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# GREEN MANURE CROPS

IMPROVE SOIL FERTILITY AND PROTECT YOUR SOILS



# WHAT ARE GREEN MANURE CROPS ?

- **Green manure crops are crops that are grown to be turned under to increase soil fertility.**
- **Leguminous green manure crops can offer small-scale farmers a tremendous number of advantages, including:**
- **Large quantities of nitrogen for the soil.**
- **Add many tons of organic matter to the soil, thereby improving topsoil depth, water-holding capacity, nutrient content, friability, and texture of the soil.**
- **Present no transportation problems,** in contrast to compost and chemical fertilizers.
- **Require absolutely no capital outlay after the initial purchase of a handful of seed.**
- **Can shade the soil all the year,** a factor important in tropical climates for preservation of soil moisture and organic matter.
- **The cover they provide for the soil protects it from wind and water erosion.**
- **Provide generous amounts of high protein fodder for animals, which can be especially valuable if it is available during the last months of the dry season** (inasmuch as fodder at this time of year is the limiting factor in traditional animal raising in much of the Third World).
- **Can provide human food,** including various kinds of **edible beans, peas, and pods.**
- **Green manure crops can provide income, by selling firewood, food or feed (and maybe seed).**
- **They often provide an incentive for people to abandon harmful traditional practices, such as burning crop residues or letting animals loose in the dry season to devour everything in sight.**
- **Some green manures, when intercropped with basic grains, can control weeds, thereby eliminating costly weeding operations.**

# COMPARISON WITH COMPOST

- Since composting is a technology that is often recommended for Third World development programs, it might be useful to compare composting with the use of green manure crops.
- **Compost merely decomposes the organic matter one already has, whereas a green manure crop can often add over 40 tons of additional organic matter per hectare.**
- **Organic matter is often in short supply** on villagers' farms (or is already being recycled).
- A compost heap takes a tremendous amount of work.
- Though compost will often benefit a vegetable garden, it is not economical when used on basic grain crops such as corn or millet.
- **A green manure crop takes a bit of labor to plant** , it takes nowhere near the labor compost does.
- When **the green manure crop is intercropped** among traditional crops (such as corn, sorghum, or millet), it **covers the ground** so well that **one or even two weeding operations can be eliminated**, thereby bringing a **net savings in labor**.
- **A compost heap requires water.** This often means it is made near a water supply but at a fair distance from where it is to be applied.
- Green manure crops are planted to take advantage of available rain water, and are planted right where they will be used.

# CROPPING SYSTEMS

- **It is often difficult for smallholder farmers to adopt green manure crop use. They cannot afford to give up scarce cropland just to grow a soil amendment. If they do have the land, they cannot afford the labor.**
- **What characteristics a legume must have to be adopted by farmers?**
- **It must be a non-woody annual with vigorous growth.**
- **It should grow well in the poorest of soils in the area without needing any kind of fertilizer.**
- **Be able to plant it in local fields with no special soil preparation, and either with a dibble stick or, preferably, by broadcasting the seed.**
- **The plant must have few enough natural enemies that it will grow vigorously without the use of any pesticides or major labor requirements.**
- **The legume should either be very shade-resistant (for intercropping) or drought-resistant (for growing into or through the dry season).**
- **If possible, it should first cover the ground well, then climb any stalks that remain in the field.**
- **If possible, the green manure crop should be edible by animals and/or humans.**

# GREEN MANURE AND LAND USE

- How to produce green manure without reducing the amount of land used for other crops?
- **Planted among traditional row crops, especially corn, sorghum, and millet without decreasing the production of the main crop the first year, and usually with large increases in the major crop in succeeding years.**
- **Green manure crops can often be intercropped with basic grains toward the middle or end of the growing season,.**
- Use a green manure crop in conjunction with alley cropping

- On very **steep hillsides**, something must be done to keep the organic matter from washing away.
- **Piling crop residues along contour lines** can help, as can contour ditches.
- Where weather is unreliable, a **combination of similar plants, one of which is more drought-resistant** (jackbean and velvet bean) **reduces risk of total loss**, yet assures a vigorous crop if rains are plentiful.
- planting a perennial every sixth row (pigeon pea), and then gathering the corn or millet residues under the pigeon pea plants at the end of the year, to be distributed six months or so later when well-mixed with better C:N pigeon pea leaves. The presence of the pigeon pea (a cash crop) will also prevent burning of residues.
- On South and Southeast Asian hillside areas, *Leucaena leucocephala* is planted as a contour barrier and constantly pruned, thereby providing erosion protection, some green manure, and firewood. This produces less gree