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How to Grow Cassava with Bio-Plant and Pro-Plant

Notes

- The production costs will be lower than with chemical fertilizers. Chemical sprays will not be needed, so money can be saved there.
- The cassava yield and quality will be higher than with chemicals. The key to success lies in preparing the soil with bio-compost as described below. If the soil has been used for chemical farming before, it will need restoring to fertility, which is where the bio-compost will help.
- The farmers should get a higher price for chemical-free cassava. After 3 years it will be recognized officially as "100% Organic".
- It's tempting to rush ahead, plough the soil, and plant a monoculture of cassava crops. But the interests of the farmers are not served in this way. The guidelines below will help the farmers to regenerate their soil while producing cassava crops with a higher yield and without disease.

1. Soil Preparation

1.1 Plant a Cover Crop

- The best way to prepare the soil is to plant a multi-species (5+ species) cover crop that includes legumes and grasses, such as carrots, peas, sorghum, millet, turnips, Sudan grass, cereal rye, annual ryegrass, clovers, buckwheat, oilseed radish, sunflower, sun hemp, and hairy vetch. Consult with your local agronomy department about which cover crops to plant because the choice depends on the climate, the state of the soil, and your goals. Grow diverse microbial life before you plant the cassava crops.
- **Mow (Flatten) the Cover Crop:** Mow the cover crop down (don't plough it) just before it produces seeds and plant through the bio-mass after having left it for 2 weeks on the soil to decay.
- If you prefer you could let your livestock graze on the cover crop and flatten it while they add urine and manure. Don't let them eat all of it because you want the soil to be covered.
- **Don't Till (Plough) the Soil:** Don't till the soil or plough in the bio-mass because then you will kill the fungi networks in the soil that feed the plants, destroy the soil structure, compact the soil, and loose the soil cover, among other harmful effects, such as the oxidization of organic matter, soil erosion, hot soil temperature, etc.

Planting into a terminated cover crop.

- Plant the cassava plants in the rows and leave the bio-mass on the soil. It will keep the soil covered and prevent weeds while providing food for the soil bacteria and fungi that will provide nutrients to the roots.
- Spray Bio-Plant on the planting rows (only) as you plant through the bio-mass. Mix 1 litre with 1,000 litres of water per hectare. 500 litres in 500 litres per acre. It is very beneficial to add the microbial life in Bio-Plant to the planting rows.

1.2 Compost and Soil Preparation

- If you prefer you could make a lot of compost mixed with Bio-Plant and spread it over the planting rows. You will need about 2 months to make the compost and a minimum of 5 MT per hectare (2.5 MT per acre).
- **How to Make Compost:** See the file at ***Section 3.2*** called ***How to Make Rich Compost with Bio-Plant – Handouts***. Click here for how to make rich compost with Bio-Plant. Scroll down to ***Section 3.2.*** Soil preparation with a lot of compost made with Bio-Plant will be invaluable in increasing growth. Add compost to the planting rows and spread it generously. Add more compost monthly on Day 30 and Day 60. The minimum amount of compost per acre should be 2.5 MT.
- If you only intend to apply manure, then spray Bio-Plant onto the manure at the rate of 1 litre per 1,000 litres of water. Per acre this would be about 500 cc in 500 litres.
- If you do not make compost, refer to the file at ***Section 3.7*** called: ***How to Prepare the Soil with and Without Compost***. Scroll down to ***Section 3.7.*** **Click here**.
- To produce a high yield the farmers should make lots of bio-compost made with Bio-Plant – one heap per hectare with more compost being made ready to place around the plants once per month during the crop.
- Prepare the soil with at least 5 MT of compost mixed with Bio-Plant so that the soil is rich. The better it is prepared, the less likely the cassava will experience disease. Leave the field for 7-14 days in the sun in order to kill the weeds before planting.

2. Planting the Cassava

- Cut the cassava poles into 20 cms. sections. Each section should have at least 5 nodes.
- When you soak the cut cassava soak them in water mixed with Bio-Plant (20 cc in 20 litres of water) for 2 days and 2 nights and then leave them in the shade to dry. The Bio-Plant will provide protection and help the cassava to sprout roots.
- Plant the cassava 80 cms. from each other; 20 cms. into the soil; and at 45 degrees. This forces the cassava to sprout roots.
- It is beneficial to plant cassava into a field where a cover crop has been terminated

3. Applying Pro-Plant

3.1 General Guidelines

- Spray the leaves with water that contains a ratio of 20 cc of Pro-Plant per 20 litres of water.
- For a hectare, mix 500 cc of Pro-Plant with 500 litres of water. For an acre, mix 250 cc of Pro-Plant with 250 litres of water. For half an acre, mix 125 cc of Pro-Plant with 125 litres of water. For 200 sq.m. mix 35 cc with 35 litres of water. For an area of 10 metres x 10 metres (100 sq.m.) mix 20 cc in 20 litres of water.
- Spray the leaves before 9 a.m. when the pores are open most. Direct the spray diagonally upwards so that the spray hits the underside of the leaves because this is where the pores (stomata) are. Make sure that the spray is a very fine, misty, foggy kind of spray. Be thorough

and generous when you spray. Spray on top of the leaves as well because the micro-organisms in Pro-Plant will coat the leaves and protect the plant from fungal diseases.

