# Geocaching BIODIVERSITY Blankenhornsberg

## "Terroir" Route - english -

**WEIN & BIODIVERSITÄT 3 / 2010**

Baden-Württemberg
STAATLICHES WEINBAUINSTITUT FREIBURG

## Welcome in the diverse nature of the viticultural landscape around the Blankenhornsberg!

### The geocaching route "Terroir" to biodiversity

The word "biodiversity" [Bio-di-ver-si-ty] isn't an easy one to say. Many of us have never heard it before. Nevertheless, we are permanently surrounded by biodiversity.

The geocaching route to "Terroir" biodiversity here on the Blankenhornsberg wants to take you on an enjoyable journey into the world of this viticultural landscape and its biodiversity.

Grapes later used for wonderful wines are not the only thing to grow in this viticultural landscape, but there also is a great number of animals and plants living here. They particularly like this area and have developed certain strategies for life here and for coexisting with other creatures. This route is to cover the diversity of living things and their life history strategies. The many different kinds of plants, animals, people, fungi, as well as their survival strategies and habitats are jointly referred to as **biodiversity** – **biological diversity**.

**Time is all yours here at the Blankenhornsberg!** Just as you like it. You will have time to take a break and relax. You will feel the wind, the sun or the cool shadows cast by trees, watch the clouds passing by overhead and look down onto the Kaiserstuhl, the Black Forest, the Rhine valley and the Vosges Mountains.

**You can set your own speed!** Your GPS will always be where you are and indicate where there may be interesting things to discover for you. From time to time, there are small (or even great) riddles and puzzles to solve. The solutions and your GPS will take you to the next station. At the end of the "Terroir" biodiversity geocaching route, you will find your reward.

Please have fun and enjoy the new discoveries offered by the first geocaching route on biodiversity at the Blankenhornsberg!

## Station T1: State Winery Blankenhornsberg and State Institute of Viticulture and Enology Freiburg

### Biodiversity at the Blankenhornsberg

The Blankenhornsberg near Ihringen is situated in the South-West of Germany, at the South-Western rim of the Kaiserstuhl, a small mountain range of volcanic origin.

As you can see, the Blankenhornsberg landscape is very diverse. The grape-covered slopes face South, West and East. The vineyards are very different, too: There are old terraces and newer vineyards on volcanic and loess ground.

Other elements contributing to the extraordinary **structural diversity** of the Blankenhornsberg wine country are the different slopes and ways-sides, walls and groves with their outskirts. Apart from that, the Blankenhornsberg is situated in a special location near the Belford Gap, which makes it an entry lane for arriving, heat-loving animals coming in from the South.

These different habitats are important for the great diversity of species around the Blankenhornsberg. The different plants and animals have also developed interesting **life history strategies** and **adaptations** to survive in this extraordinary vineyard area.

Enter the starting coordinates N 48°03.184' E 07°37.437' into your GPS and follow the path.

What kind of grape is grown directly west of the path?

Pinot gris → X = 0, Pinot Noir → X = 4, Riesling → X = 9

Now replace the X in the coordinates below with the right solution, enter the coordinates into your GPS and follow the route to the next station.

| | |
|---|---|
| N 48°03.255' | E 07°37.X41' |

**Help us record the diversity of species at the Blankenhornsberg!**

You could help to record biodiversity at the example of the **Italian cricket,** the **green lizard** or **praying mantis** at the Blankenhornsberg: If you see one of these animals along the path, we would be very happy if you wrote down the coordinates or placed a marker and passed the data on to us via email.

**We are looking for the following 3 animals:**

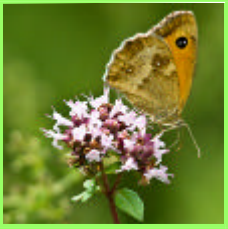
The **Italian cricket** *(Oecanthus pellucens*) is an approximately 2 cm long tree cricket living on different plants growing on slopes. Its loud sroo-sroo call can be heard from the late afternoon and throughout the evening in summer.

