Impacts, adoption, and diffusion of direct seeding mulch cropping systems (DMC) in the tropics.

A Rime-Pampa project
Funding
Coordination

What are the agricultural, environmental, sociological and economic impacts of an agro-ecological practice in small farming system?

DMC systems are meant to encourage ecological processes in soil of agro-ecosystems. In DMC systems, the soil is never ploughed and the crop is sown or planted through a plant cover, which may be growing or a mulch.

A multidisciplinary research project on a wide range of agroclimatical and socio-ecological situations assesses the impact of DMC in developing countries at different scales.

Impact of DMC on soil carbon sequestration

Carbon sequestration in soils by DMC systems are not straightforward. The assessment of carbon storage by synchronic method (sampling different field plots with different ages) and diachronic (identical field plots followed over time) gives contrasted results, respectively 1.2 to 1.3 tC ha\(^{-1}\) yr\(^{-1}\) in Brazil in a same plot at 0-20 cm depth.

Environnemental impacts of DMC

Soil biodiversity is higher under DMC. DMC limits runoff and soil detachment but does not stop rill erosion under 50% slope. Glyphosate and its metabolite ANPA are persistent during at least one year. Both migrate in sediment and runoff at rates exceeding drinking water thresholds.

Adoption and diffusion of DMC

Adoption and diffusion of DMC practices by farmers remain low, although support from projects has been important. One main constraint is the production of mulch and its conservation during the dry season. The increases of yield at farm level are less than those obtained with experimental trials. The reduction of work load strongly depends on the mulch production by farmers.

Soils as a natural capital

The soil is a common pool resource whose management depends on the different stakeholders and beneficial owners. In this context the innovation process must take into account all institutional arrangements that determine investment in soil capital. Institutional innovation must be a collective bargaining process in which groups of actors will participate according to their analysis cost / profit for technical innovation.

To know more

http://www.rime-pampa.net

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