IMPACCT CASE STUDY No. 22

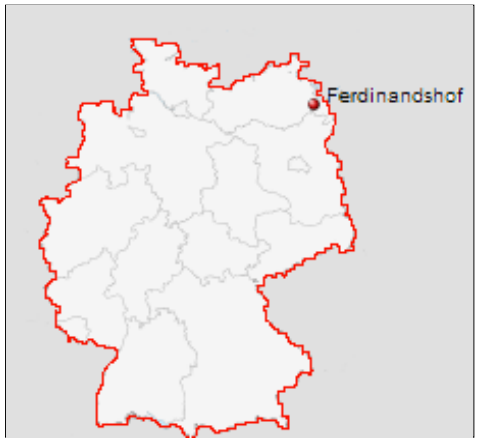
Integrated Management oPtions for Agricultural Climate Change miTigation

Milchhof Blumenthal GmbH / Ökologischer Landbau Hammer GmbH, Ferdinandshof, Germany

This case study is based on a large (~2700 ha) mixed farm located in the municipality in the Uecker-Randow district, in Mecklenburg-Vorpommern, Germany. This lies between the Randow and Zarow rivers. The landscape was formed as part of a glacial outwash plain. The soils on the farm are very sandy and as the landscape is flat there is a high risk of wind erosion. Approx. 65% of the land farmed lies in a nature park (Ueckermünder Heide Naturpark).

The farm is treated as two separate businesses. Milchhof Blumenthal GmbH is a traditional farm whilst Ökologischer Landbau Hammer GmbH undertakes organic production.

The cropping includes corn (420 ha), canola (200 ha), wheat, barley, triticale and rye (100 ha each). The livestock enterprise includes over 2300 cattle for breeding of which approx. 900 are raised organically.



Location of the case study farm

There are also 200 ha of grass-clover swards and 130 ha of other grassland. There are a number of other areas on the farm that are used for wildlife conservation including grassland, pine woodland, hedges, trees, and an area of 272 ha dedicated to bird conservation (*Grünlandextensivierungsprogramm (StAUN, Staatl. Amt für Umwelt und Natur)*). The farm also has 3 ha of kettle holes. These are shallow, sediment-filled body of water formed by retreating glaciers or draining floodwaters.

The farm undertakes a considerable amount of activities that help to mitigate climate change effects. These include:

Ueckermünder Heide

- The farm is currently undertaking of roof replacement, insulation and simultaneously installing 500m^2 of solar panel s. The energy captured will be used to heat the farm building. As a direct replacement for fossil fuels this will save money and greenhouse gas emissions as well as lowering energy costs. This is a complicated operation as the old roofing was asbestos and so must be disposed of as hazardous waste according to the relevant regulations. The cost of this work was covered by the installation company in return for renting the roof area for their own business purposes.
- The farm is also in the middle of a long term programme aimed at replacing old farm machinery (such as old tractors with narrow working widths) with larger, more efficient units. The wider width tractors mean that fewer passes of the field are required and less fuel is used. Labour requirements have also been reduced. The farm is currently spending €90,000 to €100,000 per annum on machinery updating.

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- Since 2007 a wind erosion prevention programme has been implemented. This has included planting rye as a winter cover crop for corn that also uses reduced tillage. In support of this the old moulbourd plough was replaced with a new, more efficient field cultivator. These activities have significantly decreased wind erosion and offer the potential to increase topsoil humus and soil carbon sequestration. A much higher earthworm population has been noted. The farm gained financially by implementing the wind erosion prevention programme as it received €40,000 per annum payment from the State and €95/ha per annum as a reduced tillage subsidy. There have also been financial savings by optimising machinery use and time. There is some concern, however, that the reduced tillage might lead to greater weed populations and so the need to increase pesticide use. No fuel savings have been observed.
- Other activities to reduce wind erosion have included the planting of windbreaks and hedges. Old poplar trees have been replaced with fruit trees and a new 2 km 'ecological compensation area' for railway construction has also been planted with fruit trees. These activities have also increased on farm bird populations. The farm received a state subsidy for this work.

Canola crop

- The farms concrete bunker silos used to be covered with straw bales to provide insulation but this is now being changed and foil is being used. This means that the energy intensive practice of wrapping straw and hay bales in plastic is no longer required.
- During the coming year an on-farm 0.5 MW biogas plant will be installed and the gas will be used for farm heating and will provide 'clean power' for the neighbouring village. The biogas plant feedstock will be maize and so an additional 200ha of maize will be produced on the farm.
- Manure storage areas have replaced damaged concrete floor plates. In the future the leachate will be collected and used to feed the biogas plant.
- Water conservation activities are undertaken including the use of high pressure cleaners for cleaning the barns to replace flushing the floors with hoses. Water usage has been reduced but there has been increased use of energy to power the high pressure cleaners.
- Soil nutrient management is undertaken. This includes regular soil and leaf sampling and analysis, growing more catch crops and optimisation of fertiliser application to match crop requirements. Fertilisers are not used on the grassland areas. This has saved money on fertilisers, reduced greenhouse gas emissions and reduced the risk of nitrate leaching.
- Livestock feeds are mainly produced on farm. Rations are optimised and specific grass species for different livestock breeds are produced to help minimise emissions associated with the excretion of nitrogen.

Triticale

- Energy efficiency activities have been undertaken in the livestock buildings including replacement of the fluorescent lighting systems with new metal halide lamps, windows have been installed in roofs to reduce the need for artificial lighting, and aeration curtains have been installed. These activities have greatly reduced energy consumption and so reduced greenhouse gas emissions.

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