

# MAIZE: TYPES AND THEIR PRODUCTION TECHNOLOGY

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## INTRODUCTION

**M**aize (*Zea mays* L.), generally known as corn, belongs to the Poaceae family and is the world's third most significant cereal crop after wheat and rice. It is said to have originated in Central America, namely Mexico. It is now farmed across 9.4 million hectares in India, with a yield of 24.26 million tonnes and an average productivity of roughly 2.57 tonnes/ha, contributing 9% to the country's food basket. Maize is farmed primarily for grain, but also for fodder and raw materials used in industrial operations. The global maize area is around 140 Mha, with a production of approximately 420 Mt.

Maize's history in India is not well documented. It is widely assumed that the Portuguese brought it to India from Europe in the early sixteenth century. There is no indication of its presence on the Indian plains prior to the arrival of Columbus. The most prevalent name, 'Makkai,' which means 'from Mecca,' indicating an introduction from outside India. Maize is grown for a

variety of reasons other than grain, including quality protein maize and other unique purposes known as 'Specialty Corn.' Quality protein maize (QPM), baby corn, sweet corn, popcorn, waxy corn, high oil corn, and other speciality corn varieties exist. A vast number of farmers in India are popularising and cultivating QPM, baby corn, and sweet corn.

The following is a basic overview of several types of speciality maize.

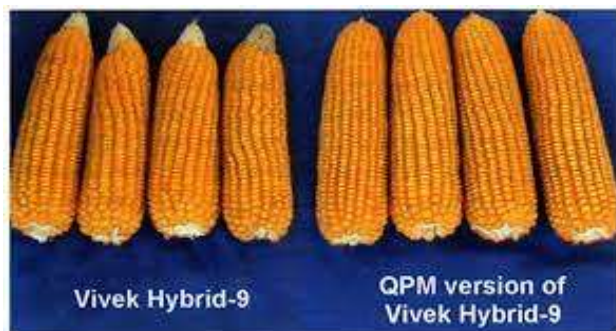
### 1. QUALITY PROTEIN MAIZE:

The quality of maize has a significant influence in the nation's food and nutritional security because more than 85% of it is utilised directly for food and feed. In this regard, the creation of "Quality Protein Maize" was made possible by the discovery of the mutants opaque-2 (O2) and floury-2 (F2), which had tremendous potential for improving the protein quality of maize (QPM). The novel dynamics of QPM, which is nutritionally superior to regular maize, emphasise its significance for animal, poultry, and piggery industries as well as for food and nutritional security.

With a balanced ratio of amino acids and a high level of lysine and tryptophan and a low content of leucine and isoleucine, quality protein maize has unique properties. Protein's biological value is increased by Quality Protein Maize's well-balanced composition of all these important amino acids. Since the biological values of milk and QPM proteins are 90 and 80%, respectively, the biological value of QPM protein is simply double that of regular maize protein, which is quite similar to milk protein. As opposed to the usual maize protein, which is less than 50%. Nine QPM hybrids with various grain colours have been created and released in India for use in farming under various agro-climatic conditions across the nation. The QPM is

produced using the same techniques as regular grain maize, with the exception of isolation, as QPM must be cultivated apart from regular maize in order to retain its purity.

## 2. BABY CORN:



Also known as immature, unfertilized cobs with 1-3 cm of emerging silk, baby corn is best harvested between 50 and 60 days after silk emergence (DAS), depending on the growing season. Over the course of 3–4 weeks, the harvest might be performed 8–10 times. It may be consumed raw as a salad and used in a variety of cuisines, including chutney, pakora, mixed vegetables, pickles, sweets, murabba, kheer, halwa, raita, and Chinese dishes. Baby corn should be 6 to 11 cm long, 1.0 to 1.5 cm in diameter, and have a normal row/ovule arrangement. Consumers and exporters often choose cream-colored to extremely light yellow hues. Baby corn has a high nutritional value that is on par with or even better than some of the seasonal vegetables. It is one of the richest sources of phosphorus in addition to proteins, vitamins, and iron. It contains a lot of fibrous protein and is simple to digest.

