

COMMERCIAL CROP PRODUCTION GUIDE SERIES

Growing Upland Rice in Nigeria



United States Agency for
International Development
www.usaid.gov

Information and Communication Support
for Agricultural Growth in Nigeria
www.ics-nigeria.org



Growing Upland Rice in Nigeria

Choice of Land

- (i) Select site in ecological zones where rice is grown traditionally.
- (ii) Choose fertile land with good water retention capacity (contain some clay and/or organic matter i.e. loamy soil).
- (iii) If you have to grow rice for one or more consecutive year on the same piece of land, seek the advice of Soil Survey and Testing Service of the Institute of Agricultural Research and Training (IAR&T) or any other reputable soil-testing unit.
- (iv) Grow legumes after rice, and plough rice residues into the soil as organic matter.

Land Preparation

- (i) **MECHANISATION:** (Forest Area) For newly cleared areas, stump big trees before the rains preferably from November to February and remove all stumps, roots and trees before ploughing. Plough once and disc harrow twice with the first rains from late February to early March to make good tilt if land is flat. Plough twice and disc harrow once if land is sloppy. Apply basal fertilizer before final harrowing. Divide the field into plots of 50 or 100m². Construct bunds depending upon the slope, to accumulate rain water. Level the land to reduce erosion.
For consecutive cropping, take necessary soil conservation measures in land preparation.
- (ii) **MANUAL CULTIVATION:** Clear and pack bush between November and February, and use hoe to remove bush and weeds. In the Savannah, land preparation can start in February, depending on the rain.

Recommended Varieties

EARLY MATURING

Faro 38 (IRAT 133), FARO 39 (IRAT 144), FARO 45 (ITA 257), FARO 46 (ITA 150).

MEDIUM MATURING

FARO 11 (OS 6), FARO 43 (ita 128), FARO 47 (ITA 117), FARO 48 (ITA 301), FARO 49 (ITA 315)

NATIONAL ACCELERATED FOOD PRODUCTION PROGRAM TESTED

ITA 321, ITA 331, IDSAID, WAB 35-2-FX, TDX 1012-12-28

Consult the nearest agricultural office or seed companies for certified seeds of recommended varieties, for your area.

Time of Planting

- (i) In the forest area, plant in mid-March to mid-April, after 2 to 3 good rains.
- (ii) In the savannah, plant rice in mid-May to Mid-June, depending on the rains.

SEED RATE

60 kg/ha by dibbling; 50–55 kg/ha by drilling in rows spaced 30 cm apart; and 80–100 kg/ha by broadcasting.

PLANT POPULATION

In dibbling or direct seeding, sow seeds 25 x 25 cm to give 160,000 stands/ha. Use a “pinch” or 4 to 5 seeds paddy per hole. Plant about 3-5cm deep, cover lightly and press. In drilling method, drill in rows 15–20 cm apart.

Fertilizer Rate and Time of Application

Undertake soil test before any fertilizer application. Do not apply any fertilizer on newly cleared land in the first year.

FERTILIZER RATE

- (i) **BASAL FERTILIZER OR FIRST APPLICATION:** Where basal fertilizer is applied, use phosphate and potash fertilizer in deficient soils at final harrowing before seeding. After bush burning, no phosphate and potash fertilizer are needed.
Apply 100kg of 15-15-15 per hectare (2 bags/ha) as basal fertilizer or just at the time of first weeding (2–3 weeks after emergence) to facilitate incorporation of fertilizer into the soil.
- (ii) **SECOND APPLICATION OF TOP DRESSING:** Apply 50 kg (one bag) of Urea per hectare—5 weeks after sowing. In areas where acidity is high, do NOT use Sulphate of Ammonia but use other sources of nitrogen e.g. urea.

