Manual of BeeBreed

BeeBreed.eu
Bee institute Hohen Neuendorf

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Contents

1 Introduction

1.1 Purpose of BeeBreed

The website `http://BeeBreed.eu` is the user interface of the breeding values estimation carried out by the LIB (Länderinstitut für Bienenkunde, Bee institute, Hohen Neuendorf). It is the platform for selection for most of systematic breeding in Europe of currently 11 subspecies and 2 hybrids in 24 countries. The method of breeding values estimation, prevailed for most livestock, unifies the basic principles of breeding by selection practised since centuries with findings of modern genetics into a easily applicable system:

- Only the performance and properties of colonies placed at the same apiary in the same season are compared as they largely depend on weather conditions and nectar availability. Only the performance differences are considered, not the performance itself.
- Not all genetic dispositions show immediately in the performance and properties of a colony. Therefore, not only own performance but also of all relatives are taken into account, graduated by the degree of relatedness.
- The genetics of a colony is formed by the genes of the queen and the drones she mated with. Therefore, controlled mating with appropriate drone colonies is of crucial importance which is also considered in breeding values estimation.

BeeBreed also serves as a central registry for queen bees, breeders, associations, mating stations and inseminators.

1.2 What is a breeding value?

There are distinctive differences between colonies with respect to honey production, behaviour, or Varroa tolerance. These differences are called forth by both the genetic constitution and environmental conditions. Only heritable differences are useful for the selection of breeding colonies, the influence of the environment should be removed. There is a universal solution for this, the concept of breeding values.

Simply put, the breeding value states, for a specific trait (measurement like honey yield, or property like gentleness), how valuable an animal is for breeding purposes. The breeding value of a colony refers to only those differences which can be traced back to the quality of the genes. For breeding value estimation, the effect of environmental influences in the various apiaries and random biologic effects not genetically determined are deducted. The performance tests of all related colonies (daughter, sisters, parents and so on) are taken into account as they have similar genes, to the degree of their relatedness. By the consideration of several traits at once, using estimated genetic correlations, the breeding values can be estimated with higher accuracy as one-time effects are filtered out to a higher degree.

1.3 How are breeding values estimated?

The performance of a bee colony results from the interaction of queen and workers, which are closely related but not genetically identical, since the workers also carry the genetic material of the drones with which the queen was mated. This is taken into account in the model of breeding values, and separate breeding values are calculated, where the value ultimately displayed is the summary of all components relevant to descendants of the designated queen.

1.4 How are breeding values interpreted?

In the estimation of the breeding value the heritable part of the differences between the peoples is extracted. For this purpose, the environmental influences must be excluded — the weather, the nectar

availability, and the influence of the beekeeper's interventions. It is assumed that these have the same effect on the colonies of the same apiary. That is why the comparitive evaluation of the test colonies in the test apiary is of the greatest importance while grading into an absolute scheme (like very gentle / gentle / aggressive / very aggressive) is not required and ultimately also not possible.

Since 1997 the breeding values are normalized into a scale where 100 corresponds exactly to the average (of the last 5 generations of breeding queens within the population), and for each number it is possible to indicate how many queens are better or worse. For example, with a breeding value of 110, only 15.8% of all queens will be better, while 84.2% will be worse. By presenting the breeding values in this way, it is possible to make the genetic superiority or inferiority of the races understandable in a way that is comparable for each trait.

However, the differences in numbers have nothing to do directly with performance. For example, in the case of two offspring queens with different breeding values e.g. concerning the honey yield can be predicted, which has the higher honey yield, but not by how many kg the yield differs. Such a prediction would also have a very high uncertainty, because the honey yield depends so strongly on the environmental conditions.

In addition to the breeding values, the reliability of the breeding value is also is displayed. The reliabilities result from a mathematical variance estimate of the calculation on which the breeding value is based and describes how well the real breeding values could be estimated. Thus, they describe in particular, whether sufficient data was available for the evaluation of the breeding value, i. e. whether sufficient number of relatives were tested. The reliability calculation takes the given performance data as error-free — a high reliability value therefore therefore does not automatically mean that the given breeding value is true. It only means that the breeding values are that the breeding values with good quality represent the given data.

1.5 How to breed with the help of breeding values?

In principle, the selection of the offspring queens is done in the same way as in the case of breeding directly according to performance — the animals with good values in all traits are selected. However, in the case of breeding directly according to performance, there is the experience that the offspring do not live up to the high expectations, because extraordinary performances are often caused by accidental influences, which no longer have an effect in the next generation. The advantage of the breeding values is that the hereditary material is judged not only from their own performance, but also from the comparison with other peoples at the same apiary, and from the comparison of close of close relatives. Thus, with good breeding values, the probability that also the descendants will also achieve very good performance, much higher than with the selection by performance alone.

It is tempting to select only the queen with the top breeding values for further breeding. In fact, the descendants of this queen have the greatest probability of achieving outstanding performance. However, it is an absurd idea that the entire beekeeping industry in Europe uses only descendants of a single queen, because then the population would become genetically impoverished and would very quickly perish from the effects of inbreeding. The breeding values should rather be understood as a lower limit, and all queens above it can in principle be considered in breeding. According to the guidelines of the D.I.B., the class A is awarded when all common breeding values are above 100 (that means above average in all traits). This criterion is met by about 30% of the registered breeding population in Germany! This gives the individual breeder great freedom to select his offspring queens according to other criteria. Great attention should always be paid to the preservation of genetic diversity. If one selects several queens for further breeding, they should be related to each other as little as possible. Often groups of closely related queens together have a high breeding value, and one should always select only one queen from each of these groups. In the coordination between several breeders it is more possible to breed as different queens as possible.

In addition to the breeding values, other criteria must also be taken into account in the breeding selection. Next, one can pay attention to traits that are not directly included in the breeding value estimation, such as overall vitality. The regional adaptation of the bees is not directly considered in the breeding in the breeding value estimation, but it can play an important role. Therefore, preference should be given to bees tested nearby or in similar landscapes.

The breeder can choose not only the mother queen, but also, to a certain extent, the paternal lineage - either through the selection of the mating station or through the choice of the lineage queen in case of artificial insemination. In breeding planning, on the one hand, the inbreeding can now be estimated, and on the other hand, attention can be paid to a favorable combination of breeding values. Paying attention to a low value of inbreeding not only helps to prevent inbreeding-related diseases of the direct descendants, but also has a positive effect on the genetic diversity of honey bees. Sometimes a very interesting breeding colony has a less good breeding value in one trait. Within certain limits this can be compensated with a mating that has a particularly high breeding value in this trait.

However, the breeder can also include characteristics that correspond to his very specific requirements profile. This also helps to maintain the genetic diversity of bees! The consideration of the breeding values helps to maintain a minimum standard of the other traits.

1.6 Performance testing

The reliability of the breeding values depends very decisively on the diligence in performance testing. The performance testing relevant for the breeding value estimation comprises the following elements:

- Determination of the total **honey yield** in kilograms. The residual honey (stock) remaining in the colony from its own collection performance counts as part of the yield.
- Assessment of **gentleness** (on a scale from “1 – stingy” to “4 – perfectly gently”). This is about the behavior towards the beekeeper during the inspection, not, for example for example the behavior towards other insects. It includes several behavioral characteristics such as the noisy flying around the intruder, targeting the intruder, approaching the intruder, and finally the stinging. This is the behavior of normally relatively few active flying bees. The aggressiveness of the bees also depends on the weather conditions, which must be taken into account as a principle when assessing the behavior. Therefore there is no absolute standard for the evaluation. It depends on the differences between the colonies of a test station in one season. It is of crucial importance that the colonies of an apiary are evaluated differently, even when the differences are small and of little practical importance for beekeeping. The average of several inspections should be determined.
- Evaluation of the **calmness** (steadiness on the comb) on a scale from “1 – strongly flying around” to “4 – absolutely steady”. This is about the behavior of bees sitting on the comb when the comb is pulled out and examined. In contrast to gentleness, the behavior of the majority of the bees matters here. Individual aggressive bees flying around do not play a role. The calmness depends on weather conditions and time of day, especially what proportion of foragers are found in the hive. The scale must be adjusted accordingly. Again, pay attention to small differences, and several inspections should be considered.
- Evaluation of the **swarm drive** on a scale from 1 – strong swarm tendency to 4 – lazy swarming. The local weather and development of the play a major role. Therefore, the yardstick must be adjusted. If no swarm tendency is found on the apiary, routine swarm-preventing measures should be omitted to “challenge” the colonies and, thus, make genetic differences visible.

With the invasion of the Varroa mite into the western honey bee in Europe and the start of Varroa resistance breeding in the 1990s, the following **Varroa resistance traits** are being tested and are summarised in the **Varroa Index.**

- Assessment of hygienic behaviour with the **pin test**. The percentage of opened cells after a certain waiting time is entered, which is also recorded.
- Measurement of the initial varroa infestation by the **mite fall** at the date of willow (*Salix caprea*) bloom or an other local indicator bloom (indicating the first relevant nectar source).
- Measurement of **Varroa infestation** progression by counting mites attached to bees, e.g. with the icing sugar method. Several measurements, preferably in the 24th, 27th and 30th calendar week.

The following characteristics also serve to test for Varroa resistance, but are so complex that they can only be carried out by institutes and by beekeepers who are specially trained and equipped with the appropriate equipment. They are also called or brood tests.

- **SMR**. Proportion of simply infested brood cells in which no reproduction has taken place. To be given as a percentage.
- **Recapping**. Proportion of recapped brood cells. To be given as a percentage.
- **Recapping, infested**. Proportion of recapped brood cells among the single capped brood cells. To be given as a percentage.
- Number of brood cells examined.
- Number of simply infected brood cells.

The following traits have been collected for a long time, but unlike the classical traits, they have not been consistently pursued as a breeding goal. They are called **colony strength traits**, because they are mainly measured by the number of bees in the colony.

- Assessment of **colony strength**, always in relation to a typical colony strength for this time of year in the scale “4 - very strong”, “3 - strong”, “2 - normal” and “1 - weak”.
- **(Spring) development**, a characteristic of how strongly and quickly the colony increases its strength after the winter break. The scale is “4 - very fast”, “3 - fast”, “2 - normal”, “1 - slow”.
- **Winter hardiness**, a characteristic of how well the colony survives the winter break, usually measured by the ratio of wintering-out strength to wintering-in strength. Scale of “4 - very good”, “3 - good”, “2 - medium”, “1 - low”, with the additional value “0 - did not survive the winter” or “missing”.

Although diseased colonies are excluded from further breeding for obvious reasons, it is important to record the type of disease and the expression in the data set in order to be able to recognise a familial accumulation and to infer a genetic predisposition from this, which is reflected in the disease resistance breeding values.

- **Chalkbrood**. Although lime brood can occur in a weakened colony under certain environmental conditions, there are also familial predispositions which are estimated with the breeding value lime brood. If chalkbrood is detected, please assess the severity of the disease according to the following key: 1 - severe severity, i.e. very many chalkbrood mummies (1000), signs of clear damage; 2 - moderate severity, i.e. considerable number of chalkbrood mummies (100); 3 - slight severity, i.e. some number of chalkbrood mummies (10); 4 - very slight severity, single occurrence of individual chalkbrood mummies. The general scheme follows that of the characteristics: 1 is particularly bad, 4 is good, whereby in the case of the best possible finding - no disease, the 4 is not given but the disease is not marked at all. If there is positive evidence of a pathogen, please also note this.
- **Chronic bee paralysis**. The disease has two different clinical pictures, therefore the evaluation of the expression is complex. The first clinical picture is characterised by bees that appear dark due to a more or less severe loss of hair on the thorax and abdomen, which in isolation may also justify a mild expression. The second clinical picture is characterised by flightless, trembling workers whose abdomen is distended. They gather at the flight hole, crawl, defecate frequently and tremble conspicuously. This is at least a moderately severe manifestation. Since infected bees usually die quickly, the dead fall is another characteristic of the expression. A laboratory diagnosis is recommended, as the disease can be confused with other symptoms in bee colonies, such as “forest harvest disease” or bee poisoning. A virus detection as an incidental finding without signs of disease should not be registered as a disease.

- **Nosemosis**. Leading symptoms are increased faecal splashes in the hive. It is important to distinguish them from faecal traces for other reasons. Diseased animals are dull and unable to fly, their presence is a sign of expression. The disease occurs mainly in spring, which can help to differentiate it from other diseases. The bees have a swollen abdomen is another sign by which the expression can be read. A laboratory diagnostic clarification is recommended, as the disease can be confused with other manifestations in bee colonies.
- **American foulbrood** is a dangerous notifiable (in Germany) disease. The veterinary office takes immediate action and the colonies are killed and the apiary sanitised. Even if this means that resistance breeding is out of the question, the record is helpful for breeding colonies. The most characteristic feature is the stretch maggot or pupa, which decomposes into a brownish, tough slime. This slime can be pulled apart into a thread without breaking. Later, a remaining dark scab can be seen in the brood cell. The severity can be measured by the number of broken brood cells and holey wax covers.
- **European foulbrood** or sourbrood. A diagnostic clue is the yellowish discoloured dead larvae, which lie bent in the brood cells, but are still structured and have not decayed into slime. Their number can already be used to note the expression. The larvae die before capping, which is why, in contrast to American foulbrood, hardly any broken brood cells or holey wax covers can be seen. The decomposing larvae lead to a sour to putrid odour in the hive, which can also be used to assess the expression. The larvae decompose to a white slime, which is not tough as in American foulbrood.
- **Deformed wing disease**. The eponymous and characteristic symptom is bees with crippled wings. Other bees have difficulty walking on the comb and holding on because the legs are paralysed or the muscles are not developed. Another sign is a shortened rounded abdomen. Furthermore, defects in the colouration of the chitin may occur. Bees may show atypical behaviour due to disturbed sensory functions, learning and memory. The number of bees marked in this way indicates the severity of the disease.
- **Sacbrood**. Infected larvae turn grey and later black and die in the stretch maggot stage usually after the cell is covered. The dead larvae disintegrate into a sack-shaped structure in which a clear, brownish liquid collects. When dried up, the “little bag” becomes a black-brown scab that bulges at the ends. This shape is reminiscent of a boat — hence the name boat brood. The brood pattern is patchy, open cells and sunken cell covers can be seen, and the number of these can be used to estimate the degree of development.
- **Acute bee paralysis**. The adult bee shows tremors and paralysis, which eventually lead to the death of the infected animal. The larvae show symptoms similar to European foulbrood, leading to death in the brood cell. The dead larvae dissolve into a slimy mass that does not draw threads, and dry up into a loose scab.
- **Black queen cell disease**. This disease is characterised by the fact that the pupae of queen bees first turn yellow and then black and finally die. The severity can be determined by the proportion of queen larvae affected. The brood of workers and drones can also be affected, but this is less characteristic.

The **vitality test** is a test for assessing varroa resistance and was established by the AG Toleranzzucht. Varroa treatment is dispensed with after the test season and wintering is carried out under continuous observation of the mite infestation. If the mite infestation exceeds the damage limit, the test is aborted. Selecting the selection box initially only confirms that the colony was wintered without treatment, a result is not yet represented. After successful wintering, the winter resistance and spring development of the following year will be evaluated in the next spring. This is where the actual evaluation takes place. For example, a colony that has died in winter is assessed with “0”.

There are other traits that are not included in the breeding value estimation, but which can potentially be important for the evaluation of a colony:

- Partial honey yield. The partial honey harvests are traditionally called “early harvest”, “summer harvest” and “late harvest”. The dates given are average periods for Germany, but they can vary from region to region. In times of the widespread Varroa mite, the late harvest is not often usable as a honey yield anyway.
- estimated stocks. As mentioned, inventories are part of the total income, but can be entered here separately.
- Reason for relinquishment. The main purpose of this field is for the owner of the record to mark whether the queen still exists and whether it is possible to breed from her. However, some of the fields also evaluate the queen, e.g. “2 - swarmed” and “6 - colony died (e.g. Varroa)”. However, this evaluation is not included in the breeding values. Thus, in the case of a swarmed colony, a corresponding evaluation of the swarming drive should not be forgotten.

By the following measures the breeder can influence the quality of the influence the quality of the breeding value estimation:

- Evaluate all colonies (also the bad ones) of a test apiary for all characteristics.
- When assessing behavioral traits, use the entire range of scores, measure several times and indicate the average of the the scores.
- Test colonies from other breeders at your own apiary and have your own queens tested by other beekeepers. If testing is carried out on several apiaries, distribute sister colonies evenly in different apiaries.

1.7 Countries, associations, breeds, populations

In May 2018, the nomenclature of queen bees, national associations, mating stations, breeders was internationalised. Each code starts with the country abbreviation, the ISO 3166 ALPHA-2 consisting of two capital letters. For German breeders this is DE, for Austria AT, for Switzerland CH etc. . The codes of all participating countries can be found in the “Code numbers of the breeders’ associations”.

There can be different associations in each country. Each association is given a number which, in combination with the country code, forms the association code.

The agreement is that each association code is only valid for the breeding of one single bee breed. If an association organises the breeding of several bee breeds, several association numbers are assigned. E.g. the Brandenburg Beekeepers’ Association uses the association codes DE-4 and DE-24. The purpose of this agreement is that the breed of a queen is clearly identified by the first two components of the queen code with the help of the table “Code numbers of the breeders’ associations”.

The queens of a breed are once again divided into populations in isolated breeding programmes. All queens of a association belong to exactly one population.

A separate breeding value estimation is carried out for each population. Depending on the organisation of the association, this can also be done at different times. This means that breeding values in different populations are not comparable - they are therefore never displayed next to each other. Therefore, a population must always be selected before displaying breeding values.

The allocation to populations can change annually. As soon as breeding material is exchanged, or colonies of different populations are tested next to each other, the merging of populations makes sense. Which associations currently belong to a certain population can be seen in the display of breeding values “Breeding value results for selected queens”.

Each breeder receives a breeder number within his association, together with the country code and association number, the complete breeder number consists of 3 components. A breeder who is active in the breeding of several bee breeds or populations must also receive several breeder numbers.

The mating stations are also organised by association. Each mating station has a number within the association, so the complete mating station code consists of 3 components, e.g. DE-4-1. Usually a different parentage is used in a mating station every year, which is why the mating station year can be entered here. The inseminators are also organised by association.

1.8 Identifiers in the bee pedigree

Only mated queens are recorded in the honeybee pedigree. Individual drones are not recorded, instead the colonies from which the drones originate are recorded as drone colonies.

A virgin queen, like the drones, is not recorded. Genetically, the bee pedigrees contains a combined entity, i.e. the queen and herself together with the drone sperm she has stored from mating.

Usually the drones do not come from a single drone colony but from a drone colony group, which usually have a common mother colony, also called the father colony. Often the individual drone colonies are not named individually, they are then simply the daughters of the father colony.

However, there are also cases where the drone colonies have different mother queens, or there is only one drone colony, or insemination is carried out with only one drone. In order to better represent these complicated relationships (compared to “normal” diploid animals), the following notation has become established, which is also used in many places in BeeBreed:

1a The 1a is the queen in question. At the same time, her colony is are also named so.

2a The mother colony, i.e. the colony in which the 1a queen emerged as a young queen.

1b The drone colonies from which the drones that mated the 1a queen come. Often there are several colonies, but if it is only one colony, it is called 1b mating. The mating station or insemination station is also called 1b.

4a The sire colony - i.e. the colony from which the drone colonies emerged. If the queens of the drone colonies do not come from a single colony, one also speaks of a “mating with several 4a”.

Important here is the fact that the mating of the 1b drone colonies does not play a role, i.e. that the genes from the sperm of the 1b queens do not enter the 1a colony, because the drones only hatch from unfertilised eggs of the queen. This means that the 1b colonies have only partial parenthood. Consequently, not the 1b but the 4a is called the father colony, because it has full parenthood in the sense that all the genes of the 4a colony enter the 1a.

In a certain way, the complicated descent situation in bees is simplified to a scheme 1a-2a-4a, which in some aspects corresponds to the descent child-mother-father in “normal” animals. An important difference, however, is the comparatively low degree of relationship between paternal half-siblings.

Genetically, the mated queen (i.e. the queen with the sperm stored from the mating) and the workers of her colony are the same, which is why queen and her colony are used synonymously, e.g. 1a can mean the queen or the colony.

1.9 Birth year and test year

The year of birth of a queen is an integral part of her nomenclature. Usually a queen is introduced into the test colonies in her year of birth and tested in the following year.

The test year is important information for the comparative performance test, because only test results of the same status in *the same test year* are compared.

In regions without winter as a rest period, the performance test can also be organised differently, for example, the queen can be born in January and tested in the same year. In order to avoid problems in these cases, the test year can be changed from the preset “year plus one”.

It is therefore important to note whether a specific function is about the year of birth or the year of the perfomance test. In some functions, both are available as alternatives.

2 Overview of BeeBreed

Part of the BeeBreed site is open to all - unregistered breeders, beekeepers, and simply interested colony. With the help of BeeBreed, every user can search the database of all registered queen bees and contact a breeder under the menu item “Breeding values”. The information texts under “Info” are also open to everyone. Under “Contact” all active breeders can be found, organised by associations that agree with this.

Another part of the pages is password-protected and organises the work of the breeders and representatives - these are the “Breeding & Performance Data” and the “Administrative Functions”.

2.1 Who can become a BeeBreed breeder?

BeeBreed is a service for associations, not for individual breeders, because the breeding evaluation is a system of coordinated cooperation between breeders. Therefore, an individual breeder cannot simply register with BeeBreed. Instead, he must become a member of one of the associations that have a service contract with BeeBreed and be recognised as a breeder there. The registration as a BeeBreed breeder is then carried out by the respective breeding officer or administrator of the association.

The largest associations are the regional associations of the German Beekeepers’ Association (D.I.B.) and the Austria Carnica Association (ACA).

2.2 Public and private data

The pedigrees of the queens and the estimated breeding values are publicly displayed on BeeBreed. The data entered by the breeders on honey yield, behavioural parameters and health information, on the other hand, are private, i.e. only visible to the breeder and the responsible breeding officer. The names, addresses and telephone numbers of breeders are displayed if the breeder so wishes.

2.3 Breeds and populations

After calling up the website http://beebreed.eu, the different breeding breeds and populations are displayed. Most queens belong to the so-called main populations of Carnica, Mellifera and Ligustica, which are decentralised breeding programmes in several countries. You can select a breeding population here, which will take you to the submenu “Breeding values”.

