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Green Manuring to a Better Soil Physical Condition



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Abstract

This paper discusses green manure and its ability to improve soil productivity through amendment of soil physical properties. Weeds might not necessarily be useless to humans if they are incorporated back to the soil to increase the soil organic matter content, fertility and other physical soil properties for optimum crop growth. Incorporating green matter back into the soil helps to store carbon in the soil instead of its release to the atmosphere. It is advised to turn all “useless” green matter into use for the soil and help the atmosphere by reducing carbon emission.

Keywords: Weed; Useless

Green Manures

The green manure basically comprises of green rotten crops or plants. Certain agricultural practices involve growing of certain “useless” crops simply to plow them under so as to make Available green manure to the agricultural land. These crops when rotten nourish the soil with their nutrients. The term “weed” generally has a negative connotation, many plants known as weeds can have beneficial properties. Weeds may also act as “living mulch”, providing ground cover that decrease moisture loss and prevents erosion. Plant materials differ in their chemical composition, rate of decomposition and suitability as Mulch materials.

High cost of chemical fertilizers in tropical agriculture necessitated dependence on biological means of maintaining soil fertility and productivity. Mulching with residues of weeds such as Siam weed and Mexican sunflower was found to increase yield of crops such as maize [1-3] and soil nutrients content. The mulches have fertilizer effect also [4].

Improving Soil Physical Properties

Green manuring has been scientifically proven to increase soil fertility due its ability to enhance soil organic matter content, available nitrogen, concentration of nutrients near the soil surface in available form, and reduce the N losses through leaching and soil erosion. Increases soil organic matter as a result of green manure improves soil physical properties by

increasing the distribution and stability of soil aggregates and decreasing soil bulk density [5]. Vegetative cover prevents the build-up of the aggregates, which could lead to the formation of surface crusts that reduce water movement into the soil; it also influences the soil moisture and temperature dynamics. The reduction of moisture losses can be attributed to the combination of several factors [6]:

- a. A significant reduction in the rate of surface evaporation and surface runoff, and
- b. Increases in infiltration rates and moisture retention capacity of the soil.

The soil physical properties that are affected by incorporation of the green manure include the structure, moisture retention capacity, consistency and density. Other properties such as the porosity, aeration, conductivity, hydraulics and infiltration are allied to the modifications to the soil structure. Post-harvest decaying roots significantly increase macropores in soil.

The potentials of Mexican sunflower (*Tithonia diversifolia*; Fam) in supplying and maintaining soil nutrients after periods of decomposition cannot be over-emphasized. It has been used as an organic fertilizer for vegetable crops, its use as green manure resulted in an increase in maize (*Zea mays*) yield and it proved as an effective source of nutrients for lowland rice (*Oryza sativa*) [7-9]

Recommendation

Green manure has a milder smell than the dung of carnivores or omnivores, making it easy to work with. Incorporating green matter back into the soil helps to store carbon in the soil instead of its release to the atmosphere. It is advised to turn all “useless” green matter into use for the soil and help the atmosphere by reducing carbon emission.

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