

## PROJECT PROCEDURE

In the first year of the trial, 100 accessions each of chickpeas and grass peas will be cultivated in small plots at the University of Hohenheim and at project partners, the Leibniz Institute of Plant Genetics and Crop Plant Research (IPK) and the Leibniz Centre for Agricultural Landscape Research (ZALF). These accessions will be evaluated according to agronomic criteria. In addition, their suitability for intercropping and weed suppression strategies will be tested in model cropping systems. To test for practical characteristics, on-farm experiments will take place at partner farms throughout the entire project duration.

In the second year of the trial, approximately 30 of the initial 100 chickpea and grass pea accessions will be selected for repeated cultivation and testing at the three sites. Experiments on drought and heat tolerance will be conducted at ZALF. At the University of Hohenheim, additional pot experiments will be performed to inoculate different strains of chickpea with various inoculants and develop methods for analyzing their contents.

The best accessions will be grown and evaluated again in the third year of the trial, so that by the end of the project, 10 to 15 genotypes suitable for domestic cultivation will be available for breeding and further propagation for each crop.

## CONTACT

### PROJECT MANAGEMENT AND CO-ORDINATION

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### PROJECT PARTNERS

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### Projekt Partners



**More Information about the Research Project**  
[https://oeko.uni-hohenheim.de/en/research\\_project\\_cilaklima](https://oeko.uni-hohenheim.de/en/research_project_cilaklima)



UNIVERSITY OF  
HOHENHEIM



CENTER FOR ORGANIC FARMING



## Research Project CiLaKlima

Genetic screening of chickpeas (*Cicer arietinum* L.) and grass peas (*Lathyrus sativus* L.): Adapting to climate change in Germany through exploration of alternative legumes for human nutrition







## Research Project CiLaKlima

### CHICKPEAS AND GRASS PEAS

Chickpeas and grass peas are protein plants (legumes). Chickpeas and their processed products, such as falafel or houmous, are recognised as a nutritious food worldwide, and are becoming increasingly popular in Germany. They are one of the most important sources of vegetable protein in human nutrition.

Due to its drought tolerance, the grass pea (also known as „German chickpea“) used to be known as a „saviour“ in times of need, but nowadays it is only common as a food in a few countries. Its cultivation is important in East Africa and Asia. Like the chickpea, it can be eaten cooked or ground as flour.

### CLIMATE CHANGE ADAPTATION?

Chickpeas and grass peas are currently rarely cultivated in Germany. However, they have great potential: due to climate change, it is becoming warmer and drier in Germany and common protein crops, such as pea or field bean, increasingly suffer from yield fluctuations. Chickpeas and grass peas, on the other hand, are well adapted to dry and warm climatic conditions and are therefore expected to be able to secure yields under dry and hot conditions in Germany too.

### QUALITY OF PLANT PROTEIN SOURCES

Due to the increasing demand for both vegan and regionally produced food, there is growing interest in the cultivation of alternative protein plants. Chickpeas and grass peas are sources of vegetable protein with nutritionally beneficial properties. They also have the advantage that, unlike lupins or soy, they do not require extensive processing before being used as food. The seeds of the grass pea are the source of the health-promoting amino acid L-homoarginine, although they may also contain toxins that can lead to poisoning if consumed in excess.

### CULTIVATION CHALLENGES

Neither crops are bred in Germany, which is why there is a lack of adapted varieties. Knowledge about successful agronomic management in Germany is scarce.

Grass peas must be cultivated with a supporting crop. This requires additional knowledge of technique and selection of a suitable mixture partner. Grass pea seeds may contain toxins. So far, however, little is known about the influence of cultivation, choice of genotype and environmental influences on toxin content.

Chickpeas can be cultivated without a supporting crop, but to date there is a lack of studies on successful cultivation methods, weed control and inoculants. Chickpea needs special nodule bacteria for nitrogen fixation which do not occur in our soils, so the seed must be inoculated with the appropriate bacteria before sowing.

### PROJECT GOALS

The main objective of CiLaKlima is to select different chickpea and grass pea accessions and evaluate their suitability for cultivation in Germany.

Additionally, the project aims to:

- Increase yield stability by selecting for practical agronomic criteria
- Improve quality (protein content, greatly reduced toxin levels)
- Test intercropping suitability of grass pea in mixed cultivation
- Test inoculation methods
- Investigate various strategies for weed suppression in chickpeas

Our project aims to provide breeders and farmers with suitable genotypes for cultivation of chickpeas and grass peas, thereby increasing interest in these crops. This will enable consumers to enjoy high-quality, locally grown food products.