

FROM SEED TO SEED

Educational films on seed production



CAULIFLOWER

Cauliflowers and broccoli are members of the Brassicaceae family and the *Brassica oleracea* species. Cauliflowers belong to the *botrytis* var. *botrytis* subspecies, whereas broccoli is part of the *botrytis* var. *italica* subspecies. The *brassica oleracea* species also includes kohlrabi, cabbage, Brussels sprouts, kale and the Savoy Cabbage.

Cauliflowers and broccoli are annual plants or biennial ones for winter varieties. They are grown for their heads which are embryonic fleshy clusters of future flowers. There are early and late varieties; cauliflowers can be white or purple, broccoli green or purple. The Romanesco broccoli is yellowish green.

🎬 Pollination of all the cabbages of all the Oleraceae species

The flowers of the *Brassica oleracea* species are hermaphrodite which means that they have both male and female organs. Most of them are self-sterile: the pollen from the flowers of one plant can only fertilize another plant. The plants are therefore allogamous. In order to ensure good pollination it is better to grow several plants.

Insects are the vectors of pollination. These characteristics ensure great natural genetic diversity. All of the cabbage sub-species of the *Brassica oleracea* species can cross with each other. You should therefore not grow different kinds of cabbage for seeds close to each other. To ensure purity, different varieties of the *Brassica oleracea* species should be planted at least 1 km apart. This distance can be reduced to 500 meters if there is a natural

barrier such as a hedge between the two varieties.

The varieties can also be isolated by placing small hives with insects inside a closed mosquito net or by alternately opening and closing mosquito nets. For this technique, see the module on isolation techniques in 'The ABC of seed production'.

▶ Life cycle of the cauliflowers and broccoli

In regions with a mild climate you can cultivate broccoli and cauliflower as biennial plants. You should sow them in the summer; the plants will overwinter in the ground, and will then form their heads and flower in the following spring. You will be able to harvest the seeds in the summer of the second year. Cauliflower and broccoli are, however, exceptions in the brassica oleracea species in that they can multiply in a single year of growth. To increase the chance of obtaining seeds in the autumn, they are sown in a warm sheltered place as early as possible, in January or February. In March or early April, they are replanted out in the ground and protected from late frosts by a frost blanket.

Seeds are saved from healthy and vigorous plants that you have observed throughout the period of growth. In this way you can check all of the characteristics of the variety : regular and vigorous growth, for cauliflowers the formation of tight heads that are well-protected by abundant leaves, for broccoli the formation of a single head or multiple side shoots, as well as a long period of budding before flowering, resistance to disease. You should select 15 plants for seed production to ensure good genetic diversity. Once cauliflowers have formed their heads, they can suffer from humidity. You can protect them from the rain with a small roof. If parts of the head start to rot you should remove them with a knife. Cauliflowers do not develop lateral flower stalks. You should therefore never cut the head. Cauliflower and broccoli should flower in July at the latest, to ensure that they can complete their ripening process which spreads out over a long period.

▶ Extracting - sorting - storing of all the Oleraceae species

The seeds are mature when the seed pods turn beige. The seed pods are very dehiscent, which means that they open very easily when mature and disperse their seed. Most of the time, the stalks do not all mature at the same time. To avoid wasting any seed, harvesting can take place as each stalk matures. The entire plant can also be harvested before all of the seeds have completely matured. The ripening process is then completed by drying them in a dry, well-ventilated place. Cabbage seeds are ready to be removed when the seed pods can be easily opened by hand.

To extract the seeds, the seed pods are spread across a plastic sheet or thick piece of fabric and then beaten or rubbed together by hand. You can also put them in a bag and beat them against a soft surface. Larger quantities can be threshed by walking or driving on them. Seed pods that do not open easily probably contain immature seeds that will not germinate well. During sorting, the chaff is removed by first passing the seeds through a

coarse sieve that retains the chaff and then by passing them through another sieve that retains the seeds but allows smaller particles to fall through. Finally, you should winnow them by blowing on them or with the help of the wind so that any remaining chaff is removed. All seeds from the *Brassica oleracea* species resemble one another. It is very difficult to distinguish between, for example, cabbage and cauliflower seeds. This is why it is important to label the plants and then the extracted seeds with the name of the species, the variety and the year of cultivation. Storing the seeds in the freezer for several days eliminates any parasites.

Cabbage seeds are able to germinate up to 5 years. However, they may retain this capacity up to 10 years. This can be prolonged by storing them in the freezer. One gram contains 250 to 300 seeds depending on the variety.

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