Good Agronomic Practices on Cowpea

Presentation at Cowpea Farmers' Outreach

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By

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Outline

- Introduction
- Site selection
- Land preparation
- Seed source
- Planting
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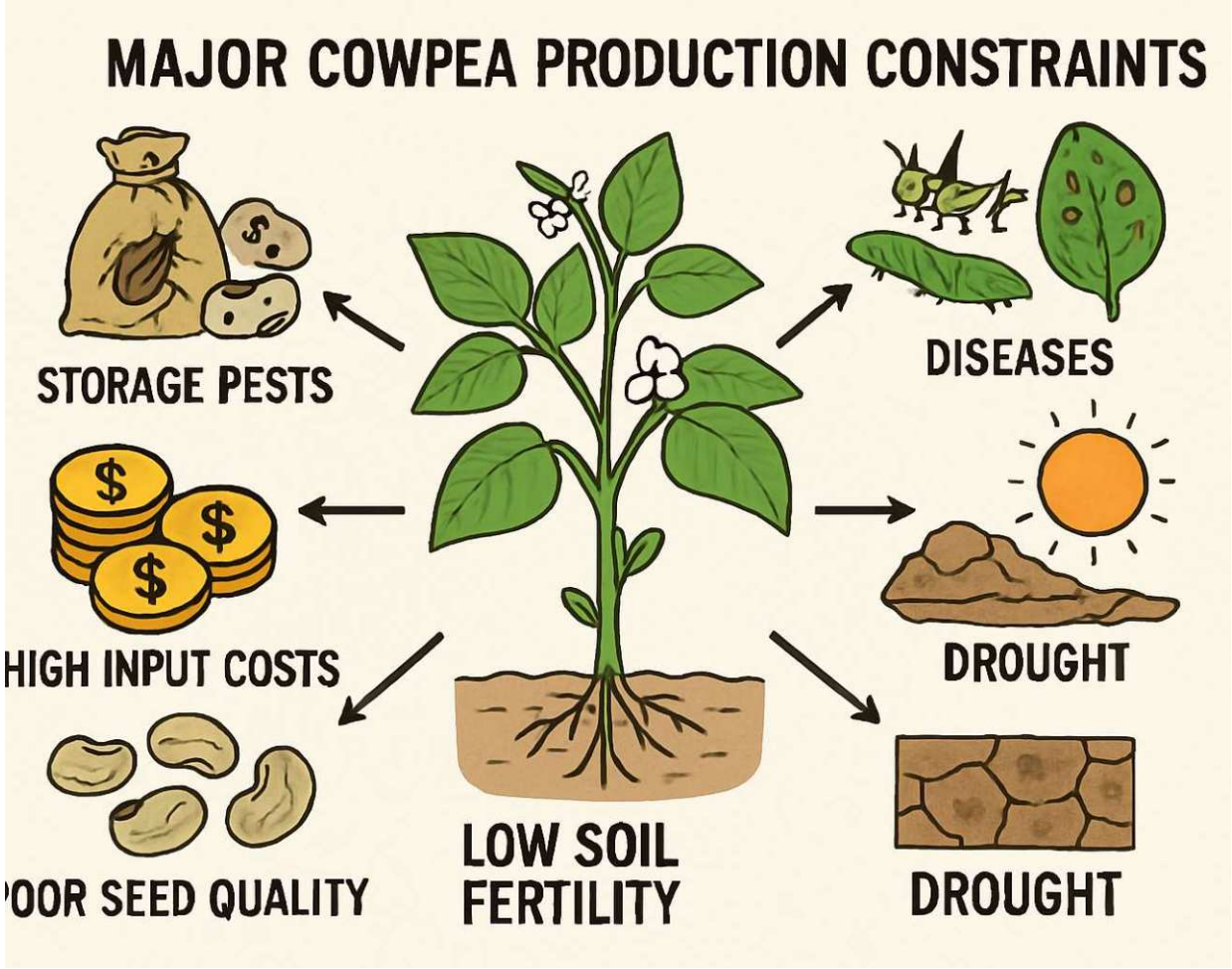
- Harvesting and
- Storage

