GUIDE TO
THE PRODUCTION OF
CASSAVA
EXTENSION GUIDE No. 17
Introduction

Cassava is one of the most popular Nigerian staple food crops from which "Gari" is made. This "Gari" produced from the cassava roots, is the cheapest carbohydrate or energy-giving food source nick-named "the poorman's food". The cassava crop has very wide adaptability to environmental and soil conditions and is drought resistant. The bulk of the country’s output comes from the southern part of the country.

Site Selection

Choose a well-drained fertile soil. Although cassava does well on a variety of soils, the crop will not tolerate water-logged conditions. For good root development, the soil should be free of crusts.

Choice of Variety

Many varieties are available including both improved and local ones. Choice of any variety should be guided by several factors such as:—

(a) High yield
(b) Disease resistance
(c) High dry matter content
(d) Starch content
(e) Gari index
(f) Digestible crude fibre

The last three criterial underscore the utility of the cassava crop for industrial, human and animal consumption respectively. It is advisable to grow the most popular and adaptable variety in your area. Visit to the Ministry of Agriculture Office or your nearest Agricultural Extension Worker will be very helpful in this respect.
Land Preparation

Cassava can be planted on flat land or ridges-depending on environment and soil type. On sandy soils planting should be on ridges or mounds. An advantage of ridge planting is its ease of planting.

Planting Material

While cuttings from any part of the stem may be used, there are significant differences in germination and yield of cuttings from different morphological positions on the stem. Both the age and length of cuttings affect germination and consequently yield of tubers.

Best cuttings are obtained from stands 12—18 months old for the late maturing varieties and at least 6 months for the early maturing varieties. Where planting material is limiting, minimum length of cuttings should be 15 cm. The young stem tops and the middles are best used.

Planting

The number of cuttings per stand is determined by the objective of the farmer: If fresh tuber is to be produced, it is recommended that one cutting be planted per stand, but where planting material is the main objective (e.g. multiplication schemes) two cuttings per stand is recommended. Planting should be done 1 metre apart.

Position

Cutting can be planted erect, inclined or horizontal, but yields from erect or slanting orientation of single cutting 2/3 buried are superior to those of horizontal orientation.

This is attributed to formation of numerous main stems and consequently overcrowding of cuttings planted horizontally. Some important notes are:
(a) Inversion of cuttings with auxiliary buds pointing downwards delays germination and reduces yield.
(b) Vertical planting produces deeper but more compactly arranged tubers.
(c) Horizontally planted materials give tubers which are shallower but more spread out.
(d) Planting in slanting position yields arrangement which is intermediate for both depth and spread.

**Time of Planting**

Time of planting is a function of rainfall trend. In the south, planting may be any time between March and July, while in the North between June and August is ideal. Plant as soon as the rains are steady and preferably immediately after a good rain.

Cassava, once established competes favourably with weeds even at the peak of wet season. If planting is to be done in dry season, cuttings should be treated with ALDRIN DUST against termite damage.

**Fertilizer Application:**

Fertile soils do not need fertilizers. Although cassava can perform appreciably well in poor soils, tuber yields are increased with application of required fertilizers to supplement the soil nutrients. Results of some fertilizer trials obtained in the southern part of the country show that Nitrogen, Phosphorus and Potassium interact with magnesium (all plant nutrients food) to increase fresh tuber yields. Thus, current fertilizer recommendations encourage the use of mixed fertilizers such as 12: 12: 17: 2 (proportions of each of the four nutrients mentioned above) at 500 kg/ha or 15: 15: 15: at 400 kg/ha. Single fertilizers could be used to provide:
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Introduction:

Cassava is one of the most popular Nigerian staple food crops. Owing to its drought resistant characteristics it is readily cultivated all over the country. The bulk of the country’s output is however produced in the south.

Site Selection:

A well drain fertile soil is ideal, although the crop performs well on varying types of soils, it does not tolerate water logged condition. Soil with hard crust should be avoided for good root development.

