

Introduction

Soil productivity is a very important concern for farmers because their harvests depend so much on the health of the soil they till. However, continuous cropping and frequent cultivation of the soil result in the degradation of its physical structures and depletion of its organic matter content leading to the decrease in its fertility. To cushion this effect, farmers allow their land to rest or fallow for a certain period. However, according to research the organic matter of soil continues to decrease even if it is left idle.

A better alternative to fallowing is legume green manuring. This practice offers more benefits compared to fallowing. Aside from conserving the soil, it also recycles unused fertilizers back to the soil instead of being leached out to waterways leading to water contamination.

What is Green Manuring?

Green manuring is a farm practice of incorporating into the soil live plant materials called, green manures, to improve its physical structure and fertility. Green manures can be any plants or crops that serves as a source of organic matter for the soil. However, leguminous plants are preferred because of their ability to fix nitrogen in the air.



Benefits derived from green manures

The benefits of green manuring is hard to quantify financially and its effect cannot be felt instantly. However, plant experts identified the following as potential benefits of this practice:

1. It adds nutrients and organic matter to the soil thereby improving its fertility.
2. It helps control weeds It protects the soil from direct sunlight and soil erosion.
3. It promotes activity of soil organisms that result to improved structure, percolation, aeration and water holding capacity of the soil.
4. It binds unused nutrients in the soil thereby preventing it from being leached out and contaminate waterways.
5. It promotes habitat for natural enemies, thus, contributes to the control of insect pests.
6. Leguminous green manures fixes nitrogen in the air for the soil.
7. Decomposing green manure helps release certain nutrients in the soil and promotes the growth of beneficial microorganisms.

How is it done?

Green manuring can be done in two ways:

1. Green manuring in situ — which involves the growing of a green manure plant and incorporating it in the area to be manured;
2. Green-leaf manuring — which involves the collection of fresh plants materials like leaves and twigs from plants growing in the vicinity, e.g. shrubs, trees, weeds.

Some considerations when using green manure

1. The time gap between incorporation of the green manure and planting the next crop should not be longer than 2-3 weeks to prevent nutrient losses from the decomposing green manure.
2. Green manures are easily incorporated when the plants are still young and fresh. If they are tall and contain bulky and hard plant parts, it is advisable to chop them into pieces to allow faster decomposition. The older the plants the longer the time of decomposition. The best time to plow under green manure is right after flowering.
3. Green manures should not be plowed deeply into the soil. For heavy soils, bury the materials 5-15 cm deep, while in light soils bury it 10 cm to a maximum of 20 cm. In warm and humid environments, the materials can be left on the soil surface to serve as mulch.

Characteristics of a good green manure

A good green manure should have the following characteristics:

1. Inexpensive to plant and easily established.
2. Produces succulent tops and roots rapidly.
3. Generate good ground cover quickly.
4. Capable of growing in poor soils (e.g. sands & clays)
5. Well adapted to local conditions.
6. It should not compete with the main crop in nutrient requirements.
7. Capable of fixing nitrogen in the air.

Recommended Legume Green Manures

Green Manure Crop	Seeding Rate (kg/ha)	Green Biomass (t/ha)	Nitrogen Content (%)	Nitrogen (kg/ha)	When to Incorporate (DAP)
Azolla	50-90	8-10	1.4-1.5	50	35
Cowpea	40	9-10	1.4-1.5	140-150	40-60
Lablab	7-18	9-10	-	220	45-60
Mustard	5-12	9-10	3.5	250-360	21-37
Pigeon Pea	45-67	9-10	4.3	250-360	45-60
Sesbania	20-90	5-19	4.3	250-360	45-50
Soybean	30-56	5-19	1.7	310	45-60
Sun Hemp	35-40	5-19	1.7	108	50-60
Sweet clover	30-40	12	2	-	40-50

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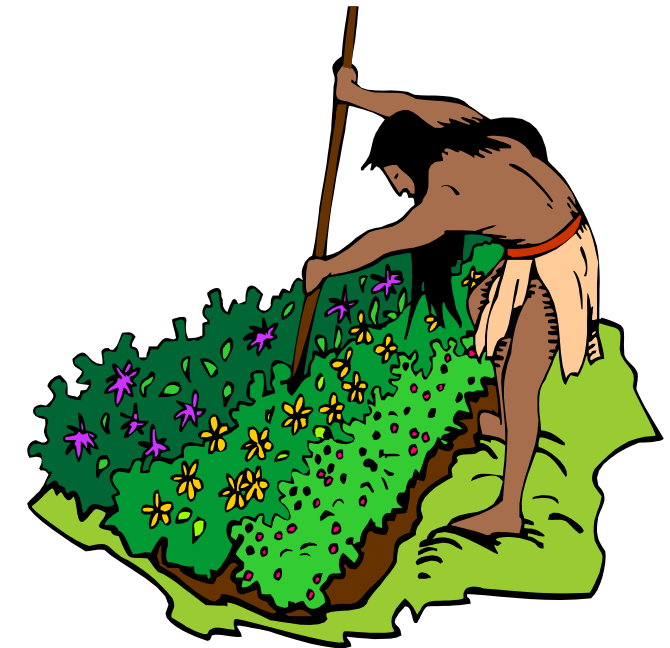
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LEGUME GREEN MANURING AS AN ALTERNATIVE TO FALLOWING



“Applying organic matter and enhancing biological nitrogen fixation combined with mineral fertilizers help maintain soil fertility for sustainable farming”