3.2 Spraying Cassava Seedlings in a Nursery in Black Bags

- Spray the seedlings every 7 days while they are in the plastic bags. The ratio is 20 cc of Pro-Plant per 20 litres of water, but you will not need to spray much of the mixture because of the size of the seedlings. Spray the leaves thoroughly.

3.3 How Much to Spray per Plant

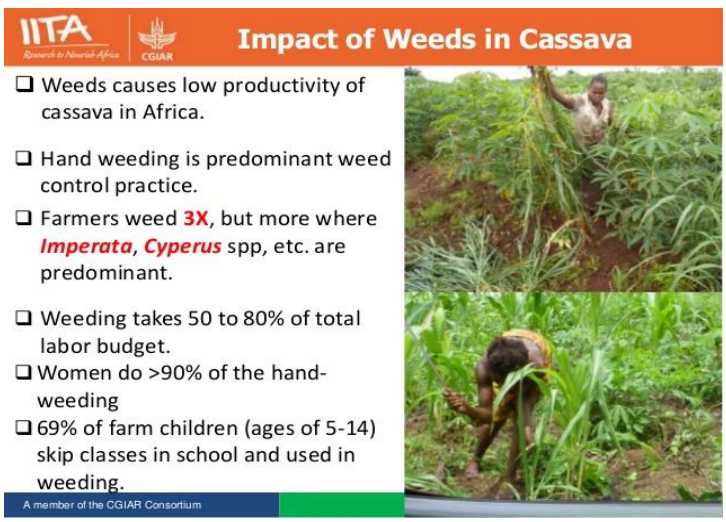
- When the plants are very small you do not need to spray much of the Pro-Plant / water mixture. The key point is to cover as many of the leaves as possible with the spray.
- Cassava usually takes 255-270 days. Spray the seedlings every 7 days in the first month after transplanting them into a field, and then every 15 days afterwards. Spray on Days 30, 45, 60, 75, 90, 105, 120 and every 15 days until 15 days before harvest.

4. Mulching and Adding Bio-Plant

- Mulch the soil around the cassava plants or use one of the other methods in **5** below to control weeds. If you mulch, it is beneficial to spray Bio-Plant on the mulch around the cassava (without touching the leaves) every 30 days until the branches become too dense.
- Extra Bio-Plant should be added monthly either by spraying it on the mulch around the base of the cassava plant, or apply it in the form of bio-compost made with Bio-Plant.
- Extra bio-compost should be added as the buds for the flowers appear and then every 30 days afterwards as the cassava tumors grow.
- If the farmer uses drip-feed pipes, the Bio-Plant could be fed through the pipes. It is better to spray Pro-Plant, though, because it coats the leaves with micro-organisms, which protect the cassava from fungal diseases.

5. How to Control Weeds

- **Mulch Cassava Fields with Dead Plant Foliage:** Mulching increases crop yield, Nitrogen, and reduces weeds significantly. It involves covering the soil surface with very large amounts of plant foliage, such as rice straw.
- It improves the soil's properties and reduces weed problems.
- Good sources of mulch materials are foliage from leguminous plants, rice straw or husks, coffee hull, and crop and weed residues. Maize stubble is usable, but it takes a long time to rot.



A mulched cassava field. No weed problems.

- **Use Cover Crops as Live Mulch on Seedbeds:** You can use food crops such as egusi melon as cover crops, and/or plant intercrops (such as maize) to reduce weed infestation in cassava farms. Egusi melon is a good "live mulch" in cassava farms. If you decide to use egusi melon as live mulch you should plant it before planting the cassava. The egusi melon should be planted very closely spaced on the seed beds to enable it to spread and cover the soil very quickly.
- **Plant Cassava in Association with Other Crops:** You can also reduce weed problems by inter-cropping cassava with other crops at planting. Crops commonly intercropped with cassava are maize, rice, grain legumes, and vegetables. It is helpful to intercrop cassava with grain legumes such as cowpea and groundnuts, which manufacture and release nutrients into the soil. Cassava + cowpea gives a higher yield than cassava + groundnuts, and a greater reduction of weeds.

Cassava intercropped with maize.