2.4 Breeders’ associations

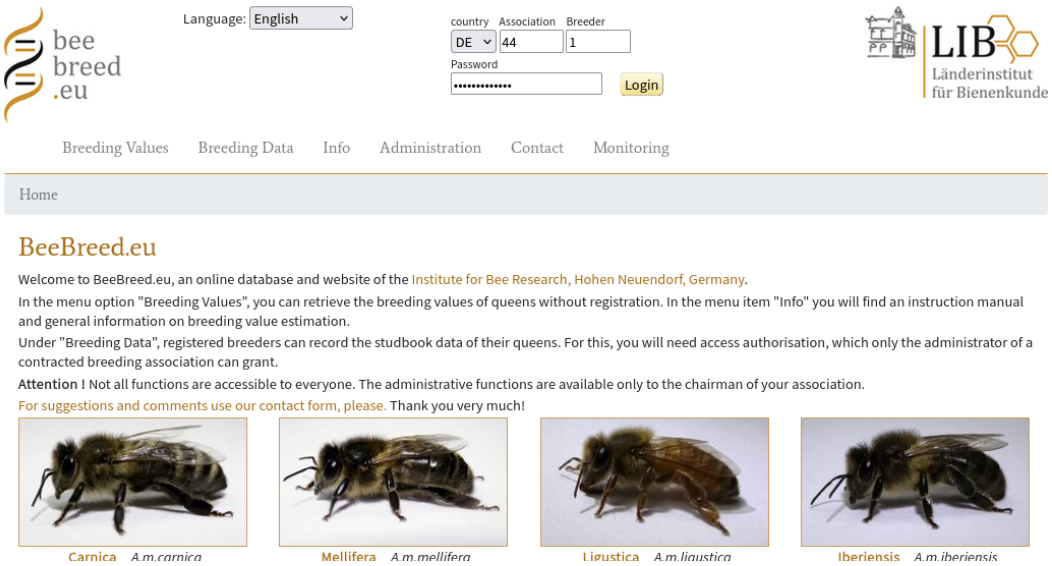
A complete overview of the participating associations can be found at

Contacts

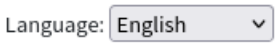
where all associations, their breeding administrators, and finally all active breeders who have agreed to this can be found. In the first column there is an abbreviation of the breed, in the second the abbreviation of the country, then the association number, which is explained in the list of code numbers just mentioned. Here you will find the name and the telephone number of the administrator of the national association or association. The letter symbol on the right enables contact via BeeBreed’s internal contact form. The symbol on the far right (pictogram with 2 torsos) opens a window of all active breeders of this association. For each of these breeders, the icon on the far right can be used to call up the contact information offered by that breeder.

3 Home page and language selection

After calling up the website http://beebreed.eu, the start page is displayed, which contains the main menu, an introductory text and direct links to the various bee breeds.



For a user who does not speak the preset language, the language selection is essential. BeeBreed can currently be displayed in 15 languages: German, English, Spanish, French, Italian, Russian, Portuguese, Dutch, Croatian, Macedonian, Polish, Norwegian, Romanian, Finnish, Ukrainian. The language can be changed by clicking on the language field.



A selection field opens in which the languages are displayed in the national language.

4 Breeding values

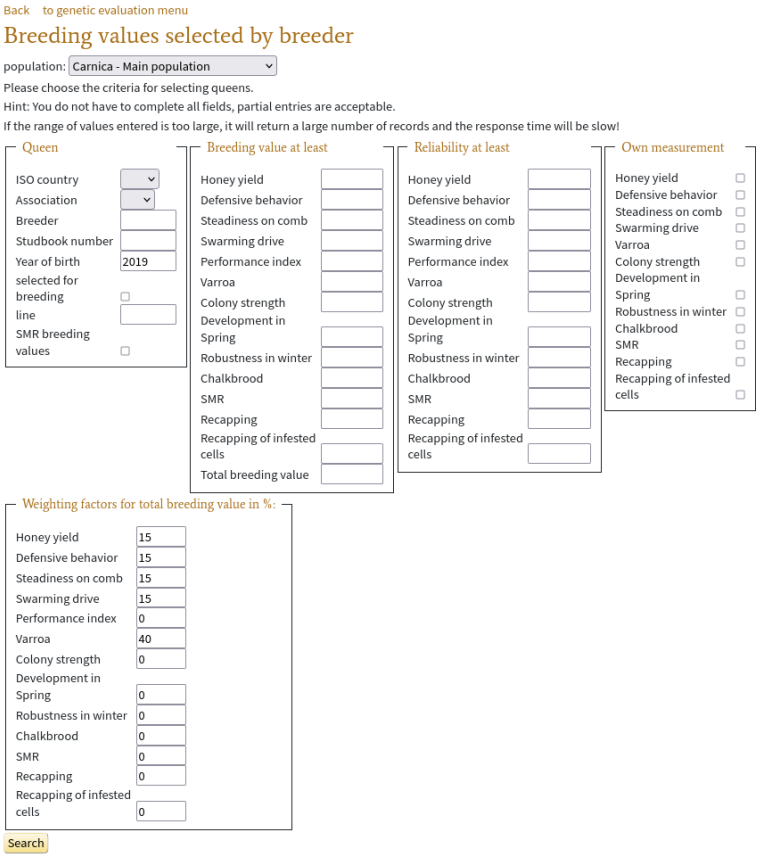
The breeding values menu is a publicly accessible area in which the pedigrees of the queen bees, the estimated breeding values, the occupations of the mating stations and the available pedigrees of the samplers can be viewed.

The queen bees in BeeBreed are divided into populations. Therefore, a population must first be selected before the individual menu items become visible. The basic principle behind this is that breeding values between different breeding populations are not comparable and are therefore never displayed together. If a registered breeder is logged into his user account, the appropriate population is already selected.

Clicking on the selection symbol displays the list of all populations from which the desired population can be selected. In German-speaking countries, the Carnica main population and the Mellifera main population are represented. Once the population is selected, the breeding values menu is displayed:

4.1 Searching for registered queens

The most important function of this menu is “Breeding value results for selected queens”, the central point for displaying breeding values.



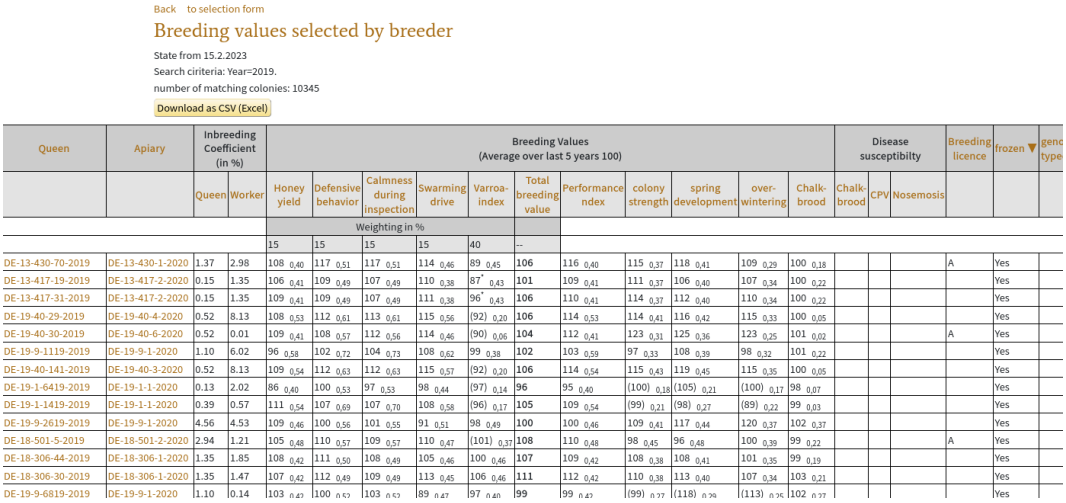
To show all queens of the Carnica main population would go beyond the scope, because that would be a table of about 200,000 entries - for runtime reasons the table length is limited to 40,000. Therefore, there is first the possibility to select filters for the queens to be searched. Each field that is not filled in indicates that no restriction is to be made with regard to this data element.

A typical selection is to restrict the birth year to the year in which the queens currently suitable for further breeding were born, which is usually the current year minus 2. For example, for the Carnica main population, birth year 2014 shows a list of 7291 queens, which is interesting for a certain overview, but

is clear for selecting a queen for further breeding. Another typical selection is the tick in the field for “licensed”, where only queens licensed for further breeding by the national associations are displayed. Furthermore, it is possible to select a specific national association, and even a specific breeder, who is addressed here with his breeder number. It is also possible to set certain limits of the total breeding value or the individual breeding values, or to sort by the breeding values.

After you have selected the restriction options, you will get to the list of breeding values by clicking on “Next”.

4.2 List of breeding values



Back to selection form

Breeding values selected by breeder

State from 15.2.2023
Search cirriteria: Year=2019.
number of matching colonies: 10345

Download as CSV (Excel)

Queen	Apiary	Inbreeding Coefficient (in %)		Breeding Values (Average over last 5 years 100)											Disease susceptibilty			Breeding licence	frozen	genc type
		Queen	Worker	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	Total breeding value	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	Chalk-brood	CPV	Nosemosis			
				Weighting in %																
				15	15	15	15	40	--											
DE-13-430-70-2019	DE-13-430-1-2020	1.37	2.98	108 0,40	117 0,51	117 0,51	114 0,46	89 0,45	106	116 0,40	115 0,37	118 0,41	109 0,29	100 0,18				A	Yes	
DE-13-417-19-2019	DE-13-417-2-2020	0.15	1.35	106 0,41	109 0,49	107 0,49	110 0,38	87* 0,43	101	109 0,41	111 0,37	106 0,40	107 0,34	100 0,22					Yes	
DE-13-417-31-2019	DE-13-417-2-2020	0.15	1.35	109 0,41	109 0,49	107 0,49	111 0,38	96* 0,43	106	110 0,41	114 0,37	112 0,40	110 0,34	100 0,22					Yes	
DE-19-40-29-2019	DE-19-40-4-2020	0.52	8.13	108 0,53	112 0,61	113 0,61	115 0,56	(92) 0,20	106	114 0,53	114 0,41	116 0,42	115 0,33	100 0,05					Yes	
DE-19-40-30-2019	DE-19-40-6-2020	0.52	0.01	109 0,41	108 0,57	112 0,56	114 0,46	(90) 0,06	104	112 0,41	123 0,31	125 0,36	123 0,25	101 0,02				A	Yes	
DE-19-9-1119-2019	DE-19-9-1-2020	1.10	6.02	96 0,58	102 0,72	104 0,73	108 0,62	99 0,38	102	103 0,59	97 0,33	108 0,39	98 0,32	101 0,22					Yes	
DE-19-40-141-2019	DE-19-40-3-2020	0.52	8.13	109 0,54	112 0,63	112 0,63	115 0,57	(92) 0,20	106	114 0,54	115 0,43	119 0,45	115 0,35	100 0,05					Yes	
DE-19-1-6419-2019	DE-19-1-1-2020	0.13	2.02	86 0,40	100 0,53	97 0,53	98 0,44	(97) 0,14	96	95 0,40	(100) 0,18	(105) 0,21	(100) 0,17	98 0,07					Yes	
DE-19-1-1419-2019	DE-19-1-1-2020	0.39	0.57	111 0,54	107 0,69	107 0,70	108 0,58	(96) 0,17	105	109 0,54	(99) 0,21	(98) 0,27	(89) 0,22	99 0,03					Yes	
DE-19-9-2619-2019	DE-19-9-1-2020	4.56	4.53	109 0,46	100 0,56	101 0,55	91 0,51	98 0,49	100	100 0,46	109 0,41	117 0,44	120 0,37	102 0,37					Yes	
DE-18-501-5-2019	DE-18-501-2-2020	2.94	1.21	105 0,48	110 0,57	109 0,57	110 0,47	(101) 0,37	108	110 0,48	98 0,45	96 0,48	100 0,39	99 0,22				A	Yes	
DE-18-306-44-2019	DE-18-306-1-2020	1.35	1.85	108 0,42	111 0,50	108 0,49	105 0,46	100 0,46	107	109 0,42	108 0,38	108 0,41	101 0,35	99 0,19					Yes	
DE-18-306-30-2019	DE-18-306-1-2020	1.35	1.47	107 0,42	112 0,49	109 0,49	113 0,45	106 0,46	111	112 0,42	110 0,38	113 0,40	107 0,34	103 0,21					Yes	
DE-19-9-6819-2019	DE-19-9-1-2020	1.10	0.14	103 0,43	100 0,52	103 0,53	89 0,47	97 0,40	99	99 0,43	(99) 0,27	(118) 0,29	(113) 0,25	102 0,27					Yes	

When the list of breeding values is displayed, it is possible to return to the selection screen by clicking on the link “to the selection form” or by using the back function of the browser, and thus to approach the desired selection step by step.

In the overview of the selected queens you will now find the identification numbers of the queen, the test apiary, inbreeding values, breeding values and the queen class.

Clicking on the queen code takes you to the family tree browser, which contains comprehensive information and further links, more on this later.

The test apiary is a code consisting of the breeder identification of the tester (first 3 components), the test apiary and the test year. This code is a link, clicking on this link will take you to a breeding value list of the test apiary.

4.2.1 Inbreeding values

The inbreeding values distinguish between the inbreeding value of the queen and the inbreeding value of the worker. The inbreeding value of the queen is based on the degree of inbreeding of the queen herself, the ancestry of the mating drones does not count here. The inbreeding value of the workers, on the other hand, results from the relationship of the queen to the mating drones. This value counts for the workers and also for the young queens that are bred in this colony. The negative effects typically described as inbreeding problems (e.g. brood with holes) depend on the inbreeding value of the workers.

4.2.2 Breeding values

The breeding values refer to the individual traits that are collected. The varroa index is a summary of the results of the pin test and the various varroa measurements.

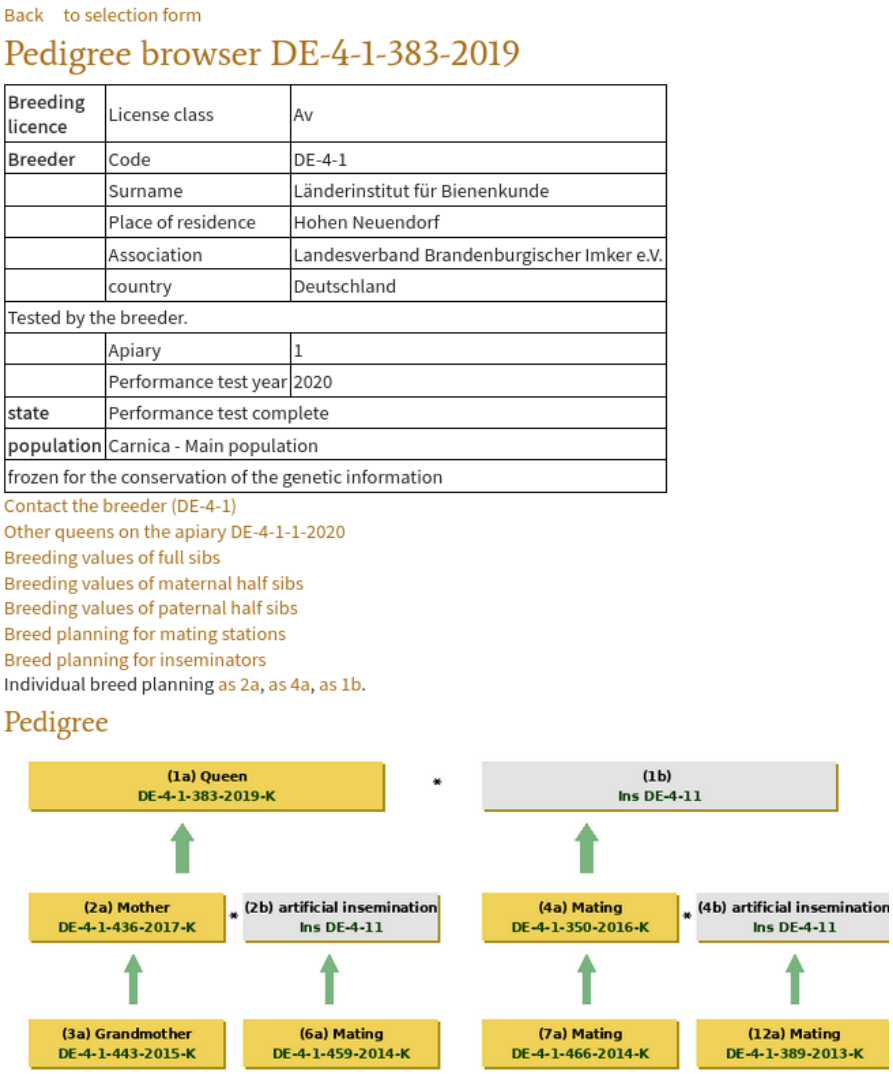
4.2.3 Total breeding value

The total breeding value results from the individual breeding values in combination with the weighting, which is also indicated in the table header. The weighting is individually adjustable, i.e. each breeder can compile his own total breeding value when looking through breeding values.

The weighting values can be set in the input masks and refer to the percentage shares in the total breeding value. The total breeding value is therefore used for your own orientation and can be changed.

4.3 Pedigree browser

A specific queen is described in the pedigree browser.



First, the most important information is shown in a compact table: Breeder and examiner (if not the breeder himself) and the licensing.

Below this are a number of references. First of all, there are contact possibilities to the breeder and the examiner[1].

[1] Both contact options are given here because BeeBreed does not store the information as to which of the two is the owner of the queen, and this is not handled uniformly.

After that there are links to functions that can also be reached directly via the menu “Breeding Values”: the breeding value display of the siblings, half-siblings and the test apiary as well as the various breeding planning functions. The advantage of using these links is that the queen displayed in the pedigree browser is directly included in the function and does not have to be entered manually via the studbook number.

If the user is logged in and has the appropriate rights, he can go directly to the input mask of the data set. There he can view the concrete performance data.

Next is the Ancestry section in the system typical of beekeeping. The ancestors are also clickable, and redirect to the pedigree browser of the corresponding colony.

Coefficients of inbreeding in %

of the queen: 8,4	of the workers: 11,6

Breeding values

State from 15.2.2023

	Breeding value	Reliability	Weighting in %
Honey yield	87	0,67	15
Defensive behavior	98	0,76	15
Steadiness on comb	101	0,76	15
Swarming drive	103	0,73	15
Varroa	111	0,73	40
Total breeding value	**104**		--
Performance index	97	0,67	
Colony strength	85	0,63	
Development in Spring	84	0,67	
Robustness in winter	88	0,55	
Chalkbrood	97	0,35	
SMR	98	0,65	
Recapping	92	0,76	
Recapping of infested cells	93	0,71	

Breeding values when used as a drone colony (1b)

	Breeding value	Reliability	Weighting in %
Honey yield	84	0,47	15
Defensive behavior	102	0,58	15
Steadiness on comb	107	0,57	15
Swarming drive	96	0,54	15
Varroa	114	0,54	40
Total breeding value	**106**		--
Performance index	97	0,47	
Colony strength	73	0,45	
Development in Spring	73	0,49	
Robustness in winter	70	0,36	
Chalkbrood	95	0,20	
SMR	99	0,40	
Recapping	88	0,60	
Recapping of infested cells	86	0,54	

Below this are the inbreeding coefficients and breeding values, together with safety and weighting factors.

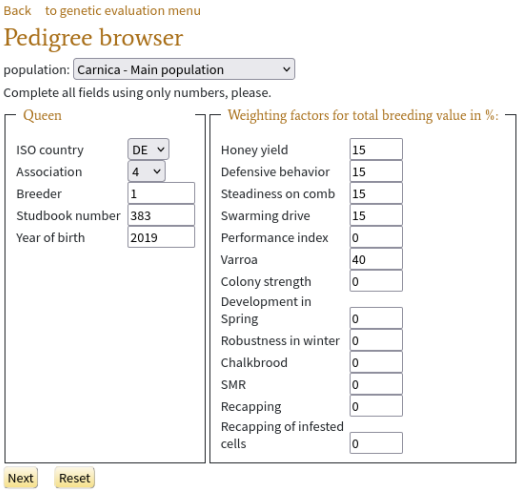
Descendants

Descendants as 2a	Descendants as 4a
DE-4-1-32-2021-D DE-4-1-34-2021-D DE-4-1-40-2021-D DE-4-1-44-2021-D DE-4-1-47-2021-D DE-4-1-49-2021-D DE-4-1-122-2021-D DE-4-1-147-2021-K DE-4-1-25-2021 DE-4-1-27-2021 DE-4-1-29-2021 DE-4-1-124-2021 DE-4-1-127-2021 DE-4-1-130-2021 DE-4-1-131-2021 DE-4-1-132-2021 DE-4-1-133-2021 DE-4-1-134-2021 DE-4-1-135-2021 DE-4-1-140-2021 DE-4-1-141-2021 DE-4-1-142-2021 DE-4-1-143-2021 DE-4-1-144-2021 DE-4-1-145-2021 DE-4-1-148-2021 DE-4-1-149-2021 DE-4-1-150-2021 DE-4-1-151-2021 DE-4-1-152-2021 DE-4-1-153-2021 DE-4-1-335-2021 DE-4-1-336-2021 DE-4-1-341-2021	none

Bracketed queens are still in process.

The following is a list of descendants. Each by code is clickable and redirects to the pedigree browser of the corresponding queen.

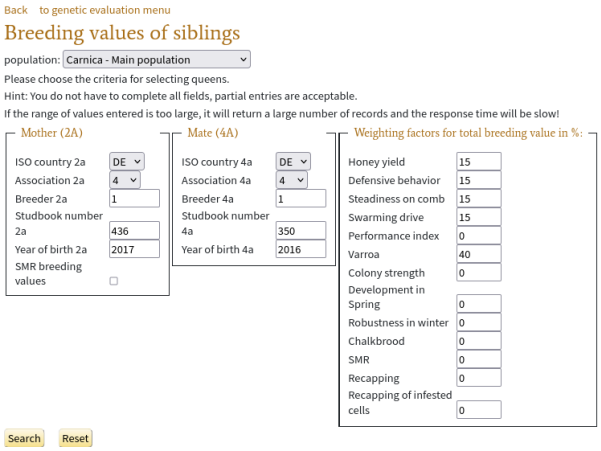
It is also possible to go directly from the breeding values menu to the pedigree browser, the corresponding menu item is called: “Pedigree scheme, inbreeding coefficient, breeding values of a particular queen”. This takes you to a selection screen for the colony:



This mask can also be reached by the link “to the selection form” in the family tree browser.

4.4 Breeding results for sibling groups

A full sibling group is characterised by the common mother colony (2a) and father colony (4a). In this function the corresponding colonies can be entered.



If only the fields of 2a are entered, the maternal half siblings are displayed. If, on the other hand, the fields of 4a are entered but the fields of 2a are left open, the paternal half-siblings are entered. As a result, a list of the corresponding siblings is displayed:

Back to selection form

Breeding values of siblings

Breeding values (State from 15.2.2023) for siblings, Search criteria:
2a: ISO country=DE Association=4 Breeder=1 Studbook number=436 Year=2017
4a: ISO country=DE Association=4 Breeder=1 Studbook number=350 Year=2016
number of matching colonies: 16

Download as CSV (Excel)

Queen	Apiary	Inbreeding Coefficient (in %)		Breeding Values (Average over last 5 years 100)										Disease susceptibilty			Breeding licence	frozen	geno-typed
		Queen	Worker	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	Total breeding value	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	Chalk-brood	CPV	Nosemosis			
				Weighting in %																
				15	15	15	15	40	--											
DE-4-1-381-2019	DE-4-1-2-2020	8.42	11.55	93 0,58	97 0,66	101 0,66	106 0,62	109 0,62	**105**	99 0,58	89 0,55	88 0,58	93 0,50	97 0,35				Av		
DE-4-1-383-2019	DE-4-1-1-2020	8.42	11.55	87 0,67	98 0,76	101 0,76	103 0,73	111 0,73	**104**	97 0,67	85 0,63	84 0,67	88 0,55	97 0,35				Av	Yes	
DE-4-1-385-2019	DE-4-1-1-2020	8.42	11.55	89 0,58	101 0,66	104 0,66	107 0,62	108 0,62	**105**	100 0,58	92 0,55	88 0,58	93 0,50	97 0,35						
DE-4-1-386-2019	DE-4-1-2-2020	8.42	11.55	89 0,58	99 0,66	102 0,66	107 0,62	104 0,62	**103**	99 0,58	89 0,55	86 0,58	90 0,50	97 0,35						
DE-4-1-388-2019	DE-4-1-2-2020	8.42	11.55	96 0,58	96 0,66	100 0,66	106 0,62	106 0,62	**104**	99 0,58	93 0,55	86 0,58	90 0,50	97 0,35						
DE-4-1-389-2019	DE-4-1-1-2020	8.42	11.55	90 0,58	101 0,66	104 0,66	107 0,62	110 0,62	**106**	100 0,58	91 0,55	87 0,58	90 0,50	97 0,35						
DE-4-1-390-2019	DE-4-1-2-2020	8.42	11.55	86 0,58	98 0,66	101 0,66	106 0,62	109 0,62	**104**	98 0,58	89 0,55	84 0,58	89 0,50	97 0,35						

In this list (as in the other breeding value lists) the average and the standard deviation (scatter) of the breeding values are displayed. In this function it is used to determine the sibling group average.

