

ECHO Asia Seed Fact Sheet

Scientific name – *Zea mays*

English common name – Maize, corn

Asian common names –

- Chinese: 玉米须 yu mi xu, 玉蜀黍 yu shu shu, pao mi
- Hindi: अनाज anaaj, मक्का makka, मकाई makaa'i, makaa
- Japanese: トウモロコシ toumorokoshi (tômorokoshi), フィールドコーン fiirudo koon
- Khmer: pôt
- Lao: khauz ph'ô:d, khauz sa:li
- Malay: jagong, jagung (Indonesia)
- Thai: ข้าวโพด khaophot
- Vietnamese: ngô



Photo: ECHO Asia staff

ECHO Asia Varieties –

- **Naga Multi-colored:** A flint field corn from northeast India. Mid-sized ears with multi-colored kernels. Grows vigorously under suitable conditions. Can be consumed by humans and animals.
- **Naga Popcorn:** Popcorn from northeast India. Hardy crop. Small ears with round, yellow, hard kernels. Can be fed to animals.
- **Hawaiian Supersweet #9 Yellow:** Yellow, sweet, and crispy when picked at the right stage of growth. Has large ears; kernels are very tender. Grows well in tropical conditions. An improved open-pollinated variety.

General description and special characteristics –

Maize is described as the most domesticated of all field crops. Originating in the vicinity of Mexico and Central America, it is considered to have descended from the wild teosinte plant and has been cultivated since the period between 3400 and 2300 BC. It is the third most cultivated cereal crop, following wheat and rice. Maize is a coarse annual grass with a stalk ranging from 0.3-7.6 m (2-25 ft) in height and has internodes. Tillers may be produced, particularly in non-hybridized varieties. Lodging is possible, but less likely in commercial corn hybrids. In addition to the underground seminal root system, maize also produces aboveground crown and brace/aerial roots help that help to keep stalks from falling over. Staminate flowers (male) are borne in the tassel at the top of the stalk and pistillate (female) flowers comprise the ear on which the edible kernels form. Key groups of maize include:

- **Dent:** With “dented” seed, this type comprises the high starch field corn varieties that are widely grown for animal feed and processed foods
- **Flint:** Having a hard “flinty” seed coat, flint corn is often multi-colored, hardy, and grown for both human and livestock consumption
- **Popcorn:** Two types: 1) rice, with pointed kernels; and 2) pearl, with rounded kernels
- **Sweet corn:** Sweeter than other types because the endosperm (before becoming ripe and dry), contains sugar as well as starch

Crop uses (culinary) – Maize is a rich carbohydrate food source. The immature kernels are consumed raw, cooked, or roasted. Maize grains are pounded or ground as meal or flour to be used in baking or as cooked cereal. Maize kernels often are soaked prior to grinding, and after fermentation are used to prepare dishes such as kenkey or pozol. Corn starch is used as a thickening agent. Young tassels may be boiled and eaten and the pollen used as a soup ingredient. Corn grains contain about 10% protein although selected varieties contain up to 20% protein. A deficiency of lysine in corn may lead to protein malnutrition if corn is used exclusively as a staple in human or animal diets. High-lysine corn has been produced through genetic selection to correct this deficiency.

Crop uses (livestock production) – Maize is an important feed source for poultry, swine, and cattle. The whole plant is used as green fodder or as silage for cattle with kernels processed into various types of feed. Ground cobs may be used as

litter material for animal bedding.

Crop uses (other) – Corn stover (stalks, leaves, and husks) may be used as a source of fuels such as ethanol or for biofuels.

Seasons of production – Grows best during the rainy season; may be grown during the dry season if irrigated.

Length of production and harvest period – Between 68-75 days from seed to maturity.

Production methods – Prefers full sun and well-drained soil. Grows best with a pH of 6.0-7.0.

Plant spacing – Establish maize in rows 60-75 cm (24-30 in) apart and 30 cm (12 in) within rows.

Pollination – Open-pollinated and will cross-pollinate. Ashworth (1991) recommends isolating varieties of corn by 3.2 km (2 miles) to ensure purity.

Environmental conditions for production – Maize is a warm climate crop, thriving in open, sunny environments having daytime temperatures of 20-24°C (68-86°F). Rainfall during the growth period should be 500 mm (20 in) or more.

Soil requirements – Maize requires large amounts of nutrients, especially nitrogen, phosphorus, and potassium. Nitrogen deficiency stunts growth and results in low yields. The application of animal manures and the practice of rotating corn with nitrogen-fixing legume crops help correct the soil nitrogen depletion so common in cornfields. Without supplemental fertilizer application, rainy season maize has been grown almost every year for over three decades on some upland farms in northern Thailand when relay-cropped with various vining leguminous green/manure cover crops.

Pests and disease – Diseases of maize include leaf blight, leaf rusts, smuts, and root, stem, and ear rots. Root rots tend to occur in compacted and poorly-drained soils. Some guidelines for disease prevention are: 1) use healthy, treated seeds and 2) practice crop rotation. Insect pests of maize include European corn borer, root worms, stem borers, aphids, grasshoppers and leafhoppers.

Seed saving – Maize ears may be harvested for seed after the kernels have sufficiently dried to store without spoilage. Hybrid corn varieties are not productive seed sources; these varieties must be purchased from seed companies each year (however, the EDN 88 article ‘Hybrid Maize Revisited’ discusses how hybrid corn varieties have been recycled or creolized over a number of years by Mexican farmers; <http://www.echocommunity.org/resource/collection/CAFC0D87-129B-4DDA-B363-9B9733AAB8F1/edn88.pdf>). Open-pollinated corn varieties may be replanted. For maintenance of open-pollinated lines, at least 30 to 50 ears from stands of at least 100-200 plants (adequately isolated from other varieties) should be picked from plants possessing desirable features. Avoid plants near cornfield borders, as these plants likely have been pollinated by wind borne pollen from other varieties growing nearby. The shelled seed kernels should be mixed thoroughly prior to planting to reduce inbreeding. Corn kernels should be completely dry before storage. Ashworth (1991) states that sweet corn varieties should be able to maintain 50% germination for three years when stored in cool, dry, dark conditions. Flint, dent, and popcorns will retain high germination rates for 5-10 years (sometimes longer) under such conditions.

References –

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