Choice of Cultivars:

Currently many varieties are available, some are improved, others are local varieties. Choice of cultivars should be guided by several factors among which are:

(a) High yield
(b) Disease resistance
(c) High dry matter content
(d) Starch content
(e) Gari index
(f) Digestible crude fibre

The last three criteria underscore the utility of the cassava crop for industrial, human and animal consumption respectively.

Varieties:

Some of the recommended varieties are:

A. TMS
   30572
   30017
   30110
   30337
   30555
   5313 x 30395
   R10/15408
   At 50357

B. 60506
   Nwago
   631024
   374

A - Varieties developed at IITA Ibadan
B - Varieties developed at NRCRI Umudike

Land Preparation:

Cassava can be planted on flat or ridges-depending on environment, soil type and structure.

On sandy soils planting may be on flats, whereas on heavy soils planting should be on ridges or mounds. An advantage of ridge planting is its ease of planting.

Propagation:

Cassava can be propagated in two ways:-

by (i) Seed-this is mainly for breeding purposes.

(ii) Rooted propagules and green shoot cuttings - this is mainly to produce disease free materials on the field.

Stem cuttings are the the main mode of propagation of cassava.

Planting - Material

While cuttings from any part of the stem may be used, there are significant differences in germination and yield of cuttings from different Morphological positions on the stem. Such differences are functions of variety used. E.g. Cultivar 53101 root yields are similar irrespective of the Morphological position of cuttings; while cultivar 60506, primary, secondary and tertiary branch cuttings differed significantly in yield.

Both the age and length of cuttings affect germination and consequently yield of tubers:

Best cuttings are obtained from stands 12-18 months old - for the late maturing varieties and at least 6 months for the early maturing varieties. Where planting material is limiting, minimum length of cuttings should be 15cm.
The disease may be controlled by planting in areas with good drainage.

Since the disease may occur from 10-12 months in susceptible varieties, early harvesting will reduce tuber loss.
FERTILIZER APPLICATION:

In many parts of the South, cassava is usually made the last crop in the rotation sequence before the land is reverted to bush. Under such condition cassava still give good yield. By virtue of its deep and extensive root system the crop is a very good forager, able to reach the less available nutrients. This has contributed to the false notion that cassava does not need fertilizer.

Current recommendation from NRCRI Umudike is

30 kg of N
15 kg of P 205
90 kg of K2O

) Per hectare

applied in ring form 4-6 weeks from planting. Potassium Sulphate is recommended over muriate of potash as the latter is known to depress yield by virtue of its chloride ion content, while the former has the advantage of sulphur. Calcium Ammonium nitrate or Urea can serve as a source of Nitrogen; while single super as a source of Phosphorous.

WEEDING:

Early weeding is important in the cassava production. Keeping the crop weed-free for the first four months after planting gives as good yield as when the crop is weed free throughout its life.

This is the period of early canopy formation and tuberization. A minimum of two properly timed weeding is needed to maintain optimum yield in cassava.
CROPPING SYSTEM

Cassava can be planted sole or intercropped. Where mechanized farming is practised, sole cropping is preferred but for small holdings, intercropping, is the rule.

Although yield of individual crop is known to be lower under intercropping, total yield is higher under intercropping.

Some of the systems include:
1. Cassava/Maize/Cowpea
2. Cassava/French beans/Okro/Tomato
3. Cassava/Maize/Melon

Cassava is not tolerant to shade, shading can reduce yield up to about 33%. This adverse effect of shade would not be compensated for by the application of fertilizer.

HARVESTING:

Cassava matures between 8-24 months depending on maturity group of the cultivar. Early maturing variety between 12-18 months and are in general higher yielding. While application of Nitrogen retards maturity. Large amount of phosphorous accelerate the process. Generous application of Potassium results in tubers of better keeping quality.

Harvesting is by hand. The crop is harvested by the farmer at the time of need; as good storage facilities are not yet existing. Thus harvesting may spread up to 6 months. Long delay in harvesting result in:-

(i) Weight and starch loss
(ii) Increased poison (HCN) content
(iii) Increased woodiness
(iv) Development of cavities with time.

