



IMPACCT CASE STUDY No. 13

Integrated Management Options for Agricultural Climate Change mitigation

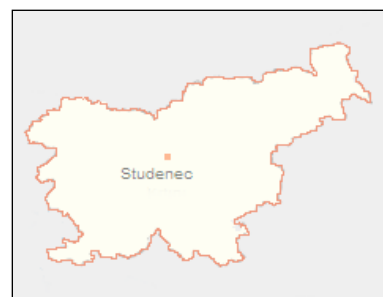
Žgajnar Farm, Studenec, Slovenia

This case study is based on a dairy farm located in Studenec, Slovenia. Studenec is a village to the west of Postojna in the Inner Carniola region of the country. The farm was bought by its present owner in 2004. At that time it was in a very neglected state but huge progress towards returning the farm to sound production and updating the technologies used has been made.

The farm is 240 ha in size of which 170 ha is permanent pasture and meadows and the remainder is given to arable production. The crop rotation is very simple and incorporates a two to three year rotation of silage maize and grass-lucerne-rye mixture. There are also 4 ha of woodland close by.

The climate is humid, temperate with harsh winters. The local topography is flat to slightly hilly. Its soils are karst and are shallow with just occasional deep pockets. Soils can become water logged in some depressions. The farm's primary enterprise is ruminant livestock, mainly Friesian cattle for milk and sheep/goats for milk and meat. Average milk production is around 6400 L per cow per year.

The farm has just converted to organic production. Animal welfare, environmental protection and climate change mitigation is given a high priority. The following activities are ongoing:



Studenec, Slovenia



Friesian cow

- The farm has invested in energy efficiency machinery including the purchase of two new tractors in 2008. Prior to that time machinery was borrowed from neighbours. This has enabled farm cultivations to be carried out quicker and in a more timely fashion, fuel consumption is lower and so CO₂ emissions are also lower. The initial capital outlay was around €300,000 but a 10% grant for the new investment was received from the State.
- The farm is currently awaiting delivery of a new slurry soil injector.
- Additional farm income is now secured by leasing out the new machinery.
- Soil management and plant nutrition activities have recently been reviewed. Fertiliser management plans are now produced annually and now that the organic conversion process is complete only organic manures will be used. The use of legumes for nitrogen fixation has also increased. These activities are expected to improve soil fertility and soil carbon sequestration as well as reducing greenhouse gas emissions. However, some costs are incurred from the increased need to undertake soil analysis (around €25-30 per sample) and commission the fertiliser management plans.

- Considerable waste management activities are undertaken on the farm, partly due to the States strategy on source separation of communal waste. Until 2005 most wastes were sent to landfill but now all wastes are separated by type (paper, card, plastic etc.), pesticides are sent to a specialist company for disposal, waste oil is delivered to communal collection sites and larger items are collected by the State twice a year. Organic wastes are composted but these will eventually go towards biogas production.
- Water efficiency has been improved on the farm via the installation of a new pipeline system in the new cattle barn and new drinking 'taps' for the cattle. These have replaced the old lead pipes and the concrete drinking trough]. Water consumption has dropped considerably many from the reduction of leaks.



The cattle barn renewed in 2010, Photo UL, Slovenia

- Renovation of the cattle barn was started in 2009 and will be completed in 2010. This has included additional insulation (barn is not heated), a new slurry collection system, a new manure pit and new equipment to promote animal welfare such as a ventilation system, improved lighting etc. Expected costs will be around €600,000.



The cattle barn renewed in 2010, Photo UL, Slovenia

- Conversion to organic production has meant that plant protection activities have been reviewed. The farm now uses mechanical methods (e.g. soil hoeing) and places greater reliance on other techniques for pest management such as proper crop rotation, mixed cropping, varietal choice etc. There are signs that biodiversity has increased on the farm however, there are now more field operations, such as mechanical weeding, which will impact on fuel consumption and greenhouse gas emissions.
- The farm only uses home-grown fodder but some is purchased from other local organic farms. However, organic feeds are significantly more expensive to buy than non-organic.
- The ensilaging of grass is undertaken on the farm and replaces classical hay making techniques. Silage hay balls are covered and stockpiled for winter use. This technique uses fewer machine operations leading to less CO₂ emissions. The baling of silage instead of using a clamp reduces loss of dry matter and CO₂. However, plastic wrap needs to be purchased and then recycled at a cost. The manufacture of plastic also requires energy and oil.
- In the coming year there are plans to install a photovoltaic and biogas facility on farm.



Stockpiling of hay balls, Photo UL, Slovenia

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