Farm scale cheese production in Finland
Case Study 12

Experimenting crop diversification and low input farming

Experimentation plot of 2 ha with feed for milk production located in Kouvola (Finland) with a rainfed conventional cereal monocropping system finally used for cheese.

3 TYPES OF INTERCROPS AND MANAGEMENT PRACTICES TESTED IN THE CASE STUDY

1. **No - tillage**
2. **Ryegrass catch crop between cereal**
3. **Oil crop in cereal**

ENVIRONMENTAL BENEFITS

1. **Reduction of erosion** in no-tillage management
2. **Reduction of nitrous oxide emissions with the catch crop**
3. **Increase of biological activity in the soil** with the oilseed crop

SOCIOECONOMIC BENEFITS

1. Reduction of workload and costs in no-tillage
2. Environmental payment for the farmer in the Rural development programme for the catch crop.
3. Higher cereal yields after the oilseed crop.

AGRONOMIC DRAWBACKS

1. Poorer yield **in no-tillage**
2. **Uncertainty** in the success of winter crops in boreal climate

ENVIRONMENTAL DRAWBACKS

1. The increase in the biological activity **reduces soil carbon stock**
2. Decrease of soil organic carbon in the 10-30 cm layer

SOCIOECONOMIC DRAWBACKS

1. Lower gross margin with the oilseed crop
2. Lower yield from the no-tillage treatment
3. Extra cost for catch crop

FINAL CONCLUSION

Is it beneficial to adopt these sustainable practices?

No-till had clear benefits for erosion abatement and can thus be recommended at least for sloping fields. No-tillage entails approx. 20 % reduced yield of barley compared to conventional tillage. However, reduced costs, also including labour costs, due to no-tillage imply slightly higher gross margin (GM) compared to conventional tillage.

Introducing oilseeds in barley monocultures implies higher cereal yields in the year following oilseed rape cultivation. Hence, the average GM for a five-year period is increased by €38/ha. This is a small economic gain, and it is dependent on the prices and yields of oilseed, which are both relatively volatile.

Even if the short-term benefits for the soil organic carbon were not evident in this study, the further yield benefits of this kind of diversification may provide benefits in the long term.

HORIZON 2020

DIVERFARMING