NATIONAL HORTICULTURAL RESEARCH INSTITUTE

FEDERAL MINISTRY OF AGRICULTURE AND FOOD SECURITY

FLUTED PUMPKIN (UGU)

(Telfairia occidentalis)

PRODUCTION GUIDE

INTRODUCTION

Telfairia occidentalis commonly known as fluted pumpkin is a tropical vine widely grown in West Africa as a leafy vegetable and for its edible seeds. Common names for the plant in Nigeria include 'Ugu' (Igbo), 'Kebewa' (Hausa) and 'Eweroko' (Yoruba). Fluted pumpkin is a perennial climber that is drought-tolerant and can be gown as an annual under limited rainfall. It is a nutritious vegetable and produces dark green leaves that can be used in soups, stews, and sauces. The leaves are rich in vitamins, iron, protein, and a considerable amount of antioxidants. The tender vine and foliage are eaten as potherb, while the seed is consumed as a nut. The seeds can be boiled, roasted or ground into paste and used for thickening soup.

SOURCE OF SEED

The source of seed is very important to avoid:

- ✓ Seeds that are of undefined origin.
- ✓ Seeds that have seed-borne pathogenic organism.
- ✓ Matured pod should be sourced from reputable sources such as:
  - National Horticultural Research Institute headquarters, Ibadan and its outstations at Bagauda (Kano State), Dadinkowa (Gombe State) and Otukpa (Benue State), Mbato (Imo State), Riyom near Jos (Plateau State)
  - Government agencies (Ministry of Agriculture, State Agricultural Development Programmes)
  - Licensed Seed Company

TIME OF PLANTING

Fluted pumpkin can be grown all year round if water is available.

METHOD OF PLANTING

Fluted pumpkin can be planted directly in the field or raised in the nursery before transplanting to the field.

NURSERY PRACTICES

To raise seeds in the nursery the following should be adhered to:

- Break the fluted pumpkin pod carefully with club or blunt object and extract the seeds
- Remove mucilage by rubbing sawdust on the seeds.
- Sow seed in sawdust using a perforated container/nursery trays for good drainage

- Sow the seeds with the pointed end facing down and cover with the sawdust
- Add water to the sawdust to make it moist
- Where top soil is used, pour sawdust on the soil to enable easier seedling emergence
- Nursery bed could be 1m in width to any convenient length for easy cultural practices like weeding
- Water the seedlings daily during dry season and every other day for the wet season.

Note: Fluted pumpkin seeds cannot be stored for more than 3 days after opening the pod. The seeds should germinate between 5-7 days and seedlings should be ready for transplanting between 14 -21 days after sowing or when they have six leaves.

Advantages of raising seedlings in nursery

- Easy management of the tender seedlings
- Timely and careful plant protection measures
- Provides favourable growth condition.

Emerging fluted pumpkin seeds sown in sawdust using nursery tray

Emerging fluted pumpkin seeds sown in sawdust on topsoil

CLIMATIC AND SOIL REQUIREMENT

- Grows best in warm, humid tropical climate
- Performs best in sandy-loamy soil that is well-drained with a pH of 6.0 – 7.5
- The soil should be rich in organic matter such as compost or cured manure

LAND PREPARATION

- Land can either be prepared manually or mechanically
- It is advisable to make beds for easy germination and good root penetration

TRANSPLANTING

- Transplant at 2-3 weeks after sowing in the nursery
- Avoid root damage while transplanting
- Transplanting is best done in the evening or early in the morning to reduce shock

SPACING

- Plant one seed/seedling per hole at distance of 1 m x 1 m to give the population of 10,000 plants/ha where leaf and pod are desired
- Where only leaf is desired, plant at 1m x 0.5m.

Note:

- Depending on the soil type, rainfall and cropping pattern, fluted pumpkin can be planted on the flat, ridges or mounds.

STAKING

Types of staking include the Teraga (table type) and single stake among others

- The tender vines should be staked using bamboo or other sticks after the first cutting/pruning (4-6 weeks after transplanting)
- Stakes should be installed at least 30 cm deep to forestall tipping over due to the heavy weight of the vines or pods

Single stake

Teraga/Table type

Advantages of staking

- Makes spraying and harvesting easier
- Exposes leaf to light and air circulation
- Keep the leaves free of soil particles
- Prevent infections caused by soil borne pathogens
- Reduces fruit damage caused by alternate heating and cooling of the pod by the soil
- Reduces incidence of pests and diseases
- Enhances production of clean pod.