4.5 Breeding values of a particular test rig

Back to genetic evaluation menu

Breeding values selected by testing

population: Carnica - Main population

Apiary

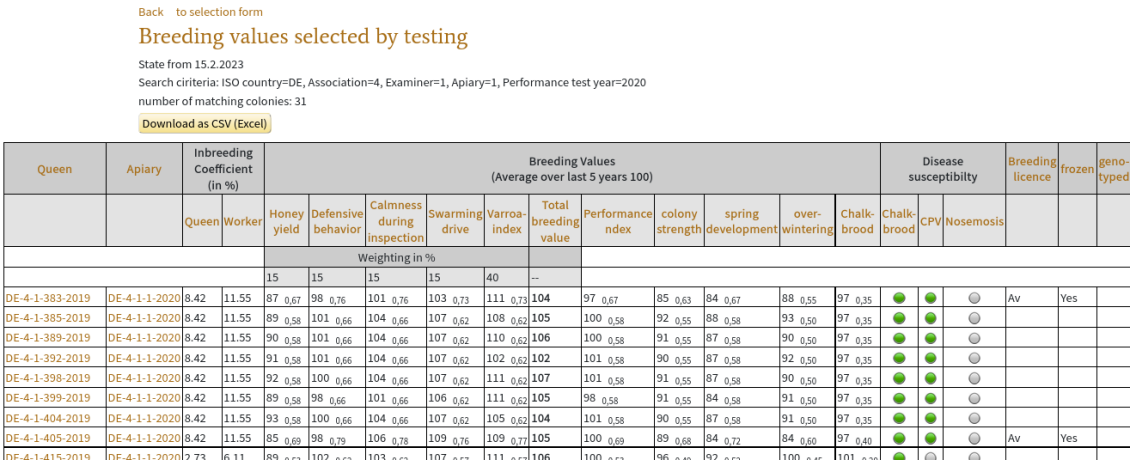
ISO country	DE
Association	4
Examiner	1
Apiary	1
Performance test year	2020
selected for breeding	
SMR breeding values	

Weighting factors for total breeding value in %:

Honey yield	15
Defensive behavior	15
Steadiness on comb	15
Swarming drive	15
Performance index	0
Varroa	40
Colony strength	0
Development in Spring	0
Robustness in winter	0
Chalkbrood	0
SMR	0
Recapping	0
Recapping of infested cells	0

Search

Under this menu item, after selecting the breeder's identification, the apiary number and the test year, the list of all breeding values of the test apiary is displayed.



Back to selection form

Breeding values selected by testing

State from 15.2.2023

Search criteria: ISO country=DE, Association=4, Examiner=1, Apiary=1, Performance test year=2020

number of matching colonies: 31

Download as CSV (Excel)

Queen	Apiary	Inbreeding Coefficient (in %)		Breeding Values (Average over last 5 years 100)												Disease susceptibilty			Breeding licence	frozen	geno-typed
		Queen	Worker	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	Total breeding value	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	Chalk-brood	CPV	Nosemosis			
				Weighting in %																	
				15	15	15	15	40	--												
DE-4-1-383-2019	DE-4-1-1-2020	8.42	11.55	87 0,67	98 0,76	101 0,76	103 0,73	111 0,73	104	97 0,67	85 0,63	84 0,67	88 0,55	97 0,35				Av	Yes	
DE-4-1-385-2019	DE-4-1-1-2020	8.42	11.55	89 0,58	101 0,66	104 0,66	107 0,62	108 0,62	105	100 0,58	92 0,55	88 0,58	93 0,50	97 0,35						
DE-4-1-389-2019	DE-4-1-1-2020	8.42	11.55	90 0,58	101 0,66	104 0,66	107 0,62	110 0,62	106	100 0,58	91 0,55	87 0,58	90 0,50	97 0,35						
DE-4-1-392-2019	DE-4-1-1-2020	8.42	11.55	91 0,58	101 0,66	104 0,66	107 0,62	102 0,62	102	101 0,58	90 0,55	87 0,58	92 0,50	97 0,35						
DE-4-1-398-2019	DE-4-1-1-2020	8.42	11.55	92 0,58	100 0,66	104 0,66	107 0,62	111 0,62	107	101 0,58	91 0,55	87 0,58	90 0,50	97 0,35						
DE-4-1-399-2019	DE-4-1-1-2020	8.42	11.55	89 0,58	98 0,66	101 0,66	106 0,62	111 0,62	105	98 0,58	91 0,55	84 0,58	91 0,50	97 0,35						
DE-4-1-404-2019	DE-4-1-1-2020	8.42	11.55	93 0,58	100 0,66	104 0,66	107 0,62	105 0,62	104	101 0,58	90 0,55	87 0,58	91 0,50	97 0,35						
DE-4-1-405-2019	DE-4-1-1-2020	8.42	11.55	85 0,69	98 0,79	106 0,78	109 0,76	109 0,77	105	100 0,69	89 0,68	84 0,72	84 0,60	97 0,40				Av	Yes	
DE-4-1-415-2019	DE-4-1-1-2020	2.73	6.11	89 0,63	102 0,63	103 0,63	107 0,57	111 0,57	106	100 0,63	96 0,49	92 0,63	100 0,45	101 0,38						

However, the function can also be used to obtain the list of test queens of all the breeder's apiaries - by leaving the "Test Apiary" field open.

It can also be used to display all test queens of a breeder, here the test year must also be left open.

The function can also be accessed directly from the pedigree browser or from a list of breeding values.

4.6 Breeding planning

Above it was described how individual queens can be filtered out of the list of all registered queens according to certain criteria. Once candidates for further breeding have been selected, BeeBreed enables even further analysis: the inbreeding calculation and the breeding value prediction, which can be found under

Breeding values → Individual breeding planning[2]

can be found. There you will find a mask where a mother (2a) and the queen to be mated (complete) must be entered. In principle, this analysis can be carried out for any two queens, although the typical application is to find a suitable mating for an already selected queen. Via the link "Occupation of mating stations" you can find mating stations, which you can further limit in the following window with year and national association (LV).

After clicking on the button "Search" the expected breeding values and the inbreeding value are displayed. Regarding the inbreeding calculation it has to be said that it can only be as accurate as the pedigrees provided, in case of gaps in the pedigree, e.g. unknown paternal descent, it will be underestimated.

The expected breeding value results from the combination of the breeding values of dam and mating.

If you want to mate a queen in a mating station, but have not yet selected a specific one, the menu item

Breeding values → Breeding planning for mating station

valuable help. Here is an overview of the expected breeding value of the new queen, which includes the existing 2a and the 4a kept in the corresponding mating stations. However, this table does not show the inbreeding value - but this can be easily determined via the link "Details". You get the same result page as the direct entry of the two queens.

Some breeders provide the list of available pedigrees in BeeBreed. These can be included in the breeding planning:

Breeding values → Breeding planning for inseminators,

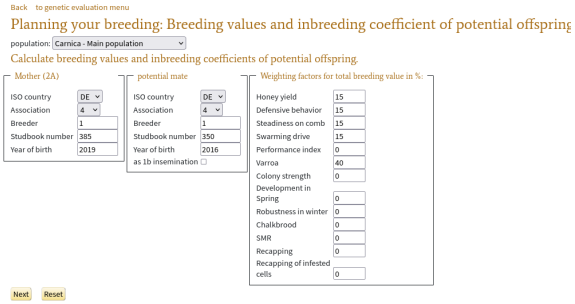
which works analogously to the breeding planning of mating stations.

[2]Here and in the following, sections indented in this way list names of menu options and linked identifiers (underlined) that lead to the function mentioned.

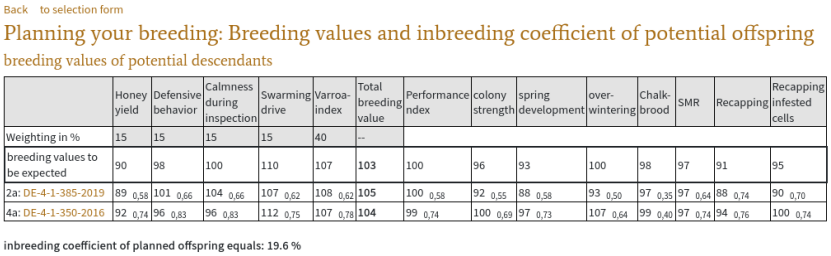
4.6.1 Individual breeding planning

This variant allows full flexibility and is intended for the breeder who inseminates artificially himself or commissions an inseminator to inseminate with drones provided by himself.

The names of the mother colony (2a) and father colony (4a) are entered and search is clicked on.



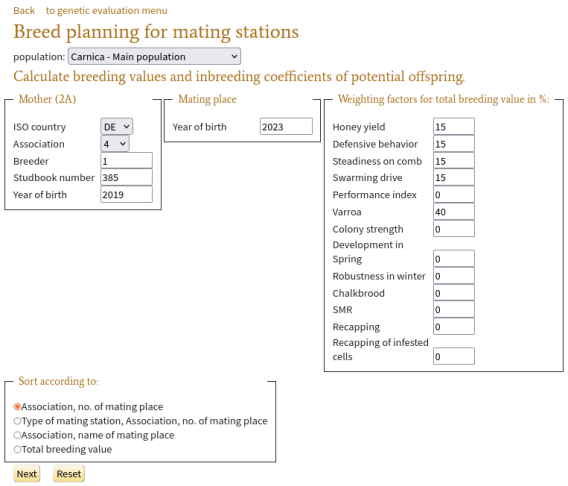
The result is the breeding values and inbreeding values of planned offspring.



Breeding planning is only possible if these queens have been included in the last breeding value estimation and the year of birth is not longer than 5 years ago.

4.6.2 Breeding planning for mating stations

This variant is intended for the breeder who wants to visit a mating station for mating. Only the code of the 2a has to be entered and, if necessary, the year of birth has to be changed.



The result is the predicted breeding values, the inbreeding values of all mating stations.

Back to selection form

Breed planning for mating stations 2023

Breeding values of the selected mother queen

code of queen 2a	Inbreeding Queen	Inbreeding Worker	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	TBV	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	SMR	Recapping	Recapping infested cells
DE-4-1-385-2019	8,4%	11,6%	89 0,58	101 0,66	104 0,66	107 0,62	108 0,62	105	100 0,58	92 0,55	88 0,58	93 0,50	97 0,35	97 0,64	88 0,74	90 0,70

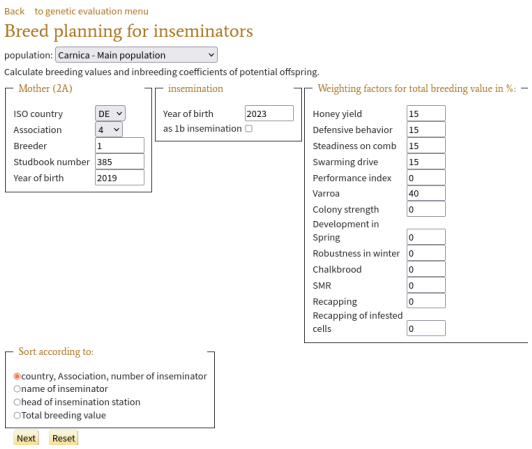
Breeding values and inbreeding coefficients of potential descendants

Mating place	Surname	from	to	TM	Mate (4A)	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	TBV	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	SMR	Recapping	Recapping infested cells	INZW
						Weighting in %														
						15	15	15	15	40	--									
DE-1-1	Hornisgrinde	25.05.	15.07.	3	DE-1-30-86-2020	99	104	105	107	108	**106**	104	102	101	101	99	103	93	93	0.7%
DE-1-2	AGT Toleranzbelegstelle Hoher Randen	25.05.	15.07.	3	DE-7-146-41-2020	96	105	106	105	108	**105**	103	98	94	98	99	98	90	91	1.2%
DE-1-3	Herrenwald	25.05.	15.07.	3	DE-1-7-57-2020	96	105	106	105	111	**107**	103	99	100	99	96	101	95	96	1.1%
DE-2-10	10 Oby. Unterwieser Wald	01.06.	05.08.	3	AT-99-120-599-2020	102	109	112	107	118	**112**	108	103	97	104	99	98	94	102	1.6%
DE-2-11	11 Oby. Freisinger Moos	23.05.	21.07.	3	DE-2-187-213-2019	99	103	103	117	107	**106**	106	107	103	106	100	101	97	97	0.4%
DE-2-12	12 Oby. Pfaffenkopf	27.05.	02.08.	3	DE-2-221-167-2020	102	105	106	110	111	**108**	106	97	97	103	98	96	94	93	1.8%
DE-2-13	13 Oby. An den 3 Wassern AGT-Toleranzbelegstelle	27.05.	29.07.	3	DE-2-326-520-2020	100	109	109	108	114	**110**	107	97	96	99	97	103	97	100	0.9%
DE-2-15	15 Oby. Sonnwendjoch	01.06.	31.07.	3	DE-2-70-9-2020	100	106	107	109	105	**106**	106	94	92	95	100				0.7%
DE-2-16	16 Oby. Raggert	01.06.	01.08.	3	DE-2-293-15-2019	99	105	106	109	106	**106**	106	100	97	100	98	96	92	96	1.2%
DE-2-18	18 Oby. Sauschütt	20.05.	05.08.	3	AT-99-120-625-2020	102	103	104	110	119	**111**	106	97	92	103	102	100	95	104	1.5%
DE-2-19	19 Oby. Wendelstein	25.05.	28.07.	3	DE-20-2-9057-2020	98	107	109	109	108	**107**	107	99	95	96	99				0.6%

The prerequisite for this is that the association administrators have already entered the voucher site information for this year.

4.6.3 Breeding planning for inseminators

This variant is intended for the breeder who wants to visit an insemination station or a breeder with drone colonies in stock for mating. Only the code of the 2a has to be entered and, if necessary, the birth year has to be changed.



The result is the predicted breeding values, the inbreeding values of all sire origins.

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Breed planning for inseminators 2023

Breeding values of the selected mother queen

code of queen 2a	Inbreeding Queen	Inbreeding Worker	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	TBV	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	SMR	Recapping	Recapping infested cells
DE-4-1-385-2019	8,4%	11,6%	89 0,58	101 0,66	104 0,66	107 0,62	108 0,62	105	100 0,58	92 0,55	88 0,58	93 0,50	97 0,35	97 0,64	88 0,74	90 0,70

Breeding values and inbreeding coefficients of potential descendants

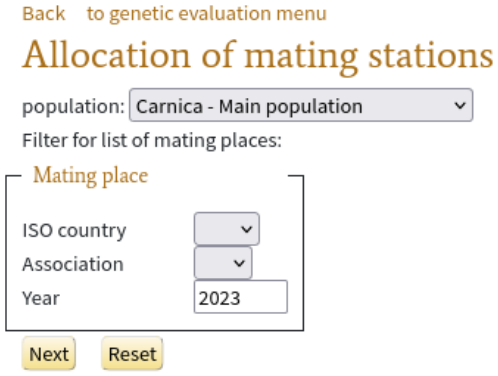
number of inseminator	Surname	director	Mate (4A)	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	TBV	Performance ndex	colony strength	spring development	over-wintering	Chalk-brood	SMR	Recapping	Recapping infested cells	INZW
				Weighting in %														
				15	15	15	15	40	--									
DE-2-47	2-Nby. Franz Reitberger Z.- Nr. -DE-2-147	Franz Reitberger sen.	DE-7-165-1151-2020	100	108	108	114	112	110	109	98	97	101	98	96	92	92	1.7%
DE-4-11	LIB	Prof. Dr. Elke Genersch	DE-4-1-437-2020	99	101	101	108	112	106	103	95	95	93	96	97	93	94	4.9%
DE-4-11	LIB	Prof. Dr. Elke Genersch	DE-4-1-318-2020	94	104	108	107	111	107	104	95	91	93	97	96	88	90	13.3%
DE-7-32	Wolfgang Scheele	0177/2903346	DE-7-146-78-2021	97	107	107	109	114	109	106	100	95	99	99	93	93	94	1.5%

The prerequisite is that the offered origins of the samplers for this year have already been entered.

4.7 Ancestries

4.7.1 Allocation of the mating stations

This function displays the ancestry represented in the drone colonies in the mating station. If necessary, the year can be changed. If the year field is deleted, all historical occupations of the document positions can be determined.



Clicking on “next” takes you to the list of mating stations together with their origins.

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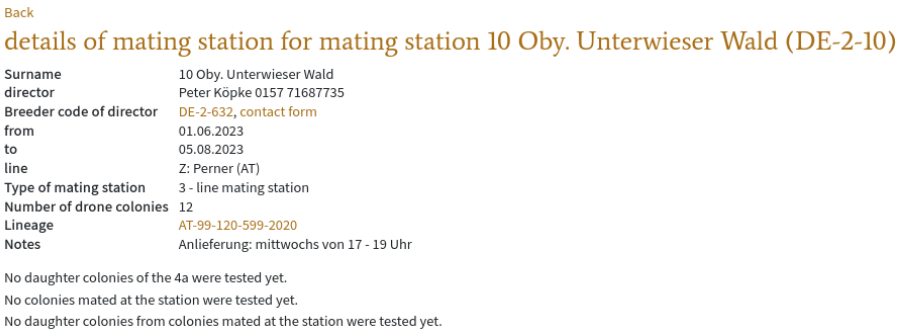
Mating station overview For all state associations in the year 2023

mating station code										Mate (4A)							
C ▼	ASSOC	No.	D		Surname	from	to	director	line	TM	AD	C4A	A4A	B4A	No4A	Y4A	
DE	1	1			Hornisgrinde	25.05.2023	15.07.2023	Ernst Kafka		3	15	DE	1	30	86	2020	
DE	1	2			AGT Toleranzbelegstelle Hoher Randen	25.05.2023	15.07.2023	Sigi Hirt 07709 528		3	20	DE	7	146	41	2020	
DE	1	3			Herrenwald	25.05.2023	15.07.2023	William Arnold 015731832253		3	15	DE	1	7	57	2020	
DE	2	10			10 Oby. Unterwieser Wald	01.06.2023	05.08.2023	Peter Köpke 0157 71687735 DE-2-632	Z: Perner (AT)	3	12	AT	99	120	599	2020	
DE	2	11			11 Oby. Freisinger Moos	23.05.2023	21.07.2023	M. Bortenschlager 01712758745	Z: Wieser	3	8	DE	2	187	213	2019	
DE	2	12			12 Oby. Pfaffenkopf	27.05.2023	02.08.2023	Max Stoib 08026 1498 DE-2-245	AGT-Population, Z: Ahrens	3	22	DE	2	221	167	2020	
DE	2	13			13 Oby. An den 3 Wassern AGT-Toleranzbelegstelle	27.05.2023	29.07.2023	Franz Höcker 0173 8112026	AGT-Population; Z: Bichlmeier	3	15	DE	2	326	520	2020	
DE	2	14			14 Oby. Anzntal	20.05.2023	31.07.2023	Petro Lorenz 0152 29463270 DE-2-611	AGT-Population, Z: Ahrens	4	15	DE	2	221	186	2020	

Click on a mating station code to access the mating station details.

4.7.2 Mating station details


Back

details of mating station for mating station 10 Oby. Unterwieser Wald (DE-2-10)

Surname	10 Oby. Unterwieser Wald
director	Peter Köpke 0157 71687735
Breeder code of director	DE-2-632, contact form
from	01.06.2023
to	05.08.2023
line	Z: Perner (AT)
Type of mating station	3 - line mating station
Number of drone colonies	12
Lineage	AT-99-120-599-2020
Notes	Anlieferung: mittwochs von 17 - 19 Uhr

No daughter colonies of the 4a were tested yet.
No colonies mated at the station were tested yet.
No daughter colonies from colonies mated at the station were tested yet.

First of all, you receive compact information on the collection centre, as provided by the national association. This is mainly the head of the mating station, the opening period of the mating station, the pedigree (4a) and some more.

The list of daughter colonies of 4a is shown. The exact list of the drone colonies set up at the mating station, should they have their own studbook numbers, is currently still being compiled. If queens with a D-approval appear there, they are probably drone colonies from this mating station. Performance-tested daughters of the 4a give an indication of the quality of the genetics of the mating station.

After that is the list of breeding queens mated at the mating station.

Back

details of mating station for mating station Borkum (DE-11-3)

Surname	Borkum
director	Rudi Bauer
from	14.05.2016
to	25.06.2016
line	47/G10
Type of mating station	2 - island mating station
Number of drone colonies	23
Lineage	DE-11-3-401-2013

6 daughter colonies of the 4a were tested:
DE-11-3-107-2015 DE-11-3-108-2015 DE-11-3-109-2015 DE-11-3-110-2015 DE-11-3-111-2015 DE-11-3-312-2015

48 tested queens were mated at the mating station:
DE-1-2-46-2016 DE-11-3-101-2016 DE-11-3-302-2016 DE-11-3-303-2016 DE-11-3-304-2016 DE-11-3-305-2016 DE-11-3-306-2016 DE-11-3-307-2016 DE-11-3-308-2016 DE-11-3-309-2016 DE-11-3-310-2016 DE-11-3-311-2016 DE-11-3-3012-2016 DE-11-70-1002-2016 DE-11-70-1030-2016 DE-11-70-1037-2016 DE-11-70-1039-2016 DE-11-70-1041-2016 DE-11-70-1043-2016 DE-11-70-1044-2016 DE-11-70-1520-2016 DE-11-70-1523-2016 DE-11-70-1525-2016 DE-11-70-1527-2016 DE-11-70-1532-2016 DE-11-70-1533-2016 DE-11-70-1534-2016 DE-11-70-1535-2016 DE-11-70-1537-2016 DE-11-76-36-2016 DE-11-76-38-2016 DE-11-128-102-2016 DE-11-128-103-2016 DE-11-128-104-2016 DE-11-128-105-2016 DE-11-128-106-2016 DE-11-128-107-2016 DE-11-128-108-2016 DE-11-128-109-2016 DE-11-128-110-2016 DE-11-128-111-2016 DE-17-168-1-2016 DE-17-168-2-2016 DE-17-168-3-2016 DE-17-168-4-2016 DE-17-168-5-2016 DE-17-168-6-2016 DE-17-168-44-2016

83 daughter colonies of queens mated at the mating station were tested:
DE-1-5-70-2017 DE-1-5-71-2017 DE-1-5-72-2017 DE-1-5-74-2017 DE-1-5-76-2017 DE-1-5-77-2017 DE-11-3-20-2018 DE-11-3-22-2018 DE-11-3-23-2018 DE-11-3-24-2018 DE-11-3-25-2018 DE-11-3-26-2018 DE-11-3-27-2018 DE-11-3-28-2018 DE-11-3-29-2018 DE-11-3-30-2018 DE-11-3-31-2018 DE-11-3-32-2018 DE-11-3-33-2018 DE-11-3-34-2018 DE-11-70-1009-2018 DE-11-70-1013-2018 DE-11-70-1019-2018 DE-11-70-1022-2018 DE-11-70-1518-2018 DE-11-70-1525-2018 DE-11-70-1526-2018 DE-11-70-1528-2017 DE-11-70-1529-2018 DE-11-70-1534-2017 DE-11-70-1534-2018 DE-11-70-1535-2017 DE-11-70-1536-2017 DE-11-70-1536-2018 DE-11-70-1537-2018 DE-11-76-1-2018 DE-11-76-2-2018 DE-11-76-5-2018 DE-11-76-8-2018 DE-11-76-9-2018 DE-11-76-10-2018 DE-11-76-11-2018 DE-11-76-13-2018 DE-11-76-14-2018 DE-11-76-16-2018 DE-11-76-19-2018 DE-11-76-20-2018 DE-11-76-21-2018 DE-11-76-37-2018 DE-11-76-39-2018 DE-11-76-40-2018 DE-11-180-1-2018 DE-11-180-3-2018 DE-11-180-7-2018 DE-11-180-8-2017 DE-11-180-8-2018 DE-11-180-9-2018 DE-11-180-10-2018 DE-11-180-11-2017 DE-11-180-15-2017 DE-11-180-24-2017 DE-11-183-1501-2018 DE-11-184-186-2018 DE-11-184-188-2018 DE-12-31-27-2018 DE-12-31-28-2018 DE-12-31-29-2018 DE-12-31-30-2018 DE-12-31-31-2018 DE-17-166-3-2018 DE-17-166-7-2018 DE-17-166-8-2018 DE-17-166-9-2018 DE-17-166-11-2018 DE-17-166-12-2018 DE-17-168-1-2018 DE-17-168-2-2018 DE-17-168-3-2018 DE-17-168-4-2018 DE-17-168-5-2018 DE-17-168-6-2018 DE-17-168-7-2018 DE-17-168-8-2018

average values for morphometric analyses

Drones

No adequate investigations found.