The brilliantly green **Green lizard** (*Lacerta bilineata*) mostly lives in the higher grass of sunny slopes. When it is not all too hot yet, it also likes to bask on stones, but it will always remain near some shrubbery.

The **praying mantis** (*Mantis religiosa*) grows up to 7.5 cm long. It is a mantis waiting for prey (in particular other insects) hidden in the grass of sunny slopes. It is usually only discovered by accident, because it is well hidden in the green grass.

For determinating butterflies, grasshoppers and birds, we recommend **the PLENUM-Taschenbegleiter** booklet "Artenvielfalt Kaiserstuhl", which can be purchased in the State Winery.

**These are some biodiversity treasures to be found along the way:**



Wild marjoram with gatekeeper butterfly

Common kestrel and other birds of prey

Different grapes for different vineyard sites

**Geocaching biodiversity Blankenhornsberg**

| Station |  |  |  | Observer's Name _____<br>Date _____ Time_____ |
|---|---|---|---|---|
| | Italian Cricket | Green Lizard | Praying Mantis | Comments, further observations |
| Example Station Tx | + | | + | |
| T1 | | | | |
| T2 | | | | |
| T3 | | | | |
| T4 | | | | |
| T5 | | | | |

| Station | Italian Cricket | Green Lizard | Praying Mantis | Comments, further observations |
|---|---|---|---|---|
| Further records<br>Enter coordinates | | | | |
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## Station T2: Grape Variety Research

If you guessed and entered the first coordinates correctly, you should now be on a path in the middle of a **vineyard**.

You probably noticed the different labels that are attached to the stakes. This is where the Institute of Viticulture and Enology performs experiments with different grape varieties and clones.


Clones are created by taking cuttings from a parent plant. They therefore have the same genetic material (like identical twins).

Almost all vines actually consist of two varieties: The upper part, which is to bear grapes, is engrafted onto a rootstock of a variety that is particularly resistant to the grape phylloxera. This **rootstock** (as in figure "5C") is from wild grape varieties originally from Northern America. Therefore, they are called "Amerikanerrebe" (American grape) in German. The **grape phylloxera**, which is only about 1 mm small, was introduced from North America and devastated whole wine growing regions in the 19th century. By sucking on the roots, these insects harm the European cultivars' nutrient and water supply.

The "American" cultivars have developed **defence strategies** against grape Phylloxera during their evolution (e.g.: fast wound closure).

Take a look around. Can you find a grape vine moth trap (see image to the right), hanging on a vine? Examine it carefully. On its back, next to the grape vine moth image, there is a large number. Which number is that?

The number corresponds to Y.

Enter the right solution into the coordinates below and enter them into your GPS. Then continue to follow the trail.

| | |
|---|---|
| N 48°0Y.420' | E 07°37.429' |

Changed buyers' interests, market-political provisions, but also climate changes require **continuous adaptation**, e.g. regarding the selection of new or fungus-resistant varieties. Therefore, viticulture is subject to constant change. The **Johanniter** is a new variety developed by the State Institute of Viticulture and Enology in Freiburg.

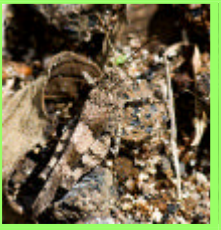
To achieve biological control of pests, **traps** are put up. Grape vine moths are attracted by their scent and caught in the glue. By counting them regularly and replacing the glue strips inside the trap, the current infestation of the vineyard can be estimated and measures can be taken.

What is a "**Terroir**"?
Terroir means the interactions of (micro) climate, soil properties, slope graduation, sun exposure and other environmental factors. Biological aspects, such as flora and fauna, or the life in the soil, which are important for aeration of soil, are included as well. It is therefore decisive for the growth and nutrition of vines and therefore also has a great influence on the grapes themselves.
Many grape varieties place special demands on their environment. These is considered when the varieties are planted.

The volcanic soil of the Blankenhornsberg is particularly well suited for Pinot Noir and Riesling grapes.

