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

Note: It's tempting to rush ahead, plough the soil, and plant a monoculture of pineapple. 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 more nutritious pineapple 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 pineapple.
- **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.
- Plant the pineapple 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.

Planting into a terminated cover crop.

- 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.
- **Note:** It is worth watching this video by Dole, which shows how the company makes its compost and plants the pineapple slips in the compost: https://www.youtube.com/watch?v=5VnXiP3RNSk

2. Preparing the Suckers for Planting: https://www.youtube.com/watch?v=wIhMTid0Ytg

- Pull off the suckers from the pineapple plants. Remove the bottom leaves so as to expose the nodes. They can then be planted in the fields in the soil on the ridges, which you have prepared with compost.
- It is a good idea to dip the suckers in Bio-Plant mixed with water at the ratio of 20 cc in 20 litres of water before planting in the soil to provide disease protection.

3. Spraying Pro-Plant

- 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 each time you spray the crop. For half an acre, mix 125 cc of Pro-Plant with 125 litres of water. For 200 sq.m mix 40 cc with 40 litres of water. For an area of 10 metres x 10 metres (100 sq.m.) mix 20 cc of Pro-Plant in 20 litres of water.
- Spray the leaves (including the flowers and fruit when they appear) before 9 AM when the pores are open most. Spray on the edges of the leaves as well. Make sure that the spray is a very fine, misty, foggy kind of spray. Be thorough and generous when you spray.

Pineapple Foliar Program of Fertilization + Flower Induction

Crop Stage	Application Method
Plant Establishment	Start applications when the young plant has the first roots. Repeat during the next two months with 10-15 days intervals.
Vegetative Development	Apply at the sprouting time, repeat with 10-15 days intervals. Stop applications at the beginning of stem thickening due to flowering buds.
Flower Induction	Apply 2-4 times two months before flowering with 15 days intervals.
	Start applications during all the leaf growing period, with 15 days intervals.
Flowering	In order to induce flowering, apply one month before stem thickening with 15 days intervals.
	Apply at the moment of the stem thickening, repeat with weekly intervals until flower opening.

Fruit Growth	Start applications at the beginning of fruit filling; repeat with 7-10 days intervals until end of harvest.
	Apply at the beginning of fruit filling with 7-10 days intervals until harvest.
	Apply during all the fruit growth period with 15 days of intervals.

4. For Extra Yield - Applying Additional Bio-Plant

- Because pineapples grow over a long period, additional micro-organisms should be added to the soil around the plants, ideally once a month (every 30 days) on Day 30 and Day 60. Compost made with Bio-Plant would be very effective way to do this. Provide several kgs. per plant.
- If the farmer does not have any compost, he could apply Bio-Plant by spraying it mixed with water at the base of the plants.
- Do not spray Bio-Plant on the leaves as this will cause them to turn yellow.
  - Hectare: Spray 500 cc of Bio-Plant mixed with 500 litres of water, or better 1 litre of Bio-Plant mixed with 500-1,000 litres of water.
  - Acre: Spray 250 cc of Bio-Plant mixed with 250 litres of water. You could spray 500 cc in 500 litres of water in order to provide more micro-organisms.

5. Chemical Sprays

- There is no need to spray chemical pesticides. It is worth watching this video by Dole, which shows how the company uses natural pest repellants so that the pineapples are 100% organic: https://www.youtube.com/watch?v=5VnXiP3RNSk
- Plastic mulching is commonly used to prevent weed growth in very large pineapple plantations. If this method is not used and you have plenty of organic mulch, then place this on the ridges around the plants. If you do not mulch, you will have to carry out manual weeding. Herbicides cannot be used in 100% organic farming, of course, and their use has a detrimental effect on the soil's microbial life.

6. Mulching

- It is important to mulch the soil between the pineapple plants or to grow a legume crop there so as to suppress the growth of weeds.

6.1 What is Mulching?

- Mulching is one of the most important ways to maintain healthy landscape plants and trees. A mulch is any material applied to the soil surface for protection or improvement of the area covered. Mulching is really Nature's idea. Nature produces large quantities of mulch all the time with fallen leaves, needles, twigs, pieces of bark, spent flower blossoms, fallen fruit and other organic material.

6.2 Benefits of Mulching

- When applied correctly, mulching has the following beneficial effects on plants and soil:
  - Mulches prevent loss of water from the soil by evaporation.
  - Mulches reduce the growth of weeds, when the mulch material itself is weed-free and applied deeply enough to prevent weed germination or to smother existing weeds.
  - Mulches keep the soil cooler in the summer and warmer in the winter, thus maintaining a more even soil temperature.
  - Mulches prevent soil splashing, which not only stops erosion but keeps soil-borne diseases from splashing up onto the plants.
  - Organic mulches can improve the soil structure. As the mulch decays, the material becomes topsoil. Decaying mulch also adds nutrients to the soil.
  - Mulches prevent crusting of the soil surface, thus improving the absorption and movement of water into the soil.
  - Mulches prevent the trunks of trees and shrubs from damage by lawn equipment.
  - Mulches help prevent soil compaction.
  - Mulches can add to the beauty of the landscape by providing a cover of uniform colour and interesting texture to the surface.
  - Mulched plants have more roots than plants that are not mulched, because mulched plants will produce additional roots in the mulch that surrounds them.

6.3 How to Apply Mulch

- Before applying any type of mulch to an area, it is best to weed the area. Spread a layer of mulching materials generously around the pineapple plants. Keep mulch 2 to 3 inches away from the stems of the pineapple plants. This will prevent decay caused by wet mulch.

6.4 How Deep to Mulch

- The amount of mulch to apply depends on the texture and density of the mulch material. Many wood and bark mulches are composed of fine particles and should not be more than 2 to 3 inches deep. Excessive amounts of these fine-textured mulches can suffocate plant roots, resulting in yellowing of the leaves and poor growth.
- Coarse-textured mulches such as straw, allow good air movement through them and can be as deep as 4 inches. A depth of 4 inches will stop weeds growing.
- Mulches composed of shredded leaves should never be deeper than 2 inches because they tend to mat together when wet, thereby restricting the water and air supply to the plant roots.

Different kinds of mulch material.