Introduction

- Cowpea (*Vigna unguiculata L. Walp.*) is an important grain legume and staple food crop for households in sub-Saharan Africa, especially in the dry savanna regions of Nigeria
- It is a key source human nutrition, food security, and income for farmers and food vendors
- The grain is rich in protein (25%), carbohydrates, vitamins, and minerals.
- green leaves and pods are consumed as a vegetable; the haulms used as fodder for animals



- The cowpea research program at IITA focuses on addressing these constraints.
- One major way is through development and deployment of new varieties that can withstand these constraints and produce high grain yields

Cowpea utilization

Site selection

- **Cowpea is grown on a wide range of soil types, from sandy to clay loam with moderate amounts of soil water and salinity**
- Well-drained sandy loam soil for rainfed cowpea, and inland depressions or along the shores of a lake for a dry season crop using residual moisture
- Cowpea does not tolerate excessively wet conditions or waterlogging and should not be grown on poorly drained soil
- **The optimum soil pH ranges from 5.5 to 6.5.**

Avoid shades, water logged areas, extreme slopes etc.

Land Preparation

- Land should be cleared of weeds and shrubs.
- It should be well drained, not waterlogged
- It should be plowed and harrowed
- Ridged at 75cm apart with animal drawn or tractor
- For dry season production: land can be prepared as small units “paddocks” for easy of irrigation

Land prepared by tractor and marked

Land prepared by tractor and ridged

Seed rate

Cowpea Type	Growth habit	Maturity	Cropping system	Spacing (cm)	Quantity of seed/ha
Erect	Determinate	Extra-early, early, and medium	Sole	50 cm between rows and 20 cm within rows (50 × 20 cm)	30 kg (12 *mudus*)
Semi-erect	Indeterminate	Early and medium	Sole	75 cm between rows and 30 cm within rows (75 × 30 cm)	20 kg (8 *mudus*)
Semi-erect	Indeterminate	Early and medium	Intercrop	75 cm between rows and 25 cm within cereal stands (75 × 25 cm)	25 kg (12 *mudus*)
Prostrate	Indeterminate	Medium and late	Sole/ intercrop	75 cm between rows and 50 cm within rows (75 × 50 cm)	15 kg (6 *mudus*)

Seed treatment

Pre-sowing seed dressing: treat seeds with Apron XL® at the rate of 10 g/4-5 kg of seeds (1 sachet)

This will enhance good germination and protect the seedlings from fungal infection

Planting seeds more than 5 cm deep will delay emergence

Seed Source & Treatment

Good

Bad

Quality Seeds

- **Sourced from Reputable seed companies**
- **Research institutes, & ADP's**

Seed treatment

- **Use either Apron star or Allstar (Fungicides)**
  - **10 g Sachet/ 4 kg of seeds**

or

10 g Sachet/ 4 mudus of seeds

Some released cowpea varieties

Variety	Yield (t/ha)	Seed coat texture	Growth habit	Maturity	Other qualities
IT13K-1308-5	1.8 -2.3	Rough seed coat, white color with brown helium, big seed size	Determinate	Medium (70–75 days)	Resistant to Fusarium wilt and Striga, tolerant to drought
IT99K-573-1-1 (SAMPEA 14)	2.6	Rough seed coat, white color with brown helium, medium seed size	Determinate	Medium (70–75 days)	Resistant to Fusarium wilt and Striga, tolerant to drought
IT99K-573-2-1 (SAMPEA 15)	2.6	Rough seed coat, white color with black helium, medium seed size	Determinate	Medium (70–75 days	Tolerant to drought, resistant to Striga
UAM09 1055-6 (FUAMPEA 1)	1.9	Rough seed coat, white color with brown helium, medium seed size	Determinate	Early (60–65 days)	Tolerant to drought, resistant to Striga, short cooking time
UAM09 1051-1 (FUAMPEA 2)	2.0	Rough seed coat, brown color with brown helium, medium seed size	Indeterminate	Medium (70–75 days)	Short cooking time, resistant to Striga. Good for intercropping

