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Cowpea Seed Production Guide

for GIZ- FANSER farmers

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Table of Contents	Page

Foreword

This guide is intended for cowpea seed multiplication. This is part of the collaboration between GIZ-FANSER Project and the Ministry of Agriculture – Zambia Agricultural Research Institute (ZARI) and the Seed Control & Certification Institute (SCCI).

The aim of the guide is to give a practical guidance to small-scale farmers involved in the production of cowpea seed to successfully achieve the desired yields and acceptable seed quality for pass on to other beneficiaries in subsequent seasons under the GIZ - Food and Nutrition Security, Enhanced Resilience (FANSER) Project. The guide discusses among other things the recommended agronomic practices as well as the seed certification and monitoring procedures that are required for the successful production of a cowpea seed crop.

The FANSER Project is operating in Luapula and Eastern Provinces with the aim of improving the nutritional situation for women of reproductive age and children under 2 years. To achieve this, one of the several strategies employed by project is to support crop diversification through legume production especially cowpea. In this regard, 130 selected farmers (40 in Katete, 40 in Petauke and 50 in Sinda) have been receiving cowpea seed and training in seed production practices for which this guide is purposed.

The guide therefore aims to firmly ground beneficiaries with the necessary knowledge and skills to grow cowpea seed using recommendations from agricultural research contrary to what the households have been traditionally practicing.

With this approach, GIZ – FANSER Project aims to support the increased access to improved cowpea seed in the targeted communities.

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COWPEA SEED PRODUCTION GUIDE

1.0 IMPORTANCE OF COWPEA

1.1 Nutritive Value

- Cowpea complements maize and other carbohydrate foods in rural diets
- Its protein content is between 23-30 percent
- Cowpea flour is added to bread and cookies worldwide
- Its leaves are cooked and eaten as relish

1.2 Small-scale farmers grow cowpea for the following reasons:

- It is a cheap source of proteins both from grain and leaf especially for rural diets
- It is a source of income from the sale of both grain and leaves
- Easy to grow and can be planted late in the season
- It gives you food in 2 months and can planted 2 times in a season in valleys
- It can be grown with less or no fertilizer
- It is drought tolerant due to its developed tap root
- It improves soil fertility when used as a green manure, cover crop, intercrop or in rotation
- It is used as fodder for livestock.

2.0 PRODUCTION CONSTRAINTS

- Limited knowledge and skills on improved production practices
- Non availability of improved varieties
- Use of local varieties that late maturing and give low yields (200-300 kg/ha)
- Crop losses due to disease and pest incidences
- Poor crop management.
- Unpredictable rainfall patterns

3.0 CLIMATIC REQUIREMENTS

- Cowpea can be grown under a wide range of climatic conditions.
- They will tolerate heat and relatively dry conditions and can be grown with less rainfall and under adverse conditions.
- However, cowpea is sensitive to cold environments

4.0 SOIL REQUIREMENTS

- Cowpea is adapted to a wide of soils, including acidic soils, but it is sensitive to water logging.
- In high rainfall areas, soils should have good drainage, or the crop should be grown on ridges.

5.0 SITE SELECTION

- Choose fertile land. But not too fertile.
- Avoid steep sloping land to prevent soil erosion
- Choose well drained soils but avoid very sandy soils.
- Avoid area with difficulty weeds like Cynodon *(Kapinga),* Nut sedge *(Ndao),* Striga *(Kaloi)*

- Practice crop rotation to avoid build-up of pests and diseases as well as contamination from previous crop
- Avoid fields prone to water logging**.**

6.0 TIME OF PLANTING

- Plant from first to second week of January
- Planting too early may cause crop loss by the rains after maturing
- Deliberate late planting allows to escape pests early in the season

7.0 LAND PREPARATION OPTIONS

- Plant on flat after ploughing
- Plant in rip lines (you may require herbicides)
- Plant in ridges especially in high rainfall areas

8.0 PLANTING

- Plant in well prepared soil with fine tilth
- Plant in moist layer of soils to ensure good germination
- Plant at 3-4cm depth with one seed per station

9.0 RECOMMENDED SPACING

- 60 X 10cm bunch types
- 75 x 15cm spreading types

10.0 FERTILIZER

- Cowpea meets much of its nitrogen needs by nodulation
- But for higher yields you can apply 25 kg/lima of D Compound at planting
- Or apply **only** well decomposed manure in rip lines at 3 coca cola cans per 1 meter.
- **Too much** fertilizer may lead to prolonged vegetative growth with few or no pods

11.0 WEED CONTROL

- It is advisable to destroy weeds at planting
- Always keep the field free from weeds
- At flowering, only remove weeds using hands
- Weed early with the first weeding at 3 weeks after planting
- Weed at least two times per growing season
- You may require to use herbicides at planting if the weed pressure is high. But this should be the last option.

