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Winter Legumes as Green Manure – a Nitrogen Source

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- Green manure species
- Timing and sawing density
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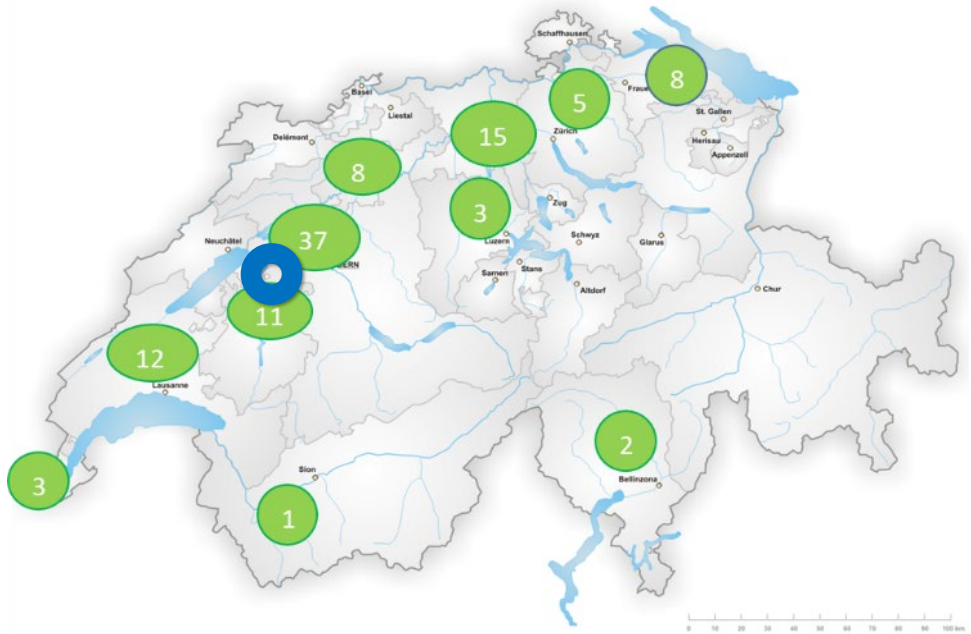
Innoplattform.bio & Terraviva

- Innoplattform.bio is an advisery service for organic vegetable & potato growers
- Terraviva ist a organic growers association (80-90 growers, founded in 1946)



Why winter legumes

- Nitrogen is often the limiting factor in organic agriculture
- Vegetable crops clears the fields late in the growing season
- There is time for green manure in winter
- Most green manures are developed for arable crops

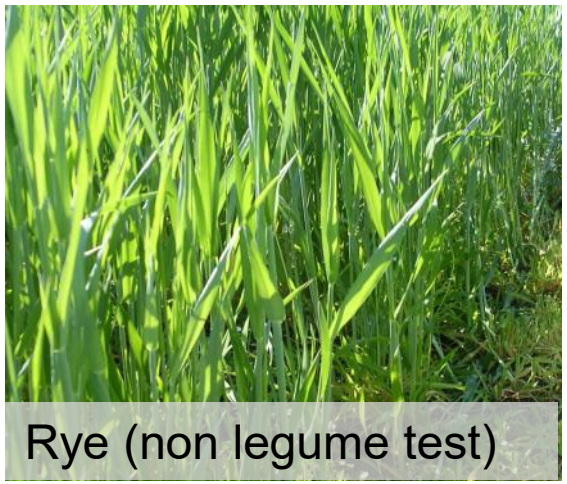
Which winter legumes?

Forage peas

Grain peas

Field beans (Vicia faba)

Winter vetch



Rye (non legume test)

Forage peas: full leaf typs, violett flowers, dark small grains
Grain peas: semi-leaf typs, white flowers, bigger, white-yellowish grains

