Quality assurance at Feldsaaten Freudenberger

www.freudenberger.net

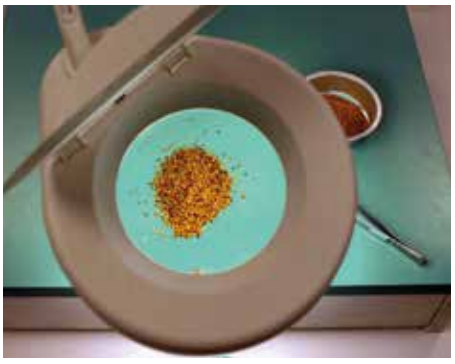
Quality assurance is a top priority at Freudenberger, since only seeds of outstanding quality produce a good harvest.

Feldsaaten Freudenberger gives the highest importance to ensuring that only the best quality seeds are delivered. A seamless quality management system is absolutely essential in order to guarantee consistently high quality. Quality assurance begins as soon as goods are received. Samples are collected from every incoming delivery batch using the ISTA sampler, certified by the Agricultural Chambers of North Rhine-Westphalia, and are tested in the in-house laboratory and ISTA testing stations. The parameters to be checked are mainly germination capacity, technical purity, dockage, humidity and thousand grain weight. Every year, around 5,000 seed specimens are tested and controlled in the in-house laboratories at Freudenberger. An additional 5,000 specimens are tested in external laboratories in Germany and abroad, which work in close cooperation with Freudenberger. These external laboratories include, among others, the labs of individual agricultural chambers and seed testing stations of the respective provincial departments. All tests are performed conscientiously and in accordance with the latest methodology. The current regulations for the all seed testing worldwide precisely define which seeds have to be tested and how. The ISTA rules for testing play a very special and important role in this regard.

Environmental chamber with germination testing

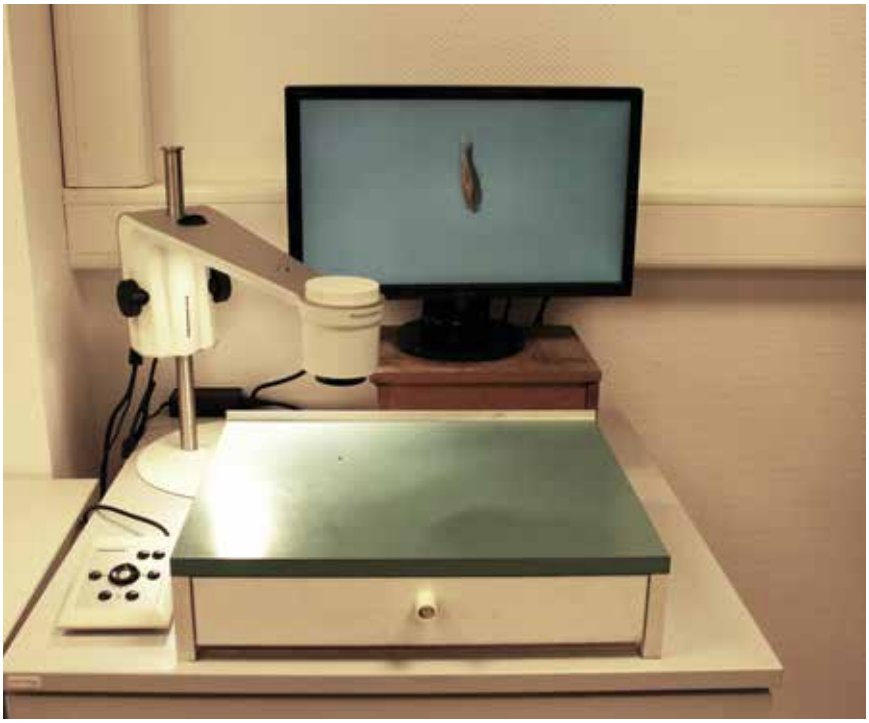
Purity and dockage

The sample size tested for determining purity and dockage at Freudenberger generally exceeds the prescribed standards. This way, we ensure that even the smallest of impurities are detected.



Workstation with lighting and magnifying lens

Microscope camera



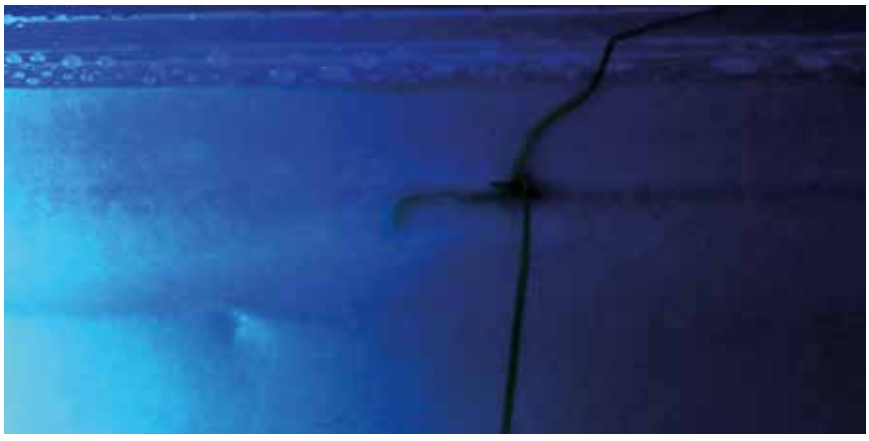
SeedBlower

The test seeds are examined by well-trained hands using forceps. Good lighting and a magnifying lens serve as ideal tools. Foreign matter is separated out and the species and/or genera are identified.

