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How to Grow Citrus Fruit Trees with Bio-Plant and Pro-Plant

Introduction

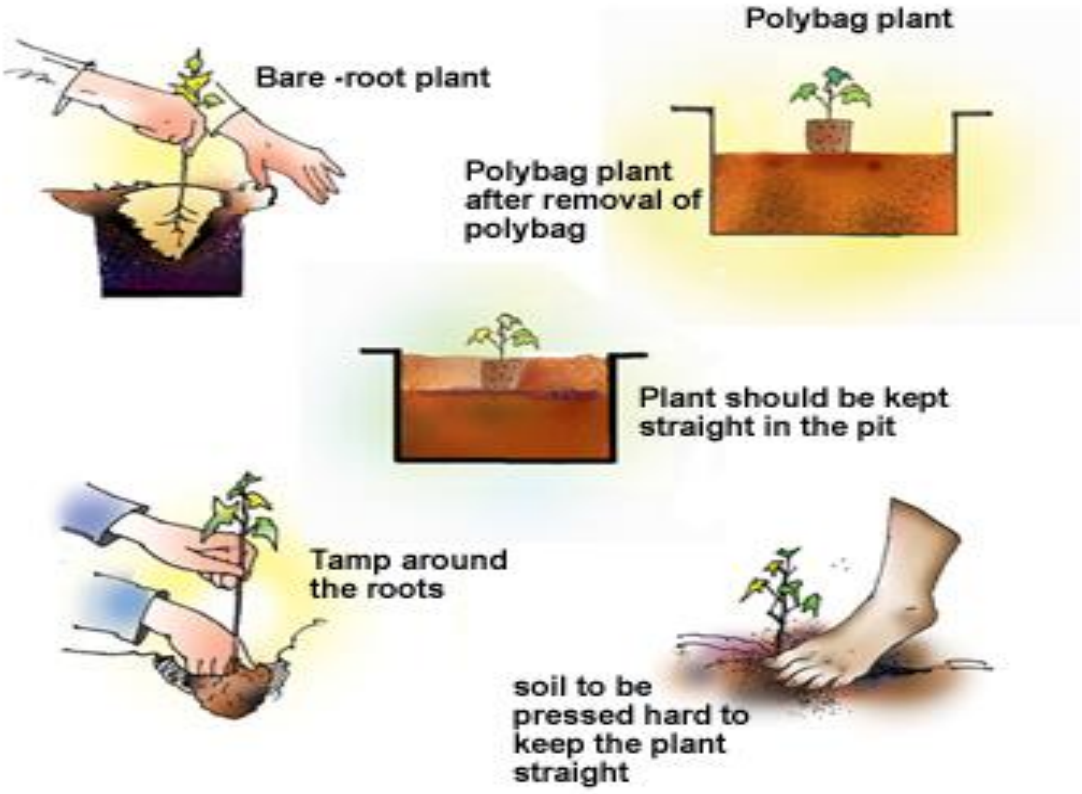
- The most important commercial species of citrus fruits are:
  - Sweet oranges (Citrus sinensis)
  - Limes (C. aurantifolia)
  - Grapefruits (C. paradisi)
  - Lemons (C. limon)
  - Mandarins (C. reticulata). These are often called tangerines.

1. Compost and Soil Preparation

- 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 holes and spread it generously around each tree after planting. Add more compost around each tree monthly.
- 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**.