FIELD MANAGEMENT

WEEDING

- Weeding is important to reduce competition for nutrient and water between fluted pumpkin and weeds
- Weeding should be done two or three times before harvesting is completed
- First weeding at 2-4 weeks after transplanting is desirable while subsequent weeding should be carried out as the need arises.

Weed Control Methods

Cultural method: It consists of management practices that enhance crops' ability to compete with weeds or minimize weed interference with crop. These include:

- Appropriate land preparation
- Adequate spacing
- Soil amendment / fertilizer application
- Mulching
- Water management
- Staking
- Crop rotation

Chemical Method

Herbicides recommended for weed control include:

- *Pendimethalin*, a broad-spectrum pre-emergence herbicide applied at 4 litres/hectare (150 mls. in 20 litres knapsack sprayer)
- *Haloxyfop-methyl*, a selective pre- and post-emergence herbicide at 1 litre/hectare for the control of grass weeds (40-50 mls per 20 litres knapsack sprayer)
- *Propaquizafop* at 0.1- 0.2 kg a.i/hectare and quizafop (0.05 - 0.2 kg a.i./hectare)

IRRIGATION

This is essential during dry season and period of dry spell

- Irrigation should be done early in the morning, and or late in the evening depending on soil type
- Recommended types of irrigation include:
  - Sprinkler
  - Drip
  - Manual

PEST AND DISEASE MANAGEMENT

- Farm hygiene reduces the incidence of pest and disease to the barest minimum.

- Good Agricultural Practices (GAPs) minimize the use of chemicals on the field.
- The farm environment must be weed free to about 5m away from the plants to prevent infiltration of pests and diseases
- Farm tools and equipment must be thoroughly cleaned after every use.

Major Insect pests of fluted pumpkin

1. Aphids *(Aphis spp.)*

Aphids *(Aphis spp.)* on leaf

Symptoms
- Curled or distorted leaves
- Honeydew droplets on leaves and sooty mold growth
- Wilting of mature plants

Management and control
- Effective practice of crop rotation
- Spray NIHORT-Lyptol (Biopesticides) fortnightly

2. Grasshopper *(Zonocerus variegatus)*

Grasshopper *(Zonocerus variegatus)* on leaf

Symptoms
- Feed on leaves, stems, and flowers of plants
- Defoliation of leaves, stems and flower

Management and Control
- Hand-picking and destruction
- Effective practice of crop rotation
- Spray NIHORT-Lyptol fortnightly

3. Leaf miners *(Liriomyza spp.)*

Leaf miners *(Liriomyza spp.)* on leaf

Symptoms
- Narrow, winding tunnels in leaves
- Presence of lead miners or their eggs
- Reduction in plant growth and yield

Management and Control
- Use yellow sticky traps
- Spray neem oil or insecticidal soap
- Spray NIHORT-Lyptol fortnightly

4. Tomato Hornworm (*Manduca quinquemaculata)*

Tomato Hornworm (*Manduca quinquemaculata*) on leaf

Symptoms
- Large holes in leaves,
- Defoliation, presence of hornworms or their eggs.

Control:
- Hand-pick and destroy hornworms
- Maintain good field sanitation
- Spray NIHORT-Lyptol fortnightly

MAJOR DISEASES OF FLUTED PUMPKIN

1. Fusarium wilt

Plant infected with fusarium wilt

Symptoms
- Rotting of seedlings under severe infection
- Wilting of mature plants
- Death of the entire plant

Management and control
- Effective practice of crop rotation
- Use of fungicides such as Benomyl, Carbendazin

2. Downy mildew

Downy mildew symptoms on leaf

Symptoms
- Bright yellow spots appear on the upper leaf surface
- Fruit development and quality are impaired

Management and Control
- Provide adequate spacing between plants
- Water plants from the base

3. Leaf blight

Leaf blight symptoms on leaves

Symptoms
- Leaf defoliation
- Sunken spots on mature pods

Management and Control
- Sow clean seeds

4. Nematodes *Meloidogyne spp i*

Meloidogyne **(Root-knot nematodes) on fluted pumpkin**

Symptoms
- Stunting, wilting and yellowing of leaves
- Galling of roots

Management and Control
- Field sanitation
- Fallowing, crop rotation, and soil solarization
- Apply *nematicides* with active ingredient *aldicarb, oxamyl,* metam sodium and *fluopyram* at recommended rate

FERTILIZER REQUIREMENTS: Organic and inorganic fertilizer can be used to improve soil fertility, but they should be applied based on soil test result.

- Apply organic fertilizer at 5 tons/ha at two weeks before transplanting.
- Apply NPK 15:15:15 fertilizer at 250 kg/ha at two weeks after transplanting.
- Apply Urea at 50 kg/ha at eight weeks after transplanting and subsequently after each harvest.