A microscope camera is used to get a better idea of the difficult-to-identify seeds. This device allows a highly magnified view of the grains. In addition, the images can be directly captured, allowing creation of digital records. Since the seeds are bought from all over the world, sometimes it is not possible to identify foreign seeds. The digital images are used to consult with international experts and determine the species or genus. In some cases, the foreign matter looks very similar to the desired seed. More elaborate methods, such as fluorescence microscopy, are then required for precise identification. In addition to grains, seedlings such as red fescue and sheep's fescue can also be identified and distinguished using this method.

The decision about what to do next with the seeds depends on whether dockage is found during these tests. Either a complaint is raised and the seed is sent back to the supplier, or it is thoroughly cleaned. Alternately, it may be used for another purpose (e.g. as bird feed). The test is also important for the cleaning process. The cleaning machine settings can always be checked based on the results. This is the only way to ensure that the cleaning results in a high-quality seed batch. The comprehensive analysis mentioned above helps to ensure consistent compliance with the regulations in place in each recipient countries. These regulations can vary greatly from country to country. Certain countries designate some plants as quarantine weeds. If a batch contains seeds belonging to these weeds, the entire batch is unmarketable. This means that thorough and careful inspections are absolute necessary.

Seed impurities in the form of foreign matter of any kind are checked and sorted out manually. Sorting out empty husks presents a special challenge because it is often extremely difficult to visually distinguish them from the entire batch of seeds. The process is simplified using the SeedBlower, a technical device in which air currents remove objects with specific weight lower than that of the actual product. The seed sample is placed in a glass tube through which air is blown from below. While the empty husks are thrown upwards, the seeds remain at the bottom of the glass tube. This makes it possible to achieve a quick and effective differentiation.



Fluorescence microscopy in red fescue

Grass undergoing germination testing

Germination capacity

Germination capacity is the most important quality characteristic of seeds. Only material that germinates can provide farmers with the desired results. No measures can correct for seeds that either do not germinate at all or have poor germination.

Control unit of an environmental chamber

Six experienced agricultural and biological technicians work in our in-house laboratory to ensure that all requirements are strictly complied with and carried out. This laboratory was expanded in 2018 to keep up with the constantly increasing sample volumes in recent years. Two special walk-in environmental chambers facilitate automatic regulation of temperature and lighting. Both chambers have a total shelf space of 40 m^2, meaning that there is sufficient space for a large number of parallel tests.

Parameters such as day and night temperature, air circulation and illumination duration can be precisely controlled with the help of specific programmes. This way, species-specific requirements can be fulfilled during germination tests, achieving precise results. At the end of a germination test, the results are evaluated and an appropriate test report is issued. In addition to the newly received seed batches, the already stored batches are also tested in order to guarantee a consistently high quality.

Precision scales

Thousand grain weight

The thousand grain weight plays a key role in seed quality. For every seed there is a desired range of thousand grain weight. If the grains are too small, then they may lack energy. If the weight is too much, the number of seeds in proportion to the field area could be extremely low at the time of sowing. This point is particularly important in the context of greening. In greening, mixtures are based on seed percentages and not weight proportion. For this reason, the thousand grain weight is determined for all incoming batches. This is the only way to ensure that the respective seed percentages are correctly calculated in mixtures.

Thousand grain weight can be determined either manually or using a seed counter. Both methods involve counting 1,000 seeds are counted determining their weight using calibrated precision scales. Data obtained in this manner is captured and guarantees consistently high quality mixture compositions.

Seed counter

Moisture content

Seed moisture content is also regulated and is subject to precise requirements. If the moisture content of the seed is too high, it can negatively impact parameters such as germination capacity and shelf life. Especially in the case of coated seed, it is important to continuously monitor moisture content and to optimally adjust the drying process of freshly produced coated seed. This is because only seeds with optimum moisture content have the required properties.

To determine seed moisture content, a drying chamber is used that can remove all moisture from the seeds. The seed moisture is then calculated by comparing the weight before and after drying.

Drying cabinet

Further tests

In addition to the above-mentioned tests, further analyses are also carried out if required. For instance, mixture compositions are analysed and the percentage of the respective component variety is determined. This helps to examine whether the mixture has the same composition as declared. Diseases and parasites are another important factor. Some of this damage can be detected on the seed itself and specific countermeasures can then be taken. For instance, if an infestation by corn weevil is detected, it can be controlled by fumigation. A special sealed chamber is available for fumigation with hydrogen phosphide. Storage pests can thus be effectively destroyed.

Quality control in practice

In addition to seed testing in the laboratory, the actual plant growth is also regularly checked and monitored. Experiments are carried out under laboratory conditions and in field trials for this purpose. This ensures that the plants growing from the seeds exhibit the required characteristics such as vitality and competitiveness. Although growth takes place under controlled conditions in the lab, the test gardens use conditions identical to those that will be present later on the farm. This helps to check whether the seed fulfils the expectations created in the indoor experiments in practice as well. The experiments and tests mentioned are just a part of the measures taken to ensure a high quality standard. Quality management starts right on the field where the seed is produced. Regular field inspections and sampling guarantee healthy growth and ensure that the harvest occurs at the right time. Once the seed has been approved, it is stored under the best possible conditions to maintain high germination capacity. The storage times are kept short depending on the individual variety and the seed stores are shipped as soon as possible. This allows the farmer to receive a top-quality product that is the ideal basis for a successful and profitable harvest.

Growing experiment on the test field

Growing experiment in laboratory