



How I implement IPM

Details of a holistic IPM strategy with low pesticide input in a European farm

My farm



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Lower Saxony
Germany

PEDO-CLIMATIC CONTEXT

Soil: Humus sand Ø 35 soil points

Climate: 700 mm annual precipitation
9.7 °C long-term average

MAIN PESTS

Insect pests: Wireworm

Weeds: Annual panicle, rumex

Diseases: Yellow/brown rust, mildew

AGRONOMICAL CONTEXT

Arable farming

Arable land: 60 ha

Crop rotation: maize, catch crop green rye, maize, winter cereals (freezing catch crop)

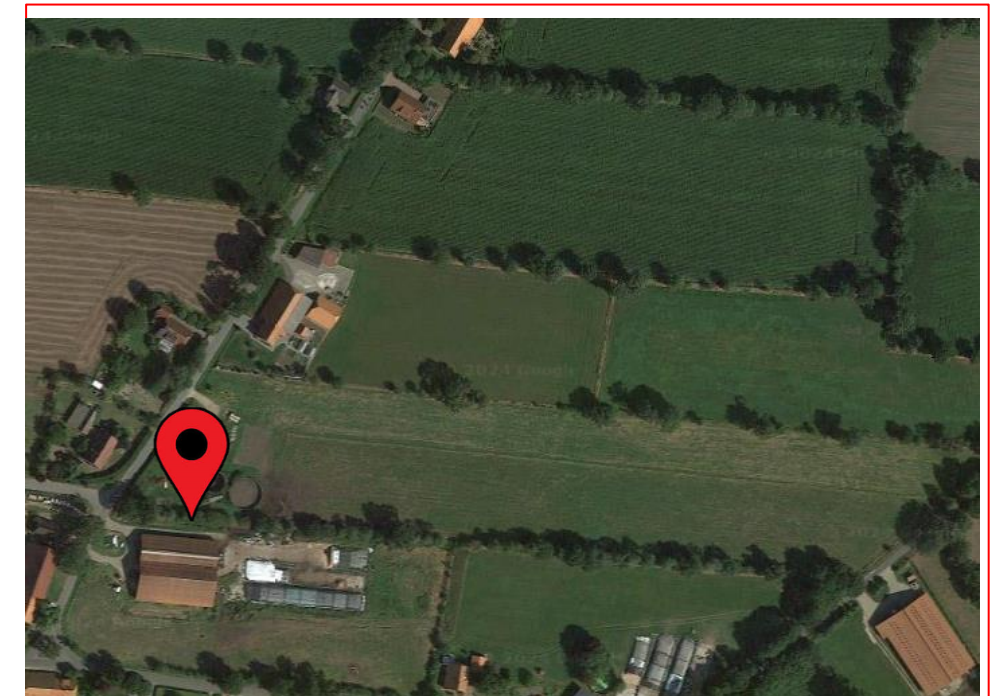
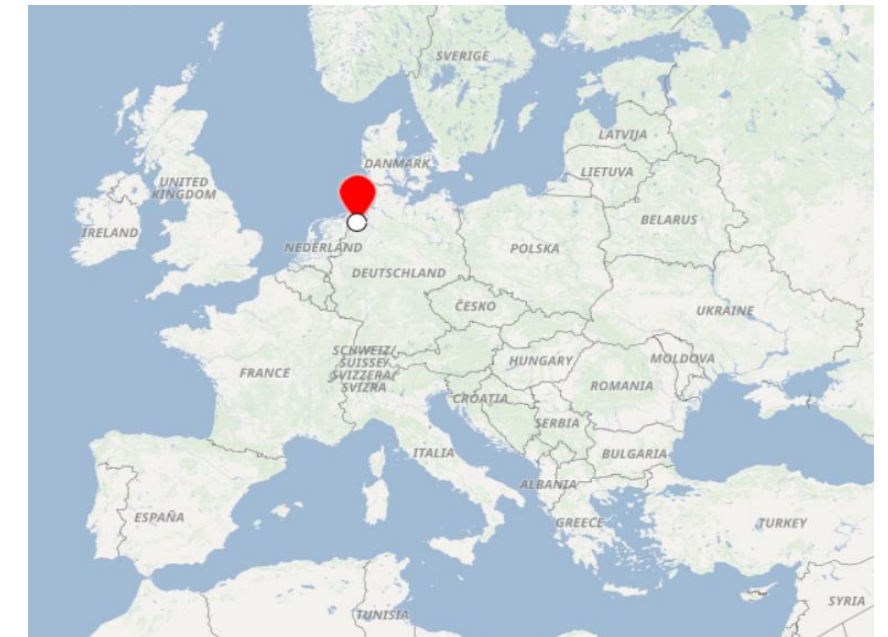
SOCIO-ENVIRONMENTAL CONTEXT

90 % water protection area

100 % red area (nitrate-polluted area)

