

## Cell fusion free varieties in vegetable production

### Mandatory and recommended varieties

Organic farming aims to preserve the integrity of the plants and respect crossing barriers in breeding. The use of varieties bred in a pollen-sterile manner by means of cell fusion is therefore controversial in organic farming. The organic farming associations in Germany, Austria, Switzerland and France reject this breeding and propagation technique.

The present list includes all available varieties of cabbage, chicory, radicchio types, sugar loaf and root parsley that are not based on cytoplasmic male sterility (CMS) transferred by means of cell fusion. The list is binding for producers of Bioland, Naturland, Demeter, Bio Austria, FNAB, Bio Cohérence and Biobreizh. Producers of Bio Suisse are not allowed to use cell fusion-bred varieties with the exception of cauliflower, broccoli, white cabbage, savoy cabbage and chicory.



### Principle and procedure

In the long term, the organic farming associations want to promote the availability of varieties that have been produced without critical breeding procedures. By publishing a common list of cell fusion-free varieties for vegetable cultivation and regularly updating the list, they maintain regular contact with the breeding companies and communicate their concerns to the companies involved.

At the same time, the organic farming associations want to provide their members with a resource that enables them to select cell fusion-free varieties with the greatest possible certainty when making choices. The associations have knowledgeable contact persons available to answer questions about cell fusion-free varieties. The list is updated annually.

### Cell fusion – what it is about

For efficient hybrid breeding, the mother line must not self-pollinate. In many plant species, the naturally occurring cytoplasmic male sterility (CMS) is used for this purpose.

In cabbages and lettuces of the Cichorium group such as chicory, radicchio and sugarloaf, no natural CMS has been observed so far. Therefore, instead of CMS, breeders use the natural self-incompatibility (SI) system, in which the plant's own pollen does not grow or grows slowly on the stigma, whereas foreign pollen grows faster. Since the SI system cannot avoid self-pollination by 100 per cent and is dependent on temperature and other factors, CMS was transferred to cruciferous and chicory species in the 1970s using cell fusion. In this way, a higher degree of hybridisation was achieved in seed production of F1 hybrids.

More information on cytoplasmic male sterility can be found in FiBL's dossier «Plant Breeding Techniques» at [shop.fibl.org](https://shop.fibl.org) > 1202.