

Seed in the home garden and in agriculture

Open-pollinated, hybrids, genetic engineering and what may be replanted

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Abstract

Whether the same variety can be grown again from one's own harvest depends on biology; whether the seed may be sown again or passed on depends on the law. The two often diverge. This paper sets twelve seed types side by side, from the open-pollinated line variety to the plant obtained by new genomic techniques, and classifies for each the biological behaviour on replanting, the legal position and the admissibility in organic farming, and it explains packet information, label colours and the rules for organic seed in Austria. It is based on the data layer `saatgutarten.json` and papers P03 and P10; the Seed Compass tool implements the classification as a packet check.

1. Two worlds, two sets of requirements

Home garden and agriculture use the same species but require different things of seed.

	Home garden, private	Agriculture, commercial vegetable growing
Priority	taste, diversity, long harvest, adaptation to the site	yield, uniformity, simultaneous ripening, suitability for machinery
Farm-saved seed	desired, often the purpose	possible, but bound to plant variety rights and the farm-saved seed fee
Legal framework	private, non-commercial sphere	variety registration, certified seed, certification, inspection body in organic farming

What is a gain in the garden, such as staggered ripening, is a cost factor on a holding with machine harvesting and standard sizes. Hybrids are therefore widespread in commercial cultivation but make little sense in the home garden with its own seed saving. How large the share of hybrid seed in the market is cannot be quantified reliably with the sources of this strand; the paper therefore gives no percentage. On concentration in the seed market see P17.

2. The seed types individually

The suitability values for home garden, agriculture and conservation (0 unsuitable to 3 very suitable) are classifications of the strand, not measured values. Figure 11 ‘Seed types compared’ presents them graphically.

2.1 Open-pollinated varieties

Line variety. Largely homozygous line of a selfer, such as wheat, barley, tomato, bean or pea. From one's own harvest, the plant typical of the variety grows again; the diversity within the variety requires more than a few plants (P14). Replanting is free as long as the variety is not protected.

Population variety. Open-flowering variety of an outcrosser, such as rye, maize, cabbage, carrot or squash. It remains true to type if isolation distance and minimum plant number are observed; otherwise other varieties cross in, or the population narrows. Replanting is free as long as the variety is not protected; for protected varieties of listed species, the farmers' privilege applies against remuneration.

Landrace. Locally adapted, heterogeneous variety without formal breeding, arising from farmer selection. Replanting is its form of conservation and is free; for marketing, the conservation variety route serves, in future the exceptions of the new regulation on plant reproductive material (P03).

Registered conservation variety. Landrace or regionally adapted variety with simplified registration under Directives 2008/62/EC and 2009/145/EC. Biologically it behaves like a landrace or population variety. Replanting is free, marketing is limited to a quantity ceiling and as a rule to the region of origin.

Variety with no intrinsic value for commercial crop production ('amateur variety'). Vegetable variety for growing under particular conditions, above all for home gardens, with simplified registration and in small packets. Mostly open-pollinated; replanting is free.

Organic heterogeneous material. Deliberately diverse plant grouping, legally not a variety, admissible since 2022 under Regulation (EU) 2018/848 and only organically produced. It is not registered but notified, and bears the label 'organic heterogeneous material'. Replanting is free, preserves the diversity and at the same time shifts it; adaptation to the site is intended.

2.2 Varieties with restricted replanting

Synthetic variety. Produced from the open flowering of defined parental components, for instance in forage grasses and clover. Replanting shifts the composition over the generations. Under Community plant variety rights, the farmers' privilege under Art. 14(1) of Regulation (EC) No 2100/94 covers only varieties that are neither hybrids nor synthetic varieties (see Limits).

Clonal variety. Vegetatively propagated, such as potato, garlic, fruit and vine. Propagation is true to variety, but diseases travel with the planting material. For protected varieties the holder's consent is needed; potato falls under the farmers' privilege against remuneration.

F1 hybrid. Cross of two inbred lines, uniform and high-yielding through the heterosis effect. Replanting segregates in the F2, the characteristics of the variety are lost; the seed must be bought anew every year. The parental lines remain with the breeder; legally, according to the data layer, the F1 is excluded from the farmers' privilege. Under the EU organic regulation it is admissible in organic farming. It is unsuitable for conservation.

CMS hybrid from cell fusion. Hybrid with cytoplasmic male sterility transferred by cell or protoplast fusion, above all in brassicas, chicories such as witloof, radicchio and sugarloaf, and root parsley. Own seed production is not possible; legally the same applies as for the F1. Cell fusion in plants that can be crossed conventionally is exempt from GMO law under Annex I B of Directive 2001/18/EC (listed as partially verified in the data layer `gentechnik.json`). The EU organic regulation permits such varieties; BIO AUSTRIA excludes them, as do Bioland, Naturland and Demeter. The information comes from FiBL and the associations.

