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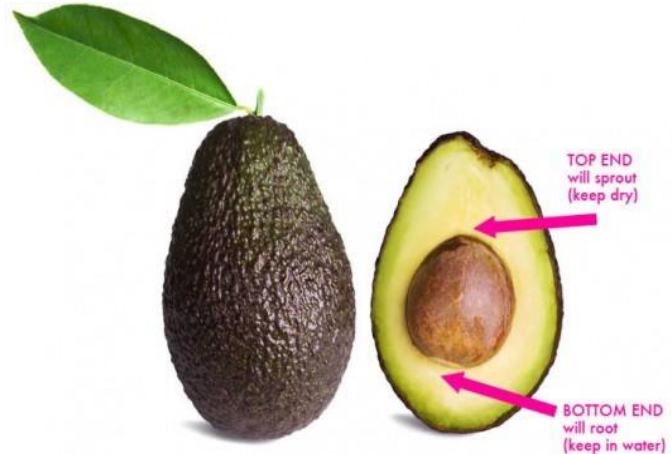
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How to Grow Avocado Trees with Bio-Plant and Pro-Plant

1. Preparing the Avocado Seeds (“Pit”)

1.1 Remove the Pit

- Carefully remove the pit (aka the seed) and rinse off all of the avocado bits that are stuck to it. You can soak it in water for a few minutes for easier cleaning. Make sure not to damage or remove the brown skin that surrounds the pit.



1.2 Identify the Ends

- Avocado seeds can range in shape and size slightly, but generally they resemble an oval-shaped sphere. They have a flat “bottom”, which is the area that the roots grow from, and rounder, slightly pointier, top, which is where the plant grows from. It is important to keep this in mind when you “plant” the avocado.

1.3 Soak the Seed

- Pierce the seed with 3-4 four toothpicks along the side of the avocado near the bottom. Then place it on top of a glass or some other type of container so that it is suspended above the water with only the bottom of the seed being soaked. Mix the water with Bio-Plant at the ratio of 10 cc in 10 litres of water. After soaking farmers also often dip the seed in undiluted Bio-Plant before planting. This video shows how to soak the seeds in water (without Bio-Plant). [Click here](#).

1.4 Give It Time to Sprout

- You should see the top of the seed begin to sprout and split around three to six weeks after soaking it in water. You will also notice roots will have grown to the base of the container. Once the stem is around six inches long, trip the set of leaves that are at the top of the plant.

1.5 Trim the Sprout

- About two to three weeks after trimming the first set of leaves you should notice a new set of leaves and a lot more roots. Once the sprout reaches around seven inches in height, cut it in half. This will encourage more growth.
- Leave part of the top of the seed uncovered. If in a few days the seed is green, it means it is healthy and should grow well. If the seed is brown or black, it is probably rotting and can be removed and replaced with another seed. Once the seed has germinated and the growth is good, it is ready to be transplanted into a pot.

2. Compost and Soil Preparation with Bio-Plant

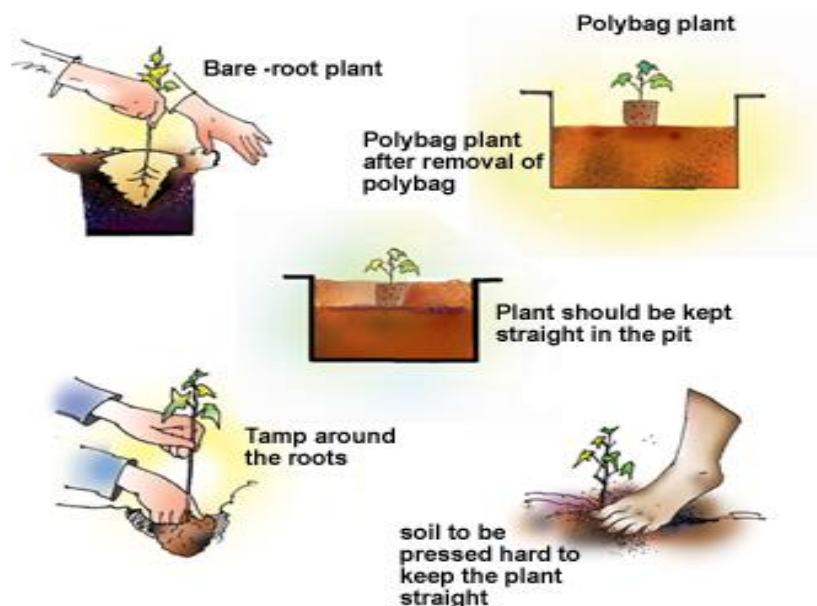
- See the file called *How to Make Rich Compost with Bio-Plant – Handouts* for how to make rich compost with Bio-Plant. [Click here](#) for the file.
- Soil preparation with a lot of compost made with Bio-Plant will be invaluable in increasing growth. Add compost to the planting holes and spread it generously around each tree after planting. Add more compost around each tree monthly.

- If you cannot make any compost, read the file *How to Prepare the Soil with and Without Compost*. [Click here](#).

3. Applying Bio-Plant

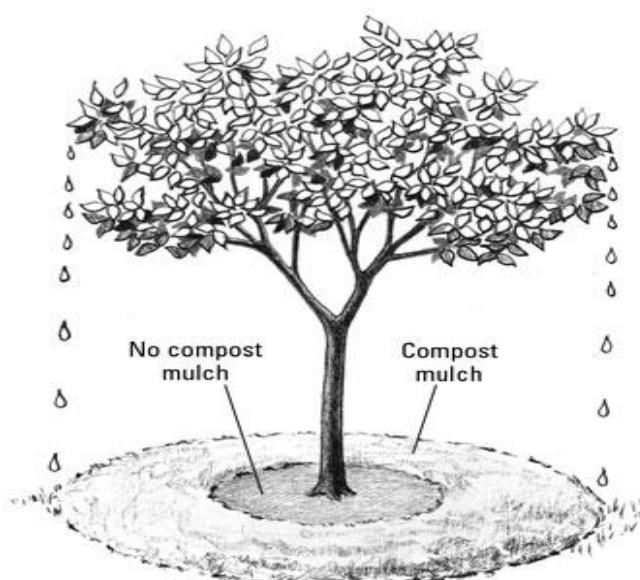
3.1 Planting Saplings

- 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.