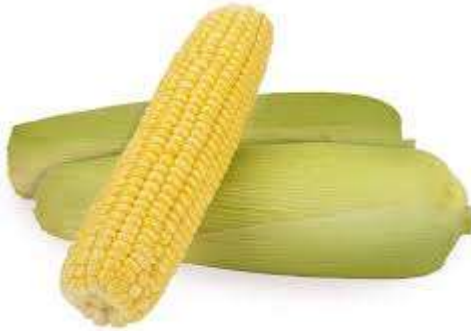
The chemicals' lingering effects are essentially nonexistent. Since it may be grown all year long, three to four crops of baby corn can be harvested each year. India has the lowest baby corn growing costs in the world, making it a potential leader in the production of this crop. It has enormous

potential for both domestic use and export. With the exception of (i) a higher plant population, (ii) a higher dose of nitrogen application due to the higher plant population, (iii) a preference for early maturing single cross hybrids, and (iv) harvesting within 1-3 days of silk emergence, baby corn cultivation practises are generally similar to those of grain crops.



## 3. SWEET CORN:

In the USA, Europe, and other developed nations of the world, sweet corn is among the most popular vegetables. It is a very energising food that is also a good source of vitamin C and A. Green cobs of grain can be consumed raw, boiled, or steam-cooked. Additionally, it is used to make recipes for soup, salad, and other dishes. Its production is profitable for periurban farmers since it is becoming popular in the nation's urban centres. Farmers may now buy green fodder for their livestock in addition to green cobs. Sweet corn typically matures early. During the kharif season, it is harvested in 70 to 75 days. During the kharif season, green cobs are harvested after 18 to 20 days after pollination, while the exact time frame varies from season to season. At the time of harvest, the grain's moisture level is typically 70% while its sugar content ranges from 11% to more than 20%.



**Sweet corn is often white and dull yellow, but dull yellow is favoured.**

**Precaution:** It should only be picked in the morning or evening. To prevent the conversion of sugar to starch, green cobs should be delivered right away to the cold storage in refrigerated vehicles. If maintained at a high temperature after picking, it loses taste. When the temperature is below 16°C, sweet corn with a high sugar content should not be planted.

#### 4. POP CORN:

Pop corn is a popular snack food in many locations across the world and is popular because to its light, porous, and crispy feel. Many conventional meals may be prepared with the popcorn flour. It must be prevented from absorbing moisture from the air, so it is consumed fresh. It is flint maize with a firm endosperm. Popcorn kernels are tiny and oval or spherical in form. The grains flip inside out and expand and explode when heated to roughly 1700C. Popcorn quality is influenced by popping volume and the lowest amount of non-popped kernels.



#### 5. WAXY CORN:

Although it is Chinese in origin, the USA uses it extensively. The appearance of the grain is wax-like and it contains just amylopectin starch. Compared to regular maize, which has 70% amylopectin and roughly 30% amylose as its starch, Food and industrial uses for waxy corn are predominant.



#### 6. HIGH OIL CORN:

The majority of common maize varieties contain 3-4% oil. High oil lines are typically those that contain more than 6% oil. The germ contains 95% of the overall oil. The amount of starch reduces as oil percentage rises. High oil content maize continues to be advantageous for the wet milling industries.

In the USA, high-oil maize is grown under contract, with farmers receiving a fair price. Since it is not marketed at a premium in India, its cultivation is not profitable. In a typical maize crop, 15-20% of the population of high oil hybrids are employed as pollen parents, and the typical corn plant is detasseled. Normal maize has more oil than usual because of the xenia effect, and its cultivation is done separately. One of the greatest types of cooking oil is maize oil

since it contains little saturated fatty acid. More than 60000 tonnes of maize oil are made accessible in India for a variety of applications.



## 7. MAIZE FOR FODDER:

Maize for fodder can be utilised at any stage of crop development. After anthesis, its quality is badly impacted. Farmers are encouraged to detassele their fodder for greater digestion and flavour in order to retain the quality of the feed. These milch animals produce more milk when given this feed to graze on. For the production of maize for fodder, the tall, green, and longer-lasting varieties are most favoured. Throughout the year, maize may be grown for feed. It uses a very high seed rate. In general, farmers develop advanced hybrid seed generations or composite types since they are more cost-effective for them.