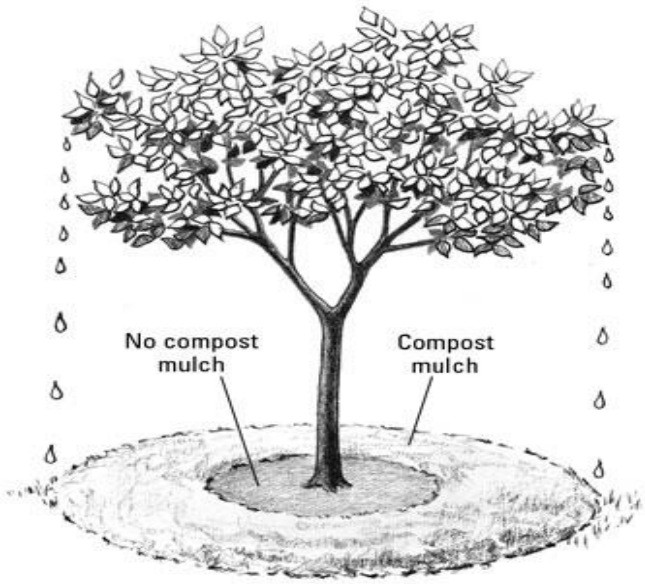
1.1 Planting Saplings

- When planting seedlings in holes, use a 1:1 mixture of bio-compost and soil in the holes. Make the hole about 60 cms. x 60 cms. x 60 cms., and fill the hole halfway up with the mixture. Then spread 5-10 kgs. of bio-compost around the sapling while avoiding placing the bio-compost against the stem of the sapling.



1.2 Applying Bio-Plant During the Growth of the Trees

- Once a month place 5-10 kgs. around trees which are already growing - a minimum of 5 kgs. per tree, if the trees are under 1 metre high, and about 10 kgs. around trees over 1 metre in height. But 10 kgs. can be applied to trees under 1 meter in height as well. Place 15 kgs., if the soil is very poor or there is a problem with disease.
- If you do not have any bio-compost, pile up leaves around the base of the tree and spray the soil once a month with a mixture of 100 cc of Bio-Plant in 100 litres of water. Pour about 2 litres of the water at the base of each tree where the roots are. *(See the diagram on the next page.)* Apply this mixture once a month. The Bio-Plant provides extra nutrients by dissolving the leaves. We recommend this because often chemical fertilizers have been used for so long that the micro-organisms in the soil have mostly been killed off, and there is a lack of minor minerals. The farmers need to try to restore the soil as quickly as possible.
- The fallen leaves could be raked into a circle around the tree up to the distance shown in the diagram, and the Bio-Plant could be sprayed on the leaves to help them break down. Bio-Plant's micro-organisms will then have organic matter to multiply in. The farmer should do this once a month, and it is a good idea to continue to do this even after flowering. *(See **1.3** below.)*



1.3 Applying Additional Bio-Plant During the Flowering Stage of the Trees

- When the flowers start to appear, spray the organic matter around the base of the tree (or soil if there is no organic matter around the tree) with 20 cc of Bio-Plant mixed with 20 litres of water. For a hectare, mix 500 cc of Bio-Plant with 500 litres of water. Ideally, spray all of the trees at their base once every 2 weeks once the flowers have appeared instead of once a month.

2. <u>Applying Pro-Plant</u>

2.1 General Guidelines

- Spray 20 cc of Pro-Plant in 20 litres of water.
- For a hectare, mix 500 cc of Pro-Plant with 500 litres of water.
- Spray the leaves monthly once the leaves have appeared until the Flowering Stage. 2-3 weeks before the flowers appear, start to spray the buds and leaves every 14 days. During the Flowering Stage and Fruiting Stage the frequency of spraying should increase. The more nutrients the tree receives, the bigger the yield. We recommend that you spray every 10 days during the Flowering Stage and every 7-10 days when the citrus fruits start to appear. You might experiment by spraying some trees more frequently than others during the Flowering Stage and Fruiting Stage in order to compare the effects.

- Continue spraying until 14 days before the citrus fruits are harvested. Harvesting starts at 4-5 years from planting.
- Spray the leaves of the trees before 9 a.m. when the pores are open most for better results. Use spraying equipment that gives a fine, misty spray, and that the spray is directed diagonally upwards so that it hits the pores of the leaves underneath as well as lands on the leaves. Be generous when you spray a tree. You do not have to spray every leaf though.
- If the farmer wishes to spray pesticides, spray them at least 3 days before or after spraying either bio-fertilizer. We encourage farmers not to use chemical sprays, though, as they kill the micro-organisms.

