

Crop rotation and its ability to suppress perennial weeds

Problem

Perennial weeds like thistle and couch-grass hinder growth and yields of arable crops. Without a proper focus on perennial weeds (through a good crop rotation system) organic arable cropping systems may not manage for more than 6 years without facing major weed problems.

Solution

Crop rotation is a key tool for preventive control of perennial weeds in arable farming. Weed-suppressing rotations include an appropriate percentage of competitive crops and green manures. Selection of the right crops and their proper management are important for successful weed prevention.

Outcome

The appropriate combination of crops and green manures prevents spread of perennial weeds and increases crop yields and quality. Weed-suppressing crop rotations are absolutely essential for sustainable organic arable farming.

Applicability box

Theme

Weed management, Soil quality and fertility, Crop-specific measures

Geographical coverage

Cool, temperate climate

Application time

At planning of crop rotation

Required time

No additional time required

Period of impact

Entire crop rotation

Equipment

No additional equipment required

Best in

All arable crop rotations

Practical recommendation

Basic rules

- Implement green manures, such as clover or lucerne, in at least 20 % of the rotation.
- Do not grow more than 50 % of cereals with low weed competitiveness in the rotation. Do not cultivate such crops for more than 2 consecutive years.
- In fields with prevalent high weed pressure cultivate only crops with high weed competitiveness.

Crop selection and composition of crop rotation

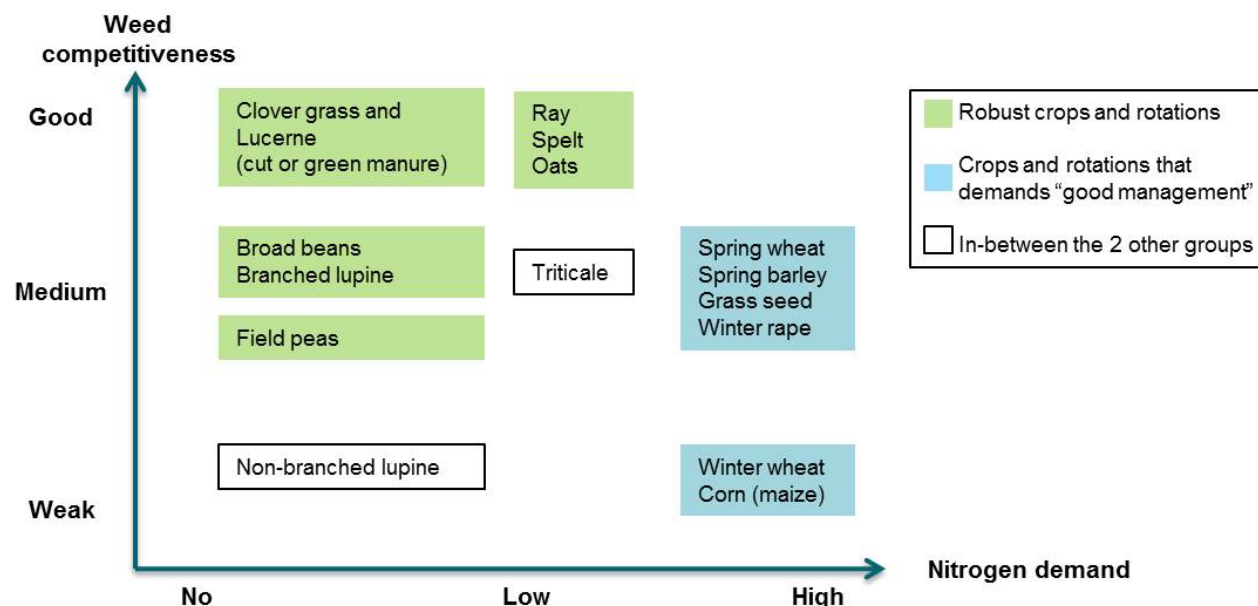


Figure 1: Crop selection in accordance to weed competitiveness and nitrogen demand