12.0 HARVESTING

- Harvest when most pods have dried & have turned brown and leaves start to drop off.
- Cowpea should be harvested in dry weather
- Harvesting is mostly done by hand
- Late harvesting leads to losses due to shattering & pest damage
- You may require to harvest more than once as pods do not mature at the same time

13.0 DRYING

- Dry the harvested pods in the sun for a few days (not more than 5 days)
- Do not over-dry the pods by observing over-drying signs such as shattering

14.0 THRESHING / WINNOWING

- Can be done by hands for small quantities
- Light beating using sticks for bigger quantities
- Care must be taken not to damage seed
- After threshing, clean the seed and separate them from chuff through winnowing

15.0 SORTING / GRADING

- Sort out good and clean seed by grading
- Use hands or mesh
- Screen out any foreign matter like little branches, leaves, stones, sick seed or husks.

16.0 STORAGE

To protect the Seed from post-harvest losses:

- Dry it before storing (MC 8-10 %)
- Use the salt method to determine if its dry enough
- Or pinch the seed between the fingers, if it creates a dent then it's not dry enough
- Store in a cool, well ventilated dry place.
- Cowpea seed can be treated using
    - Actellic powder / Shumba,
    - Seed Guard
    - Tephrosia powder (powder (1 cup of tephrosia per 3 cups of seed)

Determining seed dryness using the 'Salt Method'

- Use a dry jar, salt and a sample of dried seed
- Fill the salt into the jar up to a quarter
- Add the sample of seed into the jar up to half
- Close the jar, shake it and let it settle for about 10 minutes
- Check if no salt is stuck on the sides of the jar
- If damp salt is stuck on the sides of the jar, the seed is still too moist

- Keep seed away from moisture and rodents
- Store on raised platform e.g. on palates or logs

Caution

- Treated seed should not be eaten
- Read instructions carefully before using chemicals

17.0 SEED CERTIFICATION AND MONITORING PROCEDURE

17.1 Seed Grower Registration

- A farmer intending to grow a seed crop must register as a “seed grower” with SCCI.
- A Seed grower must be trained in seed production.
- Each registered seed grower is required to pay a fee of K195 / ha / crop (subject to revision by SCCI).
- Deadline to register is 30 November. Late registration carries a penalty.
- Only certified seed obtained from a recognised institution must be grown for seed production.
- Classes of seed; A (Pre-basic seed), B (Basic seed), C1 (Certified seed 1st generation), C2, C3 and QDS (Quality declared seed).

17.2 Seed field inspection

- Only a registered seed crop can be inspected for certification.
- Three (3) field inspections must be conducted within the crop growing period. (Vegetative, flowering and maturity stages)
- Ensure the seed field is accessible for inspection

17.3 Isolation Distances & Rogueing of off types

- Leave 10 meters Isolation distance from another cowpea field for all cowpea seed classes including Pre-basic & Basic seed, Certified Seed C1, C2, C3 and QDS
- Rogue out all plant species that look different from the rest of the plants. Consider plant height, growth habit, leaf shape, flower color, pod color etc.
- SCCI inspectors tolerate maximum of 2 off-types per 1000 plants

1.7.3 Seed Sampling and laboratory testing

- Seed must be sampled (1 Kg of seed) and tested for purity and germinating before certification
- Currently, an appropriate fee of K75 / test /sample is charged for the laboratory tests done
- Purity test (% by weight) should be 99 for Pre basic & basic, 98.5 for C1, C2, C3 and 98 for QDS
- Germination % by number should be 80, 75 and 75 for Pre & Basic seed, certified seed and QDS respectively

- **Unregistered, uninspected, non-sampled and untested seed fails to be certified as seed**

TABLE 1: SOME IMPROVED COWPEA VARIETIES

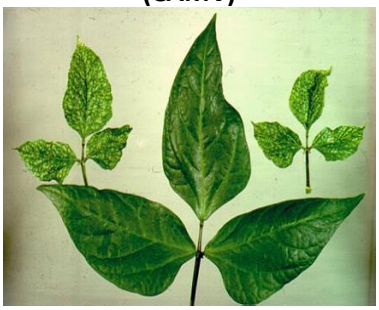
VARIETY	ATTRIBUTES
Lutembwe 	▪ Dwarf / bush type ▪ Seed Colour – light brown ▪ medium seed size ▪ Matures in 75 – 90 days ▪ Seed Rate: 15Kgs/Ha ▪ Broad Leaves; good for relish ▪ Yield: 2.0-2.5 t/ha
Bubebe 	▪ Dwarf / bush type ▪ Narrow leaves ▪ Seed Colour – Red ▪ Small seed size ▪ Matures in 60 – 75 days ▪ Seed Rate: 15kg/Ha ▪ Yield: 1.0-1.5 t/ha
Msandile 	▪ Dwarf / bush type ▪ Narrow Leaves ▪ Colour – white with Black Hilum ▪ Medium Seed size ▪ Matures in 60 – 75 days ▪ Seed Rate: 15-20 Kg/Ha ▪ Yield: 1.0-2.0 t/Ha
Namuseba 	▪ Dwarf/bush type ▪ Broad Leaves ▪ Colour – Cream white with brown hilum ▪ Medium seed size ▪ Matures in 65 -80 days ▪ Seed rate is 15-20kg/Ha ▪ Yield: 1.0-2.0 t/ha
Mtilizi 	▪ Semi-climber type ▪ Broad Leaves ▪ Seed Colour – brown ▪ Medium seed size ▪ Matures in 70 – 85 days ▪ Does not easily get damaged by weevils ▪ Seed rate is 15-20kg/Ha ▪ Yield: 1.5-2.0 t/ha

