A time-proven way of growing beans

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Many small farmers in Costa Rica grow "frijol tapado" (covered bean). Bean seeds (*Phaseolus vulgaris*) are broadcast among wild herbs or shrubs, which are later cut and left as a mulch. Until harvest, the crop receives no further work. This ancient way of growing beans remains popular despite its low yields, due to its high labour productivity and ecological stability.

"Frijol tapado" is usually grown on hill sides, preferably facing the morning sun (east to south). This way, the leaves and pods of the bean plants dry quickly in the morning (they are susceptible to rot diseases) and the plants receive maximum sunlight, since mornings are often sunny and rain usually falls in the afternoon.

Farmers look for land with a cover of tall herbs or low shrubs; there must be enough plant material to provide a mulch which can completely cover the soil. Broad-leafed plants such as "platanillo" (a banana-like herb) are preferred. Grasses are avoided since they regrow quickly and compete strongly with the beans. Land with enough vegetative cover for "frijol tapado" must have been fallow for at least one year and preferably longer, and therefore this way of growing beans is usually practiced in rather thinly populated areas. Many farmers have permanent plots with coffee, plantain or maize in flat areas near their houses, while they grow beans on hill slopes further away.

The bean seeds (40 kg/ha or more) are broadcast by hand in the standing vegetation, sometimes along cut tracks. Most farmers plant local cultivars, climbing or bush types, depending on the land or vegetative conditions. After sowing the seeds, the vegetation is cut and left as a mulch. After germination, the bean plants grow through the layers of leaves and twigs until they reach the sunlight. A few months later, the farmer returns to harvest the beans. Yields are rather low: the average is about 500 kg/ha.

A good mulch is essential for the system. The stumps of the vegetation may support climbing beans and facilitate the regeneration of the natural vegetation. Photo: authors.

Advantages of "frijol tapado"

At first glance, it seems as if the described cropping system is "primitive" and has little to offer: the yields per ha, the "sacred cows" of agronomists, are rather low. However, closer study shows several advantages.

- Agronomical. The absence of burning and cultivation and the presence of a thick mulch prevent the germination and growth of weeds. The fallow period reduces the pathogens in the soil, and the mulch prevents them from reading the bean plants through soil particle splash during rains.
- Economical. The amount of labour required is low and returns per manday worked are high; if we assume a labour input of 35 days/ha (somewhat high to be on the safe side) and a yield of 500 kg/ha, some 14 kg of beans are produced per manday. Apart from the machete and seeds, no external inputs are needed.
- Ecological. The system is adapted to fragile slope ecosystems. The soil is not disturbed by cultivation and the mulch protects it from erosion. Moreover, the natural root system is left intact and the vegetation's fast regrowth further reduces the risk of erosion and restores soil fertility.

In brief, the system is both productive and sustainable, where there are low population densities and cropping intensities.

Possible improvements

The soundness of "frijol tapado" is illustrated by the fact that it has been difficult in the past to improve the system. In Costa Rica, the use of new cultivars, treated seed, higher seed sowing densities, fertilizer and/or herbicides resulted in similar or only slightly higher yields (Platen et al 1982). In Nicaragua, an integrated bean production system based on zero tillage and mulching was developed, which gave higher yields than with "frijol tapado", but no labour requirements are given (Tapia & Camacho 1988).

Growing "frijol tapado" might be improved by starting from within the system:

- Local selection of the best bean plants (germplasm) and storage of their seeds may be useful. Currently, many farmers buy seeds in shops without knowing if they are well adapted to the local conditions.
- Refinement of criteria for the choice of soils and vegetation. Yield differences between farmers may be partly due to the variation in site characteristics.
- Discovery of methods which ensure a more even distribution of seeds and plants. A large part of the variation in yields is due to uneven plant density.
- Control of snails, one of the main threats to "frijol tapado", starting with the use of papaya leaf traps to determine their presence.

Other crops grown in the "tapado" way

Occasionally maize (*Zea mays*) is grown in the "tapado" way, for example when opening up a new plot. One farmer told us that some years ago he had grown eddoe (*Colocasia esculenta var. antiquorum*) by broadcasting small seed tubers in a forest, followed by cutting the shrubs and small trees and waiting until the tubers were ready for harvest. He then turned his pigs loose to do the harvesting – a cheap and easy way to feed them. ■

References

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