Workers

		evaluated results			Carapace markings			Hair length			felt bandage			Cubital index			
	Relevance	total	typical for the race	not typical for the race	O/e	E	R	k	m	l	F	ff	f	MW	SD	min	max
Workers of queens mated at the mating station	50%																
Workers of direct descendents of queens mated at the mating station	25%																
	tolerable				≤100	≤30	≤0	≤100	≤30	≤0	≤100	≤50	≤0	≤2,5			

Mating reliability from race examination reports by year

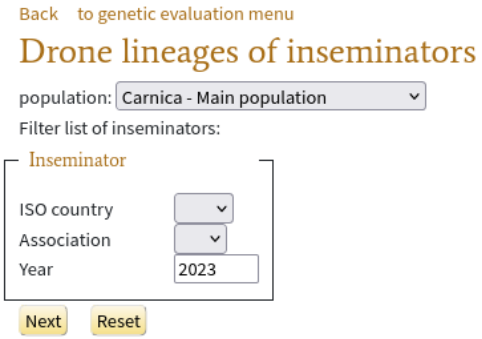
	Mating reliability	Number of appropriate mother/daughter pairs.	Mating errors
2021	100%	3	0
2020	0%	1	1
2019	100%	1	0
2016	100%	1	0
2015	100%	1	0
2013	100%	4	0
2012	100%	1	0
2002	100%	3	0

Race examination reports of the workers of queens mated at this mating station if the workers of the mother colony are confirmed to be typical for race.

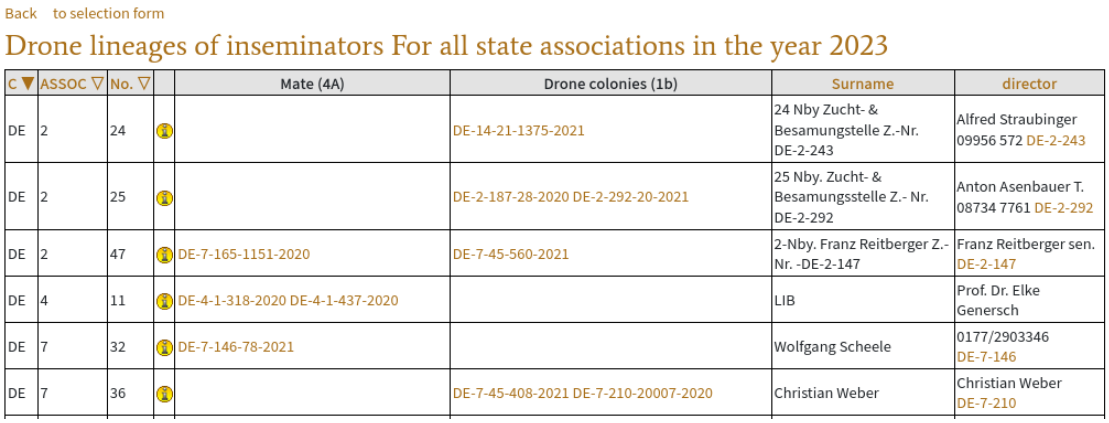
Registered breeders will additionally receive a summary evaluation of trait examinations of colonies concerning the mating station. Four categories are examined, the most important category being the drones of the daughter colonies of 4a. However, findings from queens mated at the mating station also provide indications of the purity of the mating station, whereby of course negative findings cannot necessarily be attributed to the mating station, which is why a relevance is given for each of the categories.

4.7.3 Drone lineages of the inseminators

This function displays the offered origins of the samplers. If necessary, the birth year can be changed. If the field birth year is deleted, all historical origins of the inseminators can be determined.



Clicking on “next” takes you to the list of mating stations together with their origins.



C	ASSOC	No.		Mate (4A)	Drone colonies (1b)	Surname	director
DE	2	24			DE-14-21-1375-2021	24 Nby Zucht- & Besamungstelle Z.-Nr. DE-2-243	Alfred Straubinger 09956 572 DE-2-243
DE	2	25			DE-2-187-28-2020 DE-2-292-20-2021	25 Nby. Zucht- & Besamungsstelle Z.- Nr. DE-2-292	Anton Asenbauer T. 08734 7761 DE-2-292
DE	2	47		DE-7-165-1151-2020	DE-7-45-560-2021	2-Nby. Franz Reitberger Z.-Nr. -DE-2-147	Franz Reitberger sen. DE-2-147
DE	4	11		DE-4-1-318-2020 DE-4-1-437-2020		LIB	Prof. Dr. Elke Genersch
DE	7	32		DE-7-146-78-2021		Wolfgang Scheele	0177/2903346 DE-7-146
DE	7	36			DE-7-45-408-2021 DE-7-210-20007-2020	Christian Weber	Christian Weber DE-7-210

5 Breeding and performance data

For the following sections we assume that you as a breeder have registered colonies on your apiary and check their performance.

5.1 Breeder accounts

The area not accessible to the public: Breeding and performance data” requires registration. The breeding administrator of the national association is responsible for the user accounts of the breeders and has an input mask in BeeBreed for this purpose. The name of the user account consists of the country code, a number for the national association and the breeder number, plus a password. We recommend that the administrator is informed of the password verbally beforehand.

If the umpire has registered you as a user, you can log in with the country code, the association number and your breeder number.

The login window appears the first time you click on a menu item that is not publicly accessible, such as “Breeding & Performance Data” or “Administrative Functions”.

5.2 Data sets and performance tests

The basic element of breeding data maintenance in BeeBreed, hereinafter referred to as the data set, includes the pedigree, examiner, performance test, Körklasse and other information about a queen.

Exactly one data set belongs to a queen, identified by the queen code. This also means that a double performance test is not possible.

Each record has an “owner”, normally the examiner of the queen. Only the owner and the administrator of the owner’s association have the right to change the record. Anyone who enters a new data set is initially the owner of the data set. Should the colony be performance tested, the examiner must be the owner of the record at the end. This is very important, because the test apiary is determined on the basis of the owner. In the case of colonies that have not been tested, this is less important - the last owner of the queen or the breeder.

In many cases the inspector enters the record, a change of ownership is not necessary. However, the breeder can also enter the record. If he hands over the record to an examiner for external examination, he must “transfer” the record, i.e. transfer the right of ownership.

5.2.1 For which queens should data sets be created?

A record must be entered for each performance-tested queen, at the latest after completion of the performance tests. Untested queens that have descendants within the breeding population should also be entered as records. This is especially important if these queens also have ancestors within the breeding population - creating the record closes a pedigree gap!

Data records should also be created for drone colonies for mating stations and insemination stations, especially if trait examinations have been made. The studbook numbers of the drone colonies can be stored in the information on the collection centres.

In addition, a data record can be created for each queen intended for a performance test, even already by the breeder of the queen.

For a queen intended for sale as a commercial queen, the creation of a record is unnecessary: the breeding card available in BeeBreed serves this purpose much better. If, contrary to expectations, this queen should be tested for breeding after all, the owner can still enter the record.

The creation of a hypothetical queen for the prediction of inbreeding and breeding values is unnecessary, the breeding planning function performs this function just as well.

5.2.2 Early entry of parentage

A data record can be created at the beginning of the season for each colony that is intended for performance testing. Should this colony be tested by another breeder, it can easily be transferred as a data record.

Many inspectors initially keep only a handwritten hive record card and enter everything in one operation at the end of the season. This procedure is fine, but there is a risk that colonies that have perished or been given away during the year will be forgotten. For the breeding value estimation it is of great importance that the less good colonies are also included in the performance test, because they represent the comparison to the genetically good colonies.

5.2.3 Recommended timing

Spring Year 1 Entering the parentage

Autumn Year 1 Input of the performance test results

Autumn Year 1 Conclusion with “performance test completed”, 20 December at the latest.

Winter Year 1 Release by administrator, 10 January at the latest

12 February Year 2 Queen gets breeding values

Spring Year 2 Follow-up on whereabouts and, if necessary, winter hardiness

Spring Year 2 Commission feature investigation

Spring Year 2 Request licensing

Spring Year 2 Licensing confirmed by umpire, if applicable

5.2.4 Editing and viewing rights

In the status “In process”, the examiner and the administrator responsible for the examining association have full processing rights.

Once the inspector has released the data set, the inspector loses the right to write the pedigree and the results of the performance test, because the release is the official confirmation of the performance test and the pedigree. However, the inspector can still enter data that may take place outside the actual performance test, such as winter hardiness, the results of the brood tests and the results of the vitality test. In addition, the reason for delivery, date of delivery and comment can be changed at any time.

The entry “breed-typical” should not be made by the breeder himself in the D.I.B. and ACA, it is automatically set by the module of the trait examinations.

The breeder can select a class as long as the responsible umpire has not confirmed the approval. If it is confirmed, the field is blocked.

The administrator of the examiner’s association has full editing rights at all times.

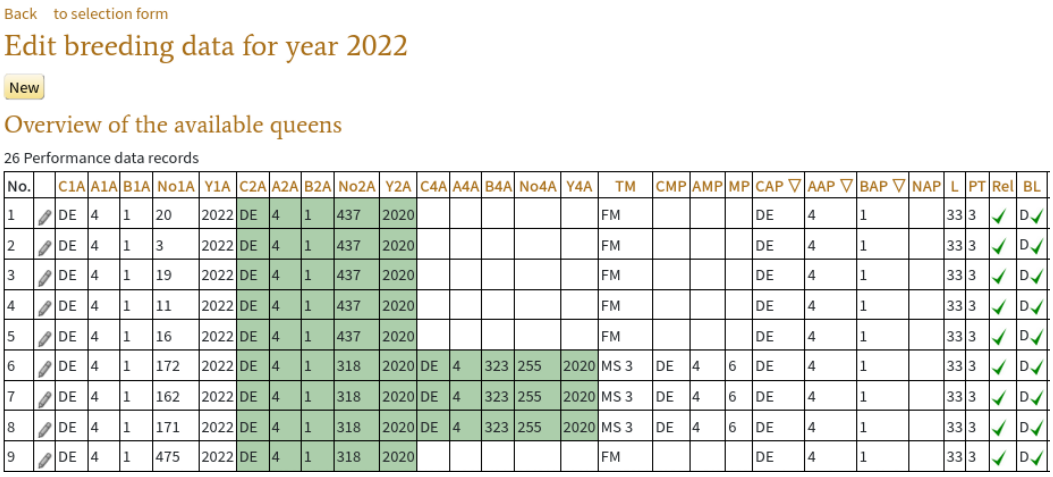
Auxiliary administrators can edit and release records, but cannot audit them.

The breeder (queen code) has the right to inspect the data record if he does not check it himself. The administrator of the breeder’s association also has this right of inspection.

5.3 Data entry

The first point is for entering new data records. First, the year of the queens to be entered is requested.

Clicking on Next will take you to a list of all the queens entered so far.



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Edit breeding data for year 2022

New

Overview of the available queens

26 Performance data records

No.		C1A	A1A	B1A	No1A	Y1A	C2A	A2A	B2A	No2A	Y2A	C4A	A4A	B4A	No4A	Y4A	TM	CMP	AMP	MP	CAP ▽	AAP ▽	BAP ▽	NAP	L	PT	Rel	BL
1		DE	4	1	20	2022	DE	4	1	437	2020						FM				DE	4	1		33	3	✓	D✓
2		DE	4	1	3	2022	DE	4	1	437	2020						FM				DE	4	1		33	3	✓	D✓
3		DE	4	1	19	2022	DE	4	1	437	2020						FM				DE	4	1		33	3	✓	D✓
4		DE	4	1	11	2022	DE	4	1	437	2020						FM				DE	4	1		33	3	✓	D✓
5		DE	4	1	16	2022	DE	4	1	437	2020						FM				DE	4	1		33	3	✓	D✓
6		DE	4	1	172	2022	DE	4	1	318	2020	DE	4	323	255	2020	MS 3	DE	4	6	DE	4	1		33	3	✓	D✓
7		DE	4	1	162	2022	DE	4	1	318	2020	DE	4	323	255	2020	MS 3	DE	4	6	DE	4	1		33	3	✓	D✓
8		DE	4	1	171	2022	DE	4	1	318	2020	DE	4	323	255	2020	MS 3	DE	4	6	DE	4	1		33	3	✓	D✓
9		DE	4	1	475	2022	DE	4	1	318	2020						FM				DE	4	1		33	3	✓	D✓

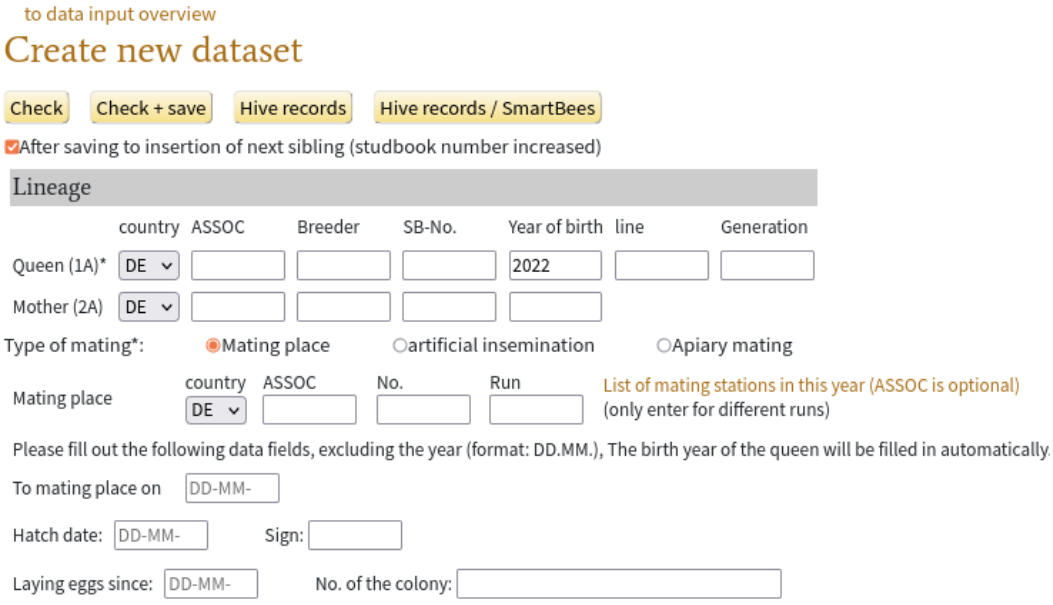
The most important button here is the “new” button, which is used to create a new data set. This takes you to the

5.4 Data set input mask

The input mask is the core of data entry in BeeBreed.

First of all, it is important to know that the entry must be completed with Save. The data record is not saved until the entry has been completed without errors. If the input mask is left, with “back” or closing the browser window, then the entries are discarded.

5.4.1 Ancestry



to data input overview

Create new dataset

Check | Check + save | Hive records | Hive records / SmartBees

☑ After saving to insertion of next sibling (studbook number increased)

Lineage

	country	ASSOC	Breeder	SB-No.	Year of birth	line	Generation
Queen (1A)*	DE				2022		
Mother (2A)	DE						

Type of mating*: ◉ Mating place ○ artificial insemination ○ Apiary mating

Mating place	country	ASSOC	No.	Run
	DE			

List of mating stations in this year (ASSOC is optional)
(only enter for different runs)

Please fill out the following data fields, excluding the year (format: DD.MM.), The birth year of the queen will be filled in automatically.

To mating place on DD-MM-

Hatch date: DD-MM- Sign:

Laying eggs since: DD-MM- No. of the colony:

The upper area of the input mask is dedicated to the lineage. The queen of the colony to be tested is designated 1a. The mother queen is 2a. When mating in an ordinary mating station, 4a is entered there, the mother of the drone colonies, so to speak the grandmother of the drones used for mating. If you

have entered the mating station, you can also leave the field for 4a open. It will then be entered after “Check + Save” as a warning so that you have the opportunity to check it again.

The code of each queen consists of the country code and 4 numbers: the (country) association, the breeder number, the studbook number and the year of birth.

For 1a, the lineage and the generation sequence can also be entered. It has no significance for the breeding value estimation, because the lineage is taken into account by the pedigree of the queens. However, it is still indicated here, because it is an indication of the regional adaptation. Similarly, the date of hatching and the queen’s mark have no direct significance for the breeding values, but they will be listed on the later breeding license.

The type of mating is of great importance. Three basic types are distinguished: artificial insemination, mating stations and open mating. In artificial insemination there is full flexibility in the choice of drone semen, and in some inseminators have no direct association in BeeBreed. Therefore, the breeder is responsible for the correct registration of the parentage. Artificial insemination is marked by mating type 1. The mating station is a facility of the association, the umpire is responsible for the correct entry of the parentage in the mating station data. The breeder only has to select the correct mating station by indicating the mating station code. The different types of mating stations are marked by mating type 2, 3, 4 and 6. Open mating means not checking the mating, and is marked by mating type 5.

The mating station mating types are:

2 Island breeding sites are line breeding sites with a very secure mating due to the island location.

3 Line hive represents the standard hive where descent from the recorded 4a is ensured by maintaining a safe distance from other colonies.

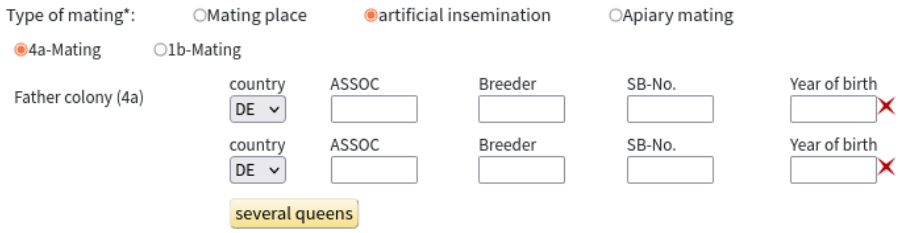
4 In the case of **breed colonies, it** is only ensured that no colonies of other breeds are set up in the vicinity, i.e. that no breed hybrids can arise. The established drone colonies represent a basic stock of the drone cloud, but since they mix with other drones, the paternal descent is not taken into account in the breeding value estimation and is also no longer recorded in the stud books and breeding licences.

6 On the **tolerance hive with several 4a there** are drone colonies of known but different parentage. The drone colonies are not treated against Varroa, so Varroa-resistant colonies make up a larger proportion of the drone cloud.

In case of artificial insemination, the inseminator code, consisting of the country code, the number for the country association and the inseminator number, is entered. In case of mating station, the corresponding code of the mating station shall be entered. If the mating station is registered, the 4a does not have to be entered, it is automatically assigned.

The mating stations already listed can be accessed via the link next to it.

The fields “Number of drones” and “Number of drone colonies” should only be filled in during insemination and may remain empty if the information is not known exactly.



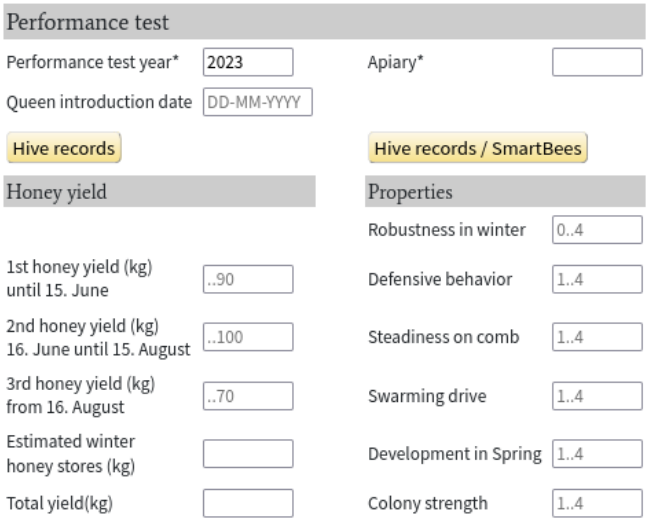
There is the possibility to enter several 4a (or 1b), which is only useful for special types of artificial insemination. In the case of the tolerance insemination with several 4a, the entry in the insemination database is sufficient, the entry is not necessary here.

The selection field of 4a/1b insemination must only be selected for artificial insemination. If drones are taken directly from tested colonies, registration as 1b mating can be considered. The entry of drone

colonies as 1b colonies, which have only been registered for drone testing, is unnecessary - 4a should be entered here.

If the performance check has not yet been carried out, the following can be skipped and the button “check + save” can be clicked directly. There are 2 possibilities. If no objections are found, the data record is saved and you remain in the input mask to enter the next queen. The association and the breeder number remain pre-filled, the remaining fields are empty again. If there are warnings or errors, however, the data record is not saved at first and a corresponding message is displayed at the top. The difference between warnings and errors is that a record with warnings can still be correct, and the button “Save despite warnings” can be used to force the record to be saved despite these warnings. If there is an error, it is impossible to save the record. There are reasons why this data set does not make sense in this way.

5.4.2 Performance test



When entering the performance test, it is important to enter the apiary number correctly. If all the colonies are on one apiary, enter 1 here, but if they are distributed over several apiaries, number the apiaries. Each year a new numbering can be created, it is also not necessary that the same number is assigned for the same location in another year.

The entry relevant for the breeding value estimation for the honey yield is “Sum (kg)”, i.e. the total honey yield. The indication of the partial yields and the estimated stocks can provide additional information in comparison with other colonies of the apiary, it appears in the studbook print and breeding licence.

The traits assessed under “Traits” range on a scale of 1 (worst) to 4 (best), with the exception of winter hardiness, which has an additional score of 0 (does not survive the winter).