METHOD OF APPLICATION

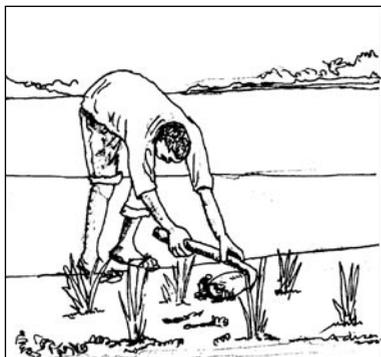
By drilling or broadcasting, ensuring incorporation into the soil. Apply fertilizer at 10 cm from base of plant (hill application) immediately after a sufficient rain.

- (i) **IRON DEFICIENCY:** When the soil is deficient in organic matter and iron, the seedlings turn yellow then white a week after germination. They later die.

- Spray 1% ferrous sulphate with 0.2% citric acid or lemon at 500 liters/ha once or twice depending on the recovery of plants.
- Apply iron chelates and urea in between rows at 25 kg/ha.

(ii) Zinc Deficiency

- Apply 25 kg/ha zinc sulphate (20% zinc) or
- Spray 1% zinc sulphate with 0.5% lime at 500 ltr/ha to the base as symptoms are seen.



Hand weeding.

Weed Control

HAND WEEDING

First weeding should be thorough and should be done within 2 to 3 weeks after emergence, using hoe instead of cutlass (The earlier the first weeding is done the better).

Second weeding should be done 6 to 7 weeks after emergence. Weed a third time, if necessary.

CHEMICAL CONTROL

- (i) **Pre-emergence:** Apply Ronstar™ 25(EC) 2-3 days after sowing or just after seeding at the rate of 4–6 litres/ha.
Spray Gramoxe™ at 2 ltr/ha when weeds have grown in the field. DO NOT spray Gramoxe™ after the germination of paddy seeds.
- (ii) **Post-emergence:** Apply Ronstar™ (PL) 14 to 21 days after planting at the rate of 5–6 litres/ha. Use Propanil (Stan F34), Tamarice or Propanil-Bentzon (Basagram) 14 to 21 days after planting at the rate of 3 kg a.i. (10 liter tin) per hectare. With a knapsack sprayer, use 220 cc of Propanil or Tamarice, except Basagram which should be used at the rate of 150 cc, in 10 liters of water. Any resistant weed species or newly germinating weeds like corn grass—*Rottboellia cochinchinensis* should be rogued. A weed-free seed-bed at planting also contributes to the effectiveness of the herbicides.

Pests

TERMITES

- (i) Preventive: Destroy all dead woods and plant residues by burning.

Locate termite mounds in surrounding bush and destroy.

- (ii) Control: Spray Nogos 50 at the rate of 30 ml per 4.51 (one gallon) of water. Nine litres (two gallons) of solution are sufficient to destroy a termite mound.

ARMY WORM

In case of an attack, spray Gammalin 20 or Carbaryl (Vetox 85) at the rate of 1.68 kg in 225 liters gallons) of water per hectare (i.e. six levels of empty large match box in 9 liters (2 gallons) of water.

VERTEBRATES

Keep 2 to 3 metre border round the field free from grass, weed and burn thrash to control rodents. Build bamboo or palm frond fence (if possible), around the field immediately after planting. Create openings at short intervals and place traps in the openings. If rats and grass cutters become troublesome, kill them with snap traps. Use scaring devices to control birds. Employ human scarers to drive birds from farms from 6 am to 7 pm first two weeks after planting, and from heading to harvesting. Use traditional means where it is effective or plant contiguous fields.

Harvesting

Harvest when 80 percent of the grains have turned straw colour to avoid shattering.

THRESHING

Thresh immediately after harvest to avoid losses. Use wacking frames or mechanical devices, but avoid threshing on bare floor. Thresh on a mat or tarpaulin over concrete floor by flailing (i.e. beating rice against the floor, or against a stick or drum). Thresh carefully and avoid dehusking the grains. Damaged grains become stained and coloured after parboiling and milling.

