GUIDE ON
YAM PRODUCTION

EXTENSION GUIDE 11
THE PRODUCTION OF

YAM

EXTENSION GUIDE NO. 11
Site:
For best yields of yam, loose, deep, well-drained soils of sandy loam type are recommended. Except in "Fadama" soil, practice crop rotation.

Land preparation:
Clear the land, rake and burn the trash. Deep plough, harrow to fine tilth and make 1 meter ridges; or make tied mounds on a straight line. The size of mounds depend on the soil type. On loose and deep, small mounds (0.5m - 1m) could be made but on heavy soils (hydromorphic soils) make heavy mounds (1m - 2m) to increase the bulk density.

Planting Material:
(i) Seed yams: whole tubers planted to establish a new crop. Recommended weight is 250-500gm. 

(ii) Setts: When a whole tuber is cut into heads (tops), middles and tails (bottoms) for propagation purposes, they are called "setts".

The best planting material is whole tuber (seed yams). For setts, the tops (with buds) which are next to the seedyams as planting materials are better than bottoms, and bottoms better than middles. Sett size should not exceed 400gm (for white yams) and
200gm (for water yam).

**Variety:**

Six yam species are commonly grown in Nigeria: White yam (*D. rotundata*); Yellow yam (*D. cayenensis*); Water yam (*D. alata*); Aerial yam (*D. bulbifera*); Trifoliate yam (*D. dumethonim*) and Chinese yam (*D. esculenta*). No variety can be recommended at present except the UM 680 – an improved cultivar of the water yam resistant to the “Appolo” disease (Anthracnose). Use the most popular variety in your area.

**Times of Planting:**

The time of planting varies location and culture. There are two crops of yam – the early (October-December) and main (February – April) crop. In the riverine areas, plant as soon after the floods have receded. It is essential to plant the main season crop which is rainfed when rainfall has become regular otherwise the setts will dry up in the soil especially with the white yam. However, higher yield of tubers can be obtained by dry season planting with full supplementary irrigation.

**Method of Planting:**

Plant seed yams horizontally where the cut yam setts should be planted with the cut surface slightly upwards at an angle.
(a) **Mounds** – Burry one seed yam in small mounds 0.5m – 1m x 1m and increase the number of seed yams according to the size of the mounds.

(b) **Ridges** – Plant the seedyams/yam sets one meter along on top of the ridges (1meter apart). The recommended plant population is 10,000 stands/ha.

**Mulching/capping:**

When yams are planted early (e.g. Oct – Dec); or before the rains, mulching/capping is recommended as soon as the yams are planted, but must be done not later than 30 days after planting. In mulching, ridges/mounds are covered with layers of dry grass. Capping is covering a part of the ridge/mound above the planted sett. The cap is kept in position with a layer of soil. Capping has been proven more economical than mulching. The mulch or cap should be removed after the rains have started to prevent termite attack.

**Weed Control:**

Yam has in initial slow growth and does not generally produce enough canopy to shade the undergrowth and suppress weeds. It is highly recommended that yam plots be kept weed free within the first 8 – 16 weeks after planting.

1) **Hoe weeding** – Carry out a minimum of two hoe weedings
at 8 and 16 weeks after planting. Hoe weeding loosens the soil and remoulds the ridges. If the mulch/caps are not removed, remove them during the first weeding.

(b) **Herbicides** - When available and at affordable prices and in large scale production, the following herbicides: Oprimextra, Diuron at 3.0kg and 3.3kg active ingredient per hectare respectively will provide 6 – 10 weeks effective weed control. Granuron at 5.0 litres per hectare can equally be used. These are pre-emergence herbicides applied after planting.

(c) **Use of Egusi** – Egusi planted early (March – April) in the rain forest zone at 40,000 stands/ha serves as a biological weed control measure.

The following rates and types of fertilizer are recommended:

(i) **Compound Fertilizer:**

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<th>15.15.15</th>
<th>20.10.10</th>
<th>25.10.10</th>
<th>27.13.13</th>
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<tbody>
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<td>50kg bags/ha</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>7</td>
</tr>
</tbody>
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(ii) **Straight/Single Fertilizers:**

<table>
<thead>
<tr>
<th>Nutrient status</th>
<th>Type of Fertilizer</th>
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<tbody>
<tr>
<td></td>
<td>N (kg/ha)</td>
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<tr>
<td>Low</td>
<td>90</td>
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<tr>
<td>Medium</td>
<td>45</td>
</tr>
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<td>High</td>
<td>30</td>
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Apply fertilizer in bands on both sides of the ridges and on mounds in a circle around the base 3 – 5 cm deep about 15 cm away from the base of the vine 9 – 11 weeks after planting (i.e. after first weeding). One match box (40 g) is needed per stand.

