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

1. Compost and Soil Preparation

1a. 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 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**.
- **In the Case of Libya** where wheat is grown in large 50-hectare, circular fields and water is applied via large sprinkler arms, and compost is not used, do the following:
  - Adjust the soil's pH, such as with Calcium Hydroxide. Soil bacteria need a pH of 6.0-6.5.
  - Spray 4 litres mixed with 4,000 litres of water over the 50 hectares.
  - Leave the fields for 2 weeks for the micro-organisms to grow before planting the wheat seeds.
- For a much better result, plant a legume cover crop to increase the soil's nutrients, Nitrogen, and soil food web. Plough in the cover crop just before the seeds appear. Spray Bio-Plant mixed with water as above. Wait 2-4 weeks for the crop residue to break down and then plant the wheat seeds.
- **Note:** If you are using a 5,000-litre tank, have two 5,000-litre tanks next to each other. One can be filled up while the other tank feeds water to the sprinklers. Or use a 25,000-litre tank for each 50-hectare field. A 5,000-litre tank will need 5 litres of Bio-Plant. One litre of Bio-Plant can be mixed with 1,000 litres of water.

2. Seed Preparation

- Soak the wheat seeds in warm water overnight for 8-10 hours. Soak the seeds in water that contains 20 cc of Bio-Plant per 20 litres. It does not have to be exactly 20 cc of Bio-Plant and more than this is fine, so do not worry. Plant the seeds the same day.
- **Planting the Seeds:** If you are using a mechanical seed planting machine, plant the seeds through the stubble of the previous wheat crop. You will then have soil cover to protect the seeds from the heat and the birds.

3. Spraying the Plants with Pro-Plant

- ***Shake the bottle vigorously before opening it.*** Pour it into a suitably-sized container and mix it with water according to the amounts below. Turn on the water tap so that the water pours into the container very rapidly.
- Spray the plants with water that contains a ratio of 20 cc of Pro-Plant per 20 litres.
- 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.
- **In the case of Libya** where water is applied via large sprinkler arms over 50-hectare, circular fields, have two 5,000-litre tanks next to each other. One is filled up while the other tank feeds water to the sprinklers. Or use a 25,000-litre tank for each 50-hectare field. A 5,000-litre tank will need 5 litres of Pro-Plant. One litre of Pro-Plant can be mixed with 1,000 litres of water.
- Spray on the leaves before 9 AM when the pores are open most. Make sure that the spray is a very fine, misty, foggy kind of spray. Be thorough and generous when you spray.
- Wheat (100-130 days): Spray on Days 30, 40, 50, 60, 70. 80, 90, (100) and every 10 days until 10 days before harvest.
- The farmer does not need to spray much of the mixture when the plants are very small.

4. For Extra Yield - Applying Additional Bio-Plant

- Because wheat grows for up to about 4 months, 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 to the soil.

5. Spraying Pesticides

- When you spray Pro-Plant the leaves get coated with micro-organisms that protect the leaves from disease. The Bio-Plant strengthens the immune system so that the plants are less susceptible to disease.
- If disease is a problem in the area, add Bio-Plant (5 cc) to the Pro-Plant (20 cc) in 20 litres of water and spray this over the wheat.
- In 100% organic farming chemical sprays should not be used. But if you wish to spray chemical pesticides, please spray them at least 3 days apart from when you apply the bio-fertilizers as the chemicals kill the micro-organisms that are now multiplying in the soil and being sprayed onto the leaves.

6. Mulching

- It is important to mulch the soil around the plants or to grow a legume crop there so as to suppress the growth of weeds and to keep the temperature of the soil down.

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 plants. Keep mulch 2 to 3 inches away from the stems of the 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.