



ORGANIC CONSULTING

HEIRLOOM CORN:
FLINT & POPCORN
AGRONOMIC GUIDE

Introduction

Heirloom corn varieties include many open pollinated flints and popcorns which were cultivated by Indigenous Peoples in the Americas since ancient times. Many of these varieties survive today and are still grown in small quantities by gardeners and specialty market growers around the United States.



Fertility & Yield:

Heirloom varieties need high levels of fertility to yield well, with nitrogen (N) being most important and limiting, just like any other corn. The difference between many heirloom corn varieties and modern hybrid field corn is that they are much better adapted to healthy soils with higher OM content that can be mineralized to provide N and other nutrients through rooting relationships with soil microbes. This is in contrast to being spoon fed high levels of immediately available nutrients. Heirloom genetics are not well adapted to high amounts of available inorganic N from synthetic fertilizers or from recently applied manure. They will consume the available N but tend to put on large amounts of vegetative growth that doesn't necessarily translate to more kernels on the cob. Also, this often causes lodging due to stalks that are too tall with ears too large to support, which can decrease yield dramatically since many of these ears are then not harvestable. It's better to have a slightly smaller, healthy ear that is harvestable rather than a very large one which is not. This means that most often the harvestable yield of an heirloom corn is going to be much lower than modern field corn, but some varieties can still yield over 100 bu/ac in the Midwest and Plains regions with proper fertility and planting practices. Also, these corns tend to perform best today in systems under long-term organic management.

Several varieties of heirloom corns were also adapted by Indigenous Peoples to the semi-arid and mountainous areas of the West. In these environments, however, yield is also limited by moisture availability. Fertility requirements should be adjusted accordingly for these lower yield potentials. Alternatively, if planned to be grown under irrigation, fertility requirements are typically greater due to a certain percentage of the nutrients, especially nitrogen (N), washing through the soil profile.

In order to achieve adequate fertility in proper form, it is ideal to prepare the soil for the corn earlier in the rotation. Incorporate manure as fertilizer in late summer ahead of a fall green manure cover crop such as a cereal/legume mix (e.g. rye/hairy vetch), which will use up immediately available nutrients and convert them to organic matter. This cover crop can then overwinter, the legume will fix additional N, and it can be terminated and incorporated through tillage the following spring. This combination of manure and green manure will typically provide all of the fertility needed for an heirloom corn on a relatively healthy soil. Termination of the preceding cover crop should be done at least 3 weeks ahead of corn planting to give residue time to break down and warm the soil for planting.

Average fertility requirements for primary macronutrients:

N: 100-150 lbs/ac

P: 30-50 lbs/ac

K: 100-150 lbs/ac

Planting:

Select varieties that can mature before the first frost in your area. Heirloom flint corns need to be spaced further apart than modern field corn, with populations roughly half of modern hybrid field corn. If on 30 inch rows, plants should be spaced 12 inches apart. If the row width is greater, say out to 48 inches in a market garden setting, they can be spaced 8 inches apart but no closer than that. Compared to 32-34k for modern field corn, this gives a per acre population in the range of 16-18k.



Since heirloom corn seed will likely have no treatments, avoid planting too early. The longer the seed sits in the ground before germination the more vulnerable it is to loss from cold wet soil conditions and predation by pests. It is possible for corn to germinate at 50 degree soil temperature, but emergence and uniformity is significantly at risk. Temperatures at night can still dip too far below that, especially in lighter or sandier soils. Heirloom corn varieties are often much more sensitive to this. Delaying planting to take advantage of warmer soil temps is strongly recommended for even emergence and an ideal stand. If you would like to save seed, remember that heirloom corns are open pollinated. If contamination from neighboring field corn is a possibility, delaying planting at least 14 days from the field corn planting should ensure that your heirloom corn will tassel and silk late enough to avoid much of the contamination risk.

Considerations for the Midwest and Plains

Planting date: mid-late May in MN & WI

Soil temperature: >65 degrees

Planting depth: 1.75 - 2 inches, up to 2.5 inches if necessary to place seed into moisture

Row spacing: 30-48 inches

Plant spacing: 8-12 inches **Population:** 16-18k/acre

Considerations for the West

Planting date: mid-late May

Soil temperature: >60 degrees

Planting depth: 1 inch

Row spacing: 24-30 inches

Plant spacing: 7-8 inches

Irrigation: 1 ½ - 2 inches/week

Critical times for water and nutrition: V3-V6 ; VT; R1-R3

Cultivating/Weeding

Good weeding is a must and regular cultivation should be practiced. Heirloom corns especially like to be hilled as it provides some added stability as well as helping to protect developing nodal roots from drying out. When cultivating or hilling after the V3 – V4 growth stage, care should be taken not to run too close to the plants to avoid pruning of nodal roots that are starting to elongate and which the plant is beginning to rely on for its nutrition.

Harvest

The corn can dry down in the field and be harvested with a combine on a larger scale as long as proper practices have been followed and lodging is minimal. On a smaller scale such as a market garden setting, harvest of ears is done by hand. In this scenario, it is often advantageous to take ears by hand when they are fully mature but before you would ideally combine. This would avoid the occurrence of late season molds or other disease that would negatively affect grain quality. Still you want to wait until the corn is dried to 22% moisture before picking. A general rule of thumb for when to pick is when the ears droop and the husks dry enough to open, revealing the ear.

Post-harvest drying and storing

Whether you combine or pick ears and shell later, the corn will likely need some drying time. Combined grain should be dried down to 12% moisture for storage. If picked by the ear, you will need to spread the ears over a screen in a warm sheltered area (an unused greenhouse late in the season can be ideal) and blow air over the ears of corn to dry down both the grain and the cob to avoid any mold growth. Lay them out in a single layer, not stacked on each other. Once it is dried enough that you are able to push corn kernels off the cob relatively easily with your thumb, it is time to shell the kernels from the cobs. This can be done by hand or by machine.

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Sources

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