TABLE 2: COMMON PESTS AND DISEASES IN COWPEA

PEST / DISEASE	DAMAGE / SYMPTOMS	CONTROL
Aphids 	▪ May infest the crop from seedling stage to maturity ▪ Sucking of sap from the plant Causes - leaf distortion - sooty mould - Transmission of viruses (CAMV) - Stunting of plants and - Poor nodulation	▪ Early planting minimizes the vector role of Aphids ▪ If necessary, spray; - Monochrotophos (32ml/16ltr of water) - Tephrosia botanical spray
Blister (Flower Beetle) 	▪ The adults eat flowers and pollen. ▪ Adults are attracted to maize pollen ▪ Adults are strong fliers ▪ Larvae often hide in the soil ▪ Secrete poison liquid that causes blisters if in contact with skin	▪ Practice Crop rotation with cereals ▪ Periodical Hand picking and killing them (use gloves when picking) ▪ Chemical Spray with ○ Monochrotophos ○ Dichlorvos ○ (Read label for rates)
Pod sucking Bugs  	▪ **Suck the sap** from developing pods and can cause; – premature drying of pods – lack of normal seed formation. ▪ Are severe in the low rainfall regions. ▪ Normally adults migrate from wild host plants	▪ Chemical Spray with – Dichlorvos – Monochrotophos – Imidachloprid (Read label for rates)
Maruca Pod Borer 	▪ Eats flowers & flower buds ▪ Bore through pods eating inside seed	Spray with Deltamethrin ▪ at flowering and ▪ at podding

Photos: www.plantwise.org.

TABLE 3: COMMON PESTS AND DISEASES IN COWPEA

PEST / DISEASE	DAMAGE / SYMPTOMS	CONTROL
Bruchids (Weevil) 	▪ Cowpea generally has poor storability ▪ Bruchids may start in the field on pods up to storage ▪ Eggs are laid either on pods and/or seed ▪ Larvae feed on the inside of seed and make holes later for exit	▪ Use of tephrosia powder ▪ Ash (2 cups ash per 10kg seed) ▪ Store in PICS bags ▪ Chemical Dusts –Actellic 1g /kg seed –Seed Guard (read label)
Cercospora Leaf Spot 	▪ Small reddish-brown spots grow bigger and lead to leaf fall ▪ It is seed borne & is spread by wind & water splash ▪ Pathogen survives on alternate hosts & debris	▪ Use of clean seed, ▪ Crop rotation ▪ Burning of the infected crop debris. ▪ If need be Spray with: ○ Benelate 50% WP at 2.5 – 5g in 10 litres of water ○ Dithane 45% at 15g in 10 litres of water.
Scab 	▪ Scabby appearance of leaves, pods, peduncles & stems ▪ Silvery grey lesions on ○ stems, ○ pods, ○ peduncles & ○ petioles	▪ Use Clean seed ▪ Rotation ▪ Burn infected Crop Debris ▪ Use recommended fungicide
Cowpea Aphid Borne Mosaic Virus (CAMV) 	• Virus is transmitted by aphids • Infected plants show: ○ dark – green vein banding, ○ leaf distortion, ○ blistering and ○ stunting.	▪ Practice crop rotation ▪ Use Clean seed ▪ Use improved varieties ▪ Natural pesticides such as Tephrosia to control Aphids ▪ Use recommended pesticides to control aphids

Photos: www.plantwise.org.

General Tips on Cowpea Seed Multiplication

- To be a seed grower you need to register with SCCI
- As a seed grower you need to be trained in seed production
- Source seed from a reputable institution or seed company
- Select land that is fertile and free from waterlogging
- Observe the isolation distance of 10 meters
- Keep records of all the activities undertaken
- Plant at the right time (1st to 2nd week of January)
- For higher yields, use organic or inorganic fertilizers
- Plant at recommended spacing 75cm x 15cm
- Always keep the field free from weeds
- Ensure your field is inspected at least 3 times before harvesting
- Scout for Diseases and pests' incidences
- spray *Imidachloprid* at least 3 times (at 3weeks after planting, flowering, and podding)
- Rogue out all suspected off types
- Harvest the crop at the right time
- Ensure the seed is thoroughly cleaned and graded
- Ensure the seed is sampled for laboratory tests
- Treat the seed with storage chemical as soon as possible
- Keep your seed in an appropriate storage material such as polythene bags
- Store in a cool, dry well-ventilated place preferably on a raised platform e.g., on pallets

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