Ingredients for soil fertility in vegetable production

Richard de Visser
HortiAdvice Scandinavia A/S

1. Organic matter management
2. Green manure strategy
3. Controlled traffic farming in vegetable production

Green manure and cover crops

- Benefits of vegetable growing season
- Crop rotation disease – be aware of Crucifera
- Avoid seed production by cutting or mowing (ex. Borago, oil radish, buckwheat)
- Urgent soil recovery – taproots!
- Weed suppression – growth and cover speed
- Biomass production - by mixtures of highly potential species
- Handling green manure before soil tillage?
- Nematode control

Green manure and cover crops

- High sowing density
  - Increased and faster cover effect
  - Smaller and more shallow roots
  - Lower C/N-ratio
- Low sowing density
  - Reduced cover effect
  - Deeper and more vigorous rooting system

Mixtures do the job

- Multi-species mixtures of cover crops increase agro-ecosystem services
- Weed suppression
- Increased ground cover
- Increased above-ground biomass
- Reduced weed biomass
- More effective nitrogen retention
- Large degree of functional complementarity among different legume species
- Stability of performance and establishment
- Combined legumes and non-legumes cover crops synchronize better with the following crop

Species and mixtures

From a 2015 presentation by Wolfgang Stumy, Swiss No-Till & Fachstelle Bodenschutz des Kantons Bern
**Green manure and cover crops**

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**German strategy to control root knot nematodes**

1. Leguminous nematode trap crop 1st. of September
2. Measure soil temp until 300 day degrees
3. Mulch down the trap crop
4. Black fallow for two months (ad compost)
5. Seed non-host weed competitive nitrogen trap crop (Avena Strigosa, variety Pratex)
6. Ready for seeding carrots in spring

**How to choose your cover crop or green manure**

- Mineralization potential in the field
- Soil type
- Choose your purpose
  - nitrogen producing or catching, soil reviving, organic matter, etc.
- Potential sowing date
- Degree of sensitiveness to frost
- Crop rotation
  - crucifera, potatoes, onions, carrots etc.
- When to establish next crop
- And what crop to establish
Mixtures do the job

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<thead>
<tr>
<th>Jordtype</th>
<th>Behov/formål</th>
<th>Etablering</th>
<th>grøngødning år 1</th>
<th>Vinter</th>
<th>fast</th>
<th>Sædskifte</th>
<th>Hovedkultur år 2</th>
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Catch crop intercropping is for the future

- Intercropping is relevant in late crops
- Intercropping reduces leaching
- Increases nitrogen input
- Will probably reduce surface run-off

But

- Timing is crucial for avoiding interspecific competition
- Species should be chosen wisely
- Technique for mechanical harvesting is missing

<table>
<thead>
<tr>
<th>Blanding</th>
<th>Art</th>
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