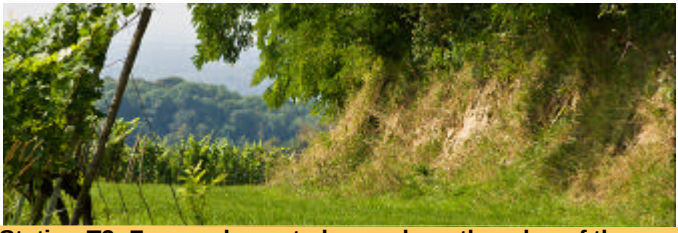
**These are some biodiversity treasures to be found along the way:**

Colour diversity of ripening berries



Well-camouflaged: The blue-winged grasshopper

Viticultural landscape with great variety



## Station T3: From volcano to loess along the edge of the wood

Plants use light energy from the sun to build energy-rich substances they need for their metabolisms. Water and the nutrients required for it are taken from the soil and transported into the upper plant parts though fixed pathways (=xylem). Nitrogen is particularly important for the structure of vital substances such as proteins. By harvesting the grapes and removing twigs, nitrogen compounds are removed from the vineyard, which are replaced again by fertilisation.
At the Institute of Viticulture, methods for exact determination of the nitrogen requirements and **fertilisation adapted to need** in viticulture continue to be developed.
Many plants react very sensitively to high nitrogen concentrations. Meadows and slopes with a great diversity of species are more often characterised by a lack of nitrogen. With a **high nutrient supply**, **biodiversity** generally decreases.

However, dandelion and stinging nettles are some plants dealing well with a high nutrient-supply.

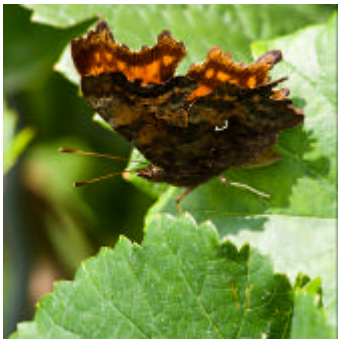
Find out which tree (with three trunks) is growing on this slope:
Oak → X = 8, Fir → X = 0, Spruce → X = 1

**!!! First, go to coordinates**:
N 48°03.613' E 07°37.661'.

Then follow the following coordinates after replacing X by the right solution.

| | |
|---|---|
| N 48°03.580' | E 07°37.6X4 ' |

A hint regarding this butterfly's name is written on its hindwing: A clear, white comma tells its name. This butterfly lives in semi-shade areas. The **comma** spends the winter as an adult animal, hiding in protected places such as stacks of wood, nesting boxes or barns.



The planthopper (*Hyalesthes obsoletus*) is living on field bindweed and **stinging nettles**. Actually, it is not really interested in vines. However, when its food is taken from it after the meadows are cut in summer, it will also suck on vine leaves. This may cause bacteria to enter the vine and cause the harmful grapevine yellows disease “Bois noir” illness.

Along the way, you can see the change from volcano to loess ground in the embankment. Surely, you are noticing the differences in vegetation, too.

Exposed loess areas show small holes. Sometimes, these holes are very busy with bees. **Solitary bees** are tending to their brood inside these holes with pollen and digested food. They must be alert, however, to ensure that no unwanted guests will sneak in: **Cuckoo bees** will simply lay their eggs in nests prepared by other bees, and their young will then eat the other's stores. Larvae of the bee fly, a diptera (see below), also live as parasites on other insect larvae.

**These are some biodiversity treasures to be found along the way::**

Chicory: summer flower and coffee substitute

Bee fly hovering in front of loess wall

Herb Paris with fruit and its four leaves in the forest

## Station T4: Grove and old terraces

We are sure that the walk through the **shadowy grove** was very pleasant after the sunny edge of the wood. Such a grove can be seen very often on mountaintops in the viticultural landscape. They are frequently located at the North face of the slopes, where vines would be exposed to too little sun. They also act as a protection from cold winds blowing down the mountain for the vines and thus balance the (micro) climate.