HARVESTING

Vine harvesting

- Fluted pumpkin should be ready for harvest at 4 weeks after transplanting and thereafter at 2–3 week intervals under good management practices
- Select vines with succulent, deep green, large leaves as these command premium prices
- Vines should be harvested with a clean sharp knife
- Cut the vine about 5 cm above the node
- Retain enough leaves on the plant to support growth for subsequent harvest
- Harvesting is best done late in the evening or early in the morning
- Keep the vines in a cool environment after harvesting and transport to the market under the same conditions
- Stop harvesting from female plants as soon as they flower or tender pods are identified so that available leaves will provide food for the fruit to develop and also prevent abortion of the flower.

Pod harvest

- Pods mature about 90 -115 days from flowering and about 9 months after sowing
- At pod maturity, the shoot often dries off
- Pods should be harvested when the ridges change from brittle to tough or hard to break.
- Matured pods should be stored in a well-ventilated room.
- Seeds in the pod can retain their viability between 3-5 months if kept in conducive environment (cool and dried place).

YIELD

Fresh leaf yield with good management could be up to 7 tonnes/hectare, while pod yield could be up to 3,000 pods/hectare in the rainy season. Leaf yield in the dry season is between 3.5 – 4 tonnes per hectare with pod yield of 1,500 pods /hectare.

POST HARVEST HANDLING

- Wash leaves gently in clean water to remove dirt and debris
- Drain thoroughly and ensure they are air-dried
- Package fresh leaves in perforated plastic bags or cool containers to maintain freshness and prevent wilting
- Package leaf should be kept in a cool, dry place away from direct sunlight
- *Telfairia* leaves have a limited shelf life of about 7 days.

COST AND RETURNS OF *TELFAIRIA* PRODUCTION (1 HECTARE)

Items	Quantity and Price/Unit	Amount (₦) /ha
Materials Input cost		
Seed	165 pods @ 7,000/pod	1,155,000
Sawdust for nursery operations	25 bags @ 1,000/bag	25,000
Organic fertilizer	100 bags @ N5,000/bag	500,000
Bamboo stakes and conveyance	500 stands	50,000
Pesticides	4 litres @ N10,000/litre	40,000
Urea	100kg (2 bags @ N38,000/bag)	76,000
NPK 15:15:15	250kg (5 bags) @ N50,000/bag	250,000
Labour cost		
Land preparation	1ha	100,000
Labour for nursery operations	10 Man-days @ 3,500/day	35,000
Transplanting	25 Man-days @ N3,500/day	87,500
Weeding	18 Man-days X 3 times @ N3,500/day	189,000
Staking	50 Man-days @ N3,500/day	175,000
Fertilizer application	20 Man-days @ N3,500/day	70,000
Application of pesticides	5 Man-days @ 3,500/day	17,500
Harvesting of vines	25 Man-days @ N3,500/day	87,500
Harvesting of pods	10 Man-days @ N3,500/day	35,000
Fixed cost		
Depreciation on tools and equipment such as nursery trays, cutlasses, hoe, watering can, hand trowel, knives e.t.c		100,000
Provision for irrigation		1,000,000
Land rent		250,000
Total cost		**4,242,500**
Miscellaneous cost (10% of total cost)		424,250
Grand Total Cost		**4,666,750**
Projected Yield and Revenue		
Vines: 7 tonnes @ N400/kg		2,800,000
Pods: 3,000 pods @ N2,000/pod		6,000,000
Total Revenue		**8,800,000**
Net Returns (Total Revenue – Total cost)		4,133,250
Benefit to cost ratio		**1.88**
Return on investment		**0.88**

Note

1. Price of inputs (such as labour and material) and output are estimated at the prevailing market price of 2025 and varies depending on location and season of production.
2. Rent on land depends on location.
3. Irrigation is a crucial component of good management practices; thus it must be budgeted for.
4. Plant protection chemicals or biopesticides may be used as the need arises.
5. 165 big pods can generate 10,000 seeds that will be required to plant 1 hectare.

The estimated cost and revenue in cultivating 1hectare of fluted pumpkin was projected at ₦4,666,750/ha and ₦8,800,000 with anticipated profit margin of ₦4,133,250/hectare. The benefit to cost ratio of ₦1.88k in the enterprise implied that for every ₦ 1 invested in the enterprise, ₦1.88k will be realized while 88k may be returned as profit with adoption of good management practices indicating that *Telfairia* production is profitable.

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