

FROM SEED TO SEED

Educational films on seed production



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Corn is a member of the Poaceae family, like the majority of cereal crops. It is part of the *Zea mays* species. There are several types of corn:

- Sweet corn (*Zea mays saccharata*), which can be eaten raw when the cobs are immature, boiled in water or grilled. Its seeds shrink as they dry. This type can be grown in cool regions.
- Dent corn (*Zea mays indentata*), whose seed is composed of a starchy core surrounded by a harder vitreous layer. Its starchy centre retracts at maturity, producing an incisive shape that gives it its name. It is a variety used to make flour, also used as animal feed.
- Flint corn (*Zea mays indurata*), which in contrast to dent corn has a seed with a very small starchy core and a more substantial vitreous layer, which is why it is mainly used for polenta.
- Popcorn (*Zea mays microsperma* or *everta*), whose seeds burst open when cooked.

▶ Pollination

Corn is monoecious, which means there are male and female flowers on the same plant. The male flower or tassel is located at the top of the stem and the female flower is found in the middle of the stem, the swollen part containing the future cob from which only the cornsilk emerges. Each silk is connected to an ovule, which after pollination will produce one kernel in the cob.

Corn is allogamous, which means that one plant fertilizes another. It is also anemophilous, meaning that it is pollinated by the wind, which transports pollen distances of over 10 km. Corn should be planted in groups with at least 3 rows so that the wind can properly transport the pollen. If there is only one row, pollination will be poor and the cobs will not be fully developed when harvested. In certain regions, corn can also be visited by bees attracted by the impressive amount of pollen that is produced. One plant can produce up to 18 million pollen grains!

To avoid cross-pollination, plant two varieties of corn at least 3 km apart.

This distance can be reduced to 1 km if there is a natural barrier such as a hedge.

You can also use the time isolation method. Two varieties of corn are sown in the same garden with an interval of several weeks between them. The goal is to avoid that the male flowers from the first variety release their pollen when the female flowers of the second variety appear. Otherwise, the varieties would inevitably cross-pollinate. For this technique, take into account the length of the growing cycle, which ranges from 55 to 120 days, depending on the variety.

It is nearly impossible to protect your variety from large industrial crops of hybrid corn grown nearby.

In this specific case, hand pollination is a solution for seed production. With this method, the rows should be further apart so there is room to walk between them. Sturdy paper bags resistant to the rain are required.

Corn plants blossom for 10 to 14 days. The hand pollination process takes three days.

The first day is devoted to bagging the female flowers. You should do this just before the silk emerges from the small cobs; if it has already emerged before the flower is bagged, it's too late. First of all, the tips of the husk leaves around the small cob are cut off to expose the emerging silks. The cob can then be covered and the bag firmly attached at its base. The male flowers are bagged the morning of the third day when the anthers, the male organs, begin to emerge from the vertical and lateral stems of the stalk. If the anthers are still green, bagging may stop their development. Before bagging, shake the plants to remove pollen from other varieties that may have been deposited by bees or the wind.

The bag should be attached so that it collects the pollen released during the morning.

Most pollen is released after the dew has dried and before noon. Tapping the flowers a few times helps make it fall. Hand pollination is done around noon on the same day because in the afternoon, the pollen in the bag may heat up too much and no longer be viable. At the end of the morning before the hottest part of the day, the different bags for collecting pollen are opened, the pollen is mixed together and then the bag covering a cob is opened. The silk should have grown about 3 to 4 cm within two days.

The pollen is applied with a brush to all of the exposed silk along its entire length. A teaspoon of pollen per cob is needed. The bag is immediately closed around the cob leaving enough space for it to develop. The silk is receptive to pollen for several weeks. Thus the cobs are left in the bags until harvest.

▶ Life cycle

Corn is an annual plant that produces cobs within one year. It is grown for seed in the same way as for consumption. In general, you should make sure that you choose a corn variety adapted to your environment. A minimum of 50 plants are necessary to maintain good genetic diversity; it is best to grow 200 plants.

Choose plants that have developed correctly and meet the selection criteria: size, colour, vigour, precocity, cob size and how well it is enveloped.

The cobs can dry on the plant. Corn is ripe when a fingernail can no longer be pressed into the kernel. The cobs can then be picked from the stalk. The husks are pulled back up to uncover the cobs and they are stored in a dry, well-ventilated place. The entire plant can also be cut and left to dry in a shed.

▶ Extracting - sorting - storing

Cobs are selected for the shape of their kernels, their colour, the number of rows of kernels, their structure and texture. Kernels that will be used for seed should be chosen from a large number of cobs to maintain genetic diversity. It is also recommended to take the kernels from the middle of the cob. Remove the seeds by rubbing the cobs; gloves should be worn.

Always put a label with the name of the variety, the species and the year inside the bag, as writing on the outside is often rubbed off. Storing the seeds in the freezer for several days kills parasite larvae.

Popcorn, dent corn and flint corn seeds are able to germinate for up to five years. In certain cases, this may be extended to ten years. Sweet corn seeds are able to germinate for up to three years. This may be extended when they are stored in the freezer.

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