Bruising of tubers should be kept to minimum to avoid rotting of tubers very early.
STORAGE:

Good, inexpensive storage method have not been discovered yet. Tubers are known to store very well under refrigeration but the cost is prohibitive. Storage in wood shavings is found good up to 21 days.

PEST AND DISEASES:
Grasshopers; (Zonocerus Variegatus)
These damage young plants but rarely become serious. Should they become serious, control may be effected by spraying with Vetox 85 at 1.5kg in 250 litres of water per hectare or with Vetox 5 or 5% Aldrin Dust.

Animals: Sheep, goats and rodents may become a problem in some areas. These animals may be kept out of the cassava fields by fencing.

Cassava Bacterial Blight (CBB): This is the most destructive disease of the crop especially in the southern part of the country where total crop loss is known. It is caused by the bacteria Xanthomonas manihotis. Symptoms are characterised by leaf wilt, defoliation, yellow exudates and dieback.

The disease is prevalent at the peak of the rainy season. It is primarily spread when infected cuttings are used as planting materials. Secondary spread is by rain splash.

The disease is controlled by the use of the highly tolerant varieties recommended above. Use healthy planting material to avoid the spread of the disease.

Tuber rot: The field symptoms of the disease are first observed by the death of isolated plants. The tubers of such affected plants show advanced stages of decay. Many factors such as water-logging, the fungi Fomes Lignousus and Sclerotium rolfsii may cause the disease.
Planting:

The number of cuttings per stand is determined by the objective of the farmer: If fresh tuber is to be produced, it is recommended that one cutting be planted per stand, but where planting material is the main objective (e.g. multiplication schemes) two cuttings per stand is recommended. Planting should be done 1 metre apart.

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Time of planting is a function of rainfall trend, in the South, planting may be any time between March and July, while in the North between June and August is ideal.

Cassava, once established competes favourably with weeds even at the peak of dry season. If planting is to be done in dry season, cuttings should be treated with ALDRIN DUST against termite damage.
30 kg of N
15 kg of P₂O₅
90 kg of K₂O

per hectare

The fertilizer materials could be applied between stands 4—6 weeks from planting. Potassium sulphate is preferred to muriate of potash as source of potassium since muriate of potash is known to depress yield due to its chloride content. Potassium sulphate has an additional advantage of supplying sulphur to the crop. Calcium Ammonium nitrate or Urea can serve as a source of Nitrogen; while single super can serve as a source of phosphorus. The calcium ammonium nitrate could be applied at the rate of 140 kg/ha while Urea may be used as a substitute at the rate of 70 kg/ha. The single superphosphate could be applied at the rate of 75 kg/ha and potassium sulphate at the rate of 200 kg/ha. If muriate of potash is used, 145 kg/ha should be applied.

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The disease may be controlled by planting in areas with good drainage.
Since the disease may occur from 10—12 months in susceptible varieties, early harvesting will reduce tuber loss.

**Harvesting**

Cassava matures between 8—24 months depending on maturity groups of the cultivar. Early maturing varieties mature between 12—18 months and are in general higher yielding. While application of too much Nitrogen retards maturity, large amount of phosphorous accelerates the process. Generous application of Potassium results in tubers of better keeping quality.

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**Storage**

Good, inexpensive storage methods have not been discovered yet. Tubers are known to store very well under refrigeration but the cost is prohibitive. Storage in wood shaving is found good up to 21 days.

Alternatively, the cassava roots should be left in the soil for some time for harvesting at the time of need. However, harvesting should not be delayed for too long to avoid loss in quality and quantity.
Prepared and distributed by:

Agricultural Extension and Research Liaison Service, Ahmadu Bello University, P.M.B. 1044, Samaru—Zaria.

In cooperation with:

National Root Crops Research Institute, Umudike.


Printed by Bamed Printers & Sons Box 6690. Kaduna.