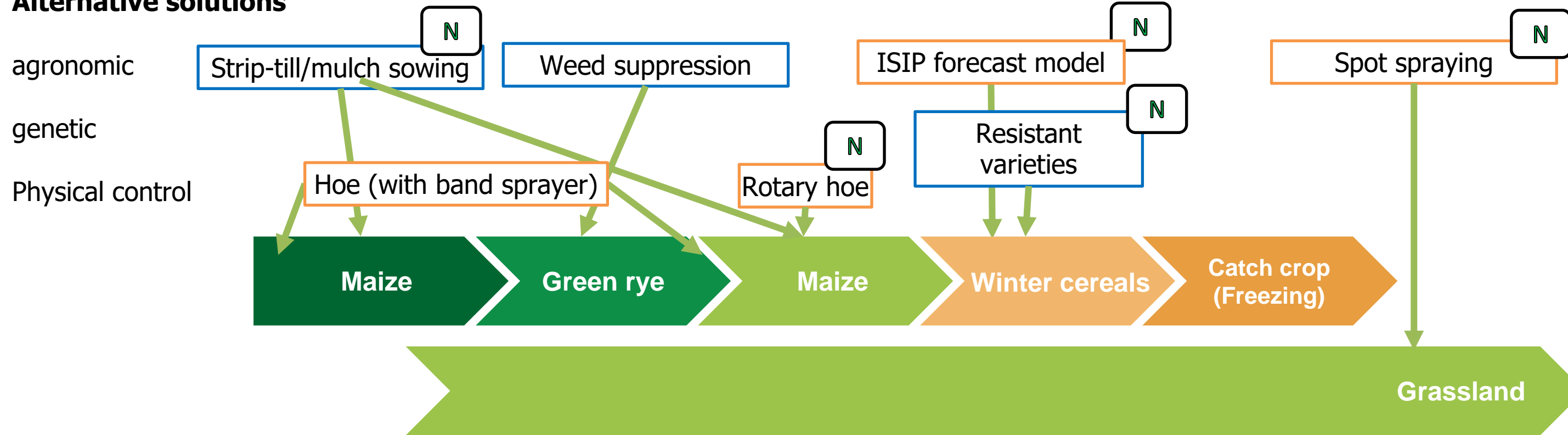
OBJECTIVES AND MOTIVATIONS OF THE FARMER

Combining economic success with sustainability and adapting to new political conditions at an early stage



My strategy

Alternative solutions



Key measures

- Spot spraying in permanent grassland achieved good results with greatly reduced PPP - costs similar to area treatment caused by the reduced application rate
- No-till, strip-till or mulch-sowing methods are recommended
- Hoe band spraying (reduced application rate) works well in maize, unless there is too much organic matter on the surface (which is actually desired). The use of a rotary hoe is recommended.
- Catch crops and cover crops promote erosion control
- Physarium 4-3 is suitable as a winter cereal

CHEMICALS AND BIOCONTROL

In grassland, PPPs are only used to a very limited extent within the spot spraying process. Due to the location within the water protection area, commercially available PPPs are used on the arable land to a limited extent as required and in accordance with legal requirements.

Insecticides: Innovative solutions against wireworm and crows in maize F
 Fungicides: ISIP forecast model N
 Herbicides: Innovative solutions to prevent the germination of catch crops after strip-till or mulching F

*Green = low risk
 *Blue = bioCONTROL agent
 *Orange=Auxiliary

Legend N New solution

F Missing solution

Pests controlled

very good

- Preventive measures, e.g. choice of location and variety, crop rotation with suitable intermediate crops, tillage
- Technical aids for the reduction of PPPs

medium

- Wireworm (maize pickling)
- Crow food

to improve

Evolution of the use of pesticides

very good

- Spot spray process
- Rotary hoe

medium

- ISIP forecast model
- Striptill / mulch sowing
- Hoe with strap tip

to improve

- Maize pickling (wireworm)

Key conclusions

The challenges

Agronomic:

Green rye/strip-till without total herbicide

Ecological: Mechanical hoeing increases N mineralisation (in water protection areas) and humus decomposition. Ground-breeding birds disturbed by mechanical weed control

Economic: Mechanical solutions associated with increased effort/costs, Specialised technology difficult to obtain

Social: Coordination with Contractors

Sustainability indicators

very good

- ↘ Use of environmentally harmful products
- ↘ Use of hazardous or toxic substances (for users, consumers)
- = Use of landscape conservation
- = Overload
- ↗ Use of cover crops (undersown crops, intermediate crops)
- ↗ Machine utilisation

medium

- ↗ Energy costs
- ↗ Use of renewable energies
- ↗ Use of fossil fuels
- = Costs for crop protection products
- ↗ Distribution of work over the year
- ↗ Working time
- = Use of synth. fertilisers
- = Satisfaction of the farmer

to improve

- ↗ Complexity of the cultivation system
- ↗ Operating expenses
- ↗ Mechanisation load
- ↗ Workload

Legend

Environmental indicators
Social indicators
Economic indicators

= constant

↗ Increase

↘ Acceptance

↗↗ Significant increase

↘↘ Significant decrease

Our feedback



“ For our family business, it is important to ensure economic success and to farm sustainably at the same time. On our arable and permanent grassland, we actively promote farming methods that are favourable to the climate and the environment. It is also particularly important to adapt to new political conditions at an early stage.

Farmer: Renke Ackermann (Germany)

- The spot spray method has proven to be particularly favourable for permanent grassland. It is an ecologically and economically sensible method of weed control.
- The Strip-Till tillage method combines yield security and erosion protection by not mechanically tilling a large part of the field and allowing the mulch to act as a protective layer.
- For a future project, I would like to see better organisation and more output in the first few years



“ This family-run business is a good example of how expertise, curiosity about new technical developments, ambition and environmental awareness come together. Innovative methods are tested at an early stage and the challenges and potentials are recognised, also in cooperation with the Chamber of Agriculture.

Advisor: Dr Leena Karrasch (Germany)

- For mechanical weed control, the use of a rotary hoe in maize has the advantage that the hoe does not clog. This method still needs to be developed further.
- The use of an interactive, weather-based forecast model (ISIP) is useful for decision support.
- The combination of methods used on this farm unites all areas of recent integrated crop protection.