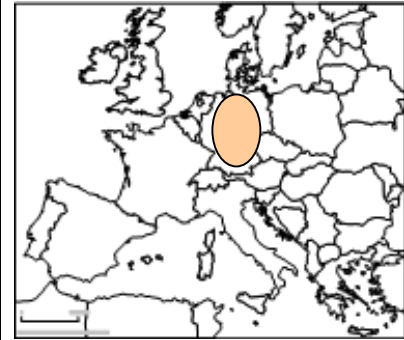


Description of the existing breeding initiatives in Europe on landraces, conservation varieties and amateur varieties

Kultursaat

Vegetables– Germany



The Initiative

In 1985 a number of biodynamic vegetable producers, who were involved in multiplication and breeding of open pollinated varieties, set up the "Initiativkreis für Gemüsesaatgut aus biologisch-dynamischen Anbau" (The Initiativecircle for vegetable seeds from biodynamic farming). Within this informal platform they exchanged experiences and discussed issues related to organic seed multiplication and breeding. During the years they realised that, to avoid conflicts between the time dedicated to professional vegetable production and time dedicated to breeding, the vegetable producers needed some economic compensation for their breeder activities. To promote their breeding work, raise funds and coordinate their breeding activities, members of the "Initiativkreis" established the (non-profit) association Kultursaat in 1994.

At present eighteen breeders are working by order of Kultursaat. These breeders are located all over Germany, one breeder is situated in the Netherlands and two others are based in the north of Switzerland. Together they cover all major vegetable crops, such as e.g. carrot, cabbage, lettuce, tomato, sweet pepper, pumpkin, cucumber, onion, leek, beans and beetroot. The crop choice of each breeder depends on his individual interests and affinity with the crop. But Kultursaat also actively stimulates gardeners to pick up breeding of crops that are not included in its activities yet.

The breeders are financed through Kultursaat for their breeding activities. To apply for funding, each breeder has to submit a project proposal once a year that is evaluated by the executive board, a committee that consists of five of the members, mainly breeders themselves. The association also handles the official procedures for the registration and application for breeders' rights of new varieties. When breeders' rights are granted, the individual breeders transfer these rights to the Kultursaat association. Another important field is the exchange of knowledge and experiences between breeders. This is realised by bi-annual meetings. Furthermore, new breeders are personally coached by more experienced members and the more experienced breeders also can ask for personal coaching by one of the other members. In 2007 Kultursaat also started a genebank for the collection and *in situ* maintenance of open pollinated varieties (co-funded project by the German Federal Program for organic farming).

Besides practical breeding and seed multiplication, the members are also active in developing new plant evaluation and breeding methods that are inspired by anthroposophy, such as peripheral effects (e.g. biodynamic preparations, planetary configuration, sound) on appearance of plants and breeding and picture forming methods (e.g. copper chloride crystallization and rising pictures) to evaluate quality.

For seed production and marketing the "Initiativkreis" has established an independent seed company: it started in 1989 under the name "Allerleirauh" and developed in 2001 in Bingenheimer Saatgut AG. This company contracts organic farmers to multiply the varieties that were bred by the breeders of Kultursaat and other open pollinated vegetable varieties that are interesting for organic farmers. The majority of the about hundred seed growers are also member of the "Initiativkreis".

Bingenheimer Saatgut AG is owned by shareholders, but shares are not freely negotiable. The shares are only issued to named persons or institutes that are known by the others ("vinkulierte Namensaktien"). Among the shareholders are the Kultursaat breeders and seed producers. Bingenheimer Saatgut AG pays license fees to Kultursaat association for the multiplication of the varieties of which Kultursaat has obtained property rights (s.a.).

The income through license fees has increased over the last years, but main funding comes from private foundations. One of the important donors is the Zukunftsstiftung Landwirtschaft, a private fund that has been established specifically for long term support of organic seed and breeding initiatives. In recent years they also are supported through projects of the German government and agreements with organic retailers.

Membership of Kultursaat is open to anybody who pays the membership fee. In 2007 in total 248 persons were members; besides the eighteen breeders also producers, hobbygardeners, traders and consumers. The organization employs three persons and is lead by an executive board that consists of a delegation of the members.

Organic vegetable production

All breeders are biodynamic, but the varieties are aimed at all organic growers in Western Europe and so they do not exclusively target a specific cropping system. They do aim at varieties that are adapted to specific regions and agro-ecological conditions. This is realised by having the network of eighteen breeding projects in different regions with different climates and soils.

All breeders are either commercial organic vegetable producers themselves or have their breeding on a commercial biodynamic farm. When breeders do not manage the commercial vegetable production themselves, the commercial farmer also takes part in the evaluation of the selections. This is to make sure that varieties are developed within the agricultural practice and will comply with the requirements of organic farmers. The types of farms the breeders work vary from less than 5 ha to over 100 ha.

Although they do not target a specific organic cropping system, they aim at developing varieties with superior sensory (particularly taste) and nutritional quality. Therefore the varieties are specifically suitable for farmers and market channels with a special interest in the production of high quality food.