5.4.3 BeeBreed hive record card

Clicking on “Hive records” takes you to an electronic record card on which the results of individual inspections can be entered.

multiple measurements according to date DE-4-1-1-2022

No.	time	Honey yield	Properties					Varroa traits						
								Varroa mite drop		infestation measurement		pin test		
	Date/ week*	Total yield (kg)	Defensive behavior	Calmness during inspection	Swarming drive	Development in Spring	Colony strength	Number of mites	Days	Number of mites	Weight of bees [g]	Hygienic behavior	waiting time (h)	notes
1	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
2	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
3	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
4	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
5	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
6	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
7	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
8	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
9	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			
10	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200			

Check | Check + save | check + save + back | back without saving | Insert row | delete all data

These entries have (except for Varroa infestation measurements) no direct significance for the breeding value estimation, the total yield or the total score is still included in the breeding value estimation. The entries are voluntary for the breeder, but offer some potential advantages:

- the breeder has an electronic hive record card for his own record keeping
- the breeder can have the data summarised into an overall evaluation
- the umpire can inspect the hive record card and consult with the breeder if necessary

If the hive record card has been filled in, the data set status is set to “Performance check done”, and the performance data in the main screen remain empty, the data from the hive record card will be summarised and entered in the main screen when “Checking” or “Checking + Saving”:

- Honey yields are added. However, if partial yields or stock have been specified in the main screen, the data from the hive record card are ignored.
- The average of the gentleness ratings is entered.
- The average of the honeycomb seat scores is entered.
- Of the swarm drive scores, the worst score is entered.
- The average of the strength ratings is entered.
- The average of the spring development assessments is entered.
- The average of the pin test results is entered.
- The average of various pintest waiting times is entered.

However, if the examiner has made an overall assessment, the cane card measurements are not taken into account. The background here is that an informed overall assessment is of higher value than a simple averaging. If the examiner wishes to redo the summary, it is sufficient to empty the field in the main screen.

5.4.4 SmartBees hive record card

multiple measurements according to date DE-4-1-1-2022

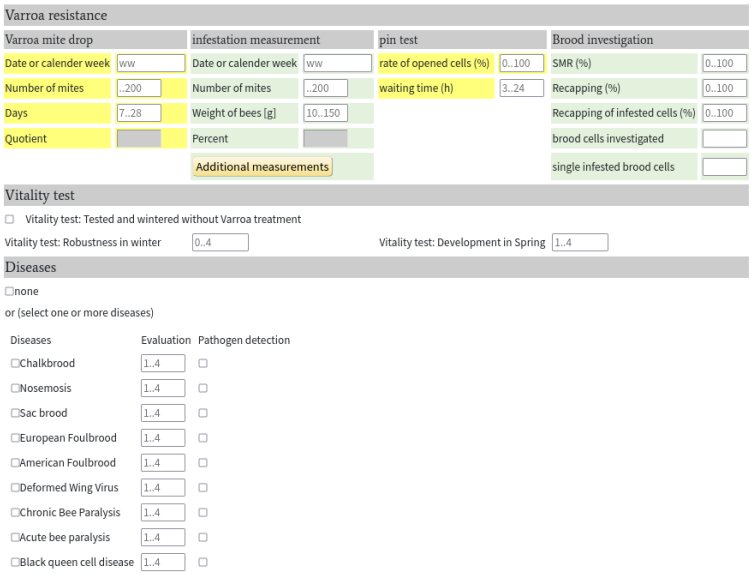
No.	time	Honey yield	Properties					Varroa traits							
								Varroa mite drop		infestation measurement		pin test			
	Date/ week*	Total yield (kg)	Defensive behavior	Calmness during inspection	Swarming drive	Development in Spring	Colony strength	Number of mites	Days	Number of mites	Weight of bees [g]	Hygienic behavior	waiting time (h)	notes	
1	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
2	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
3	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
4	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
5	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
6	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
7	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
8	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
9	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕
10	ww/DD-MM-		1..4	1..4	1..4	1..4	1..4		1..21		5..200				✕

Check | Check + save | check + save + back | back without saving | Insert row | delete all data

The SmartBees hive record card refers to the performance testing protocol developed in the European SmartBEES project, which collects some additional information:

- Instead of evaluating colony strength, spring development and winter hardiness as assessment censors, the number of occupied honeycomb aisles, the number of brood combs and their brood density are recorded for individual inspections. This is therefore a simplified Liebefeld estimation method, which only involves an approximate estimate of the number of bees. Of course, it is important here that all test colonies of an apiary are evaluated with the same hive dimensions.
- If the censoring for the total evaluation is left open in the data set, a conversion is carried out within the breeding value estimation. This conversion is much more complicated and can also (in contrast to the averaging for gentleness) not be done directly online, i.e. it does not appear in the main mask of the data set.
- Evaluation of defensive ability against the Oriental (Vespa orientalis) and Asian hornet (Vespa velutina), from 1 (helplessly at the mercy) to 4 (effective behaviour). Includes fly-out inhibition and formation of the defensive ball.
- Queen status: 0 - no queen and no brood; 1 - pins seen; 2 - maggots seen; 3 - capped brood; 4 - queen seen but no brood; 5 - queen and brood seen.

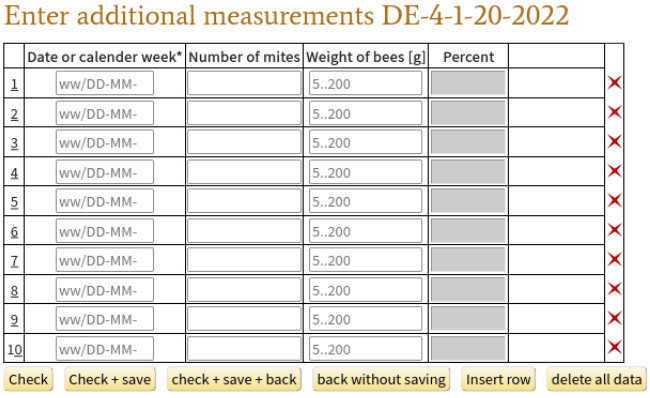
5.4.5 Diseases/resistance



The data of the Varroa mite infestation, which is usually carried out in spring at the time of the salvia flowering, is to be entered in the fields highlighted in yellow. The number of mites is entered here and the number of days the collection device (nappy) was used in the hive.

The green highlighted fields under “Infestation measurement” are used to enter the mite infestation of a bee sample, whereby the date or calendar week, the number of mites found and the weight of the bee sample must be entered here.

Click on “more measurements” to access the option to enter several measurements per year.



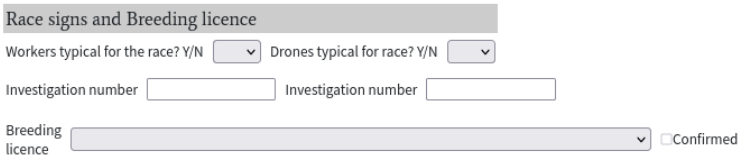
The date field offers the possibility to enter either the calendar week or the exact date. The year can be omitted, in which case the test year applies.

In the “pin test”, a certain number of brood cells (e.g. 50) are pricked and the pupae killed. After a waiting period, the opened cells are counted. The waiting time can vary according to local conditions, it is only important that all test colonies on an apiary have the same waiting time. The number of opened cells is divided by the number of pricked cells and given as a percentage, i.e. multiplied by 100. If there are several measurements per year, the average of all measurements should be given here. The pupae can be killed with a cold treatment instead of a pin - the values are also entered under “Pin test”.

In the diseases, the corresponding diseases can be selected by clicking as soon as the first signs of disease appear. Multiple selection is also possible. It is important that the field “none” is clicked if no

diseases were found but the colony was checked for diseases. Leaving all fields open means that no disease check was carried out or was possible.

5.4.6 Breed characteristics and licensing

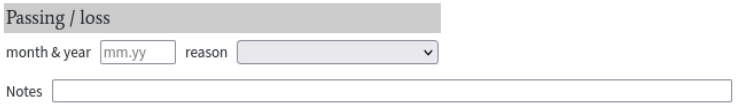


After the annual breeding value estimation has been carried out, and a queen from one's own colony meets sufficiently high breeding values, low inbreeding and other conditions that make it a suitable animal for further breeding, it can be proposed for licensing. See the section on "Applying for licensing" below.

A condition for licensing in Carnica and Mellifera pure breeding is the trait test, which is entered at this point.

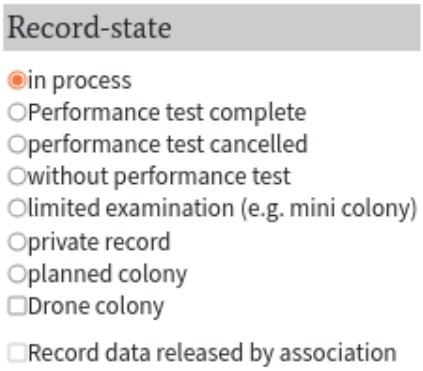
Therefore, licensing should not be applied for at the time of entering the performance test, but only after reviewing the breeding values!

5.4.7 Levy/Loss



The subsequent sections "Breed Characteristics" and "Shedding/Loss" will be filled in later, and are dealt with here below.

5.4.8 Record status



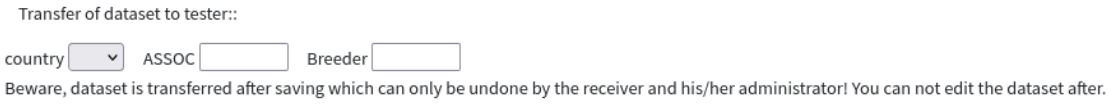
A newly created data set is initially "in process". As long as it remains in this status it is not considered for the breeding value estimation, it is not an official part of the breeding population.

When the breeder has finished processing the record, he chooses one of the other options, depending on whether the performance test was completed, cancelled, or not carried out at all. By choosing one of these options, the breeder gives the record to the responsibility of the association. The umpire

now has the task of checking the plausibility of the pedigree and the data. If this is the case, the data set is released, i.e. the queen in question now officially belongs to the breeding population and will be entered in the next breeding value estimate.

In some cases it makes sense to assign a studbook number to untested queens and to enter them in BeeBreed. These are, on the one hand, entries of drone colonies for which a trait test is carried out. On the other hand, the entry can complete pedigree gaps. If a queen has been bred from registered queens and is used for further breeding, it is important to enter it without its own performance test (which occasionally happens by mistake when passing on breeding material). It is important that the record status in these cases is set to “without performance test”.

5.4.9 Transfer data for performance testing



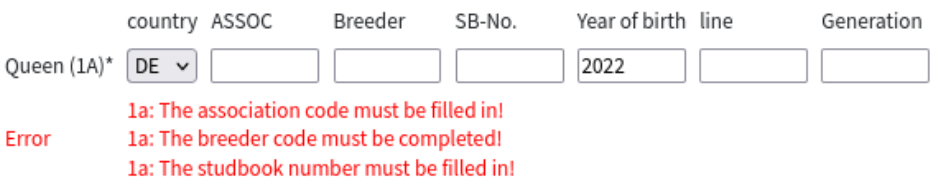
In these fields, the breeder can be named who is to become the owner of the record, i.e. mostly the transfer of the record from the examiner to the breeder. After saving, the transfer request is marked. Only when the recipient accepts this wish, the data set is fully transferred.

5.4.10 Check and save

The data entry is completed with “Check + Save”. If warnings occur but no errors, the warnings are displayed in the input mask, the data record is not yet saved at this point. An additional button “Save despite warnings” appears and the data is saved.

There can be many circumstances that result in a data set that is “out of the norm”. This does not mean that the data set is “wrong”. It is only a hint to check the record again. If the check shows that it is meant to be and is correct, the record should still be saved. Under no circumstances should the data be falsified, just to avoid warnings!

However, if errors occur, it is not possible to save the data set, and normally it does not make sense to do so because the error is too serious. The error message can be found directly at the place of the incorrect entry. For example, the fields of 1a must always be filled in:



The field “Check” checks the data set without leaving the input mask and writing data.

5.4.11 Next Sibling Queen when using “New”

After the successful saving of the data record, one reaches the data entry of the next sibling queen. This means that the pedigree is kept the same, the studbook number is incremented by 1.

However, this only happens when creating a new data set, i.e. when you have entered the input mask via “Data entry” and “New”.

5.4.12 Apply for licensing

The approval is applied for by selecting the approval class in the queen’s entry mask. In the section “Breed Characteristics” you will find the selection bar “Körung”, where you can select the requested class. The grading classes refer to the current regulations of the D.I.B., but are similarly valid in other countries. The classes are:

A the ordinary licensing, which is permissible if all conventional breeding values (for honey yield, gentleness, comb fit, swarm inertia) are above 100, i.e. above average.

Av the ordinary licensing, if in addition the pre-root tolerance traits have been measured and their breeding value is above average

B For this class, the performance index, which consists of equal parts of the breeding values honey yield, gentleness, comb fit, swarm drive, must be above 100, i.e. this class is selected for queens in which individual breeding values are outstanding, but others are below average.

D the grain class for drone colonies, which essentially requires a trait examination of the drones.

P the inspection class, if the conditions of the other inspection classes are not fulfilled, but special characteristics of the colony nevertheless make it a candidate for further breeding

J the class for countries to which the special subdivision of the D.I.B. does not apply.

With a subsequent click on the button “check + save”, the approval is applied for and immediately appears in a list which can be called up by the umpire.

The field “confirmed” is greyed out because this confirmation has to be done by the umpire. If he has confirmed the inspection, a greyed out tick will appear in this case.

In German Carnica pure breeding, it is required for licensing that samples of workers and drones are tested for breed purity. In concrete terms, this means that the breeder collects the corresponding bees and sends them to one of the trait testing centres.

The trait examination centres have a separate area in BeeBreed, whose final result, the trait examination result, also appears in the record mask as soon as it is created.

In the Swiss Mellifera breeding genomic analyses for breed unity are carried out, the examination numbers of which can be entered here.

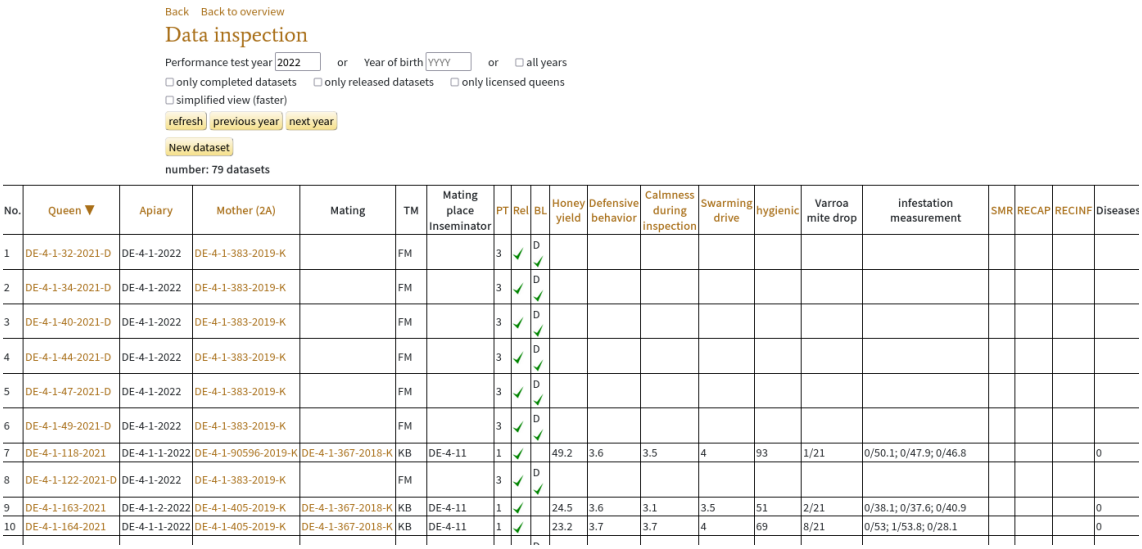
For the final classification of whether the worker bees and drones are typical for the breed, the selection fields above are provided.

5.4.13 Posting the whereabouts

The transparency of the breeding process should not only refer to the one year of the performance test. To ensure that it remains comprehensible what has happened to a colony, this should be entered under “Delivery/Loss”.

5.5 Data access

If you want to edit existing data records, you can use the data view function.



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Data inspection

Performance test year 2022 or Year of birth YYYY or all years

only completed datasets only released datasets only licensed queens

simplified view (faster)

refresh previous year next year

New dataset

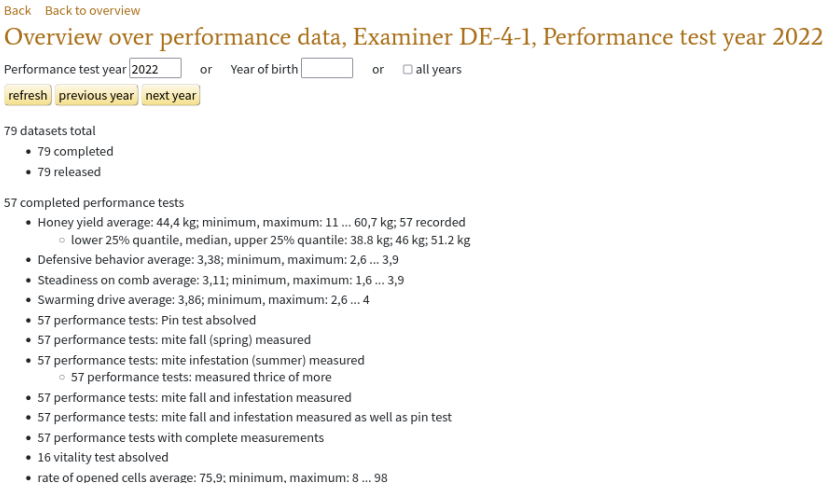
number: 79 datasets

No.	Queen ▼	Apiary	Mother (2A)	Mating	TM	Mating place Inseminator	PT	Rel	BL	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	hygienic	Varroa mite drop	infestation measurement	SMR	RECAP	RECINF	Diseases
1	DE-4-1-32-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
2	DE-4-1-34-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
3	DE-4-1-40-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
4	DE-4-1-44-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
5	DE-4-1-47-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
6	DE-4-1-49-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
7	DE-4-1-118-2021	DE-4-1-1-2022	DE-4-1-90596-2019-K	DE-4-1-367-2018-K	KB	DE-4-11	1	✓		49.2	3.6	3.5	4	93	1/21	0/50.1; 0/47.9; 0/46.8				0
8	DE-4-1-122-2021-D	DE-4-1-2022	DE-4-1-383-2019-K		FM		3	✓	D ✓											
9	DE-4-1-163-2021	DE-4-1-2-2022	DE-4-1-405-2019-K	DE-4-1-367-2018-K	KB	DE-4-11	1	✓		24.5	3.6	3.1	3.5	51	2/21	0/38.1; 0/37.6; 0/40.9				0
10	DE-4-1-164-2021	DE-4-1-1-2022	DE-4-1-405-2019-K	DE-4-1-367-2018-K	KB	DE-4-11	1	✓		23.2	3.7	3.7	4	69	8/21	0/53; 1/53.8; 0/28.1				0

Here are short summaries of all own data records of the current year, including performance and trait data. If older birth years are to be edited, this birth year (or the test year) is changed and by clicking on “update” the corresponding queen list appears. Clicking on the queen code takes you back to the input mask for the data record.

You can also use the function “Data entry” described above. Here the pencil symbol must be clicked to edit the data set.

5.6 Performance data overview



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Overview over performance data, Examiner DE-4-1, Performance test year 2022

Performance test year 2022 or Year of birth or all years

refresh previous year next year

79 datasets total

- 79 completed
- 79 released

57 completed performance tests

- Honey yield average: 44,4 kg; minimum, maximum: 11 ... 60,7 kg; 57 recorded
  - lower 25% quantile, median, upper 25% quantile: 38.8 kg; 46 kg; 51.2 kg
- Defensive behavior average: 3,38; minimum, maximum: 2,6 ... 3,9
- Steadiness on comb average: 3,11; minimum, maximum: 1,6 ... 3,9
- Swarming drive average: 3,86; minimum, maximum: 2,6 ... 4
- 57 performance tests: Pin test absolved
- 57 performance tests: mite fall (spring) measured
- 57 performance tests: mite infestation (summer) measured
  - 57 performance tests: measured thrice of more
- 57 performance tests: mite fall and infestation measured
- 57 performance tests: mite fall and infestation measured as well as pin test
- 57 performance tests with complete measurements
- 16 vitality test absolved
- rate of opened cells average: 75,9; minimum, maximum: 8 ... 98

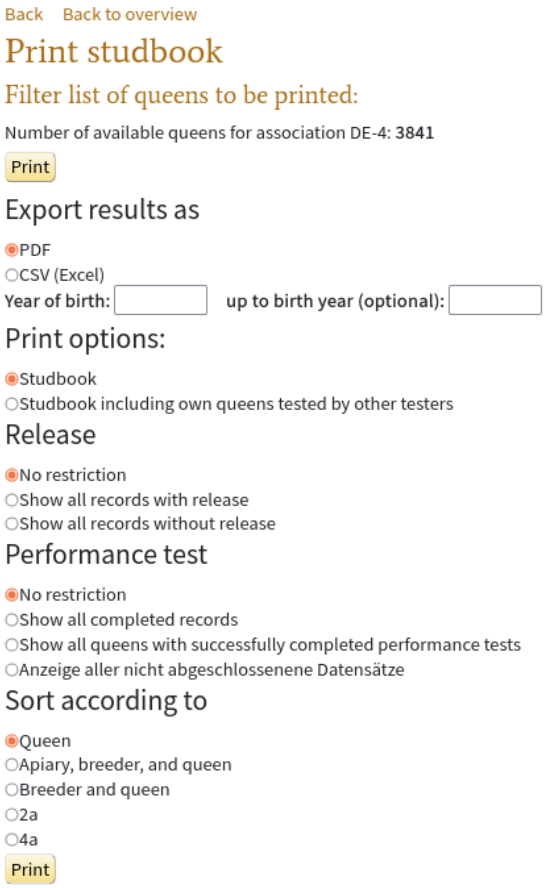
This provides an overview of the number of records and performance data for a given test year.

5.7 Print studbook

There is the possibility to read out test data in summarised form with the function “Print studbook and test report” from BeeBreed. First of all, it is used to create the stud books and test reports that have been established in breeding for decades, but it is much more flexible than the name initially suggests.

Performance data is not public. This function always outputs only the data to which the user has access. In the case of an ordinary breeder, this is his own inspection data and the results of the external

inspection of his breeding queens. In the case of an umpire, this is the entire inspection data of the national association, plus all external inspection data of breeding queens from the national association.



If only a printout is desired, then the option “PDF” is the correct one. With the CSV option, on the other hand, the data is output in tabular form. The CSV file can be read in with Excel, but can also be processed with many other programmes. Sophisticated users can use this function to read out all performance data available in BeeBreed to which access is permitted. It should be noted that in the PDF output a selection of fields is made so that the print output still works, whereas in the CSV output the data is complete.

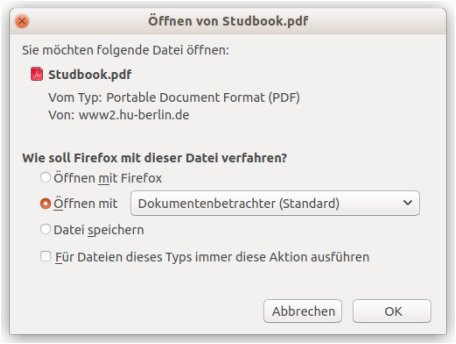
Usually stud books and test reports refer to a certain year of birth, which is to be entered in “Year of birth:”. If more than one year of birth is desired, the first desired year of birth is entered here and the last desired year of birth is entered in the field “until year of birth: (optional)”. In this way, all data of the national association can potentially be retrieved.

In the print function section all available queens are recorded under “Test report (all tested queens)”, with “Stud book (only own queens)” the test data are hidden which one has carried out oneself in external testing.