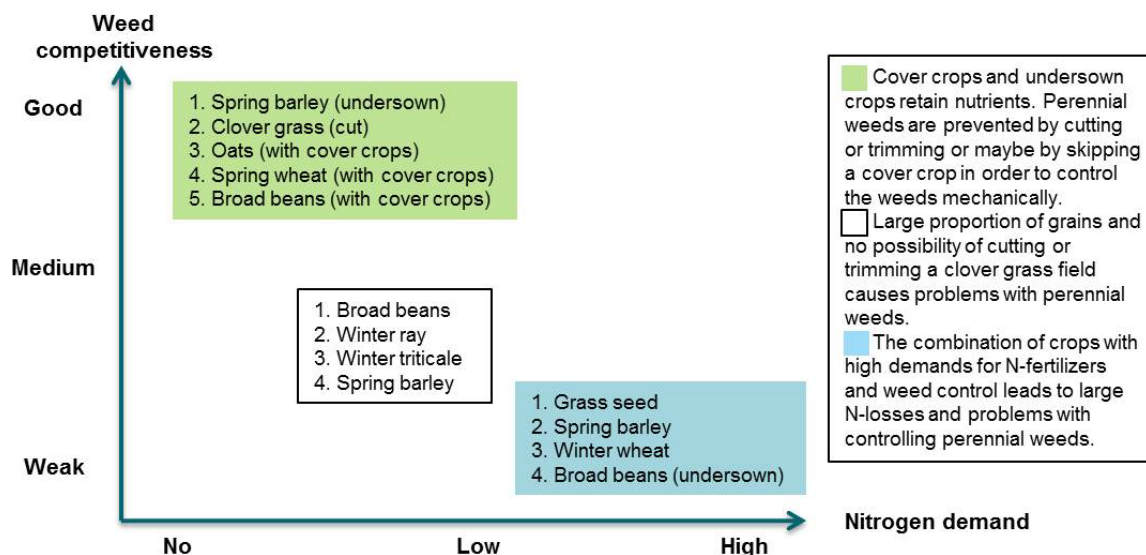


Figure 2: Three crop rotations in accordance to weed competitiveness and nitrogen demand.

Points to consider in case of high weed pressure:

- Do not grow grain legumes where perennial weeds are a problem. Late harvest in combination with loose plant stands (light) and high nutrient availability before harvest further propagates the growth of perennial weeds.
- Do not sow winter crops after lupine or broad beans, as winter crops leave perennial weeds undisturbed during a long period of time. Instead, undersow a cover crop in the legumes to hold-back the nutrients and then sow a competitive crop in spring.
- Do not sow spring barley after grass-clover, as spring barley does not take up the available nitrogen effectively and thus creates a high risk of nitrogen leaching. Instead, grow oats or spring wheat undersown with cover crops two years in succession. On clayey soils and in dry climates though, winter crops are better than spring crops.
- Do not leave a badly established crop unmanaged until harvest, as weeds might take over. Decide before beginning of June, whether to leave the crop or better control the weeds effectively and lay the foundation for a successful crop next year.
- Do not leave a badly established cover crop unmanaged in autumn, as perennial weeds might flourish. In autumn weeds can be controlled with relatively low cost. You may concentrate on weed control measures on infested parts of a field only.
- On sandy soils, sow rye, triticale or winter spelt instead of winter wheat, as winter wheat does not grow well on such soils and encourages propagation of perennial weeds.

Further Information

- www.landbrugsinfo.dk/udfasning (Danish website)
- www.landbrugsinfo.dk/Oekologi/Planteavl/Filer/saedsrifter_fakta.pdf (Danish factsheet)
- Check the [Farmknowledge tool database](#) for more practical recommendations.

Share your experience with other farmers, advisors and scientists! Use the comment section on the [Farmknowledge platform](#)! If you have any questions concerning the method, please contact the author of the practice abstract by e-mail.

About this practice abstract and OK-Net Arable

Publisher:

SEGES P/S, Agro Food Park 15, DK-8200 Aarhus N, Denmark
Phone +45 87 40 50 00, info@seges.dk, www.seges.dk

IFOAM EU, Rue du Commerce 124, BE-1000 Brussels
Phone +32 2 280 12 23, info@ifoam-eu.org, www.ifoam-eu.org

Author: Margrethe Askegaard, mga@seges.dk

Language editing: Simon Moakes (FiBL)

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