2.2 If the trees are too tall for spraying the leaves with Pro-Plant, then mix 100 cc of Pro-Plant with 100 litres of water and pour about 2 litres of the mixture about a metre from the trunk of each tree every month.

2.3 For Immediate Use with Citrus fruit Trees Already Growing

- If you are just beginning to use Pro-Plant, spray the leaves and citrus fruits with water that contains 30 cc of Pro-Plant per 20 litres of water. When the flowers or citrus fruits are on the trees, spray the whole tree with no less than 30 cc and no more than 35 cc per 20 litres of water. If the flowers have not yet appeared, then spray at the ratio of 20 cc of Pro-Plant per 20 litres of water every month.
- For a hectare, mix 500 cc of Pro-Plant with 500 litres of water before the flowers and citrus fruits appear, and 750 cc in 500 litres of water, if the flowers or citrus fruits have appeared. For an acre, mix 250 cc of Pro-Plant with 250 litres of water before the citrus fruits appear and 375 cc in 250 litres of water, if the flowers or citrus fruits have appeared.
- Spray the trees every 14 days once the flowers have appeared, and every 7-10 days when the citrus fruits have appeared. Spray the leaves and the buds, flowers, and citrus fruits. Continue until 14 days before the citrus fruits are picked.
- Spray Pro-Plant with a fine, misty spray. Spray on the leaves as well as diagonally upwards so that Pro-Plant enters the pores of the leaves underneath as well as on the leaves. Spray the leaves well, and ideally before 9 a.m. when the leaf pores are open most.
- If the farmer wishes to spray pesticides, spray them at least 3 days after applying either bio-fertilizer.

2.4 Applying Bio-Plant as a Fungicide

- Replace the chemical fungicide you may be using with Bio-Plant mixed with water.

a. For Prevention: Dosage: 5-10 cc/20 litres of water. Spray on the tree. Avoid the leaves as much as possible. (This is to prevent fungus, but only apply this mixture, if you think that you might have a problem with fungus. If you are applying compost every month and spraying Pro-Plant regularly your trees should be protected already.)

b. A Little Fungus: 10-20 cc/20 litres of water. Spray on the tree, if there is some fungus already. Avoid the leaves as much as possible.

c. The Whole Tree Has Fungus:

1. Spray 50 cc/20 litres of water only on the branches. Or:
2. The farmer can scrub or brush on the branches 50 cc/20 litres of water. Avoid the leaves. Spray every 7-10 days for better effect, if the trees have fungus already. When you spray Pro-Plant the leaves get coated with micro-organisms that protect the trees from disease. The Bio-Plant strengthens the immune system so that the trees are less susceptible to disease.

- If there is a need to spray pesticides, please spray them at least 3 days apart from when you apply the bio-fertilizers as the chemicals kill the micro-organisms that will now be multiplying in the soil and being sprayed onto the leaves.

3. Preparing the Citrus Fruit Seeds

- Select seeds from healthy mother trees.
- Soak the citrus fruit seeds in water that contains 20 cc of Bio-Plant per 20 litres for 24 hours. The ratio is 10 cc of each bio-fertilizer per 10 litres of water. If the amount of seeds is small, then reduce the water to just a few litres.
- Sow the seeds in seedbeds or polybags (18 x 23 cm). Water the seeds twice a day. The seeds will germinate in 2 to 3 weeks

4. Mulching

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

4.1 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 citrus fruits and other organic material.

4.2 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.

4.3 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 trees. Keep mulch 2 to 3 inches away from the stems of the plants and trees. This will prevent decay caused by wet mulch.
- Newly planted trees require a circle of mulch 3 to 4 feet in diameter. Maintain this for at least three years. Do not pile mulch against the trunk.
- In the case of established trees try to apply the mulch from close to the trunk of the trees to at least 6 to 12 inches beyond the drip-line of the tree. Because the root system can extend 2-3 times the crown spread of the tree, mulch as large an area as possible.

4.4 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.