Expected Yield

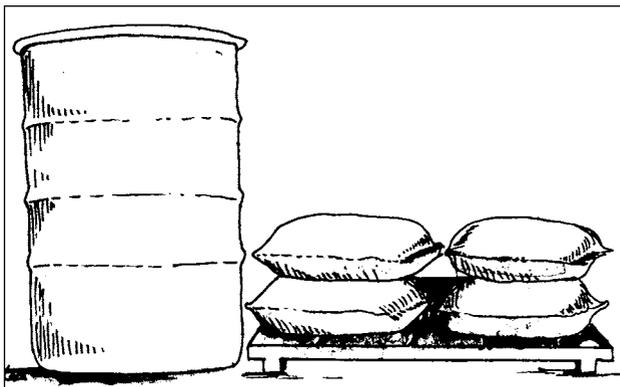
If above recommendations are followed, and rainfall is adequate, an average yield of 1.5–2.0 t/ha could be obtained.

Drying

Dry paddy properly to a safe moisture content of 13–14 percent, by spreading on clean concrete floor, mat or tarpaulin. Sun-dry slowly for 2–3 DAYS to reduce breakage during milling. On a clear bright day, sun-dry for one day only by spreading paddy thinly on clean concrete floor, mat or tarpaulin. Use mechanical drier if possible.

Storage

Store in cool, dry rodent-proof conditions. Infested paddy should be fumigated with phostoxin in air-tight containers at the rate of one tablet per jute bag (100 kg paddy) or 10–15 tablets per ton of paddy.



Proper storage of rice in airtight containers or in jute bags.

Processing

- (i) **PARBOILING:** Soak paddy in hot water at 70°C for 5 to 6 hours. Discard all floating empty grains. Parboil rice by steaming soaked paddy put in a jute bag for 10 to 16 minutes by suspending the bag over steaming water in a drum. Stop parboiling when rice husks start to split open. Chalky grains or white centers indicate incomplete parboiling, which may cause breakage of grains during milling.
- (ii) **Milling:** Mill rice in a two-storage milling machine. Always mill one pure variety at a time.

Footnote: State Government should assist farmers to obtain quicker results of soil testing e.g. procurement of soil testing kits, through Extension Service. There is need for some mechanism for estimating only what farmers should know about the nutritional status of soil e.g. major elements (N, P, K), Fe, pH and S instead of detailed soil analysis.

About ICS-Nigeria

Information and Communication Support for Agricultural Growth in Nigeria (ICS-Nigeria) is a project which aims to increase the quantity and quality of information available for increased agricultural production, processing, and marketing and also strengthen the capacity of farmer assistance organizations to package and disseminate information and agricultural technologies to farmers for the alleviation of rural poverty.

In recent past, investment in the support services to Nigerian agriculture has been neglected with the result that this sector has not realized its full potential to contribute to the prosperity and economic development of the country. Meanwhile, increasing population pressure and the accompanying need to intensify agricultural production is leading to erosion of the natural resource base on which agriculture depends.

The sustainability of production is threatened by a vicious cycle of declining soil fertility and increasing problems of pests, diseases, and weeds. Moreover, the lack of knowledge on how to add value through proper storage, processing, and marketing impedes agricultural growth.

Promising technologies exist to address these problems, but their adoption is constrained by a lack of information packaged in appropriate formats, and poor communication channels for this information, between farmers and the research, extension, and education organizations that are supposed to address these issues.

ICS-Nigeria aims to assist in meeting these challenges by developing appropriate-format materials for disseminating information and agricultural technologies to target user groups, while increasing capacity of farmer assistance organizations to produce information materials. At the same time, communication channels will be reinforced so that information flow is enhanced.

Agricultural technologies have been selected on the basis that they will lead to agricultural commercialization thereby enhancing rapid income generation for farmers and private sector practitioners. The project is taking advantage of existing agricultural development programs in Nigeria, national research institutes, and international research institutes in and out of Nigeria to identify these technologies. The project is also taking advantage of existing successful partnerships arising from recent and ongoing programs to enhance information flow.

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