuron or Gramoxone + Diuron) for chemical weed control.

However, it is important to ensure that the products used are approved.

Plough the plot with a plough (cattle or donkeys) or tractor at least 7 days after applying the herbicide and after a heavy rain.

**NB. If the soil is fairly loose after the first rains, you should not plough and consider direct seeding for each of the 2 options**

## **II.4. Sowing Period and Method**

The table below indicates the sowing periods for each agro-ecological zone

**Table 2 : Agro-ecological zones and sowing periods**

<b>Agro-ecological zone</b>	<b>Sowing period</b>
<b>Sudano-Sahelian zone</b>	June
<b>High Plateaux Zone</b>	Season 1: April-may Season 2: July – Mid-August
<b>Guinea High Savannah Zone</b>	June
<b>Bimodal rainfall forest zone</b>	Season 1: April-may Season 2: August -September
<b>Monomodal rainfall forest zone</b>	April-may

Sow in rows, with 3 seeds per cluster, with 50 cm spacing between rows and 15 cm between clusters in the row. Re-sowing takes place 7 to 10 days after sowing, only for empty cluster.

***Sowing density:***

40 cm x 15 cm (flat) with 3 seeds per cluster;

45 cm x 15 cm (flat) with 3 seeds per cluster;

50 cm x 15 cm (flat) with 3 seeds per cluster;

50 cm x 20 cm (flat) with 3 seeds per cluster;

70 cm x 15 cm (flat) with 3 seeds per cluster;

80 cm x 15 cm with 3 seeds per cluster;

**Quantity of seeds: 60-70 kg**

**Sowing depth 2-3 cm**

## **II.5. Crop maintenance**

**Weeding:** For properly prepared land, 2 weeding cycles are sufficient to control weeds. The **1<sup>st</sup> weeding** takes place 2 to 3 weeks after sowing and the **2<sup>nd</sup> one** (combined with ridging), 35 to 40 days after sowing.

The surroundings of the farm should be kept clean to reduce insect and pest attacks.

### **Phytosanitary protection for soya bean**

In general, soya bean is not vulnerable to many attacks. However, if there are any signs of attack in the field, you should contact the extension agents for appropriate advice. Nevertheless, a preventive insecticide and fungicide treatment (maneb), applied about 4 weeks after sowing, will help prevent any attacks.

### **Fertilisation:**

Fertilisation is highly dependent on agro-ecological zones. It is advisable to contact local extension and advisory services for optimum fertilisation. However, phosphorus and potassium inputs are generally required. These fertilisers should be applied during soil preparation (ploughing, harrowing). They can be applied as soon as the crop emerges, with 50kg/ha of phosphorus and 100kg/ha of potassium. These fertilisers are available on the market in the form of KCl and Superphosphate. Apply 14-23-14 200kg/ha and complete at fruiting with a potassium-rich foliar fertiliser. After pod formation, apply a potassium-rich

foliar fertiliser 12-12-46 or another formula at a rate of 1-2kg per hectare, supplemented with insecticide to preserve seed quality.

## **II.6. Harvesting and post-harvest operations**

Harvesting takes place when the pods are mature, when the leaves and stems begin to turn yellow and dry out, and the pods turn brown or grey.

The pods must be harvested quickly to avoid losing the seeds due to dehiscence (bursting of the pods) in the variety grown. For second season harvests, it is advisable to thresh the soya beans on the tarpaulins directly in the farm: pick the pods early in the morning, leave them for a few hours under the sun and then thresh. The haulms can be buried to improve soil fertility.

Harvested haulms are stored in a shed for varying lengths of time. The pods are threshed and winnowed to remove the broken seeds, waste and foreign matter.

Potential yield per hectare is around 2.5 tonnes for the NCRISOY-1 variety, 3.0 tonnes for the NCRISOY-2 variety and up to 3-3.5 tonnes for TGX 1835-10E, with crude protein content of 35% and 38% respectively and oil content of 18%.

## **II.7. Storage**

Seeds harvested during the rainy season must be dried to avoid mould and rotting. The seeds should be dried thoroughly, bagged and placed on a floor in a dry and well-ventilated place. Soya beans suffer very little damage during storage. It is recommended to use insecticide to ensure good preservation or store soya bean beans in PIC bags for direct consumption.

