



Crop Management Practices

An Agricultural Extension Initiative of **INDORAMA**

Potato



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Potato



Potatoes, the world's 4th most popular food crop, after maize, wheat, and rice, is a widely consumed meal in every country. In Nigeria, it is consumed in over 500,000 households weekly, while in Ireland, it is considered as their staple food

The potato is a crop which has always been the 'poor man's friend'. Nigeria is the fourth biggest producer of potato in Sub-Saharan Africa with a production yield of about 843000 tons per year.

Soil

Growing potatoes in an open area with full access to sunlight is the best way to go about the cultivation. The site could slope slightly, be protected from the wind, and be facing southward. Potatoes can be produced on a wide range of soils, ranging from sandy loam, silt loam, loam and clay soil. Soils for potato should be friable, well aerated, fairly deep and well supplied with organic matter. Well drained sandy loam and medium loam soils, rich in humus are most suitable for potato. Light soils are preferred because they tend to promote more uniform soil temperatures and make harvesting of the crop easier. They are well suited to acidic soils (pH 5.0 to 6.5) as acidic conditions tend to limit scab disease.

Climate

Potato is a cool season crop. It thrives best in cool regions where there is sufficient moisture and fertile soil. Satisfactory tuber growth occurs if soil temperatures are between 17 and 19°C. Tuber development virtually stops if temperatures rise above 30°C. High temperatures at any part of the growing period affect the size of the leaflets, thereby reducing the tuber formation. It grows best under long day conditions.

Propagation

Potatoes are grown from cut seed and small whole tubers, and both are satisfactory provided they came from disease free stock. Small whole tubers have certain advantages in that they save the labor of cutting and are less likely to rot in the ground. Blocky pieces with square cuts and a minimum of cut surface are most desirable.

- **Timing:** Potatoes should be planted in dry soil with a temperature of preferably 7°C.
- **Planting Depth:** The depth should be between 12 to 15 cm below the surface and

between 4 to 5 cm above the furrow base in order to protect seed against wet weather conditions.

- **Spacing:** The potatoes should be spaced for up to 12 inches. The soil type, moisture, fertility,

harvest size, and potato variety is taken into account when arriving at a decision for this phase.



Field Preparation:

A well pulverized seed bed is required for good tuberisation of potato crop. Potato is taken as a cool season crop, the field should be ploughed once 20-25 cm deep with soil turning plough. Thereafter, two to three cross harrowings or four to five ploughings with local plough should be done. One or two plankings are also needed to make the surface smooth and leveled.

Seed Treatment:

The sprouted tubers should be used as planting material. Both the whole and cut tubers should be treated with 0.25 per cent Aretan / Tafasan (6% mercury) solution for at least 2 minutes against black scurf disease and rotting of seed potatoes. Dipping of cut seed tubers in 0.5% Dithane M-45 for ten minutes is also effective in avoiding rotting in early planting.

Seed Size, Seed Rate and Spacing:

Tubers having 30 to 50 g weight are the most economical and give the highest yield. Whole tubers should be planted for early crop. This will avoid rotting of tubers. Large seeds can be effectively used by increasing plant to plant spacing and smaller tubers by decreasing it.

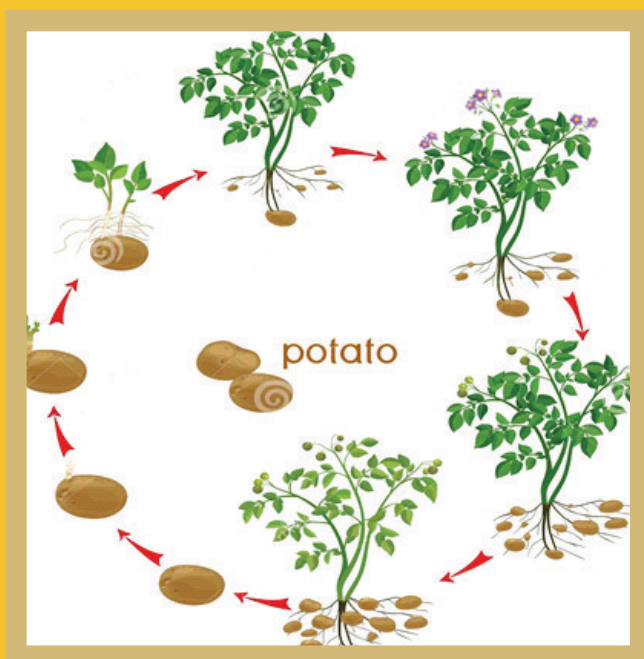
Distance between rows should be 55 and 60 cm and between plants 20 and 25 cm. About 2.0-2.5 Tons of seed is sufficient for planting one hectare area.

