

Avoiding hoeing in organic oilseed rape

Problem

Oilseed rape sown in summer only forms a dense canopy in the following spring. In autumn and winter, the stands can become infested with weeds, and in vulnerable areas, soil erosion can occur.

Solution

Undersowing helps to increase soil cover in autumn and thus suppress the emergence and growth of weeds. In oilseed rape, frost-sensitive legumes are best suited for undersowing. They fix nitrogen and thus contribute to the large nitrogen requirement of oilseed rape plant through mineralisation. After dieback in winter they form a thin layer of mulch on the field.

Benefits

- Suppression of seed weeds (pictures 1 and 2)
- Reduction of soil erosion
- Reduction of nutrient leaching
- Extra nitrogen is fixed and utilised by the oilseed rape
- Weed control is usually not required, which helps to reduce variable costs
- Thanks to the absence of mechanical weed control less carbon is released from the soil

Disadvantages

- Significant competition with the oilseed rape crop is possible (depending on the undersown crop and the date of its dieback)
- Depending on the seeding technology, mechanical weed control may not be possible
- Annual and root weeds can compete with the rape seed
- In following crops, a higher weed pressure may occur
- Additional costs for undersown crop seed

Practical recommendations

- In Central Europe, sowing should occur at the end of August
- Fertilization: 15-20 t/ha composted manure in autumn, 30-50 m³/ha of slurry in early spring (as soon as vegetation restarts and the soil is dry enough), if organic commercial fertilizer is used, apply in February
- Either mix legumes and oilseed rape and sow them at the same time, or sow the legumes at the last tillage and afterwards sow the oilseed rape through precision seeding. The precision seeding in rows has the disadvantage that the distribution of oilseed rape and undersown crop is uneven.



Recommended species and mixtures

- Only mixtures of frost-sensitive species are suitable for undersowing. Based on previous experiences, a mixture of buckwheat (*Fagopyrum esculentum* 7 kg/ha) or fenugreek (*Trigonella foenum-graecum* 7 kg/ha), with pea vines (*Lathyrus sativus*, 6 kg/ha), lentils (7 kg/ha), vetch (*Vicia* 5 kg/ha), clover (*Trifolium alexandrina* 3 kg/ha), phacelia *orguizotia* (2 kg/ha), corresponding to a total 30 kg/ha, is recommended.
- In dry conditions, the addition of some flax can be interesting. Flax also has an inhibiting effect on germination of weeds.
- In case of increased weed pressure, the addition of 20 to 50 kg per hectare of a frost-sensitive faba bean can improve weed suppression. In autumn, faba beans can also have a positive effect against flea beetles (*Psylliodes*) and other pests. If the legumes and oilseed crop are sown the same day, sow the faba bean first at a sowing depth of 5-8 cm and then the rape at only 1-2 cm.

Advice

- The weed pressure in the seedbed should not be too high; if necessary, perform a weed treatment before sowing (false bed seeding).
- If the rape seed is sown with precision seeding, it is still possible to use mechanical weed control.
- After cereals, it is essential to germinate grains in advance with a stubble cultivation.
- Undersowing is not recommended if root weeds such as docks (*Rumex obtusifolius*) and couch grass (*Agropyron repens*) are present, as these weeds cannot be hoed due to the undersown crop.

Practical testing

If this method seems to be suitable for your farm, we recommend that you test it under your own farm conditions as follows:

1. When sowing the oilseed rape, dedicate a part of the field for testing.
2. Apply the new method on one of the two plots. The other plot can be cultivated as usual.

Evaluation

Visual evaluation: Under favourable conditions, undersowing only has minimal effects on the growth of the oilseed rape crop. Nonetheless, it might be interesting to compare the size and development of the oilseed rape crop and weed density in both plots at different stages. After the harvest, a visual assessment of the soil structure (with e.g. the spade test) can bring interesting findings. Photographs of the trial plots document possible differences and facilitate the analysis at a later time.

Quantitative evaluation: The absence of mechanical weed regulation can have a negative impact on the oilseed rape yield. It is recommended to compare the yield from both plots.

Further information

Links

- On www.bioaktuell.ch, you will find information on the undersowing technique as well as on other possibilities for soil covers (German/French).
- General information on undersowing at www.oekolandbau.de (German).

About this practice abstract and DiverIMPACTS

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