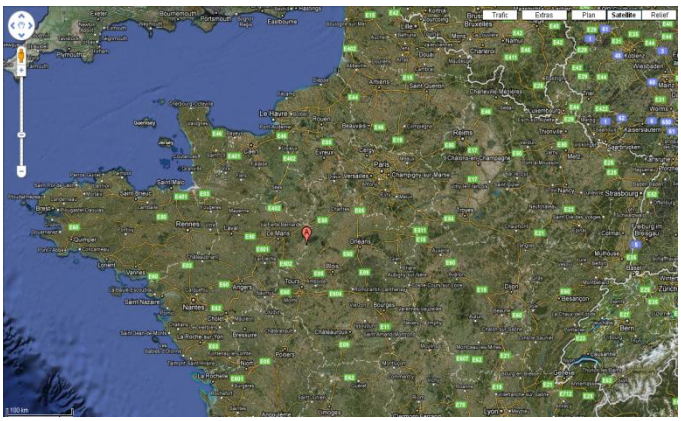
IMPACCT CASE STUDY No. 4

Integrated Management oPtions for Agricultural Climate Change miTigation

Champ, Marolles lès Saint Calais, France

This case study farm is located in the region of Pays-de-la-Loire in north-western France. It is a 120 ha arable farm growing wheat, oilseed rape, fescue, winter broad beans and winter peas. The topography of the area is mostly flat with just a few slopes and the soil is a sealed silt or stony silt. The climate is described as 'shaded oceanic'.

The farm is situated in a French Nitrate Vulnerable Zone. It has around 2 km of hedges and biological corridors between cultivated and wintering areas that containing many wild plants.



Location of the case study farm

The farmer has implemented a number of activities and changes to practices to help mitigate climate change and improve the farm profits.

- Partly due to the cost of diesel fuel and partly to reduce greenhouse gas emissions the farm has rationalized its use of farm machinery and now uses a minimum-till system and does not undertake soil preparation except for one passage prior to seeding. This has reduced fuel consumption and so decreased costs, greenhouse gas emissions and saved labour. There will also be a small increase in soil carbon.

Photo: INRA

- In 2006 a new cropping regime was introduced to help reduce machinery use and increase soil organic matter. This included making maximum use of legumes in rotations and use of cover crops. There are now up to 10 crops in the cropping plan compared with 3 prior to the change. Whilst this did result in less use of machinery the increase in soil organic matter was not significant (less than 0.1%). However, there has been a noticeable increase in pollinating and beneficial insects.
- The farm has also increased its recycling and now ensures that packaging, especially empty pesticide containers are fully recycled. Another example is the capture and storage of rainwater. This is subsequently used for spraying pesticides saving around 20,000 litres of treated mains tap water each year.
- In 2006 the farm established biological corridors between the cultivated and over wintering areas. These areas are rich in wild plants and have stopped machinery uprooting hedges. This has greatly increased biodiversity on the farm and decreased soil erosion. It will also help reduce nitrate leaching and increase soil carbon. However, some extra costs have also been incurred to purchase seeds and seedling.

Photo: INRA

Farm staff have been participating in locally provided training on the efficient use of farm inputs. This has enabled them to review the crop nutrition and crop protection strategies used on the farm.

- Regarding crop nutrition the farm uses very little synthetic fertilizers. Instead it relies on the use of legumes in the rotation and as both cover and catch crops. Consequently the use and cost of synthetic fertilizers has been greatly reduced.
- The environmental benefits are also likely to be significant with decreased nitrogen losses via leaching and as gaseous emissions from the reduced use of purchased fertilizers. In addition there will be reduction in indirect greenhouse gas emissions associated with fertilizer manufacture.
- In 2009 the farm changed its practices with respect to drying fescue prior to storage. Before this date the fescue was mowed at 18% moisture content and then dried using gas powered heaters to a 12% moisture content. In order to reduce the use of natural gas and reduce greenhouse gas emissions the farm now uses windrowing such that the crop is allowed to dry in the field.
- The farm has also changed its approach to crop protection. This has been does using a variety of different techniques:
    - A more varied mix of seed varieties is selected – four varieties were used during 2009 and six are planned for 2010.
    - Greater use of farm-saved seed is being made.
    - Treatments are made using very little water, for example 45 l/ha compared with 200 l/ha in the previous conventional system.
    - Fungicides and insecticides are no longer used and only one or two herbicide treatments are made each year.

Wheat under sorghum, Photo: INRA

This has reduced costs of crop protection products and reduced greenhouse gas emissions.

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