## **II.8. Products and by-products**

Oil, meal  
Yoghurt, milk  
Cakes, infant flour  
Hay for animal feed

### III - PROVISIONAL OPERATING ACCOUNT FOR 1 HA (For illustration)

#### BUDGET

Operations	Units	Qty	Unit cost	Total	Yr1
<b>I.INVESTMENT COSTS</b>					
<b>1.2.1 Small equipment</b>					
Sprayer	U	1	35,000	35,000	35,000
Machete	U	4	2,500	10,000	10,000
Hoe	U	4	3,500	14,000	14,000
All-purpose carrier	U	1	85,000	85,000	85,000
Triple decametre	U	1	10,000	10,000	10,000
Overall	U	1	15,000	15,000	15,000
Bucket	U	3	1,500	4,500	4,500
Boots	U	1	5,000	5,000	5,000
File	U	4	1,000	4,000	4,000
Twine	Roll	1	3,000	3,000	3,000
Gloves	U	3	2,500	7,500	7,500
Face mask	Pack	1	1,000	1,000	1,000
Nameplate	U	0	0	0	0
<b>Subtotal Small equipment</b>				<b>194,000</b>	<b>194,000</b>
<b>2. OPERATION EXPENSES</b>					
<b>TOTAL INVESTMENTS</b>				<b>194,000</b>	<b>19,4000</b>
Land rental	ha	1	50,000	50,000	50,000
<b>2.1 Inputs</b>					
Seeds	1 kg sachet	40	800	32,000	32,000
Insecticides (Cypermethrin)	Litre	1	5,000	5,000	5,000
Herbicide Nicosulfuron	Litre	1	5,000	5,000	5,000

N-P-K 20-10-10	50 kg bag	2	27,500	55,000	55,000
<b>Subtotal inputs</b>				<b>147,000</b>	<b>147,000</b>
<b>2.2 Works</b>					
Soil preparation					
Clearing/Cleaning	HJ	20	2,500	50,000	50,000
Ploughing		20	2,500	50,000	50,000
Staking and sowing		6	2,500	15,000	15,000
Spreading mineral fertiliser	HJ	2	2,500	5,000	5,000
Insecticide treatment	HJ	2	2,500	5,000	5,000
Herbicide treatment	HJ	2	2,500	5,000	5,000
Weeding/Ridging	HJ	15	2,500	37,500	37,500
<b>Subtotal Works</b>				<b>167,500</b>	<b>167,500</b>
<b>2.3 Harvest and post-harvest operations</b>					
Harvesting	HJ	10	2,500	25,000	25,000
Transportation and handling	FF	1	50,000	50,000	50,000
Threshing, winnowing and packaging	HJ	10	2,500	5,000	5,000
<b>Subtotal harvest and post-harvest operations</b>				<b>80,000</b>	<b>80,000</b>
<b>TOTAL OPERATION EXPENSES</b>				<b>394,500</b>	<b>394,500</b>
<b>TOTAL EXPENSES</b>				<b>588500</b>	<b>588500</b>

## DEPRECIATION

Designation		Qty	Unit cost	Total cost	Lifespan	Year	1 Season/Year	2 Seasons/Year
Sprayer	U	1	35000	35000	3	11,666.66667	2,916.666667	5,833.333333
Machete	U	4	2500	10000	2	5,000	1,250	2,500
Hoe	U	4	3500	14000	2	7,000	1,750	3,500
All-purpose carrier	U	1	85,000	85,000	5	17,000	4,250	8,500
Triple decametre	U	1	10,000	10,000	2	5,000	1,250	2,500
Overall	U	1	15,000	15,000	2	7,500	1,875	3,750
Bucket	U	3	1,500	4,500	1	4,500	1,125	2,250
Boots	U	1	5,000	5,000	2	2,500	625	1,250
File	U	4	1,000	4,000	1	4,000	1,000	2,000
Twine	Roll	1	3,000	3,000	1	3,000	750	1,500
Gloves	U	3	2,500	7,500	1	7,500	1,875	3,750
Face mask	Pack	1	1,000	1,000	1	1,000	250	500
<b>TOTAL DEPRECIATION</b>						<b>75,666.66667</b>	<b>18,916.66667</b>	<b>37,833.33333</b>

## FINANCIAL RESULTS

Designation	Price	Qty	Total	1 Season/Year	2 Seasons/Year
Operating costs				394,500	789,000
Depreciation				18,916.66667	37,833.33333
Turnover	240	2000	480,000	480,000	960,000
Gross margin				85,500	171,000
<b>Net profit</b>				<b>66,583.33333</b>	<b>133166.6667</b>