Planting dates

Agroecological zone	Commencement of rains	Rainfall duration	Cowpea growth habit	When to plant after rains fully established
Sahel zone	May	June–August	Determinate (early and medium maturity) Indeterminate (medium maturity)	14–28 June 20–25 June
Sudan savanna	June	June–September	Determinate (early and medium maturity) Indeterminate (medium and late maturity)	25 June–24 July 19–22 July
Northern Guinea savanna	July	July–October	Determinate (early and medium maturity) Indeterminate (medium and late maturity)	25 July–8 August 28 July–3 August
Southern Guinea savanna	August	August–November	Determinate (early and medium maturity) Indeterminate (medium and late maturity)	25–30 August 24–28 August
Derived Savanna	March	March – November	Determinate (early and medium maturity) Indeterminate (medium and late maturity	25 August- 10 Sept. 24 August – 3 Sept.

PLANTING

Planting

- **Two seeds per hole on the ridge**

- **Sowing depth – 2-3cm**

- **Spacing Between rows 75cm**

  Between plants 20 – 25cm

Thinning

- **Done at 2 weeks after sowing to 2 plant per hill**

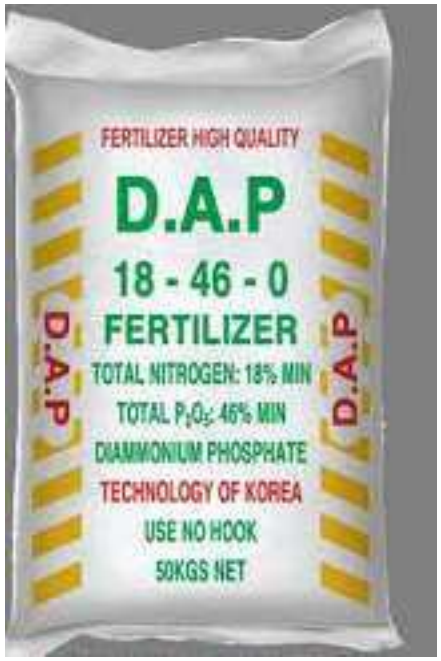
Fertilizer Application

Little N & K but more of SSP(18% P2O5) or DAP (18% N and 46% P2O5)

Mix 1 bag of NPK with 3 bags SSP per hectare

OR

Apply two bags DAP/hectare at sowing, but not later than 7 days after planting



weed management

- Manual
- Chemical
- Pre land preparation
- Pre-emergence
- Post –emergence/ selective herbicide

Weeding Management

- Pre land preparation (2 weeks before land preparation). Spray;
  - Glyphosate at 4 litres/ha
  - Pendimethalin (4 litres/ha) applied pre-emergence
- Selective herbicide
- use 3 WAS- Raptor or Legume Force
  - OR
- 2 Hoe weeding at 3 & 6 WAS

Weed management

Product trade name	Brand or common name	Rate (liters/ ha)	Quantity/sprayer load	Conditions of use	Remarks
Glufosinate Ammonium (pre land preparation)	Lifeline, Basta, Slasha	1.6-5 liters	150-400 ml in 15 L sprayer or 180-550 ml in 20 L sprayer	Contact/semi-systemic herbicides for total weed control. Apply on non-cultivated land or before planting	Plant after the weeds are killed. Do not mix glufosinateammonium with glyphosate for use
Glyphosate (pre land preparation)	Round-up, Glycel, Kill off, Clearweed, Sarosate, Touchdown, Delsate etc	4-6 liters	350-500 ml in 15 L sprayer or 450-650 ml in 20 L sprayer	Systemic herbicide, Apply on emerged weeds before land preparation	Apply where troublesome weeds are common. Wait for 10 days after application before preparing land.
Pendimethalin (Pre emergence)	STOMP 455 CS	2-3 liters	150-250 ml in 15 L sprayer or 250-350 ml in 20 L sprayer	Apply immediately after planting or a day later	Apply where troublesome weeds such as *Rottboellia* are common. Do not plant or replant any crop other than those mentioned for one year after application.

