UNIVERSITÄT HOHENHEIM

- Kleinhohenheim -
Organic Research Station of the University of Hohenheim, Stuttgart
Germany

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1 Introduction

The farm Kleinhohenheim is part of the Research Station for Livestock Biology and Organic Agriculture at the University Hohenheim and its purpose is explicitly to serve in teaching and in experimental research in organic agriculture. Located in the vicinity of the campus (about 3 km), 60 ha of land (arable fields and meadows), buildings, machinery and personnel are available to examine various research questions in organic agriculture.

2 History

Kleinhohenheim has been used agriculturally since it was founded in 1772 by Duke Carl Eugen of Württemberg. In 1817, Kleinhohenheim became the “Royal Württemberg Estate for the Model Husbandry of Foals and Cattle (Appenzeller)”. The remains of the foundations, which today are part of the sheep barn, originate from this time and were built as a so-called “Schweizer-Haus”. In 1864, the estate was transformed into a tenant farm and from 1922 on it was rented by the then Higher Agricultural School of Hohenheim. In 1976, the estate, in its current size, was transferred to the State of Baden- Württemberg which subsequently allotted the land to the University Hohenheim for cultivation. Since 1993, the estate has been cultivated according to the guidelines of German organic organizations. Annual certification has been in place since 1996, after the obligatory period of transition.

3 Natural Site Conditions

The research station lies at the edge of the Filder Plain, in the southern periphery of Stuttgart. The elevation of Kleinhohenheim is about 435 m (a.s.l). The long-term annual average precipitation is 700 mm, the long-term annual average temperature is 8.8°C.
The dominant soil types are Luvisols and Cambisols, often with stagnic properties. Through the almost 2 m thick soil horizons of the “Filder clay” (loess to sandy loamy clay), the soils exhibit a high water holding capacity and are well suited to agricultural use. The Stuttgart region is very hilly, therefore most fields at Kleinhohenheim also exhibit slopes.

4 Fields

Kleinhohenheim has a total of 73 ha. Half of the land is used for arable cropping and the other half for grasslands (32 ha). The remaining 8 ha consists of pathways, field edges and hedges.

5 Type of Agriculture and Membership in Organizations

Kleinhohenheim is cultivated according to the guidelines of bio-dynamic agriculture and is therefore a member of the Demeter producers' organization. In addition, the farm is also a member of Bioland and Naturland.

6 Research in Organic Agriculture at Kleinhohenheim

The research station Kleinhohenheim is available to all scientists of the University Hohenheim, as well as project partners in other universities and research institutes. In addition, Kleinhohenheim plays an important role in teaching, on the one hand through excursions in which students can become acquainted with the practical aspects of organic agriculture and, on the other hand, through experiments as a part of various projects and theses.

Because the research station has been managed organically since 1993, the effects of previous conventional management, as well as problems from conversion, can now be considered to be irrelevant. Therefore, the fields are very suitable for such research projects that necessitate a long-term period of organic management prior to the experiment.

In order to implement the systematic thinking of organic agriculture, the research work in crop production is generally carried out within the existing crop rotation. When necessary, research parcels can be set up on which conventional management is applied.

The approval of experimental procedures is given by a committee of scientists that is assigned to the research station and supervises the various experiments, in order to ensure that they can be carried out together on the limited space available.

Figure 1: Maize breeding experiment in cooperation with the plant breeding company KWS (summer 2008).

7 Current Research Projects at Kleinhohenheim

In 2009, the following experiments will be carried out within the contexts of the following research projects:

- Influence of organic management on nutrient cycles in the soil, soil biological and microbiological properties and on the properties of the soil structure.
- Examination of selection criteria in the context of organic maize breeding.
- Improvement of the phosphate supply in organic agriculture through the application of bio-superphosphate.
- Influence of stubble cultivation on weeds and yields in an 8-stage crop rotation under the conditions of organic farming.
- Influence of subsoil cultivation on weeds and yields in an 8-stage crop rotation under the conditions of organic farming.
- Comparison of varieties of parsnips.
- Resistance to *Phytophtora infestans*: Comparison of different tomato varieties.
- Onion production in organic agriculture.
- Lentil production (varieties, sowing date, weed management) in organic agriculture.
- Application possibilities for plant-based fertilizers in field vegetable production.
- State variety trials in organic agriculture – winter wheat.
- State variety trials in organic agriculture – summer oats.

In addition, every year numerous student experiments also take place (projects, bachelor and master theses).

7 Crop Rotation

The fields of the research station are divided into two crop rotations. One rotation is a field crop rotation and the other is a field vegetable rotation. The crop rotations are presented in Table 1.

Table 1: Crop Rotations at Kleinhohenheim

Year	Field Crop Rotation (ca. 23,3 ha)	Field Vegetable Rotation (ca. 8,5 ha)
1	Clover grass	Clover grass
2	Clover grass	Field vegetables with a high demand for nutrients (e.g. brassicas)
3	Winter wheat and cover crop	Spring wheat
4	Oats and cover crop	Winter rye and cover crop
5	Faba beans and cover crop	Field vegetables with a low demand for nutrients (e.g. carrots, onions)
6	Spelt and cover crop	Spring wheat with undersown clover grass
7	Row crop (potato or maize)	
8	Triticale undersown with clover grass	

7 Sheep Production (Lamb Production)

Sheep production within the research station has been assigned to the organically managed Kleinhohenheim since 1996 and is housed in the renovated, former cattle barn. Sheep production is a way to make use of the fodder produced on the grasslands and through field fodder production and therefore also as a provider of organic fertilizers ('dual function'), in addition to the possibility of carrying out research on sheep husbandry.

The flock consists of about 250 ewes (Merino landrace) and 4 breeding rams, as well as about 180 lambs (average value over several years).

The animals spend the winter in the barn and graze on the fields of Kleinhohenheim during the summer. The animals are either fenced or herded, in the latter case they are housed in the barn at night in order to allow for better nutrient management.

Figure 2: The sheep at Kleinhohenheim.