

SWEET-CORN

INTRODUCTION

Genetically, maize (mealies) and sweet corn are very closely related, with most scientists accepting that standard or sugary (su gene) sweet corn developed as a mutant of maize. This sweet corn accumulates about twice as much sugar (about 12 %) and eight to ten times more water-soluble saccharides than normal maize has at the immature stage, when it is normally consumed as green mealies. This traditional or standard sweet-corn has been available for over 170 years.

Since then, but especially in more recent years, there have been other mutations, such as the sugar enhancer (se) gene, with a sugar content of up to about 18 %, the shrunken-2 (sh2) gene, also known as super sweets, with about 25 % sugars, and several others, some with even higher sugar contents.

Green mealies, even with their relatively low sugar and high starch content, are popular with consumers in KZN. The rate of conversion of sugar to starch is rapid, and may occur within a day or so at high temperatures. Prices for the product are more favourable for large ears and early in the season - before Christmas. The main cultivar is SR52, but the older Hickory King, or even Silver King are still favoured by many growers and discerning consumers.

Sweet-corn is rapidly becoming more popular with all population groups as it becomes better known, and it is intended in this section to discuss this crop only. Standard sweet-corn (su or sugary gene) is not grown commercially to any great extent in KZN. Although it has twice as much sugar as green mealies, these sugars convert to starch fairly rapidly. Most commercial plantings fall in the super sweet or shrunken-2 (sh2) class, which has a much higher sugar content that does not convert to starch. The eating quality of the ears therefore remains good for a much longer period than green mealies or standard sweet-corn.

It must be noted that the various sweet-corns, as well as maize (mealies), can pollinate one another. Any such cross-pollinated kernel will have the characteristics of that parent with the lowest sugar content. This means that any sweet-corn pollinated by maize will result in maize-type kernels with low sugar. Similarly, super sweet-corn pollinated by standard sweet corn will "lose" sugar and produce standard sweet-corn kernels.

Care must thus be taken to separate plantings of one kind of sweet corn from another, and all types from maize, in order to avoid this deleterious effect. One can either separate such plantings by time (they should not flower at the same time) or by distance (some authorities suggest that from 100 to 200 m distance between plantings is sufficient, although many suggest a distance of at least 400 m).

Climate

As with green mealies, sweet corn requires a warm to hot, frost-free growing season. The required soil temperature for rapid emergence is from 20°C to 35°C. The optimum mean monthly temperatures for best growth and kernel quality is between 15°C and 25°C. Growth is inhibited below 10°C and above 35°C.

Soils

Well-drained, loamy soils are most suitable. Although roots may develop to a depth of about 750 mm, most of the roots occur in the top 500 mm or so. This is the depth to which the soil must be wetted during irrigation.

Cultivars

The most popular cultivars include Paradise, Challenger, Golden Sweet, Prolific, Samurai, Shimmer, Star 7702 and Star7708

Planting

The super sweets(with the shrunken-2 gene) have a small, shrunken seed with relatively few reserves, except for a high sugar content. As the seed imbibes water after planting it tends to exude some sugars, on which various organisms feed. If germination and emergence is slow, as happens with cold soil conditions, some of these organisms may attack the seed, resulting in weak plants or a poor stand.

Ideally, therefore, the seedbed should be well-prepared and sufficiently moist, with warm conditions, for rapid emergence. Planting too early in the season can cause severe problems with these super sweets. Seed should not be planted deeper than about 30 to 40 mm, for the same reason.

Planting times

cold areas	(heavy frosts)	Sept/October to Dec
warm areas	(light frosts)	Aug/Sept to Jan/Feb
hot areas	(no frosts)	Jan to March, July to Sept

There is a tendency for the later plantings to be more seriously affected by the virus disease, Streak, and often also by leaf blight and insect pests.

Spacing

Rows are generally drawn 700 to 800 mm apart, with plants in the row spaced at 250 to 350 mm. The closer the spacing the smaller the resulting ears produced, but often the larger the yield. With green mealies, the larger the ear the more desirable it is. This holds to some degree for sweet corn, when ears are sold loose. However, most sweet corn is sold as pre-packs, with ears topped to size - usually 120 to 150 mm long. Growers should conduct spacing trials to determine the optimum for their own growing conditions for the cultivar selected. Reducing row spacings would hold the best promise of increasing the number of saleable ears of acceptable length.

Fertilizer

As with all other vegetable crops, fertilizer dressings should be based on the results of a soil analysis. On soils previously well-fertilized, 400 to 500 kg of 2:3:2 (22) Zn at planting, plus 500 to 600 kg LAN as side-dressings during growth, should prove adequate. On poorer soils, 1000 kg 2:3:2 (22) Zn, plus 400 to 500 kg LAN, may be needed.

Irrigation

Most sweet-corn crops are grown under irrigation. The crop is sometimes allowed to be partially stressed for water in the early stages of growth, as this tends to favour the development of a stronger root system. However, it is difficult to assess how much stress can be applied without affecting yields detrimentally, so most growers maintain soil moisture throughout growth. Moisture stress at the early silking to early ear development stage should be avoided, as this can severely depress yield.

Registered herbicides include:

application soon after planting and pre-emergence of weeds
acetochlor (Acetochlor 700, Wenner)
acetochlor/atrazine/sulcotrione (Schooner)
alachlor (Alachlor, Lasso, Sanachlor 384, Alanex 384, Lasso Micro Tech)
s-metolachlor (Dual S Goal 915)
application post-emergence of annual broad-leaved weeds
atrazine/sulcotrione (Galleon)
bromoxynil/terbuthylazine (Terbo)
application just before planting, soil incorporated
EPTC (Eptam, EPTC)

Common pests

American bollworm, cutworms, and various stalk borers are responsible for the most damage to sweet corn plants. Other pests - astylus beetles, black maize beetles, chafer beetles, false wireworms, leafhoppers, nematodes and red spider mites - may become troublesome at times. A significant number of insecticides are registered for the control of bollworm, stalk borer and black maize beetle, and various products are registered for use against the other pests listed.

Diseases

Some cultivars show resistance, or at least tolerance, to common rust. Other diseases causing losses include the fungal diseases leaf blight and grey leaf spot and the virus causing maize streak, for which there are no known resistant cultivars. Rust tends to be more of a production problem in later summer plants, while the two fungal diseases of foliage become significant as production-limiting factors during wetter seasons, but they are usually found in sweet-corn plantings in KZN.

Harvesting, packing and marketing

Ears are generally picked in the milk to soft dough stage. Unlike green mealies, which are usually either marketed loose or in sugar pockets, sweet-corn is generally pre-packed for marketing. Ears are usually packed in threes, but different packings may vary from two to seven, provided the packings have a consistent number on the cooled shelves at the point of sale. Usually all ears are topped to a uniform length of 120 to 150 mm for each pack. Some of the wrapper leaves on a portion of the ear are cut away (a "window") to expose some of the kernels for prospective customers to see.

Returns per hectare for sweet-corn are usually appreciably higher than for green mealies. For both crops, prices early in the season - before Christmas - tend to be much higher than later on, when green mealies are more plentiful.