Staking:

Staking is necessary for good yields especially in the rain forest zone. This enables the leaves to spread for maximum sunlight which is essential for production of starch and tuber formation. Guinea-corn stalks may be used where small trees, branches and bambooes are scarce. After the guinea-corn heads have been cut off, the stalks are bent over and woven to form a trellis about 75-80 cm high. The vines are trained on this trellis.

Intercropping:

Intercropping is a common practice in Nigerian agriculture. Were yams are often produced under the intercrop system. The following yam based intercropping have been found viable and most promising. Yam/maize/cassava; yam/maize/cassava/okro; yam/maize/egusi. The usual population for the major crops yams and cassava are 10,000/ha and maize 40,000/ha. Recent finding show that yam can profitable be grown in alternate rows and without any appreciable yield losses.

Pests and Diseases:

(i) Pests – the common field pest of yam especially in the riverine
areas is the yam beetle. The beetles bore into the yam tubers in the field and reduce their value. Aldrin dust was used to treat seed yam to control yam beetle. Because of the residue problem and the subsequent ban of Aldrin dust, new chemicals have been recommended. These include carbosulfan (Marshall dust) and Sumithion.

Scale insects and mealy bugs on tubers cause poor germination in the field. Sprays of Nuvan and dust of Carbosulfan are recommended control measures.

(ii) **Diseases:** Soil borne nematodes reduce the quality of tubers by causing warts, galls and cracks on them and thereby promote rots. Two recommendations include – preplant application of carbofuran at 2.7kg ai/ha; crop rotation and use of certain cover crops e.g. stylo, crotolaria, centrosema and groundnuts fallows in farm rotation.

Another important disease which causes considerable loss in the water yam is the “Anthracnose” disease. Control measure include: field sanitation, early planting and staking; application of high “N” dosage (90kg/ha); and use of resistant variety e.g. UM 680.

Other diseases include: leaf blight, leaf spot, Rust and virus, Control measures include: Good farm sanitation; use of clean planting materials; crop rotation; use of resistant varieties.

The early harvest (“milking”) occurs June-August. The tuber
is cut out and removed while the crown or head is re-buried in the soil to produce another crop. The main harvest occurs in October-January. As soon as the vines and leaves dry up, the tubers are carefully dug up. Care must be taken to minimize bruising and damaging the tubers.

The best tool for harvesting is an iron digger. It is advisable to lift the tubers with a sheath of soil and later shake or wash off the soil after curing. Carry tubers to the barn immediately to minimise exposure to the sun.

Storage:

There are several methods of storing yams, depending on the customs in the area where the crop is grown. To achieve good yam storage, tubers must be prevented from sprouting and rotting.

(a) Traditional storage – One popular method is to prepare a frame work of upright poles in double rows under the shade of trees. The yams are cleaned and tied one by one to the erect poles. Where tubers are not tied to poles, they should be heaped but should be placed in a single layer in a cool dry area.

(b) Improved Yam Barn – This system was developed by the NRCRI Umudike. In this system, shade (either of thatch or corrugated metal sheet) are constructed. Open
sided shelves are made and the tubers are placed on the shelves. The barn is protected from rats by erected dwarf wall completed with a strong wire mesh for crops ventilation.

Yam can be served as food - pounded, boiled, mashed, fried, roasted and baked.

Yam may also be processed into flour, chips, ‘elubo’ or amala’.

Average yield is about 10 – 15 metric tons per hectare (sole crop) and 8 – 12 metric tons/hectare (intercropped).

Seed Yam Production

There are two methods:

(i) “Milking” - When the early crop of yam is harvested by milking, and if the roots and stem are not damaged, the final harvest produces seed yams.

(ii) Seed Yam Production by the Minisett Technique: This is a step by step procedure developed by the NRCRI Umudike and described in the NRCRI Advisory Bulletin No. 11 (Ewueke et al 1985).

The technique can be summarized as follows:

a) Sett size and time of planting – For white and yellow yams, plant 25gm setts; for water yam, use 15gm setts. Plant as soon as the rains become regular and constant. Under irrigation, plant all year round.
(b) Cultural Operations;
Dress cut setts with minisett dust or any other proven, safe and potent seed dressing chemical. Plant at 2.5cm along 1 meter ridges (to give 40,000/ha). Weed, at least 2 times; stake and apply fertilizer. Use 200 – 400 kg/ha NPK and apply 8 – 10 weeks after planting.
Minisets can be intercropped with maize and egusi followed by cowpea (in relay).