Under “Release:” a filter can be set after setting the switch “Performance test done:”.

Furthermore, the sorting order can be set. When selecting “Queen”, the order is related to the breeder of the queen, whereas with “Apiary, Breeder, Queen” it is related to the inspector.

After clicking on “continue”, the PDF or CSV document is generated and sent to the browser.



Occasionally, problems occur with the display of PDF documents if the automatic display of PDF documents is set, but the connection to Acrobat Reader is not configured correctly. It is recommended to configure the browser to ask before displaying the document and it is saved.

DEUTSCHER IMKERBUND E.V.

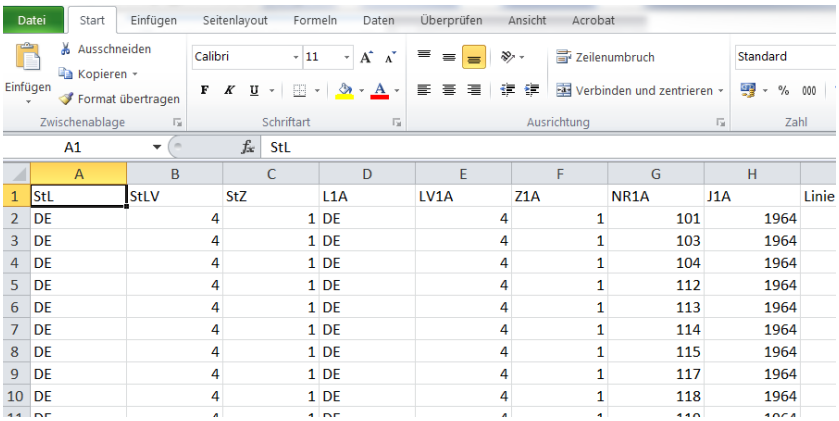
Studbook / Page: 1

Association: Code: DE-4
Landesverband Brandenburgischer Imker e.V.

Examiner: Länderinstitut für Bienenkunde, Hohen Neuendorf Code: DE-4-1

Year:			Pedigree		Breeding						Performance								Pro
Studbook number	line	Generation	Studbook number Mother	Mate (4A/1B)	Hatch date	Sign	Type of mating	To mating place/insemination on	Mating-/insemination station (LV/Nr.)	Laying eggs since	No. of the colony	Apiary	1st honey yield (kg)	2nd honey yield (kg)	3rd honey yield (kg)	Estimated winter honey stores (kg)	Total yield(kg)	% of apiary average	Ranking	Defensive behavior
DE-4-1-101/64			DE-4-250-92/63				5					1					15,4	101,6	6	
DE-4-1-103/64			DE-4-250-92/63				5					1					10,7	70,6	10	
DE-4-1-104/64			DE-4-250-92/63				5					1					15,8	104,2	5	
DE-4-1-112/64			DE-4-250-92/63	DE-16-5-848/61			3		DE-16/10			1					16,6	109,5	4	4
DE-4-1-113/64			DE-4-250-92/63	DE-16-5-848/61			3		DE-16/10			1					17,6	116,1	2	
DE-4-1-114/64			DE-4-250-92/63	DE-16-5-848/61			3		DE-16/10			1					14,9	98,3	7	
DE-4-1-115/64			DE-4-250-92/63	DE-16-5-848/61			3		DE-16/10			1					20,7	136,5	1	
DE-4-1-117/64			DE-4-250-92/63	DE-16-5-848/61			3		DE-16/10			1					11	72,6	9	

The studbook as PDF document is designed for A3 printout in landscape format, but printout in A4 format is also possible.

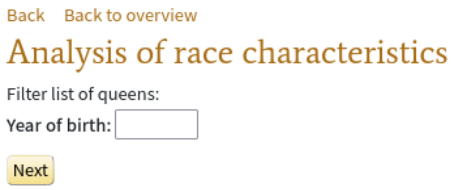


	A	B	C	D	E	F	G	H	
1	StL	StLV	StZ	L1A	LV1A	Z1A	NR1A	J1A	Linie
2	DE	4	1	DE	4	1	101	1964	
3	DE	4	1	DE	4	1	103	1964	
4	DE	4	1	DE	4	1	104	1964	
5	DE	4	1	DE	4	1	112	1964	
6	DE	4	1	DE	4	1	113	1964	
7	DE	4	1	DE	4	1	114	1964	
8	DE	4	1	DE	4	1	115	1964	
9	DE	4	1	DE	4	1	117	1964	
10	DE	4	1	DE	4	1	118	1964	

The CSV format is designed for editing with Excel or another spreadsheet programme.

5.8 Morphological investigation

If you have sent bee samples to the BeeBreed associated morphological investigators, the result reports can be viewed under this menu item. First, the year can be selected (otherwise all results are displayed).



By clicking on “next”, the findings are summarised in a table.

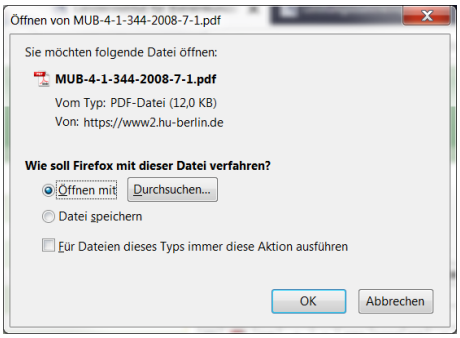
Back Back to previous form

Analysis of race characteristics

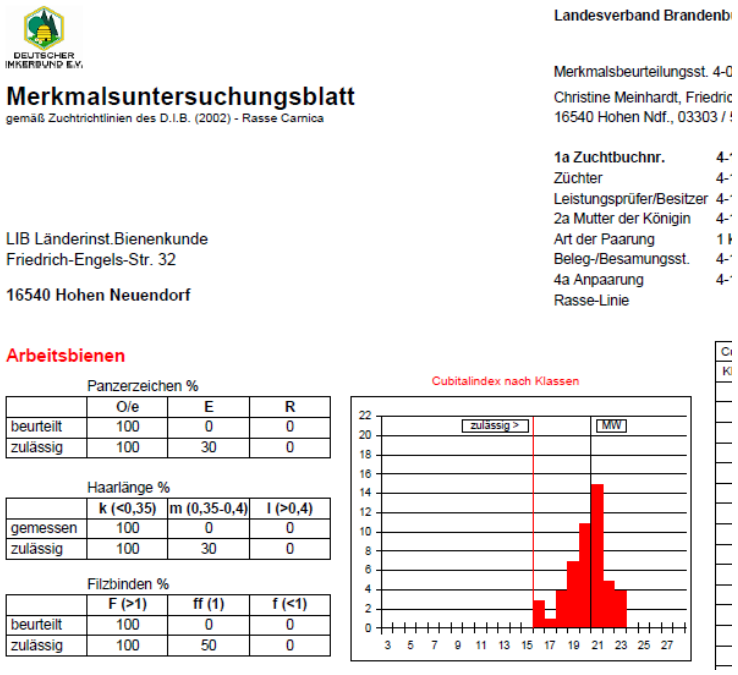
Number of queens with performance test data in association 4 for year = 2020: 112

	No.	MA	CAP	AAP	BAP	NAP	C1A	A1A	B1A	No1A	Y1A	C2A	A2A	B2A	No2A	Y2A	C4A	A4A	B4A	No4A	Y4A	TM	CMP	AMP	MP	L	PT	Rel	BL	License date	tW	tD	
☐	1		DE	4	1		DE	4	1	34	2020	DE	4	1	367	2018						FM				33	3	✓	D ✓	04.06.2021		j	
☐	2		DE	4	1	1	DE	4	1	319	2020	DE	4	1	493	2018	DE	4	1	436	2017	KB	DE	4	11	33	1	✓	Av ✓	20.05.2022	j	j	
☐	3		DE	4	1	2	DE	4	1	316	2020	DE	4	1	493	2018	DE	4	1	436	2017	KB	DE	4	11	33	1	✓	Av ✓	20.05.2022	j	j	
☐	4		DE	4	1	1	DE	4	1	318	2020	DE	4	1	493	2018	DE	4	1	436	2017	KB	DE	4	11	33	1	✓	Av ✓	22.05.2022	j	j	
☐	5		DE	4	1		DE	4	1	216	2020	DE	4	1	488	2018	DE	4	311	521	2016	MS 3	DE	4	5	33	3	✓	D ✓	04.06.2021		j	
☐	6		DE	4	1		DE	4	1	178	2020	DE	4	1	488	2018						FM				33	3	✓	D ✓	04.06.2021		j	
☐	7		DE	4	1		DE	4	1	67	2020	DE	4	1	488	2018						FM				33	3	✓	D ✓	04.06.2021		j	
☐	8		DE	4	1		DE	4	1	22	2020	DE	4	1	367	2018						FM				33	3	✓	D ✓	04.06.2021		j	
☐	9		DE	4	1		DE	4	1	30	2020	DE	4	1	367	2018						FM				33	3	✓	D ✓	04.06.2021		j	
☐	10		DE	4	1		DE	4	1	215	2020	DE	4	1	488	2018	DE	4	311	521	2016	MS 3	DE	4	5	33	3	✓	D ✓	04.06.2021		j	

Click on the PDF symbol to download the document.



The morphological investigation sheet summarises the results of the examination and is part of the licensing in Carnica breeding.



DEUTSCHER IMKERBUND E.V.

Merkmalsuntersuchungsblatt

gemäß Zuchtrichtlinien des D.I.B. (2002) - Rasse Carnica

Landesverband Brandenb

Merkmalsbeurteilungsst. 4-0

Christine Meinhardt, Friedric
16540 Hohen Ndf., 03303 / !

LIB Länderinst.Bienenkunde
Friedrich-Engels-Str. 32

16540 Hohen Neuendorf

1a Zuchtbuchnr.	4-
Züchter	4-
Leistungsprüfer/Besitzer	4-
2a Mutter der Königin	4-
Art der Paarung	1
Beleg-/Besamungsst.	4-
4a Anpaarung	4-
Rasse-Linie	

Arbeitsbienen

Panzerzeichen %

	O/e	E	R
beurteilt	100	0	0
zulässig	100	30	0

Haarlänge %

	k (<0,35)	m (0,35-0,4)	l (>0,4)
gemessen	100	0	0
zulässig	100	30	0

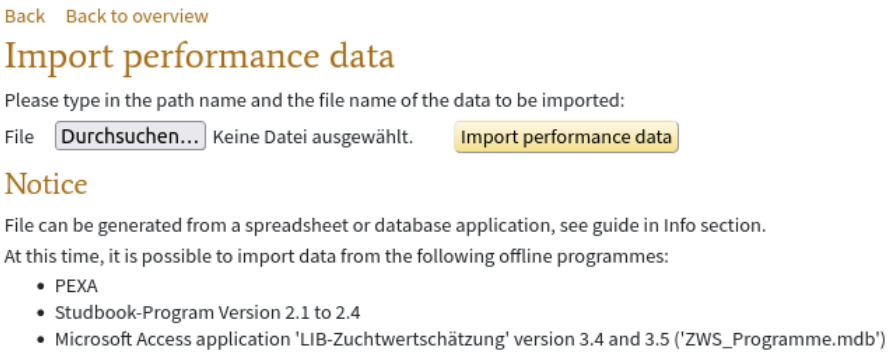
Filzbinden %

	F (>1)	ff (1)	f (<1)
beurteilt	100	0	0
zulässig	100	50	0

Cubitalindex nach Klassen

5.9 Performance data import

The service data import is an alternative to entering the services via the input mask. It is intended for users with good computer skills who enter their service data in a local database. There is separate documentation of the import format in the info section.



Back Back to overview

Import performance data

Please type in the path name and the file name of the data to be imported:

File Durchsuchen... Keine Datei ausgewählt. Import performance data

Notice

File can be generated from a spreadsheet or database application, see guide in Info section.

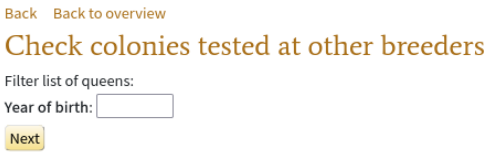
At this time, it is possible to import data from the following offline programmes:

- PEXA
- Studbook-Program Version 2.1 to 2.4
- Microsoft Access application 'LIB-Zuchtwertschätzung' version 3.4 and 3.5 ('ZWS_Programme.mdb')

The prepared file is selected in the browser. Clicking on “continue” imports the data, whereby an extensive warning and error list is output. Check this list thoroughly and pay particular attention to whether the import of a data set was successful or refused. A repeated import of the revised file is conceptually provided for - newly imported data overwrite previous data of the same studbook number.

5.10 Control of own colonies that are externally tested

Normally, the examiner has full responsibility for a record. In the case of third-party testing, the original breeder is not involved. However, he still has a right to inspect the data, which is possible via this function.



After clicking on “next”, your own externally inspected queens are displayed, but only if they have been approved by the inspector’s association.

Back to selection form

Check colonies tested at other breeders

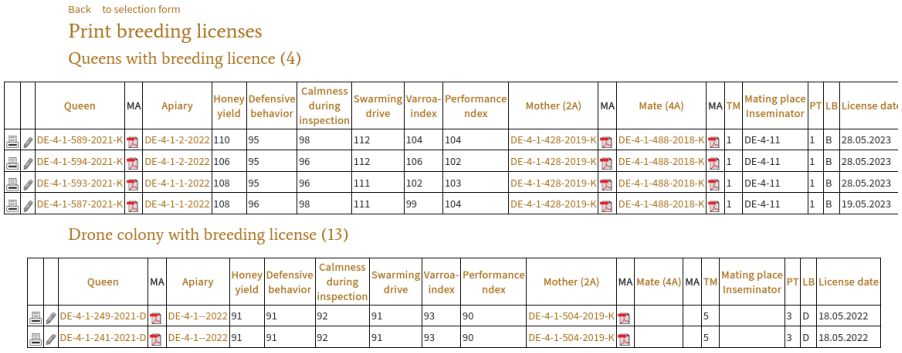
99 Released queens which have been tested externally, for year = 2021

No.		C1A	A1A	B1A	No1A	Y1A	C2A	A2A	B2A	No2A	Y2A	C4A	A4A	B4A	No4A	Y4A	TM	CMP	AMP	MP	CAP ▽	AAP ▽	BAP ▽	NAP	L	PT	Rel	BL	
1		DE	4	1	377	2021	DE	4	1	90596	2019	AT	99	645	708	2017	KB	AT	2	3	AT	2	3	7	90	1	✓		
2		DE	4	1	327	2021	DE	4	1	90596	2019	AT	99	671	8010	2018	MS 3	AT	99	88	AT	99	99	1	90	1	✓		
3		DE	4	1	341	2021	DE	4	1	383	2019	AT	99	120	71841	2018	KB	AT	99	70	AT	99	377	2	33	1	✓		
4		DE	4	1	323	2021	DE	4	1	90596	2019	AT	99	120	71841	2018	KB	AT	99	70	AT	99	377	2	90	1	✓		
5		DE	4	1	379	2021	DE	4	1	90596	2019	AT	99	671	8010	2018	MS 3	AT	99	88	AT	99	526	1	90	1	✓		
6		DE	4	1	462	2021	DE	4	1	90596	2019	BE	1	584	3361	2017	KB (1b)				BE	1	584	1	90	2	✓		
7		DE	4	1	459	2021	DE	4	1	90596	2019						FM				BE	1	584	1	90	1	✓		
8		DE	4	1	469	2021	DE	4	1	405	2019	BE	1	584	3361	2017	KB (1b)				BE	1	584	1	33	2	✓		
9		DE	4	1	470	2021	DE	4	1	405	2019	BE	1	584	3361	2017	KB (1b)				BE	1	584	1	33	2	✓		

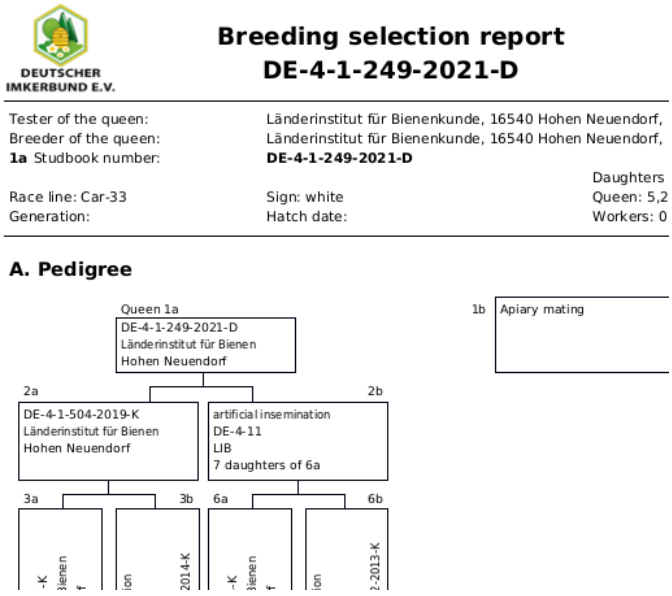
5.11 Printing of breeding licenses and breeding applications

This menu item enables the printing of breeding licences. A Körantrag is a similar document of a queen whose Körung has not yet been confirmed by the Landesverband. The application for approval is described above. First of all, the list of breeding licences can be restricted to a specific year.

After clicking on “next”, the available breeding licences and applications are summarised in a table, subdivided according to breeding queens and drone colonies (D-licensing).



After clicking on the printer symbol, the breeding license or application will be downloaded as a PDF.



DEUTSCHER IMKERBUND E.V.

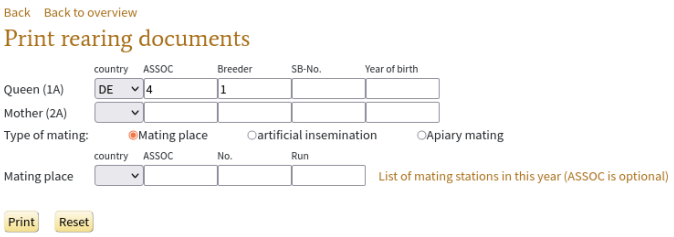
Breeding selection report
DE-4-1-249-2021-D

Tester of the queen:	Länderinstitut für Bienenkunde, 16540 Hohen Neuendorf,	
Breeder of the queen:	Länderinstitut für Bienenkunde, 16540 Hohen Neuendorf,	
1a Studbook number:	**DE-4-1-249-2021-D**	
		Daughters
Race line: Car-33	Sign: white	Queen: 5,2
Generation:	Hatch date:	Workers: 0

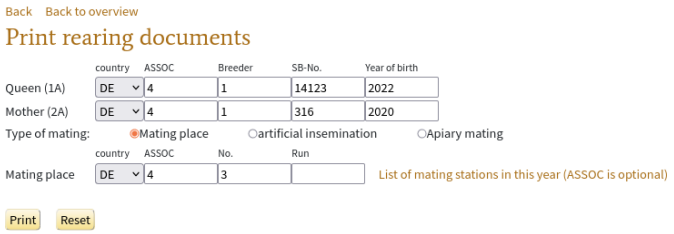
A. Pedigree

5.12 Printing of breeding cards

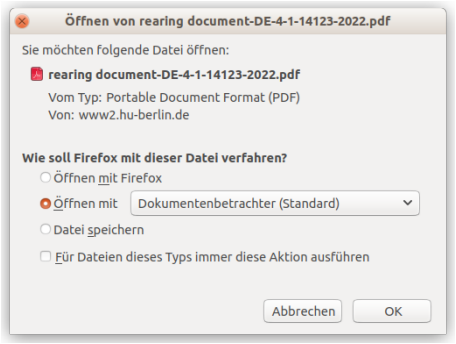
This menu item enables the printing of breeding cards that can be enclosed with queens sold or passed on.



A studbook number must be assigned under the own breeder's identification, the code of the mother and the mating, as well as either the code of the mating station or the inseminator must be entered.



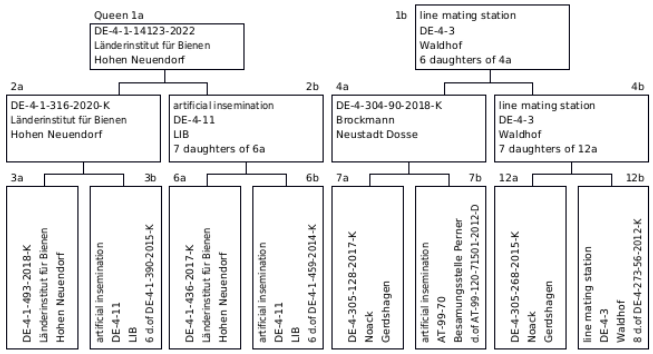
After clicking on "print" the printer symbol, the breeding card will be downloaded as a PDF document.



The breeding card looks like this:

Studbook number DE-4-1-14123-2022

A. Pedigree



B. Mother (2A)

	Breeding values	Reliability
Total breeding value	111	
Honey yield	100	0.5
Defensive behavior	105	0.6
Steadiness on comb	108	0.6
Swarming drive	106	0.54
Varroa	114	0.56

70% 100% 170%

C. Mate (4A)

	Breeding values	Reliability
Total breeding value	86	
Honey yield	101	0.72
Defensive behavior	105	0.81
Steadiness on comb	104	0.8
Swarming drive	97	0.76
Varroa	(66)	0.7

70% 100% 170%

5.13 Genomic breeding values

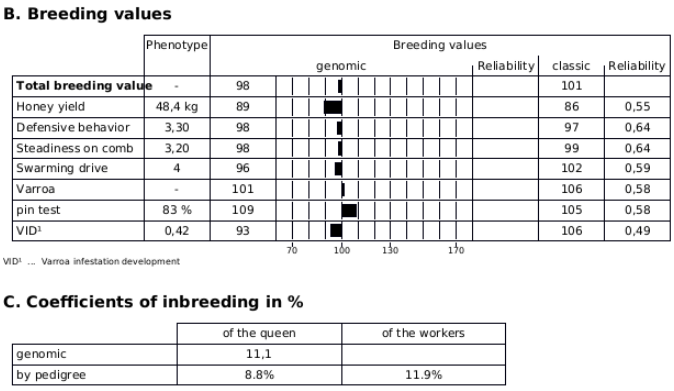
Each breeder can view the genomic breeding values of his queens from which genotyping has already been carried out. They are stored in the function “Genomic breeding values”.

All gene profiles for which the breeder has a right of inspection are shown. The list displayed can be filtered for a test year or year of birth, similar to the function “View data”.