Weed management Cont'd

Product trade name	Brand or common name	Rate (liters/ ha)	Quantity/sprayer load	Conditions of use	Remarks
S-Metolachlor (pre-emergence)	Dual Gold 960 EC	0.6-1.6 liters	50-150 ml in 15 L sprayer or 70-180 ml in 20 L sprayer	Apply immediately after planting or a day later	
IMAZAMOX Post emergence/ selective	Raptor	1.5- 3 liters	150 ml in 15 L sprayer or 180 ml in 20 L sprayer	Apply at lease 3 weeks after germination	
Imazethapyr Post emergence/ selective	Legume force	1.5- 3 liters	150 ml in 15 L sprayer or 180 ml in 20 L sprayer	Apply at lease 3 weeks after germination	

Pests and diseases

- **Parasitic weeds-*Striga gesnerioides* and *Alectra vogelii***
- **Fungal diseases- *Fusarium* wilt, *Cercospora* leaf spot**
- **Bacterial blight disease**
- **Scab disease of cowpea**
- **Virus diseases**
- **Insect Pests : aphids (*Aphis craccivora* Fabricius), whiteflies (*Bemisia tabaci*), flower thrips (*Megalurothrips sjostedti* Trybom), pod borers (*Maruca vitrata* Fab) and a complex of pod and seed-sucking bugs such as *Riptortus dentipes* Fab, *Clavigralla tomentosicollis* Stal, *Anoplocnemis curvipes* Fab, and *Nezara viridula***
- **Storage pests: *Callosobruchus maculatus* (Fabricius)- cowpea weevil**

Insect control

Active ingredient	Brand or common name	Application rate	Estimate for one sprayer load	Mode of action	Remarks
Lamda-Cyhalothrin 2.5% EC (Insecticide)	Karate 2.5 EC	0.4– 0.8 L/ha	35–70 ml in 15-L sprayer or 50-80 ml in 20-L sprayer	Contact and stomach insecticide	Controls flying and soil dwelling insects such as whiteflies and *aphids*
Lamda-Cyhalothrin plus Dimethoate	Kart dim 315EC	0.8–1 L/ha	50–60 ml in 15-L knapsack sprayer or 70-80 ml in 20-L knapsack sprayer	Systemic action	Controls sucking pests such *Maruca* and pod sucking bugs
Cypermethrin plus Dimethoate insecticide	Best Action, Cyperdiforc, Superplus, Sherpaplus	Follow label directions	80–100 mL in 15-L sprayer or 100-120 ml in 20-L sprayer	Systemic action	Controls plant sucking insects such *Maruca* and pod sucking bugs
Acetamiprid a neonicotinoid insecticide	Assail 30 SG	Follow label directions	Read and follow label direction for crop specific	Systemic action as well as contact and stomach poison	Active against *aphids* and whiteflies

Spraying regime

First spraying: 30 and 35 days (4–5 weeks) after planting when flower bud initiation has started

Second spraying: Conduct the second spraying 7- 10 days after first spraying when the crop is in full flowering and podding to control Maruca and other sucking or chewing insects

Third spraying: Conduct 7-10 days after the second spraying for medium varieties, and when there is an attack of Maruca and pod sucking bugs

A fourth spraying may be necessary for late-maturing indeterminate varieties.

Harvesting and storage

- Harvesting is done by handpicking matured Pods
- After harvest, sun-dry the pods on a platform or tarpaulin for proper drying before threshing
- Thresh the pods and winnow to separate the seeds from the chaff or haulms
- Cleaned seed to remove debris and broken seed; packed in plastic bags for storage

Maturity, Harvesting & Threshing

- Medium maturing (75 – 80 days)
- Hand-pick of dried pods, and
- Thresh either manually or use a threshing machine.

Harvesting and storage

AFTER HARVEST WHAT NEXT?

Cowpea storage in triple PICS bag.

Harvesting and storage

- **Clean out the store thoroughly before a new crop is loaded**
- **Only well-dried and properly cleaned seeds should be stored**
- **Safe moisture content for storage is 7–8%; such seeds make a cracking sound when crushed between the teeth**
- **PICS bags (multi-layer, made of 2 polyethylene bags)**
- **Plastic bottles and clay pots are also used**
- **Fumigation and use airtight containers: Phosphine has been widely used as a grain fumigant for the control of storage pests for many years. Aluminum phosphide is marketed as Phostoxin, Cyclotoxin, Forcetoxin, Protex, Gastoxin, etc.**

Thank You