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

Note: It's tempting to rush ahead, plough the soil, and plant a monoculture of soybeans. 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 soybeans 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 beans, 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 also depends mainly on the state of the soil and your goals. Grow diverse microbial life before you plant the soybeans.
- **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 seeds 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.

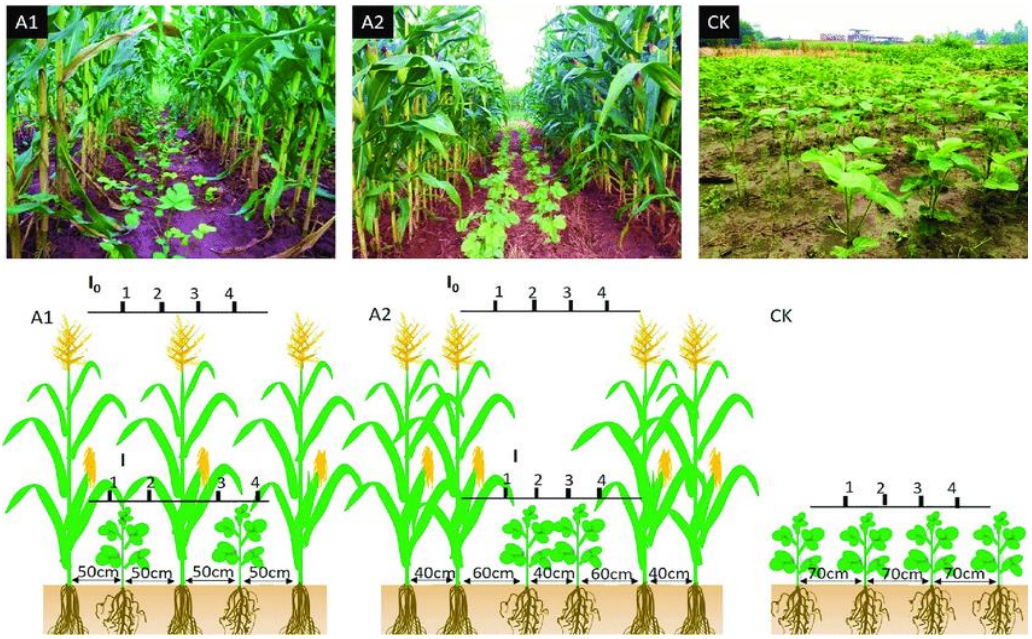
- Spray Bio-Plant on the planting rows (only) as you plant through the bio-mass. Mix 1 litre with 1,000 litres of water per hectare. 500 litres in 500 litres per acre. It is very beneficial to add the microbial life in Bio-Plant to the planting rows.

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.

1.3 Plant a Companion Crop (Intercrop)

- If you don't want to plant a cover crop in spite of the many benefits of doing so, intercrop the rows of soybeans with a companion plant, such as maize. You must have diversity of microbial life in the soil.



Maize-soybean relay-strip intercropping system and sole cropping system of soybean. A1: "50 cm + 50 cm" one row of maize and one row of soybean; A2: "160 cm + 40 cm" two rows of maize with wide-narrow row planting, where two rows of soybeans were planted in wide row with 40 cm; and with 60 cm row spacing between maize and soybean. CK: row spacing of soybeans in the sole cropping system was 70 cm.

2. Seed Preparation

- Don't use GMO soybeans. Why? Because you won't get a high enough Brix level in the plants and this means that insect pests will see the soybeans as food.
- Put the seeds in a container with water. Soak them overnight for up to 12 hours in warm water mixed with Bio-Plant. The container of water only needs to cover the seeds by 2 inches. Place a cloth over the top to increase the warmth during the soaking. Keep the seeds in a warm place out of direct sunlight. Soaking them will speed up germination in the soil.
- Soak the seeds in water that contains 20 cc of Bio-Plant per 20 litres. The bacteria in Bio-Plant will penetrate the seeds. (The ratio is 10 cc per 10 litres of water.) If the amount of seeds is small reduce the water to just a few litres. It does not have to be exactly 20 cc of Bio-Plant and more than this is fine, so do not worry.
- If you don't wish to soak the seeds, spray them with Bio-Plant before planting them.

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.
- 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.
- Spray the plants with water that contains a ratio of 20 cc of Pro-Plant per 20 litres.
- Spray it 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.
- Spraying every 7 days will provide more nutrients, but every 10 days is normal.
- Soya beans (95-100 days): Spray on Days 20, 30, 40, 50, 60, 70, 80, 90 until 10 days before you harvest. Alternatively spray every 10 to 15 days if you want to lower your costs, but spray every 7-10 days once the flowers appear after 45-55 days after planting.
- The farmer does not need to spray much of the mixture when the plants are very small.
- Choose the frequency of spraying that suits you best. Spraying every 7 days will give a higher yield than every 10 days. If the farmer chooses to spray every 10 days, then when the flowers appear, change to spraying every 7 days and continue spraying every 7 days.

4. For Extra Yield Apply Additional Bio-Plant

- Because soya beans grow for about 3 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.
  - 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.
  - Hectare: Spray 500 cc of Bio-Plant mixed with 500 litres of water, or 1 litre of Bio-Plant mixed with 1,000 litres of water.

5. Spraying Pesticides

- When you spray Pro-Plant, the leaves get coated with micro-organisms that protect the leaves from disease. Bio-Plant strengthens the immune system so that the plants are less susceptible to disease.
- In 100% organic farming chemical sprays should not be used as the chemicals kill the micro-organisms that are now multiplying in the soil and being sprayed onto the leaves.
- But 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 soya beans.

6. After Harvest

- Either plant a cover crop or plant a completely different crop. If you plant a different crop, plant a cover crop after harvesting it. Planting another soybean crop immediately is not recommended.
- If you have livestock plant cover crop mixtures that the livestock can graze on. The combination of the cover crop species and the urine and manure of the livestock will benefit the soil tremendously.
- Keep the soil covered at all times.