No.		Queen ▼	Honey yield	Defensive behavior	Calmness during inspection	Swarming drive	Varroa-index	TBV		
1		DE-4-1-183-2017	89	98	98	96	101	98		
2		DE-4-1-184-2017	86	92	92	93	98	94		
3		DE-4-1-185-2017	92	96	98	96	96	97		
4		DE-4-1-186-2017	87	90	90	93	94	92		
5		DE-4-1-188-2017	88	96	97	95	100	96		

Each line contains the following information:

- consecutive number
- PDF print of a document containing the genomic breeding values and inbreeding values in the context of the classical breeding values. The frame is formed by the master data and the pedigrees of the queen



B. Breeding values

	Phenotype	Breeding values				
		genomic	Reliability	classic	Reliability
Total breeding value	-	98		101	
Honey yield	48,4 kg	89		86	0,55
Defensive behavior	3,30	98		97	0,64
Steadiness on comb	3,20	98		99	0,64
Swarming drive	4	96		102	0,59
Varroa	-	101		106	0,58
pin test	83 %	109		105	0,58
VID[1]	0,42	93		106	0,49

70 100 130 170

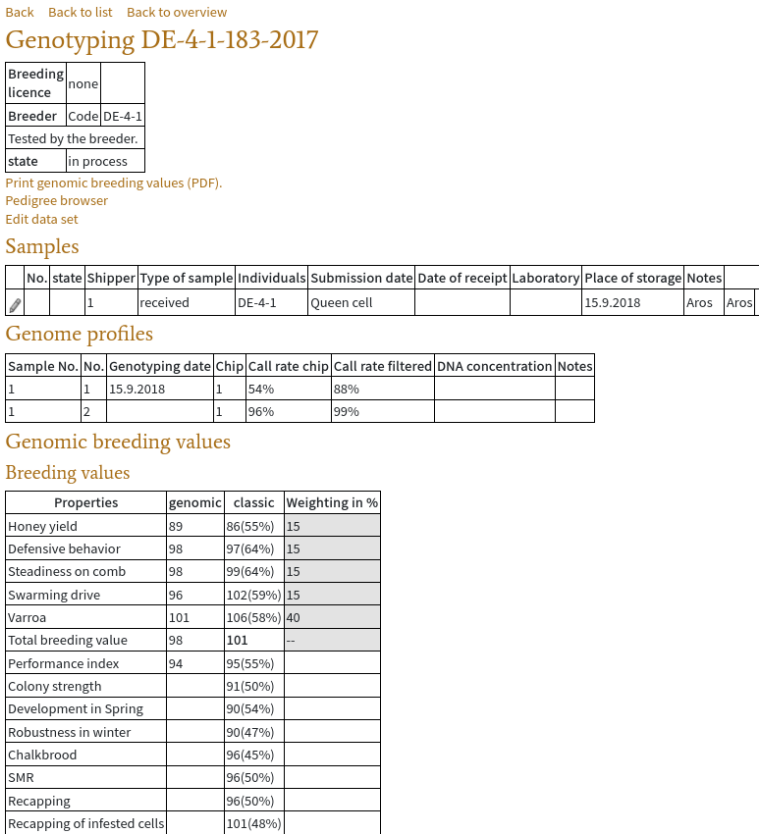
VID[1] ... Varroa infestation development

C. Coefficients of inbreeding in %

	of the queen	of the workers
genomic	11,1	
by pedigree	8.8%	11.9%

- Queen code which, when clicked, redirects to the pedigree brwoser.
- Genomic breeding values of the 4 classical traits, the Varroa index and the total breeding value, which cannot be adjusted in the weights here.

- Click on the DNA symbol to show further details of the genome profile. In this overview, master data, information on the samples, the laboratory information on the genotyping, and the detailed genomic breeding values are shown.



Back Back to list Back to overview

Genotyping DE-4-1-183-2017

Breeding licence	none	
Breeder	Code	DE-4-1
Tested by the breeder.		
state	in process	

Print genomic breeding values (PDF).
Pedigree browser
Edit data set

Samples

	No.	state	Shipper	Type of sample	Individuals	Submission date	Date of receipt	Laboratory	Place of storage	Notes	
			1	received	DE-4-1	Queen cell			15.9.2018	Aros	Aros

Genome profiles

Sample No.	No.	Genotyping date	Chip	Call rate chip	Call rate filtered	DNA concentration	Notes
1	1	15.9.2018	1	54%	88%		
1	2		1	96%	99%		

Genomic breeding values

Breeding values

Properties	genomic	classic	Weighting in %
Honey yield	89	86(55%)	15
Defensive behavior	98	97(64%)	15
Steadiness on comb	98	99(64%)	15
Swarming drive	96	102(59%)	15
Varroa	101	106(58%)	40
Total breeding value	98	**101**	--
Performance index	94	95(55%)	
Colony strength		91(50%)	
Development in Spring		90(54%)	
Robustness in winter		90(47%)	
Chalkbrood		96(45%)	
SMR		96(50%)	
Recapping		96(50%)	
Recapping of infested cells		101(48%)	

- Pencil symbol for editing the data set

5.14 Genotyping applications

Genotyping is handled by the LIB, with the sample takers sending the samples directly to the laboratory (IFN Schönow). Samples can only be processed if they are sent together with a request for genotyping on which a barcode is printed that allows direct reading into the laboratory's software. Consignments to the laboratory without a corresponding application cannot be processed and will be discarded.

Genotyping will only be activated by associations and breeders who have concluded an agreement with the LIB. The rule will be that an association orders a certain number of genotypings that serve a specific purpose. Individual genotypings of single queens of a breeder with their own accounting is currently not foreseen, as a genotyping only makes sense in the context of other genotypings. However, individual users for whom a larger number of genotypings are carried out (e.g. voucher centre operators) may receive individual invoicing.

The content of the agreement on genotyping is that the LIB will issue a collective invoice to the invoicee of the genotypings, which refer to all genotypings made under his responsibility. The responsible breeding administrator can allow breeders in his area of responsibility to apply for genotypings independently in the user administration. These must then be approved individually. Those entitled to genotyping may send in the samples themselves or nominate a breeder to send in the samples.

In terms of gene applications, these are the following roles, which are differentiated by unlocked websites and functions in BeeBreed.

Breeding administrator as account holder Breeders' representatives can activate breeders to apply for genotyping within the framework of the user administration, whereby this allocation also determines the invoicing. Breeders' representatives may designate queens of the association for genotyping and determine the sender of the sample.

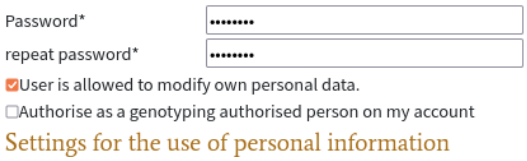
Breeder on individual account can request genotyping and receive an individual invoice from the LIB

Breeder with accounting by the association can apply for genotyping, but this can be approved individually by the responsible umpire, and is then also paid for by the association

Sample submitter If another breeder is named as submitter when applying for genotyping, this breeder can generate the application form.

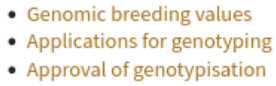
5.14.1 BeeBreed administrator as account holder

A Breeding Administrator who is registered as an account holder in the LIB first has the possibility to authorise breeders to submit genotyping requests. To do this, the user data must be edited in the administration menu.

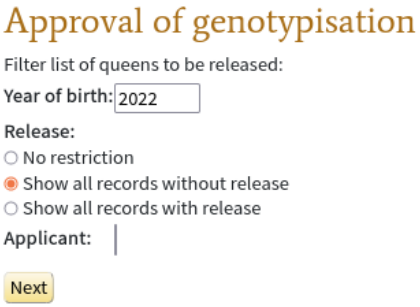


The selection of "Authorise as genotyping authorised person on my invoice" activates BeeBreed functions for the genotyping functions for this breeder. At the same time, the association's invoice data is noted in the user data. This has the effect that the LIB invoice for all genotypings of this breeder goes to the breeding administrator of the association who made this change.

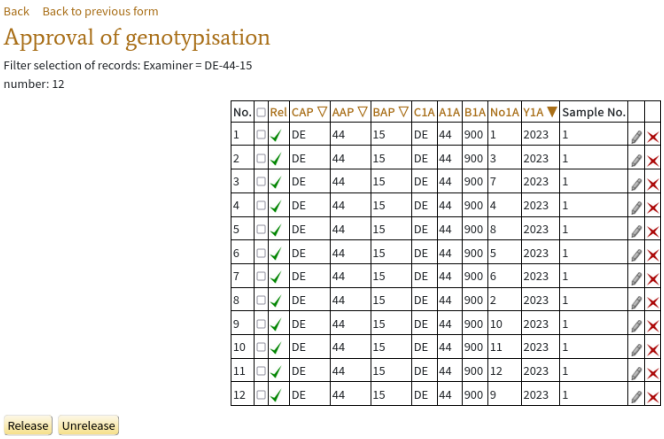
The Breeding Administrator has 2 additional functions in the menu "Breeding and Performance Data" concerning gene applications. The



The function "Genotyping applications" allows you to create, edit, delete and print genotyping applications in your own name. The exact procedure is described below. The "Approval of genotyping" only concerns breeders who have been allowed to apply for genotyping. With this function, in case these breeders have actually requested genotyping, they are released, i.e. confirmed.



First of all, you can filter by year and whether you want to show all applications, only those that have not been released or only those that have already been released.



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Approval of genotypisation

Filter selection of records: Examiner = DE-44-15

number: 12

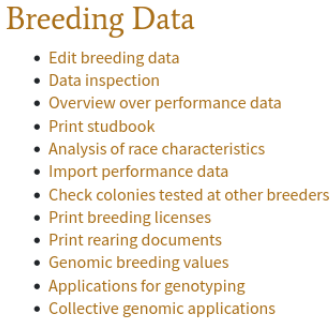
No.	Rel	CAP	AAP	BAP	C1A	A1A	B1A	No1A	Y1A	Sample No.
1	✓	DE	44	15	DE	44	900	1	2023	1
2	✓	DE	44	15	DE	44	900	3	2023	1
3	✓	DE	44	15	DE	44	900	7	2023	1
4	✓	DE	44	15	DE	44	900	4	2023	1
5	✓	DE	44	15	DE	44	900	8	2023	1
6	✓	DE	44	15	DE	44	900	5	2023	1
7	✓	DE	44	15	DE	44	900	6	2023	1
8	✓	DE	44	15	DE	44	900	2	2023	1
9	✓	DE	44	15	DE	44	900	10	2023	1
10	✓	DE	44	15	DE	44	900	11	2023	1
11	✓	DE	44	15	DE	44	900	12	2023	1
12	✓	DE	44	15	DE	44	900	9	2023	1

Release Unrelease

The sampling can be selected individually via the click box or in the block (click box in the title bar) and confirmed by clicking on “Set release”. Conversely, the release can also be cancelled. The gene application can be viewed by clicking on the pencil symbol. The effect of the release for the breeder is described below.

5.14.2 Breeder on individual account

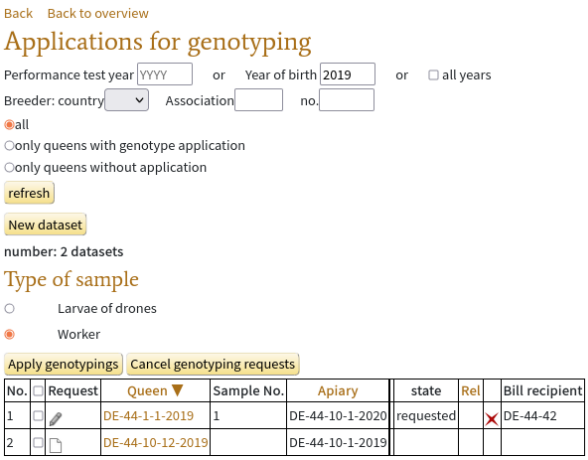
Breeders who have been activated for this by LIB or by the Breeding Administrator have the menu option Genotyping applications in the menu “Breeding & Performance data”.



Breeding Data

- Edit breeding data
- Data inspection
- Overview over performance data
- Print studbook
- Analysis of race characteristics
- Import performance data
- Check colonies tested at other breeders
- Print breeding licenses
- Print rearing documents
- Genomic breeding values
- Applications for genotyping
- Collective genomic applications

It is used for selecting queens for sampling, processing details for applications, deleting applications and finally printing the accompanying letters.



Back Back to overview

Applications for genotyping

Performance test year YYYY or Year of birth 2019 or all years

Breeder: country Association no.

all

only queens with genotype application

only queens without application

refresh

New dataset

number: 2 datasets

Type of sample

Larvae of drones

Worker

Apply genotypings Cancel genotyping requests

No.	Request	Queen	Sample No.	Apiary	state	Rel	Bill recipient
1		DE-44-1-1-2019	1	DE-44-10-1-2020	requested		DE-44-42
2		DE-44-10-12-2019		DE-44-10-1-2019			

First of all, filters for the selection of eligible queens can be found here: the year of testing or the birth year, which can be switched off via “all years”. The list can be restricted to certain breeders, whereby only queens that one has tested oneself are shown here.

After that, the selection is made whether all queens, only queens with an already submitted genotyping request (for editing and deleting gene requests) or only queens without a genotyping request (for new breed submission). The button “update” is used to activate the filters.

Each sample to be genotyped must exist as a data record in the BeeBreed studbook. If you find that this record does not yet exist, there is a button here to create a new record to simplify matters.

Below this is a note on how many queens remain after filtering. The following selection “Type of sample” refers to the quick application for several genotypings in the block. However, some information that is requested in the complete application (such as the number of individuals) is omitted. The button “Apply for genotyping” below converts the samples selected in the table below into gene applications. Gene applications can be cancelled *en bloc in the* same way.

Genotyping can also be done individually by clicking on the “new document” icon in the table below.

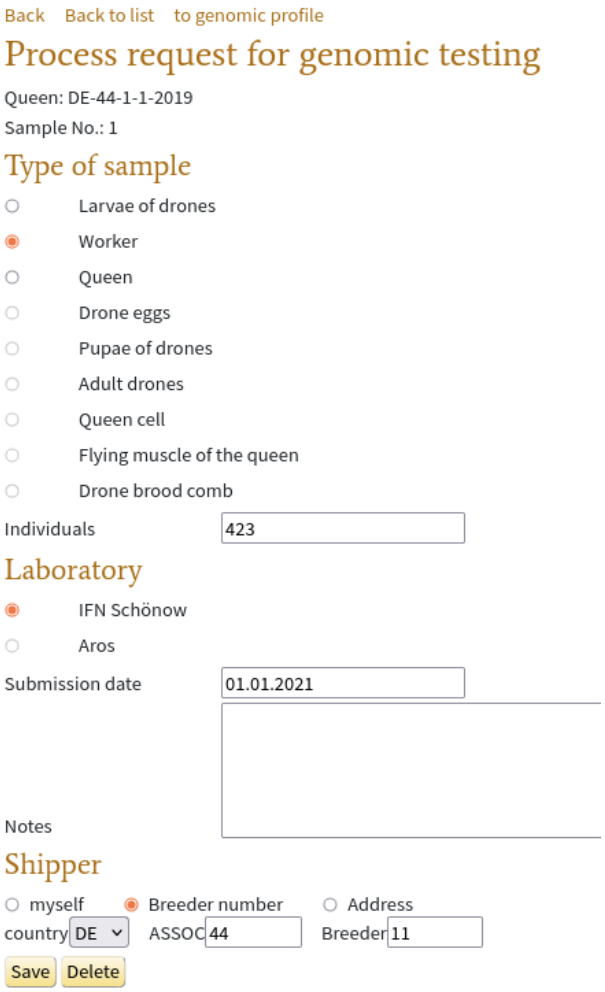
No.		Request	Queen ▼	Sample No.	Apiary	state	Rel		Bill recipient
1	☐		DE-44-1-1-2019	1	DE-44-10-1-2020	requested		✕	DE-44-42
2	☐		DE-44-10-12-2019		DE-44-10-1-2019				

The table of genotpyisation applications contains the following information or references:

- consecutive number
- Selection box for the quick application
- Direct link to submit or edit the request
- Code of the queen and reference to the gene profile
- Sample number
- Code of the test bench
- Print option of the application form
- Status of the sample. A genotyping request where the sample is already registered in the laboratory or has already been processed into a gene profile can no longer be changed.
- Marking of the release by the invoice recipient (FG)
- Possibility of deleting the application
- Identification of the invoice recipient (breeder code)

The creation as well as the editing of genotyping masks leads to the function

5.14.3 Process request for genomic examination



Since sampling could be repeated in the event of a failed sampling, each sample also bears an additional consecutive sample number, but normally this is 1. Then the type of sample is indicated. So far, only drone maggots, workers and queens have been established in the process chain with the laboratory. As a rule, young drone maggots should be genotyped, reliable results can be expected here and the queen is not killed.

Workers can also be processed, but a separate studbook number must be assigned for each individual worker. Whole queens can also be genotyped, whereby they are killed, i.e. this only makes sense for discarded queens. The other options are currently greyed out and cannot be accessed.

The number of individuals refers to the number of drone larvae that together represent the queen genotype. Currently, there is only the process chain with IFN Schönow, Aros refers to the cooperation lab of the predecessor project, but their data is also available in BeeBreed. The submission date and the comment field complete the information.

The selection option Sender allows you to name a breeder in your own name who will send the sample. If the breeder number is selected and entered, the breeder will receive a printout of the application form, which is described below.

When entering the sender's address, only the address is entered in the application form, no changed BeeBreed functions result. In any case, the sender's address refers to the zootechnical role of "sampler", by his signature the sampler confirms the proper sampling and represents the association paying the invoice. In the application form, the LIB is referred to as the invoicee because the laboratory invoices the

LIB for the laboratory costs, which has nothing to do with the LIB invoicing the breeders' associations and breeders.

The application is completed with saving.

5.14.4 Breeder with accounting by the association

As already mentioned, these breeders can apply for genotyping, but they have to wait for the approval of the breeding administrator receiving the invoice before they can print out the application form.

No.		Request	Queen ▼	Sample No.	Apiary	state	Rel		Bill recipient
1			DE-44-10-2-2018	1	DE-44-10-1-2019	requested			DE-44-42

shows the state before the release, after the release it looks like this:

No.		Request	Queen ▼	Sample No.	Apiary		state	Rel		Bill recipient
1			DE-44-1-1-2019	1	DE-44-10-1-2020		requested			DE-44-42

The printer icon has appeared next to the share tick.

5.14.5 Sample submitter

As mentioned, an application for genotyping can also name a breeder who will send the sample, even if he cannot apply for genotyping himself. If such applications are available for a breeder, the menu item "Genotyping applications" can be found under "Breeding & performance data", which leads to a list of printable applications.

Back Back to overview

Applications for genotyping

No.	Applications for genotyping	
1		DE-44-1-1-2019, 1

5.14.6 Genotyping request

The genotyping application of a genetic sample looks like this:

Länderinstitut für Bienenkunde, Friedrich-Engels-Str. 32,
16540 Hohen Neuendorf

IFN Schönow GmbH
Labor für Gendiagnostik
Bernauer Allee 10
16321 Bernau
Germany

Auftraggeber:
Länderinstitut für Bienenkunde
Friedrich-Engels-Str. 32
16540 Hohen Neuendorf
E-Mail: andreas.hoppe@hu-berlin.de

Antrag auf SNP-Genotypisierung für diagnostische Zwecke

Honigbiene DE-44-900-1-2023
Handelspapier gemäß VO (EG) Nr. 1069/2009

Typ der Probe: Arbeiterin (K3)

276 44 900 00001 2023 01

Auftraggeber:
Länderinstitut für Bienenkunde
Friedrich-Engels-Str. 32
16540 Hohen Neuendorf

Probennehmer:
wie Auftraggeber

Rechnungsempfänger:
wie Auftraggeber

Datum / Unterschrift

Mit der Unterschrift werden die Richtigkeit der aufgeführten Angaben bestätigt und die AGBs der IFN Schönow GmbH akzeptiert.

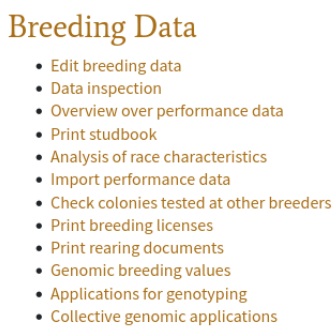
The sender of the sample please sign. Through the process of releasing the application, this signature is legitimised by the contractor.

For this purpose, the samples should be packed in boxes in which the samples are placed in a certain order and allow the laboratory worker to work through one sample after the other.

Usually an Eppendorff tube is used, but other leak-proof containers can also be used. The lid should be labelled with the item number, the side of the jar with either the full studbook number or the colony number (designation for workers).

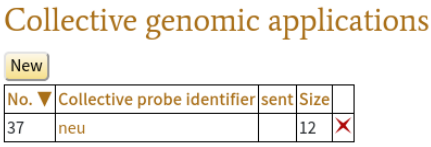
In order to combine samples into a collective application, the samples must first constitute a valid individual application, i. e. with the approval of the invoicee, if applicable.

After selecting the menu application for collective applications



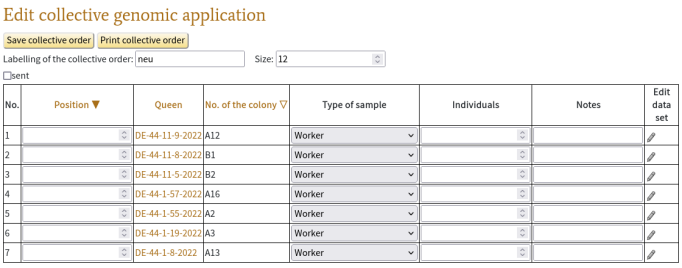
there is initially only an empty list of collective applications:

Click on “new” to create a new collective application with the name “new” which will be named in the next step.

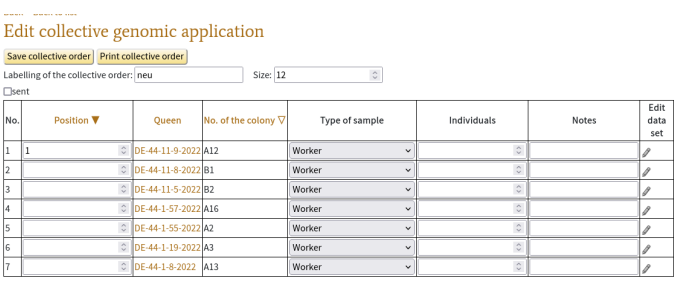


Clicking on the collective request identifier takes you to the collective order editing function:

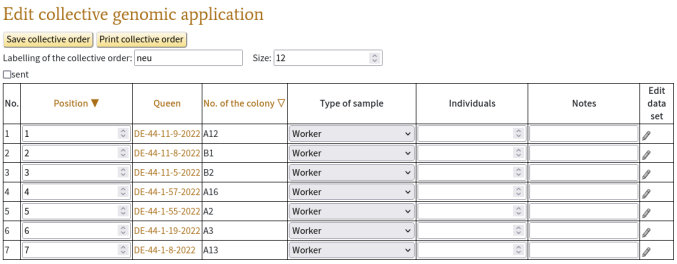
Here you can change the labelling of the collective order, which is also printed on the collective application. It should correspond exactly to the labelling of the box in order to avoid confusion in the laboratory. The size of the box can also be entered here. After the name and greetings have been entered, the collective order should first be saved. The request to select queens for genotyping indicates that valid applications are not yet available. As soon as these are available, the list of valid applications will be shown here. If an expected application does not appear here, it may be due to a lack of approval from the invoice recipient. These applications will be shown in this list until the sample has been processed in the laboratory or until the application has been deleted again.



The application is added to the collective application by entering a position number.



After assigning the position number, do not forget to save it!



Edit collective genomic application

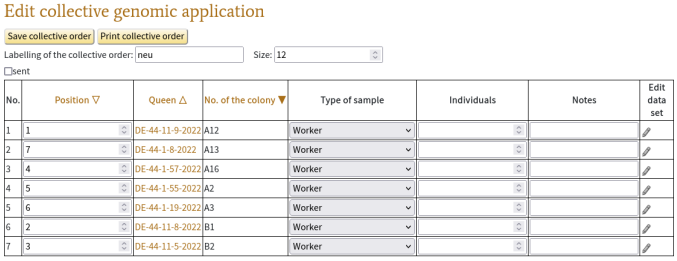
Save collective order | Print collective order

Labelling of the collective order: neu Size: 12

sent

No.	Position ▼	Queen	No. of the colony ▽	Type of sample	Individuals	Notes	Edit data set
1	1	DE-44-11-9-2022	A12	Worker			
2	2	DE-44-11-8-2022	B1	Worker			
3	3	DE-44-11-5-2022	B2	Worker			
4	4	DE-44-1-57-2022	A16	Worker			
5	5	DE-44-1-55-2022	A2	Worker			
6	6	DE-44-1-19-2022	A3	Worker			
7	7	DE-44-1-8-2022	A13	Worker			

The organisation of longer lists is done by sorting by clicking on the heading of position, queen and colony number.