While cutting the tubers, care should be taken that each piece has two to three eyes and weighs at least 25g.

Methods of Planting:

There are three methods of planting:

- **Planting potatoes on ridges:** After preparation of field, ridges are made at a distance of 45-60 cm with the help of spade.
- **Flat method:** Planting of potato is done on the flat surface in shallow furrows. Ridges are made after germination when plants attain 10-12 cm height. This method is suitable for light soils.
- **Planting potatoes on flat surface followed by ridges:** Potatoes are planted in furrows and immediately after planting tubers, small ridges are made. Later on these ridges are made thick by earthing up of the side soil.



Manures and Fertilizers

Potato crop is a heavy feeder and hence needs heavy doses of fertilizers for its good growth and yield.

Nitrogen: It is the most important nutrient affecting the potato production. Response of nitrogen is invariably quite high. In soils of good fertility, which are loamy in nature, the requirement of nitrogen will be about **150 kg per hectare means 326 kg (Apx 7 Bag) of Indorama Granular Urea.**

Phosphorus: Application of phosphate at the rate of 80 to 150 kg per hectare is recommended in various types of soils, depending upon their available phosphorus status and their phosphate fixing capacity.

Potassium: Application of potassium along with nitrogen and phosphorus is necessary for potato crop, especially in light textured soils. The application of potassium up to 150 kg per hectare is recommended, depending upon the potassium supplying capacity of the soil and the potato variety.

Earthing

Proper development of tubers depends upon, aeration, moisture availability and proper soil temperature. Therefore, proper earthing up is necessary. Earthing should be done when the

plants are 15-22 centimeters high. Generally earthing is done at the time of topdressing of nitrogenous fertilizers. The ridges should be broad, loose and high enough to cover up tubers. If necessary, a second earthing may be done after two weeks of the first one.

Disease Management

LATE BLIGHT

This disease is caused by a fungus called *Phytophthora infestans*. The disease may attack almost any time after the crop has put up fairly good foliage. Initially, the lower leaves are infected. They show water-soaked lesions especially towards margins. The spots turn black as the affected leaves start rotting.

Control Measures

- Use potato tubers for seed from disease free areas to ensure that the pathogen is not carried through seed tuber and Grow resistant varieties
- Spraying should be done with Dithane M-45 or Dithane Z-78 (2.5 kg per 1000 litres of water per hectare). Spraying should be repeated at 10-12 days interval.

Pest Management

EPILACHNA BEETLE

It is one of the serious pests of a potato crop. They feed on the foliage. The grubs scrap away the chlorophyll from the leaves leaving only veins. The grubs or larvae of these beetles are very sluggish and move very slowly while feeding on leaves. These are yellowish in colour with erect spines on their body. A severe infestation may cause a loss up to 70 per cent in yield.

Control Measures

- Spraying with 0.2 percent Sevin 50 WP (Carbaryl) at the rate of 1000 litres of water has been found quite effective.
- Dusting of 10 percent Sevin dust at the rate of 30 kg per hectare may also control the pest.

CUTWORMS

The damage is caused by the caterpillars by cutting off the growing potato plants. They may cut the twigs, leaves or entire potato plant above the soil surface. They do more harm by cutting the plants than by actual feeding. The

full grown caterpillars are about 5 centimetres long. During day time they remain hiding in the soil and in the night damage the crop. In the later stage, they also feed on the tubers and thus reduce their market value.

Control Measures

- Flooding of field reduces the activity of the caterpillars.
- Use of Temik 10 G at the rate of 8-10 kg per hectare at the time of sowing has been found effective in controlling this insect.
- Use of Carbafuran 3 G at the rate of 30 kg per hectare at the time of sowing has also been found very effective.

APHIDS

These are small insects, either pale yellow or dark in colour. Both nymph and adult damage the plant by sucking the cell sap from the leaves, tender shoots and stem. The leaves of attacked plants become yellowish and they loose vitality. Besides this, aphids secrete honey dew on the leaves on which black mould develops. This interferes in the photosynthesis. The winged aphids also transmit serious viral disease in this crop.

Control Measures:

- Spray Metasystox 25 EC or Rogor 30 EC at the rate of 600 milliliter in 1000 litres of water per hectare.