2.3 Genetic engineering and new genomic techniques

Genetically modified variety (GMO). Authorised under Directive 2001/18/EC and Regulation (EC) No 1829/2003. In practice mostly hybrids; patents and licence agreements as a rule prohibit replanting. In Austria cultivation is prohibited (Gentechnik-Anbauverbots-Rahmengesetz, Austrian GMO Cultivation Ban Framework Act, BGBl. I Nr. 93/2015, and provincial laws), and seed must be GMO-free: the Saatgut-Gentechnik-Verordnung (Austrian Seed GMO Ordinance) sets a threshold of 0.1 per cent for adventitious contamination. In organic farming GMO seed is prohibited.

Category 1 NGT plant. Obtained by new genomic techniques and classified under Regulation (EU) 2026/1388 as equivalent to conventional breeding; the regulation applies from July 2028. Biologically, replanting depends on the variety type. Patents on the traits are possible and are disclosed in a public database (P10). Seed must be labelled ‘Category 1 NGT’, food derived from it need not. In organic farming NGT plants of both categories are prohibited. The details are covered in P16.

3. Overview

Seed type	Replanting, biological	Replanting, legal	Organic farming
Line variety	true to variety	free if unprotected; otherwise farmers' privilege for listed species against remuneration	admissible
Population variety	true to variety with isolation and enough plants	free if unprotected; otherwise farmers' privilege for listed species against remuneration	admissible
Landrace	true to variety with isolation; diversity intended	free	admissible
Conservation variety	as landrace or population variety	free; marketing within quantity ceiling	admissible
Amateur variety	mostly open-pollinated	free; marketing in small packets	admissible
Organic heterogeneous material	diversity remains, shifts	free; marketing after notification	organic only
Synthetic variety	composition drifts	according to data layer excluded from farmers' privilege	admissible
Clonal variety	vegetatively true to variety; diseases travel with it	consent if protected; potato with farmers' privilege	admissible
F1 hybrid	segregates in the F2	excluded from farmers' privilege	admissible under EU organic regulation
CMS hybrid	male sterile, no seed production	as F1	EU organic yes; BIO AUSTRIA, Bioland, Naturland, Demeter no
GMO	depending on variety type	patents, licences; cultivation prohibited in Austria	prohibited

Seed type	Replanting, biological	Replanting, legal	Organic farming
NGT-1	depending on variety type	patents possible, disclosed	prohibited

4. What may be replanted and passed on

Unprotected varieties. Old landraces and conservation varieties are as a rule not protected (P10); replanting is free. Passing them on then touches only the law on market admission, as soon as it counts as marketing (P03).

Protected varieties in the home garden. Acts done privately for non-commercial purposes are exempt from plant variety protection. Supplying to third parties is not covered by this exception; it requires the holder's consent.

Protected varieties on the holding. The farmers' privilege permits farm-saved seed on one's own holding only for certain species, namely fodder plants, cereals, potato and oil and fibre plants, and only against equitable remuneration, the farm-saved seed fee. Small farmers are exempt from it; decisive is a cultivated area no larger than that needed to produce 92 tonnes of cereals, or, for potatoes, 185 tonnes per harvest (P10). Vegetables do not fall under the farmers' privilege. Passing propagating material to third parties remains prohibited here too.

National plant variety protection in Austria. The above applies to Community plant variety rights. For varieties protected under Austrian law, § 4(4) of the Sortenschutzgesetz 2001 (Plant Variety Protection Act) governs farm-saved seed more broadly: plant variety protection does not cover the cultivation of harvested material of a protected variety if the propagating material comes from the farmer's own cultivation. The provision names no list of species and no exception for hybrids or synthetic varieties. The conditions, such as a fee, may be laid down in an agreement between the representatives of the right holders and of the farmers; small farmers are to be exempted. Which protection applies is shown in the variety list; biologically, an F1 segregates on replanting in any case.

Patented traits. If a variety contains a patented trait, farm-saved seed on one's own holding is permitted to the same extent as under plant variety rights; passing on requires a licence (P10).

Exchange and supply to non-professionals. Under the text of the new regulation on plant reproductive material with a view to adoption (Council document 12839/26), the exchange of small quantities between farmers at local level without monetary consideration is to be permitted, excluding varieties protected by plant variety rights as well as hemp, opium poppy, potato, citrus and vine; what counts as a small quantity is laid down by the member states for each species. Supply to non-professionals is to become possible without full variety registration, excluding hemp, opium poppy, potato and turf grasses. The regulation has not been formally adopted and applies only 48 months after entry into force (P03). The Seed Law Check and the Action Compass guide through these questions.

