

Slash and Learn

Dr. Aracely Castro of the International Center of Tropical Agriculture presents a new model of agricultural management that makes life better for farmers, the soil they till and ecosystems that surround them. Lesson one: mulch, don't burn.

Practised by over 200 million people, slash and burn agriculture covers 20 percent of all tropical land area worldwide. The process is practiced because it does offer short-term benefits. It provides firewood, nutrients for crop development, and kills pests. But in the long-term it destroys the soil and productivity of the land to the point where most plots are abandoned within three years. The continued deforestation has devastating impacts on the environment: ecosystem services and biodiversity are reduced while huge portions of carbon are released into the atmosphere. The Food and Agriculture Association of the United Nations estimated that 25 percent of man-made carbon emissions came from deforestation. It also poses great risks for the farmers: Burnt soil is drier and less fertile, which increases the chance for crop failure in a dry season.

In the rural village of Quezungal, Honduras, agricultural innovators found an alternative that worked so well for the local population that they named their system after them. The Quesungual Slash and Mulch Agroforestry System (QSMAS) is a small-holder production system that combines simple principles with smart technologies and practices to improve the management of vegetation, soil, water and nutrients in drought-prone areas of the sub-humid tropics. The first step is to manage the natural vegetation, not burn it, through selective and progressive “slashing-and-pruning”. Next, the biomass from the trees, shrubs and weeds are used to enrich the permanent soil cover. Potentially damaging forms of agriculture, such as tillage and direct seedling are replaced. Finally, fertilisers are applied at the appropriate time and place.

QSMAS has already been adopted by 6,000 farmers in 7,000 hectares in Candelaria, Honduras, and is expanding throughout Latin America. The mulching is paying off: runoff, erosion, water turbidity and surface evaporation have gone down dramatically, while infiltration, green water use and soil water storage capacity have increased. Essentially, the increased quality of the soil boils down to more crop per drop of water



Photo: Mikael Ullén/SWI

Dr. Aracely Castro received the 2009 World Water Week Best Poster from Dr. Akiça Bahri of the Scientific Programming Committee for the entry “Improving the efficiency of rainwater use on hillsides in the sub-humid tropics: agricultural & environmental benefits of Quesungual system”.

Slash and burn

- Non sustainable; production plots usually abandoned after two to three years.
- Above-ground carbon stocks are severely reduced in the short term.
- Soil fertility declines after burning due to the loss of nutrients through volatilisation, drift of ashes, soil erosion and crop nutrient removal.
- High rates of soil erosion due to lack of soil cover and the loss of soil structural stability.
- Production plots provide firewood only once from the conversion from secondary forests.
- Deforestation due to shifting cultivation and extensive extraction of firewood.
- Loss of biodiversity due to deforestation.
- High vulnerability to extreme climatic events.
- Reduced water availability in soil for crop production.

Slash and mulch (QSMAS)

- Sustainable; production plots exist on farmers' fields up to 10 to 12 years.
- Carbon increases over time from biomass accumulation.
- Fertility is sustained and even increased due to spot fertilisation and nutrient recycling through management practices.
- Low soil erosion in the rainy season due to permanent soil cover and improved soil structure and stability through soil organic matter.
- Production plots provide firewood and other wood products (e.g. timber) during their productive life.
- Regeneration of the native vegetation.
- Restoration and maintenance of biodiversity.
- High resilience of the whole landscape to effects of climate change.
- Improved capacity to utilise rainfall, store and provide water for crops during dry spells.

and hour of labour. That is not a hard sell to pitch: and that is why local farmers are spreading the word to their neighbors in Nicaragua (Somotillo) and Colombia (Suárez) where the system has taken root. Dr. Castro is confident that the system could be adopted

by smallholders under similar conditions in sub-humid tropics worldwide. The potential to mitigate climate change and improve food security to millions is enormous.

By Josh Paglia, SIWI