Motivation for involvement in breeding

The initiative started out of concern with the disappearance of open pollinated vegetable varieties as well as the lab-based techniques that are used in modern plant breeding. Commercial seed companies are replacing open pollinated varieties by hybrids that cannot be multiplied by the farmers and gardeners themselves. Nowadays, open pollinated varieties of the major vegetable crops are scarce. Furthermore, a number of techniques, such as protoplast fusion to

obtain cytoplasmic male sterility (CMS), that are used in so-called modern plant breeding are not in accordance with the principles of organic farming. Therefore a number of organic vegetable producers decided to maintain and multiply open pollinated varieties that were interesting for organic farming and this evolved in also improving the varieties by breeding.

Another important aspect is that members of Kultursaat consider breeding and varieties as a part of our cultural heritage and they consider the maintenance of this heritage as a task of mankind.

Breeding and seed multiplication

The most important aim is to develop "new" varieties that contribute to human nutrition. For Kultursaat a vegetable should contribute to the consumers' physical well being and spiritual development. As these aspects of food quality are exceedingly difficult to be identified by measuring the contents of nutritious substances (e.g. vitamins, proteins), they apply methods to determine quality such as the earlier mentioned picture forming methods. A good taste is a vital indicator for nutritional quality and this receives the major emphasis in all breeding programmes. Furthermore, in Kultursaat's quality concept, a distinctive ripening phase and a harmonious balance between vegetative growth and ripening of the product is important to obtain. Besides this, breeders also look at adaptation to organic growing conditions (good rooting ability, efficient in uptake of soil nutrients, tolerance to diseases and abiotic stresses).

Starting point for the breeding are open pollinated varieties that were available on the commercial market, collected from organic producers and obtained through genebanks. Currently, they are also setting up their own genebank. This is because commercial open pollinated varieties are rapidly disappearing. They find it important that varieties are maintained in situ, so that these can co-evolve with agricultural practice. In genebanks seed maintenance is isolated from practical agriculture and done with smallish plots instead of ("authentic" and) broad fields that are common in practice.

They distinguish maintenance breeding ("EHZ") and "new" breeding ("Neu-Züchtung"). *Maintenance* breeding is aimed at conserving the open pollinated varieties true to type. If open pollinated varieties are not maintained with care these degenerate and become less productive and loose quality. For maintenance breeding plants that are typical for the variety, are selected.

For breeding *new* varieties the methodology depends on the crop and its reproductive system (cross pollinator, self pollinator). In all crops, but especially in the cross pollinating crops (cabbages, carrots) they have obtained major success by positive mass selection, with a strong focus on taste. Also important for the success is the fact that they work at commercial farms, where open pollinated varieties are grown in large fields. So, as a result there are many plants to select from and this increases the chance of finding new plant types with positive traits, within an existing variety.

In self pollinating crops, such as tomato, diversity within open pollinated varieties is much smaller. One option they have successfully pursued is to sow hybrids and select among the off spring. They also make deliberate crosses to create variation to select from.

Varieties are registered through the regular official procedures at the German Bundessortenamt (as a rule) or any corresponding agency.

Achievements and Future Challenges

The success of initiative can be measured by the number of varieties they have produced: in 2007 42 varieties of 16 different vegetable crops were officially registered and applications for the registration of 10 more varieties were in progress.

To promote the use of the varieties and increase income for breeding, together with seed company Bingenheimer Saatgut AG and retailers they are developing the marketing concept: "Vegetables with Character" ("Gemüse mit Charakter"). Most Kultursaat varieties have a distinctive and superior taste than conventional varieties. However, so far in Western Europe, vegetable consumers are not aware of the name of the variety. For eleven of their varieties they have developed promotion material, which includes posters, flyers with information on the variety and a description of its specific taste and labels for the crates. The varieties are grown by 50 producers and sold in Germany through 12 organic retailers. Generally producers receive a better price from retailers. Fabricators as vegetable juice producers use Kultursaat varieties because of the better taste and merchandise their products using the varieties' names. Main obstacle is that production of seeds and vegetables lags behind consumer demand. In 2005 the concept has gained an award at the yearly international organic trade fair BioFach (in Nuremberg, Germany).

Contact

Kultursaat e.V. – Verein für Züchtungsforschung und Kulturpflanzenerhaltung auf biologisch-dynamischer Grundlage
Schlossstr. 22, 61209 Echzell, Germany
E-mail: kontakt@kultursaat.org

Further information

Websites

www.kultursaat.org

[Kultursaat e.V., non-profit association]

www.oekoseeds.de

[Bingenheimer Saatgut AG – Ökologische Saaten, seed company]

Literature

Fleck, M, 2007. Motivation für biologisch-dynamische Gemüsezüchtung. Katalog Bingenheimer Saatgut AG – Ökologische Saaten 2008: 65-66

Heinze, K, 2007. Sorten mit Charakter: Profil fürs Gemüseregal. BioHandel (Juni 2007):16-19

Heinze, T, 2006. Für eine Kultur des ökologischen Landbaus. Ökologie & Landbau 138(2/2006): 29-31

Kultursaat. Biologisch-Dynamische Züchtung: „Wir züchten nicht für uns selbst, sondern für zukünftige Generationen!“ Kultursaat, Bad Nauheim, 22 pp.

Kultursaat, 2004. Biologisch-Dynamische Gemüsezüchtung. Gemüse mit Charakter. Kultursaat, Echzell, 12 pp.