5. What the packet says

5.1 Labelling

Information	Meaning
F1 / hybrid	hybrid seed for one season; replanting segregates
open-pollinated / open-flowering	replanting possible; for outcrossers isolation and enough plants

Information	Meaning
Category 1 NGT, genetically modified	prohibited in organic farming; GMO cultivation banned in Austria
plant variety protection / ® variety name	propagation and passing on require consent; private, non-commercial sphere exempt
dressed / treated	treated; the treatment must be stated; chemical-synthetic seed dressing is not admissible in organic farming

If information on the variety type is missing, it does not follow that the seed is open-pollinated.

5.2 Label colours

Officially certified seed of agricultural species bears a label whose colour shows the category: white for basic seed, blue for certified seed of the first generation (C1 seed), red for the second generation. Vegetable seed is often sold as standard seed, which is not officially certified but true to variety and subject to post-control; its label is dark yellow. Mandatory information comprises variety denomination, category, species, lot number and quantity as well as the indication of GMO and chemical treatment (for vegetables under Directive 2002/55/EC).

6. Organic seed in Austria

In organic farming, organically propagated seed is mandatory. In Austria an order of precedence applies: first organic seed, then in-conversion seed, only after that conventional, untreated seed with the authorisation of the inspection body. For species on the positive list there is no exception. Availability is demonstrated via the AGES organic plant reproductive material database; organicXseeds is not the Austrian database. Seed dressed with chemical-synthetic agents is not admissible in organic farming; physical or biological treatments and authorised agents are permitted. GMO and NGT seed of both categories is excluded. Where association guidelines are stricter than the EU organic regulation, for instance in excluding CMS hybrids, the association rules apply to member holdings.

7. Warnings for practice

1. **Do not use F1 for replanting.** Whoever wants to save seed themselves chooses open-pollinated varieties; CMS hybrids supply no seed at all.
2. **No GMO cultivation in Austria;** seed must be GMO-free.
3. **NGT and GMO are prohibited in organic farming.** From July 2028, look out for 'Category 1 NGT' on seed.
4. **Do not pass on protected varieties without consent,** not even by exchange (P10).

The Seed Compass asks for the information on a packet and states whether replanting makes sense biologically and is permitted legally, and whether the seed may be used in organic farming. For taking self-saved seed into a collection, see the Collection Manager and P11.

Figures

Seed types compared				
Comparative classification, not a variety assessment				
	Home garden	Agriculture	Conservation	Replanting
Line variety	very suitable	very suitable	very suitable	true to type
Population variety	very suitable	suitable	very suitable	true to type if isolated
Landrace	very suitable	suitable	very suitable	true to type if isolated
Registered conservation variety	very suitable	suitable	very suitable	true to type if isolated
Variety with no value for commercial cultivation	very suitable	limited	very suitable	depends on species
Organic heterogeneous material	suitable	suitable	very suitable	stays diverse
Synthetic variety	limited	very suitable	limited	drifts
Clonal variety	suitable	very suitable	suitable	vegetative
F1 hybrid	limited	very suitable	unsuitable	segregates
CMS hybrid from cell fusion	unsuitable	suitable	unsuitable	sterile
Genetically modified variety	unsuitable	unsuitable	unsuitable	depends on variety
Category 1 NGT plant	limited	suitable	unsuitable	depends on variety

Open-pollinated varieties can be self-propagated; hybrids segregate when replanted, CMS hybrids are sterile.

Classification by the strand under EU and Austrian variety and seed law. Data layer saatgutarten.json. SAMEN-PROV0001

Figure 1. Seed types by area of use. Source: data layer of the strand, see figure footer.

Limits of this paper

The paper provides orientation and does not replace legal advice; the legal position is as of 24 September 2026. The exclusion of F1 hybrids and synthetic varieties from the farmers' privilege is regulated for Community plant variety rights in Art. 14(1) of Regulation (EC) No 2100/94; the data layer supports it with a study by the Research Services of the German Bundestag. The Austrian Plant Variety Protection Act contains no such exception (§ 4(4), checked against the wording on 28.09.2026); the table in section 3 refers to Community plant variety rights. The information on cell fusion in GMO law is listed as partially verified in the data layer; the information on association guidelines comes from FiBL and the associations themselves. No reliable market share of hybrid seed is available. The regulation on plant reproductive material has not been formally adopted; the implementing acts for the NGT regulation are outstanding.

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