3.2 Applying Bio-Plant During the Growth of the Trees

- Once a month place 5-10 kgs. of compost 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 compost pour about 2 litres of a mixture of Bio-Plant in water around each tree where the roots are. The ratio is 100 cc of Bio-Plant in 100 litres of water. Cover the wet area with a few inches of leaves or dried grass. Apply this mixture once a month.
- The fallen leaves could be raked into a circle around the tree up to the distance shown in the diagram below. If you have enough organic matter, such as leaves or dried grass, place a thin



layer on the soil around the tree, pour the Bio-Plant & water mixture onto it, and then cover it up with a few inches of organic matter as mulch. Bio-Plant's micro-organisms will then have some organic matter to multiply in while it breaks down the organic matter and add nutrients to the soil.

3.3 Applying Additional Bio-Plant During the Flowering and Fruiting Stages

- When the buds and flowers start to appear, add more compost made with Bio-Plant around the trees regularly, such as every two weeks. If the compost was not made with Bio-Plant spray it every two weeks with Bio-Plant mixed with water at the ratio of 100 cc of Bio-Plant in 100 litres of water. If there is no organic matter around the tree spray about 2 litres of the mixture around each tree once every 2 weeks once. Cover the sprayed bare soil with mulch.
- Continue to do this every two weeks throughout the flowering and fruiting stages.

4. Applying Pro-Plant

4.1 General Guidelines

- The ratio for spraying Pro-Plant is 20 cc of Pro-Plant mixed with 20 litres of water. If there are about 1,000 trees per hectare, you will need to mix 1 litre of Pro-Plant with 1,000 litres of water and to apply this as shown below.
- **Months 1-6:** When 3 or 4 leaves have appeared, spray the leaves every 7 days. From Month 3 change this to spraying every 14 days.
- **Months 7 Onwards:** Spray once per month.
- **Buds Stage:** When the buds appear, start to spray the buds and leaves every 14 days.
- **Flowering and Fruiting Stages:** 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 10-14 days during the Flowering Stage and every 10-14 days when the avocados 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 of spraying every 10 days and 14 days.
- **Varieties**
 - 'Fuerte': Hybrid of Guatemalan and Mexican races with thin skinned green-pebbled fruit of very good flavour. This variety has many lines with different shapes; the pear-shaped fruit is preferred in the export market. Matures 6-8 months after flowering.
 - 'Haas': Vigorous grower and bears medium-sized, rounded, rough-skinned, black avocados. Propagates well. Matures 8-9 months after flowering.
 - 'Nabal': Bears fruit in alternate years. Its green avocados have a good flavour. Matures 8-9 months after flowering.
 - 'Puebla': Spreading, dark green tree bearing deep purple to maroon round fruit. This variety is normally used as a rootstock. Matures 5-7 months after blossoming.
 - Others: 'Reed', 'Simmonds', 'Booth 7&8', 'Pinkerton', 'Bacon', 'Lula' and 'Taylor'
- **Harvesting** starts at 3-4 years from planting but a good yield is obtained from the 6th year onwards. It is not easy to tell when the avocados are ready for harvesting unless they are of the varieties that change colour at maturity. Harvest a sample and keep at room temperature. If they soften within 7-10 days without shrivelling then the fruit of that age are ready for harvesting.
- Continue spraying until 14 days before the avocados are harvested.
- 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.

4.2 Tall Trees: 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 once per month. Change this to every 10-14 days during the Flowering and Fruiting Stages.

4.3 For Immediate Use with Fruit Trees Already Growing

- If you are just beginning to use Pro-Plant and the buds, flowers, and avocados have not yet appeared, spray the leaves with water that contains 30 cc of Pro-Plant per 20 litres of water once a month for the first 3 months. Then change to the normal ratio of 20 cc of Pro-Plant mixed with 20 litres of water.
- But if the flowers or avocados are already on the trees, spray the whole tree with no less than 30 cc and no more than 35 cc of Pro-Plant per 20 litres of water every 10 days.
- Spray the leaves and the buds, flowers, and avocados. Spray Pro-Plant with a fine, misty spray. Spray on the leaves diagonally upwards as well as downwards 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.

4.4 Applying Bio-Plant as a Fungicide

- If the trees have fungal problems and you have been using a chemical fungicide, replace the chemical fungicide with Bio-Plant mixed with water as shown below.

a. For Prevention: Dosage: 5-10 cc of Bio-Plant mixed with 20 litres of water. Spray this on the tree trunk and branches where the fungus is. Avoid the leaves as much as possible. (This is to prevent fungus, and 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 of Bio-Plant mixed with 20 litres of water. Spray this on the tree, if there is some fungus already. If the fungus is mostly on the tree trunk and branches, avoid the leaves as much as possible when you spray the mixture.

c. The Whole Tree Has Fungus:

1. Spray 50 cc of Bio-Plant mixed with 20 litres of water only on the branches. Or:
2. The farmer can scrub or brush on the branches 50 cc mixed with 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.

- **Note:** 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.

5. 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.

5.1 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 avocados and other organic material.

5.2 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.

5.3 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.

5.4 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.