In spring, flowers like lilies of the valley and wood anemones also blossom in these groves.

Once, **wood** was an important resource for viticulture. Each vine was tied to its own wooden stake. Today, the vines are tied to a wire frame, for which fewer stakes are needed. Most of these stakes are made of steel these days, too. In viticulture, wood is still mainly used for barrels, though: Approximately 80-150 year old oak trees are used for the **barrique barrels**.

From one oak trunk, approximately 3-4 barrels can be produced. Since the barrel's wood will no longer give off enough aroma compounds after about 3 years, the barrels are then replaced by new barrique barrels. The limited supply of suitable oaks, the expensive manufacture and relatively short useful time explain why barriques are so very expensive.

Here, you need to find out which plant has taken possession of the little hut.

It is ___ ___ ___ .

The letter "v" appears Y -times in the name of this plant.

You can remain on the path for this as well.

| | |
|---|---|
| N 48°03.41Y' | E 07°37.687' |

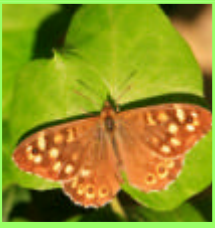
These two **snails** have fled the heat at the ground. Up here in the vines it is quite a lot cooler already. In high summer, they will close off their houses with a membrane layer so that they will not dry out. If the heat continues, a chalky cover will keep out both heat and possible predators.

The special feature of this area is its great s tructural diversity: Embankments with and without shrubbery, different waysides, edges of forests, grape varieties und vines of different ages can be found on a very small area. In summer, you will see the striking **Adonis Blues** (*Polyommatus bellargus* ) flying in this area.

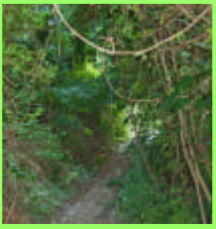
A great **variety in structure and habitats** is often connected to a high variety of species: Animal and plant species place their own very special requirements to their habitats; the more diversity there is, the more species can usually be encountered. Additionally, many animals are frequenting different habitats depending on age, weather, season and time of the day. This makes a habitat mosaic all the more precious. On hot summer days, you can observe **butterflies** flying from the embankments to the shadows of the grove (e.g. the gatekeeper). The **speckled wood** will only land on leaves and will never stay on blossoms. The males defend their patches against rivals in the forest half-shadow. Sand lizards are living along the edges of the woods.

**These are some biodiversity treasures to be found along the way:**

Clematis, a climbing plant growing at slopes



Speckled wood on a light patch in the forest



Path and climbing plants along the grove

**Station T5: Slopes with volcanic rock and loess blankets**

Now you are standing in front of a large slope where the dark volcanic rock is visible well. On top of it, there is a loess blanket. If you are here on a hot day, you will be able to feel how much this volcanic ground heats up.

You can observe many animals and plants that enjoy both the heat and the many flowers on this lean, unfertilised slope.

To cope with the **lack of water**, some plants have developed strategies to store water: **Goldmoss stonecrop** and **houseleek** (see images on the next page) are able to store water in their leaves. To avoid becoming food for thirsty animals, stonecrop contains numerous repelling substances, such as tannins and alkaloids. **Spurge** also contains substances that should actually keep hungry animals from eating it. However, nothing is perfect even in nature. The distinctive spurge hawk moth is not harmed by the poison, and its caterpillars feed on the plant (see image to the right).

Plants are not helpless. If too much of them is eaten away, they will increase their production of **plant compounds** to spoil their enemies' appetites. If this does not help, the volatile scents will attract ichneumon wasps which lay their eggs in the caterpillars or other natural enemies or eat them.

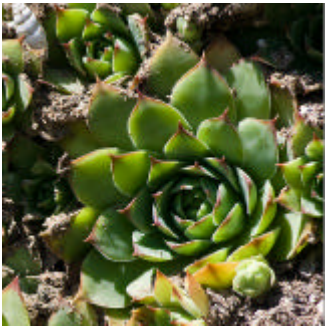
Now you may almost have tripped over a large stone.
The stone says:

Großtal, Katzental → [X] = 6 or Kleintal, Kotzental → [X] = 7 ?

