

# Intercropping grain peas with barley

## Problem

Grain peas are a valuable feed crop containing around 20% crude protein. Cultivated as a pure crop, grain peas are prone to lodging, which often leads to late weed infestation, soil contaminated grains and yield loss.

## Solution

The cultivation of half-leafless grain peas and barley prevents lodging and quality/yield loss. After several years of trials in Switzerland, the intercropping of grain peas and barley became a standard to cultivate grain peas.

## Benefits

The barley provides support to the peas, preventing lodging and, thus, reduces yield loss. It increases the soil cover and thus suppresses weeds. Growing two crops at the same time also mitigates the risk of yield loss in one of the crops. With intercropping there is a higher land utilisation per hectare than with pure stand.

## Applicability box

### Theme

Crop-specific measure, intercropping

### Agronomic conditions

Temperate regions; Switzerland

### Application time

Sowing

### Required time

No additional time during cultivation, however peas and cereals may need separating after harvest.

### Period of impact

Duration of crop and next crop in the rotation

### Equipment

For sowing, use a cereal drill. Use a harrow for basic weed control.

### Best in

Deeper, not too dry soils. Also suitable on the periphery of soybean adapted zones.

## Practical recommendation

- Finding the suitable varieties to combine (same maturity) can be accomplished by a simple strip trial. We use half-leaved peas varieties.
- The seedbed should not be too fine-grained after cultivation or reduced tillage (advantage: better channel flow from deeper soil layers during drought periods). A further possibility is mulch-till, whilst on heavy soils a plough might be needed. Possible application of green manure or compost.
- For sowing machines with only a single tank, homogeneously mix the seeds at a seed rate of 80% of pure pea stand density and 40% of pure barley stand density before filling the seeder. During sowing, repeatedly check the homogeneity of the mixture, and for sowing machines with two or more tanks, apply the seeds of the mixture species separately. The mixing ratio might be adapted over time according to local growing conditions.



Examples of protein peas-barley mixtures. Photos: FiBL, Hansueli Dierauer.

- To avoid yield loss due to drought during the blooming stage, it might be better to sow the mixture in autumn. The blooming stage is then earlier, at a time when more water is likely to be available. However, spring sowing is also possible.
- Sow with a cereal drill at a row spacing of 12 cm and a placement depth of 3 to 4 cm into the same or in separate rows (depending on the sowing machine). Do not sow too early to keep the pea plants small enough during winter.
- Weed control is usually not needed, but a high weed pressure can be controlled by harrowing in early stages.
- No nitrogen fertilization for the crop is needed. Irrigation would only be needed in extremely dry year.
- Harvest: adjust harvester sieves to peas. Open threshing concave and hulling bars wide enough. Low drum rotation. Keep the airflow lower compared to a pure pea harvest; check regularly for grain loss. Place the vario-table in the back. Adjust to an aggressive cutting angle.
- In order to avoid legume fatigue in the soil, only cultivate the mixed crop every seventh year. Do not grow lupines, vetches, lucerne or pure stands of red clover in between. In case of Legumes fatigue do not cultivate peas for 10 years.
- To market the harvest, equipment to separate the two components might be needed. Talk to your local collection station. If more farmers use the intercropping system, they might see the advantages.

## 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. Before sowing, separate a narrow plot from the field that is large enough for two harvester widths.
2. Mark the plot of the trial area with two poles.
3. Apply the new method on the narrow plot. The rest of the field can be cultivated as usual (e.g. peas in pure cultivation).

## Evaluation and sharing of the results

**Visual evaluation:** In order to visually evaluate the efficiency of the method, the stability of the pea plants under the two management schemes can be evaluated and compared before harvest. Photographs of individual plant stocks help to document results for analysis at a later time.

**Quantitative evaluation:** For a quantitative evaluation of the mixed crop, the yield of the pea-barley mixture must be weighed separately. It is easiest to weigh the mix-elements after separating them.

Use the comment section on the <https://www.diverimpacts.net/service/forum/forum/discussion.html> 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

### Video

- [Anbau von Mischkulturen - Körnerleguminosen mit Getreide](#) (Sept. 2015, German): Information on different mixed crops with legumes and cereals.

### Weblinks

- Check the [Organic Farm Knowledge](#) tool database for more practical recommendations on mixed crops.
- The method is described further on the Swiss platform [bioaktuell.ch](#) (German and French).
- Technical leaflet ([Erfolgreicher Anbau von Körnerleguminosen in Mischkultur mit Getreide](#)) about intercropping grain legumes in the [FiBL shop](#).

## About this practice abstract and DiverIMPACTS

### Publisher:

Research Institute of Organic Agriculture (FiBL)  
Ackerstrasse 113, Postfach 219, CH-5070 Frick  
Phone +41 62 865 72 72, [info.suisse@fibl.org](mailto:info.suisse@fibl.org), [www.fibl.org](http://www.fibl.org)

**Authors:** Matthias Klaiss, Tobias Gelencsér and Gilles Weidmann (FiBL)

**Contact:** [matthias.klaiss@fibl.org](mailto:matthias.klaiss@fibl.org)

**Translation:** Florin Regli

**Language editing:** Simon Moakes

**Permalink:** [zenodo.org/record/3794916](https://zenodo.org/record/3794916)

This practice abstract was elaborated in the DiverIMPACTS project, based on the EIP AGRI practice abstract format.

DiverIMPACTS: The project is running from June 2017 to May 2022. The overall goal of DiverIMPACTS - Diversification through Rotation, Intercropping, Multiple Cropping, Promoted with Actors and value-Chains towards Sustainability - is to achieve the full potential of diversification of cropping systems for improved productivity, delivery of ecosystem services and resource-efficient and sustainable value chains.

**Project website:** <https://www.diverimpacts.net>

© 2020

