Organic arable crops and its technical approach compared to conventional arable farming at test field in wagna

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Organic farming at the lysimeter test
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“Fertility of a soil depends on its humus-content...
... all organic substances contain the matter to produce and finish any vegetable crop.”

Albrecht Daniel Thaer (1752 - 1828)

Minimum principle
“Soil fertility stands in relation to its content of nutrients.
Fertilizer application means, to replace the withdrawn nutrients.”

Justus von Liebig (1803 – 1873)

maximum filling level = maximum yield

principles of organic farming

Completing cycles
- Manure is used accurate
- respect crop rotation

Saving resources
- fossil energy
- limited resources even like ground water

Avoid poisonous substances
- no chemical pesticides
- manure is prepared

Animal friendly and surface-linked livestock
- livestock is strictly linked to surface
- z.B. piggery per ha: organic: 14 places
  conventional: 28 places

factors of the nitrogen cycling

- N_{2} \rightarrow \text{denitrification}
- \text{manure, plant material, compost}
- \text{humus, organic material}
- \text{humification and mineralisation}
- \text{nitrate leaching}
- \text{NO_{3}^{-}}
- \text{ammonium}
- \text{N_{2}}
- \text{biological nitrogen fixation}
- \text{bacterium- and fungus protein}
- \text{clay minerals sorption fixation}
- \text{= immobilisation}

\text{NH}_{4}^{+} + \text{NO}_{3}^{-} \rightarrow \text{atmospheric nitrogen}
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test field in wagna

**Organic plot**
- 1. year: lucerne
- 2. year: corn
- 3. year: spelt
  - white clover is undersawn
- 4. year: oil pumpkin
  - lucerne is undersawn

**Conventional plot**
- 1. year: corn
  - intercrop (rye, rape)
- 2. year: corn
- 3. year: winter barley
  - intermediat crop (mustard)
- 4. year: oil pumpkin
  - ryegrass is undersawn

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crop rotation in organic farming

**Plant mass:**
- lucerne
- corn
- spelt
- undersown
- oil pumpkin

**Cultivation:**
- mulch seed
- tillage
- mulch seed

**Leaching potential:**
- high
- low
facts an assumptions

- no chemical pesticides on the organic plot
- smaller yields and also lower nitrogen withdrawals by organic farming
- biological nitrogen fixation corresponds to characteristic values
- yields contain as much nitrogen as legumes can fix
- cultivation intensity in organic plot is lower than in conventional plot
- humus content in the organic plot should increase

Thank’s for your attention!

nature is working