Effects of winter legumes on maize

Green manure
sawing: mid october
Incorperation: end of april

Maize:
Sowing beginning of may
Harvest beginning of September

Incorperation with different tools

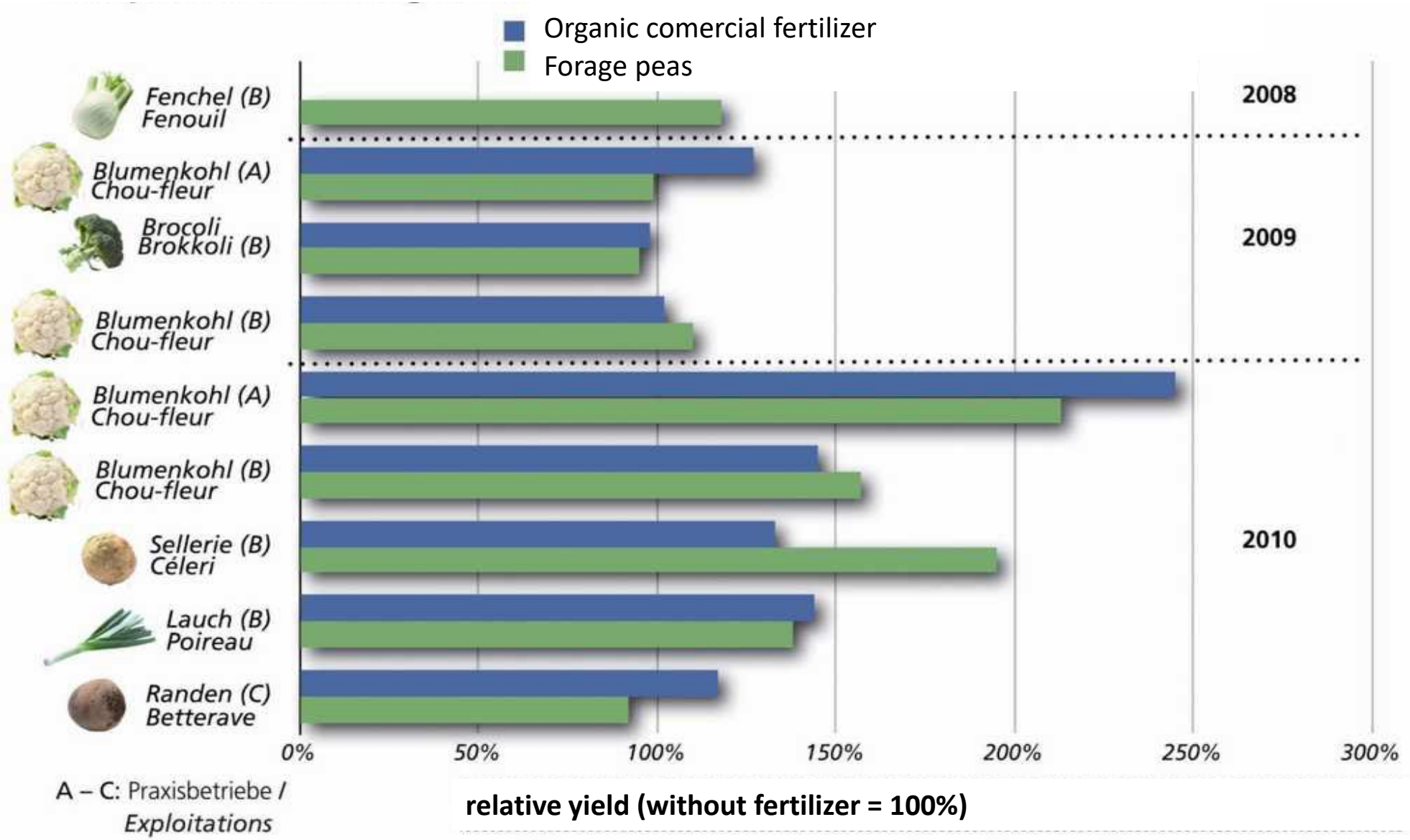
Plow (22-25cm deep)

Disc harrow (8-10 cm, deep)

Cultivator (1st 6-8 cm, 2nd 11-13 cm)

Stovel plow (ca. 6 cm)

Yield effect of prelimenary forage peas on subsequent vegetables



Graphik D. Eppenberger

Advantages / disadvanteges of using forrage peas

- Positiv
  - Needs little temperature
  - Tolerant to late sawing
  - Good weed supression
  - Deliver a lot of nitrogen (> 100 kg N/ha)
  - Low risks of transmitting root knot nematods (temperature sum not exeeded)
  - Very low risk for wire worms and larvae of craneflies
- Risks
  - Need enough percipitation in (early) spring
  - Not for early subsequent crops
  - Peas are quit crop rotation sensitive (no legumes in rotation)
  - Risk of Thielaviopsis/Chalara in subsequent crop
  - Low inpact on organic matter





How to do it successfully..

- Sowing time: mid october (switzerland),
  - 2-3 weeks before first frost
  - 3-4 cm deep drilling (for frost resistance)
  - Variety: EFB 33 (organic seeds in Germany)
- Highest nitrogen yield beginning of flowering
  - > 3 kg fresh weight per m^2
- Use front mulcher
- E.g. disk harrow for incorperation
- Incorperation 3-7 days before sowing/planting of the subsequent crop