Edit collective genomic application

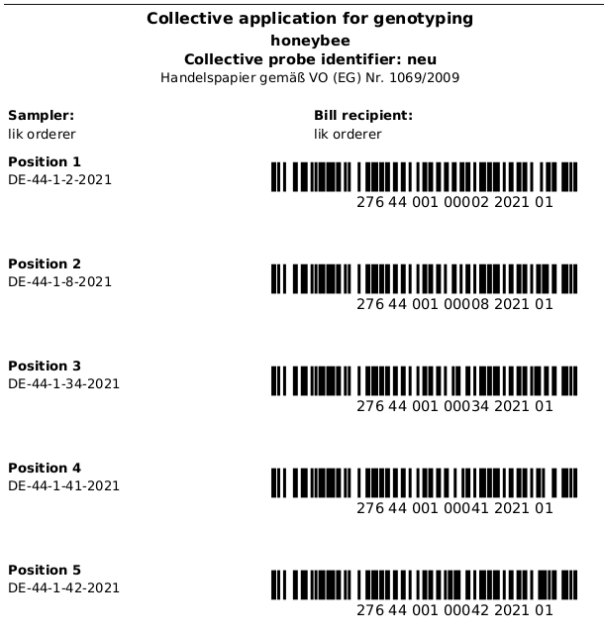
Save collective order | Print collective order

Labelling of the collective order: neu Size: 12

sent

No.	Position ▽	Queen △	No. of the colony ▼	Type of sample	Individuals	Notes	Edit data set
1	1	DE-44-11-9-2022	A12	Worker			
2	7	DE-44-1-8-2022	A13	Worker			
3	4	DE-44-1-57-2022	A16	Worker			
4	5	DE-44-1-55-2022	A2	Worker			
5	6	DE-44-1-19-2022	A3	Worker			
6	2	DE-44-11-8-2022	B1	Worker			
7	3	DE-44-11-5-2022	B2	Worker			

After completion of the box, the collective application can be downloaded and printed out as a PDF via "Print collective order".



Collective application for genotyping
honeybee
Collective probe identifier: neu
Handelspapier gemäß VO (EG) Nr. 1069/2009

Sampler:
lik orderer

Bill recipient:
lik orderer

Position 1
DE-44-1-2-2021
276 44 001 00002 2021 01

Position 2
DE-44-1-8-2021
276 44 001 00008 2021 01

Position 3
DE-44-1-34-2021
276 44 001 00034 2021 01

Position 4
DE-44-1-41-2021
276 44 001 00041 2021 01

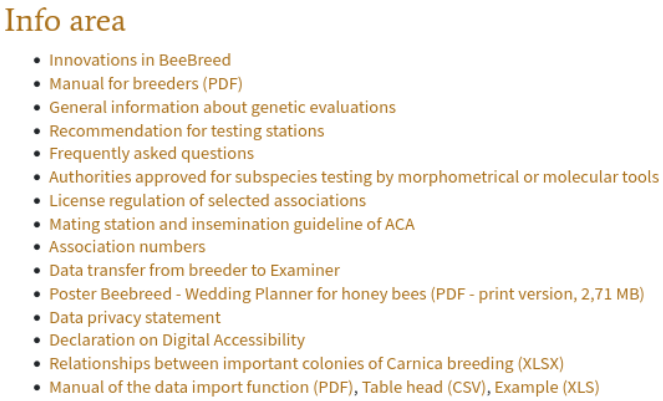
Position 5
DE-44-1-42-2021
276 44 001 00042 2021 01

5.14.7 Collective requests for genotyping

If several samples from one breeder are to be genotyped, it becomes increasingly time-consuming to attach a separate application form to each sample. To simplify this, BeeBreed provides one application form for multiple samples.

6 Info

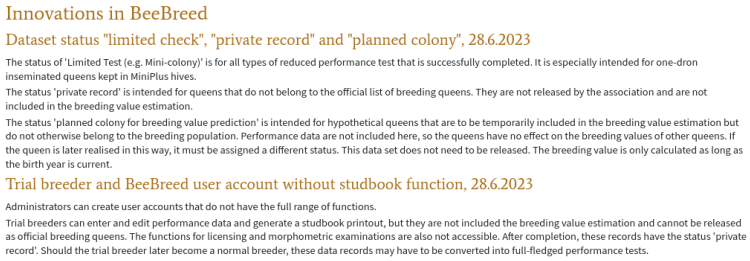
In the info area there is further documentation that is freely accessible to all visitors of the website.



Info area

- Innovations in BeeBreed
- Manual for breeders (PDF)
- General information about genetic evaluations
- Recommendation for testing stations
- Frequently asked questions
- Authorities approved for subspecies testing by morphometrical or molecular tools
- License regulation of selected associations
- Mating station and insemination guideline of ACA
- Association numbers
- Data transfer from breeder to Examiner
- Poster Beebreed - Wedding Planner for honey bees (PDF - print version, 2,71 MB)
- Data privacy statement
- Declaration on Digital Accessibility
- Relationships between important colonies of Carnica breeding (XLSX)
- Manual of the data import function (PDF), Table head (CSV), Example (XLS)

The main place to go if something is not as usual is the list of recent changes under “Innovations in BeeBreed”.



Innovations in BeeBreed

Dataset status "limited check", "private record" and "planned colony", 28.6.2023

The status of 'Limited Test (e.g. Mini-colony)' is for all types of reduced performance test that is successfully completed. It is especially intended for one-dron inseminated queens kept in MiniPlus hives.

The status 'private record' is intended for queens that do not belong to the official list of breeding queens. They are not released by the association and are not included in the breeding value estimation.

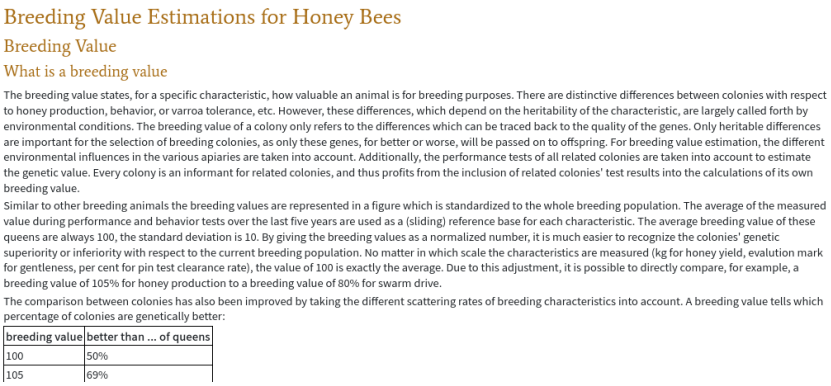
The status 'planned colony for breeding value prediction' is intended for hypothetical queens that are to be temporarily included in the breeding value estimation but do not otherwise belong to the breeding population. Performance data are not included here, so the queens have no effect on the breeding values of other queens. If the queen is later realised in this way, it must be assigned a different status. This data set does not need to be released. The breeding value is only calculated as long as the birth year is current.

Trial breeder and BeeBreed user account without studbook function, 28.6.2023

Administrators can create user accounts that do not have the full range of functions.

Trial breeders can enter and edit performance data and generate a studbook printout, but they are not included the breeding value estimation and cannot be released as official breeding queens. The functions for licensing and morphometric examinations are also not accessible. After completion, these records have the status 'private record'. Should the trial breeder later become a normal breeder, these data records may have to be converted into full-fledged performance tests.

An introductory text can be found under “General Information on Breeding Value Estimation”.



Breeding Value Estimations for Honey Bees

Breeding Value

What is a breeding value

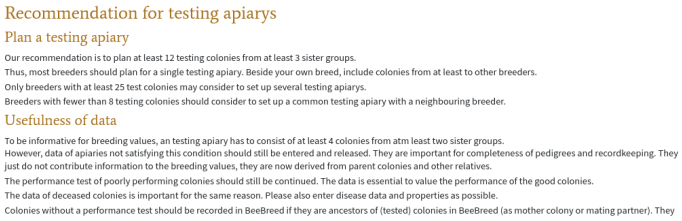
The breeding value states, for a specific characteristic, how valuable an animal is for breeding purposes. There are distinctive differences between colonies with respect to honey production, behavior, or varroa tolerance, etc. However, these differences, which depend on the heritability of the characteristic, are largely called forth by environmental conditions. The breeding value of a colony only refers to the differences which can be traced back to the quality of the genes. Only heritable differences are important for the selection of breeding colonies, as only these genes, for better or worse, will be passed on to offspring. For breeding value estimation, the different environmental influences in the various apiaries are taken into account. Additionally, the performance tests of all related colonies are taken into account to estimate the genetic value. Every colony is an informant for related colonies, and thus profits from the inclusion of related colonies' test results into the calculations of its own breeding value.

Similar to other breeding animals the breeding values are represented in a figure which is standardized to the whole breeding population. The average of the measured value during performance and behavior tests over the last five years are used as a (sliding) reference base for each characteristic. The average breeding value of these queens are always 100, the standard deviation is 10. By giving the breeding values as a normalized number, it is much easier to recognize the colonies' genetic superiority or inferiority with respect to the current breeding population. No matter in which scale the characteristics are measured (kg for honey yield, evalution mark for gentleness, per cent for pin test clearance rate), the value of 100 is exactly the average. Due to this adjustment, it is possible to directly compare, for example, a breeding value of 105% for honey production to a breeding value of 80% for swarm drive.

The comparison between colonies has also been improved by taking the different scattering rates of breeding characteristics into account. A breeding value tells which percentage of colonies are genetically better:

breeding value	better than ... of queens
100	50%
105	69%

Note the information on planning test apiaries with the aim of improving the quality of breeding value estimation.



Recommendation for testing apiarys

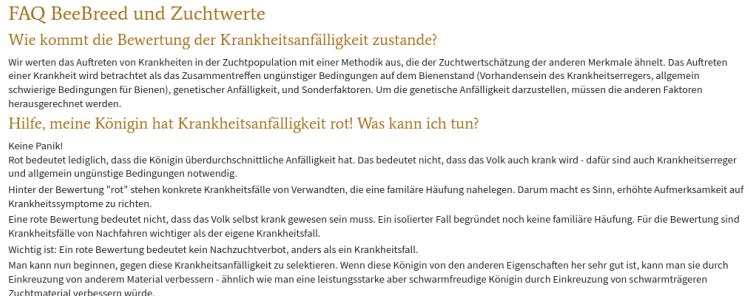
Plan a testing apiary

Our recommendation is to plan at least 12 testing colonies from at least 3 sister groups.
Thus, most breeders should plan for a single testing apiary. Beside your own breed, include colonies from at least to other breeders.
Only breeders with at least 25 test colonies may consider to set up several testing apiarys.
Breeders with fewer than 8 testing colonies should consider to set up a common testing apiary with a neighbouring breeder.

Usefulness of data

To be informative for breeding values, an testing apiary has to consist of at least 4 colonies from atm least two sister groups.
However, data of apiaries not satisfying this condition should still be entered and released. They are important for completeness of pedigrees and recordkeeping. They just do not contribute information to the breeding values, they are now derived from parent colonies and other relatives.
The performance test of poorly performing colonies should still be continued. The data is essential to value the performance of the good colonies.
The data of deceased colonies is important for the same reason. Please also enter disease data and properties as possible.
Colonies without a performance test should be recorded in BeeBreed if they are ancestors of (tested) colonies in BeeBreed (as mother colony or mating partner). They

Further, constantly updated questions and answers about BeeBreed can be found in “FAQ - frequently asked questions and answers”.



FAQ BeeBreed und Zuchtwerte

Wie kommt die Bewertung der Krankheitsanfälligkeit zustande?

Wir werten das Auftreten von Krankheiten in der Zuchtpopulation mit einer Methodik aus, die der Zuchtwertschätzung der anderen Merkmale ähnelt. Das Auftreten einer Krankheit wird betrachtet als das Zusammentreffen ungünstiger Bedingungen auf dem Bienenstand (Vorhandensein des Krankheitserregers, allgemein schwierige Bedingungen für Bienen), genetischer Anfälligkeit, und Sonderfaktoren. Um die genetische Anfälligkeit darzustellen, müssen die anderen Faktoren herausgerechnet werden.

Hilfe, meine Königin hat Krankheitsanfälligkeit rot! Was kann ich tun?

Keine Panik!
Rot bedeutet lediglich, dass die Königin überdurchschnittliche Anfälligkeit hat. Das bedeutet nicht, dass das Volk auch krank wird - dafür sind auch Krankheitserreger und allgemein ungünstige Bedingungen notwendig.
Hinter der Bewertung "rot" stehen konkrete Krankheitsfälle von Verwandten, die eine familiäre Häufung nahelegen. Darum macht es Sinn, erhöhte Aufmerksamkeit auf Krankheitssymptome zu richten.
Eine rote Bewertung bedeutet nicht, dass das Volk selbst krank gewesen sein muss. Ein isolierter Fall begründet noch keine familiäre Häufung. Für die Bewertung sind Krankheitsfälle von Nachfahren wichtiger als der eigene Krankheitsfall.
Wichtig ist: Ein rote Bewertung bedeutet kein Nachzuchtverbot, anders als ein Krankheitsfall.
Man kann nun beginnen, gegen diese Krankheitsanfälligkeit zu selektieren. Wenn diese Königin von den anderen Eigenschaften her sehr gut ist, kann man sie durch Einkreuzung von anderem Material verbessern - ähnlich wie man eine leistungsstarke aber schwarmfreudige Königin durch Einkreuzung von schwarmträgeren Zuchtmaterial verbessern würde.

There are the D.I.B. and ACA body guidelines.

Breeding Class Requirements

According to the breeding guidelines of the German Beekeepers Association, the license for a breeding queen is issued as

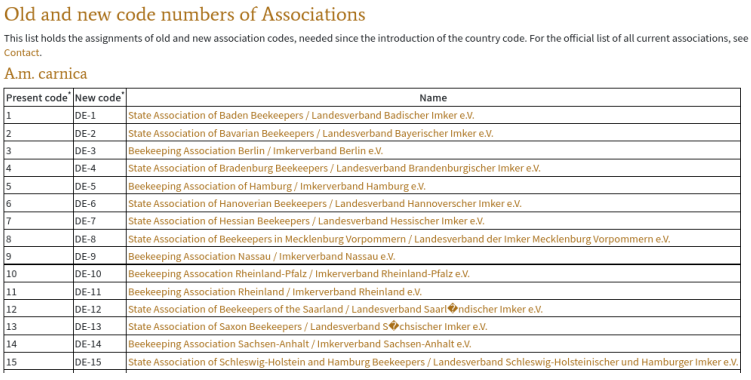
Class Av:

- 2 Varroa criteria assessed
- Varroa index over 100
- 3 customary breeding values over 100
- 2 customary breeding values over 95
- 6 sibling colonies or at least 0.35 certainty of breeding values honey yield
- two ancestor generations have been licensed or the performance testing can be documented
- Physical features of workers and drones are typical for the breed

Class A:

- All 4 customary breeding values are over 100
- 6 sibling colonies or at least 0.35 certainty of breeding values honey yield
- two ancestor generations have been licensed or the performance testing can be documented
- Physical features of workers and drones are typical for the breed

For the introduction of the country code, this list of associations with code numbers before/after was created.



Old and new code numbers of Associations

This list holds the assignments of old and new association codes, needed since the introduction of the country code. For the official list of all current associations, see Contact.

A.m. carnica

Present code*	New code*	Name
1	DE-1	State Association of Baden Beekeepers / Landesverband Badischer Imker e.V.
2	DE-2	State Association of Bavarian Beekeepers / Landesverband Bayerischer Imker e.V.
3	DE-3	Beekeeping Association Berlin / Imkerverband Berlin e.V.
4	DE-4	State Association of Bradenburg Beekeepers / Landesverband Brandenburgischer Imker e.V.
5	DE-5	Beekeeping Association of Hamburg / Imkerverband Hamburg e.V.
6	DE-6	State Association of Hanoverian Beekeepers / Landesverband Hannoverscher Imker e.V.
7	DE-7	State Association of Hessian Beekeepers / Landesverband Hessischer Imker e.V.
8	DE-8	State Association of Beekeepers in Mecklenburg Vorpommern / Landesverband der Imker Mecklenburg Vorpommern e.V.
9	DE-9	Beekeeping Association Nassau / Imkerverband Nassau e.V.
10	DE-10	Beekeeping Association Rheinland-Pfalz / Imkerverband Rheinland-Pfalz e.V.
11	DE-11	Beekeeping Association Rheinland / Imkerverband Rheinland e.V.
12	DE-12	State Association of Beekeepers of the Saarland / Landesverband Saarl�ndischer Imker e.V.
13	DE-13	State Association of Saxon Beekeepers / Landesverband S�chsischer Imker e.V.
14	DE-14	Beekeeping Association Sachsen-Anhalt / Imkerverband Sachsen-Anhalt e.V.
15	DE-15	State Association of Schleswig-Holstein and Hamburg Beekeepers / Landesverband Schleswig-Holsteinischer und Hamburger Imker e.V.

7 Administrative functions

Administrative Functions

- Administration of own user account

Breeders have the possibility to edit their own user data, but only if the responsible umpire has enabled this. The background to this restriction is that BeeBreed, as mentioned above, is a service for the associations, which decide on the input rights of the individual breeders themselves.

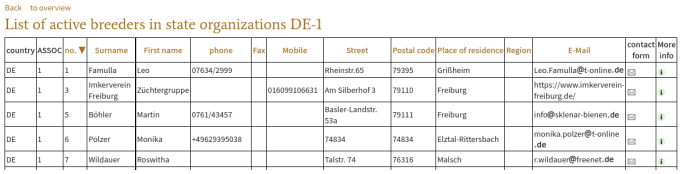
In the form, name, address and other personal information can be changed. Also note the options below as to which of this personal information should be displayed publicly.

8 Contacts

Under Contacts you can find the list of all breeders, organised by associations.

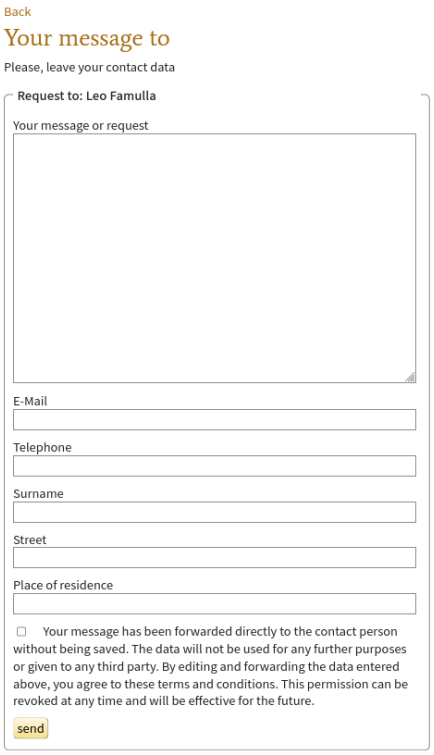
Association			Breeder	breeding administrators								
country	ASSOC	Surname		no.	Surname	First name	phone	Fax	Mobile	Street	Postal code	Place of residence
DE	1	Landesverband Badischer Imker e.V.		999	Famulla	Leo	07634/2999			Rheinstr. 65	79395	Grißheim
DE	2	Landesverband Bayerischer Imker e.V.		114	Günthner	Theo	09938 597	09938 950190		Haidstr. 2 Nindorf	94533	Buchhofen
				990	Günthner	Theo	09938 597			Nindorf, Haidstr. 2	94533	Buchhofen
				994	Wintersperger	Ruediger	09564/4511			Hildburghaeuser Str. 46	96476	Bad Rodach
DE	3	Imkerverband Berlin e.V.		999	Timm	Gutrun						

After clicking on Contacts, the list of all Breeding Administrators of the associations can be found first. By clicking on the person symbol, one then gets to the list of all (active) breeders of the association.

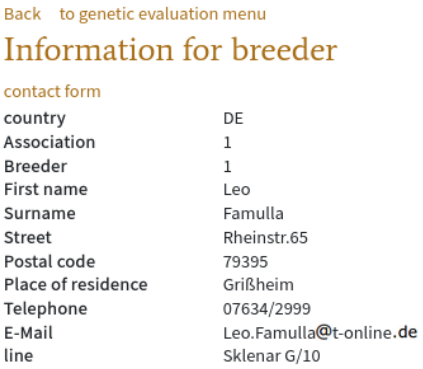


country	ASSOC	no.	Surname	First name	phone	Fax	Mobile	Street	Postal code	Place of residence	Region	E-Mail	contact form	More info
DE	1	1	Famulla	Leo	07634/2999			Rheinstr.65	79395	Grißheim		Leo.Famulla@t-online.de		
DE	1	3	Imkerverein Freiburg	Züchtergruppe			016099106631	Am Silberhof 3	79110	Freiburg		https://www.imkerverein-freiburg.de/		
DE	1	5	Böhler	Martin	0761/43457			Basler-Landstr. 53a	79111	Freiburg		info@sklenar-bienen.de		
DE	1	6	Polzer	Monika	+49629395038			74834	74834	Elztal-Rittersbach		monika.polzer@t-online.de		
DE	1	7	Wildauer	Roswitha				Talstr. 74	76316	Malsch		r.wildauer@freenet.de		

The letter symbol on the far right takes you to the contact request screen.



This contact request also works if the email address is not displayed publicly.



The information symbol leads to further details about the breeder.

9 Other elements of the website

9.1 Cookies

When you log in for the first time under your breeder ID, you will be asked to confirm the setting of a cookie. This cookie cannot be rejected because it ensures that you can only access your own temporary data during your login session. Other cookies, such as for so-called tracking, are not stored.

The cookie is stored for a long time so that a reconfirmation is only necessary if the cookies have been deleted or you log on to another computer or browser.

9.2 Header - above the page

9.2.1 BeeBreed logo

Click here to go directly to the start page, the page with the bees of the individual breeds.

9.3 Log out

Clicking on this button logs you out and gives you the opportunity to log in again. This is useful if you have several user accounts. The logout function also deletes session information and is an option for a clean start if there are unexplained problems in the BeeBreed website, which are possible due to conflicting internal data or network problems.

9.3.1 Logo of the LIB

Click here to go to the Institute's homepage.

9.4 Breadcrumbs - website hierarchy

The so-called breadcrumbs are found under the main menu and above the title. They contain direct links to the higher-level pages in the website hierarchy.

9.5 Footer - below the page

9.5.1 Contact

Here you will find a contact option to the BeeBreed administrator at the Länderinstitut für Bienenkunde Hohen Neuendorf e.V. (LIB), for quick access in case of problems.

9.5.2 Imprint

Here you will find information on the operator of the website, the Länderinstitut für Bienenkunde Hohen Neuendorf e.V. (LIB).

9.5.3 Privacy policy

Here you can find the privacy policy of the Länderinstitut für Bienenkunde Hohen Neuendorf e.V. regarding the BeeBreed service.

9.5.4 Accessibility

Here you can find the statement on digital accessibility.

9.5.5 Restart page

This function deletes all session information and the cookie described below and is a way for a clean start in case there are unexplained problems in the BeeBreed website, possible due to conflicting internal data or network problems.