!Wait a moment: Your next goal requires a small detour. First, continue to follow the road to the West and then South until you have reached a steep road. Then follow your GPS arrow.

| | |
|---|---|
| N 48°03.261' | E 07°37.4[X]9' |

**Houseleek** (Sempervivum tectorum), which also grows in the wild here, stores water in its leaves to survive even through dry spells. Direct contact to the hot ground is decreased by an isolating layer of older and dead leaves.



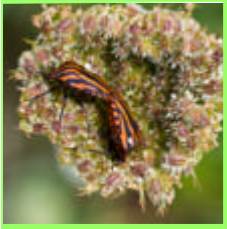
You may see one of the species we are looking for: praying mantis, green lizard and **Italian cricket**. You can often watch the latter basking here. Especially in the evening, its loud sroo-sroo-call can be heard, which it can perceive them with its hearing organs on its "lower front legs" (circle).

This slope is worth waiting for a while and watching the things that happen here:

Do you see one of the large wasp spiders with its yellow and black stripes sitting in its zig-zag-decorated net? You will surely be able to recognise the last thing it caught and wrapped up in spider silk. Its colour is a clear signal for birds: "Do not eat! I sting, bite or I am poisonous," even if sometimes it is only camouflage.

Can you hear the crickets and grasshoppers? If you are walking along this path on a warm summer evening, it will be impossible to miss the song of the Italian cricket.

**These are some biodiversity treasures to be found along the way:**



Love nest: Wild carrot with striped shield bug

Spruce hawk moth caterpillar

Heath snails / goldmoss stonecrop

## Station T6: Terroir diversity – wine (culture) diversity

If you are visiting the Blankenhornsberg at different times of the day, you will see areas where the sun shines from morning to evening, and others which are mainly only sunny in the mornings or afternoons. The **micro climate** resulting from this is therefore different, as well: In summer and autumn, dew will remain longer; in winter, snow will take longer to thaw. The grape varieties planted here are chosen according to that.

You already noticed the **age variety of the grapes** here at the Blankenhornsberg. In addition to some truly old and gnarled vines, you can also see many young plants. A vine will flower for the first time when it is 2 or 3 years old. Most grape varieties are self-pollinating. In contrast to this, the fruit trees at the foot of the vineyards require insects for **pollination**. Wild bees, honey bees, flies and many others perform this free **service** for them. In return, they receive nectar from the bottom of the blossoms, as well as some pollen.

Dead and hollow plant stems and flower bottoms are also important as winter quarters. Many larvae spend the winters here. Sometimes, you can see the holes through which they left the stems.

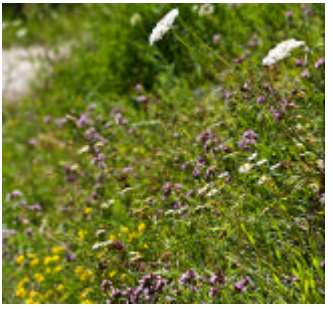
Try to guess why this single vineyard used to be called Doktorgarten (= doctor's garden):
Because
- this wine is recommended by doctors? Y = 8
- doctors like to go for a walk here? Y = 9
- Professor Doctor Adolph Blankenhorn used this vineyard for research even in the 19th century? (Y = 3).

Enter the solution and check the distance to the next goal! It is less than 3 km away!

| | |
|---|---|
| N 48°0Y.135' | E 07°37.407' |

Usually, vines start to blossom in early June. The vine's blossom is botanically referred to as a panicle, and is also called “flower cluster”. The image shows such an inflorescence shortly before it opens. In case of low pollination, which also leads to a low fruit set, vine cultivars speak of “coulure”.

Since fruit trees are not blossoming throughout the whole year, many pollinators move to the **waysides and meadows rich in flowers** when the fruit trees have stopped blossoming. In particular when stores must be built up for hibernation in autumn, waysides and slopes that are rich in flowers are a very important refugia.



