

Winter field peas as green manure before maize

Problem

On arable farms without livestock, nitrogen insufficiency can occur when cultivating nutrient demanding crops like maize. This can lead to yield losses and weed infestation.

Solution

Use a green manure of winter field peas before growing crops that have a high nitrogen demand in the rotation.

Outcome

Ploughing in winter field peas in spring provides 100 kg of nitrogen to the succeeding crop and increases yield. The improved development of the crop also leads to an improved weed control.

Possible disadvantages are the growing costs and restrictions when cultivating peas as a main crop in the rotation.

Applicability box

Theme

Nutrient supply, Weed control

Geographical coverage

Temperate climate

Application time

In autumn after late crops before cultivating nitrogen needy crops like maize or field vegetables.

Required time

Sowing and treatment of green manure.

Period of impact

Succeeding crop

Equipment

Plough, disk harrow, rotary harrow, mulching device

Best in

Arable farms without livestock

Practical recommendation

Position of green manure in the crop rotation

- After late crops like potatoes, sun flowers and field vegetables. After grains, green manure is possible after repeated stubble treatment against root weeds.
- Possible succeeding crops are maize, potatoes or field vegetables that require nitrogen (e.g. spinach). Not grain legumes.
- The earliest point for repeating the pea fertilization on the same field is after 6 years. In between this time frame, peas must not be cultivated as a main crop.

Cultivation of winter field peas

- In case of soil compaction, primary soil tillage should be carried out. Seedbed preparation with a rotary harrow or a tined rotor.
- Ideal seeding period: Beginning of October to middle of November. Sowing depth: 3-5 cm.
- Quantity of seeds: End of September/beginning of October: about 1,5 kg/a (100 seeds/m²), middle to end of October: 2 kg/a, frost seeding in winter: max. 4 kg/a

Mulching

- Do not incorporate the peas too early as the N fixation of the peas does not start until April.
- Ideally, use with a mulcher mounted at the front end to ensure the shredding of all stems.
- After 1-3 days, mix dried-in green matter into the soil surface (10 cm deep) – on light and medium soils with a disk harrow or a flat cultivator, in heavy, smooth soils use a skim plough.
- In no-till farming of maize, compress the peas after blooming in May with a crimper-roller and allow them to dry.

Precautions

- Green manuring is less suitable before sunflowers, flax and millet, as they do not require so much nitrogen and more than 60kg N per ha from the winter peas could be lost.
- The seed quantity can vary depending to the weight of a thousand seeds of field peas.

- Before grain maize, the field peas often do not have enough time to properly develop.
- Cultivating carrots after a green manure with field peas is not recommended due to the increased risk of spread of sooty mould (*Chalara*) and carrots cannot fully utilise the available nitrogen.



Left photo: Winter field pea before blooming; right photo: grain pea in bloom (Photos: Hansueli Dierauer, FiBL).

Practical testing

If this method seems to be suitable for your farm, we recommend that you test it under your own farm conditions applying it only on a part of the field. Treat the remaining land as usual.

Evaluation and sharing of results

Visual evaluation: In order to evaluate the method's effectiveness, compare the development of the succeeding crop at various stages. With the help of photographs, you can document the result and consult it later on for analysis. Also, compare the development of weeds and the condition of the soil (humidity, structure, activity of earthworms) in both areas.

Quantitative evaluation: To identify yield differences, you can compare the weight of the harvest yield from the trial field with the one from the standard field (convert yields on unit area from 1 a or ha).

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



Further information

- Practice Abstract 005 on [direct sowing of maize in forage peas](#)
- The [Farmknowledge tool database](#) offers practical follow-up information on the cultivation of green manure.

About this practice abstract and OK-Net Arable

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