Realizing the benefits of cover crop legumes in smallholder crop-livestock farms of the hillsides of Central America

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Context

Land use intensification
Nutrient depletion
Soil fertility decline
Lack of dry season feed
Crop and livestock productivity decrease
Income decrease
Food insecurity

Objectives

• to evaluate on-farm the productivity of the crop-livestock system when Canavalia brasiensis is used as green manure or as dry season feed
• to study nitrogen (N) fluxes under those two options

This study is done with 11 farmers and their families in Santa Teresa, Condea, Nicaragua.

Hypotheses

Canavalia brasiliensis

what we know...
• is a perennial herbaceous legume, native from Central America, and underutilized
• is highly drought adapted (stays green during 5 months of dry season)
what we ask...
• Does Canavalia (partially) removed or not, increase the N input in a maize/Canavalia rotation, compared to the traditional maize/bean rotation?
• Are water losses smaller in a maize/Canavalia rotation, compared to the maize/bean rotation?
• Does Canavalia increase milk production?
• What are farmers’ perceptions about including Canavalia as green manure or as forage?

Canavalia biomass

Yields:
Maize grain yield in the first rainy season 2007 ranged from 520 to 5300 kg/ha.
Canavalia biomass production, evaluated when cut in January 2008, was highly variable between and within farms.

Results:
Planting of Canavalia resulted in a significantly higher milk production of about one liter milk per day. No effect was found on milk quality. Differences between farms were due to different lactation stages of cows.

Conclusions

• Canavalia increases available forage biomass and augments milk production in the dry season.
• The positive effect on milk production is recognized by the farmers and they show a clear interest in continuing with this new technology.
• The first results of the green manure experiments will become available and provide more insight in the feasibility to include Canavalia brasiliensis in the maize-bean system of the hillsides of Central America.
• Knowledge sharing and capacity building: farmers, researchers and extensionists held a workshop in Nicaragua in February 2008. One MSc and one BSc student from Switzerland and two BSc students from Nicaragua are doing their theses within the project. The project is regularly presented at national and international meetings.