Usually, the **long-eared owl** is a rather crepuscular and nocturnal bird. In winter, however, it can also be observed during the day. The landscape with its many structures and open country (hunting!), forests and slopes with trees as resting and breeding places and abandoned crows' nests is perfect for this species.

Many birds can also be observed among the grapes. They are hunting for insects or perching on the grapevine stakes. You may also see different birds of prey circling overhead. Among them are the common buzzard, the honey buzzard and the common kestrel.

**These are some biodiversity treasures to be found along the way:**

Early ripening red wine varieties

At the same time: late red wine varieties

Terroir variety – aroma variety

## Station T7: Wine variety

**Tasty biological diversity**

Now you are back where you started from. Thank you for walking the geocaching route on "Terroir" biodiversity to the end and collecting some impressions regarding the environment, the plants and animals living here and their life history strategies in the vineyard landscape.

Now all you have to do is to figure out the **solution**:

- Write the solution numbers for the different stations onto the sheet (available in the State Winery Blankenhornsberg during the opening hours)
- Add up the solution numbers
- And translate this **sum of solution numbers** into the solution with the help of the table on the paper.
- If you say this word to the employees of the State Winery, you will receive the little reward you are eagerly waiting for.

Now it is high time to get to know the wines of the State Winery or to try out new wines while enjoying the view of the Kaiserstuhl, the Black Forest, the Rhine Valley and the Vosges Mountains. And as is proper for a true geocaching route, we have also hidden a **logbook** (a kind of a "summit book") where you can enter your name. Again, you need the **sum of your solution numbers**. If the sum is above 10, replace X by 2, otherwise replace X by 3. The coordinates for the mailbox with the

**The State Institute of Viticulture and Enology Freiburg**
Is a practice-oriented research facility for viticulture in Baden-Württemberg in the area of the Ministry of Nutrition and Rural Areas. Its **research topics** cover a wide range and include anything that is connected to viticulture and wine production. Special focus is placed on sustainability in viticulture: Scientists determine where and how which vines grow best, how wine must be kept and worked; they experiment with new wine production methods and grow new and fungus-resistant grape varieties. They also research the ecology of the vineyard landscape, as well as methods of dealing with pests and fungi.
All wines that are from Baden and should be sold as quality wines or better have passed an analytical and a sensory test here at the Institute of Viticulture and Enology first and then receive their official certification number.
With a particularly large proportion of trainees for the professions of "wine grower" and "wine-trade cooper", the Institute faces its responsibility towards the next generation.
The Institute of Viticulture and Enology Freiburg has a **research winery** with a vineyard area of approx. 37 hectares at the Blankenhornsberg and in Freiburg for its experiments.
The "**State Winery Freiburg & Blankenhornsberg**" (Staatweingut Freiburg & Blankenhornsberg) sells the wines grown in these places. It is a member of the association of Prädikat Wine Estates (Verband deutscher Prädikatsweingüter; VDP) and ECOVIN.

**Opening hours of the State Winery Blankenhornsberg in Ihringen**
79241 Ihringen / Germany
Phone: ++49 (0)7668 / 9915-0
Monday – Friday, 08:30 to noon and 13.00 to 17.00,
Saturday (May - October): 10:00-16:00

**Vinotheque opening hours in the State Institute of Viticulture and Enology Freiburg**
Merzhauserstr. 119, 79100 Freiburg / Germany
Phone: ++49 (0)761 / 40 16 5 - 44
Monday – Friday 09:00 to 13:30 and 14.00 to 19.00,
Saturday 10:00 to 16.00

**WEIN & BIODIVERSITÄT (Internet) 3 / 2010**
**ISSN 2190-6602**

**Imprint**

Issuer
State Institute of Viticulture and Enology Freiburg (WBI)
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Geocaching consulting: BITOU GmbH
Translation consulting: Inlingua Freiburg
Version: June 2010