Harvesting

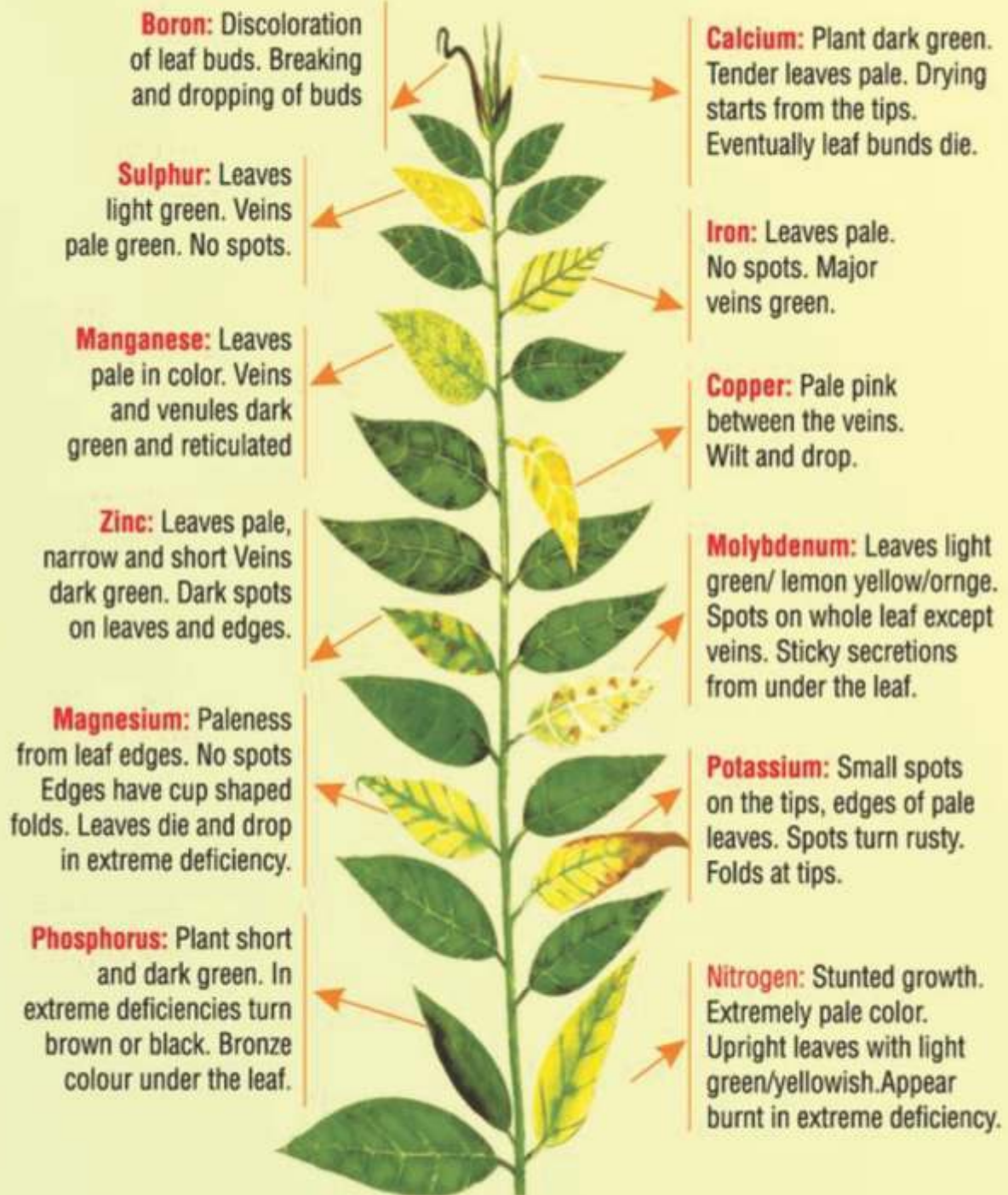
Crop should be harvested when haulms start yellowing and falling on the ground. At this stage haulms should be removed at ground level. The crop should be harvested about 15 days after cutting the haulms. Digging is done with spades in small fields. Suitable tractor operated potato diggers are available now for digging the potatoes in big fields. There should be optimum moisture in the soil at the time of harvest. After digging, the tubers may be allowed to dry on the ground for some time in shade.

Yield

With recommended package of practices, a yield of 30 to 40 tons per hectare can be obtained.



Deficiency Chart of Micronutrients



THE COLOUR REPRESENTED ARE INDICATIVE.
THEY MAY VARY FROM PLANT TO PLANT