

# KEYS

## TO PROFITABLE PRODUCTION

### KEYS TO PROFITABLE SWEET CORN PRODUCTION FOR WHOLESALE AND DIRECT SALES MARKETS

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Sweet corn is grown predominantly as a fresh market crop in Texas in the spring and summer. Reported acreage harvested declined from 2,200 acres in 1976 to 1,800 acres in 1980 because of the expense of controlling earworms and the rising cost of hand harvesting and handling. Production of sweet corn for direct sales outlets and local farmers markets, however, has been increasing steadily in all areas of the state. Per capita consumption of sweet corn has remained at 8 pounds.

#### Production Areas and Seasonal Movement

Sweet corn is grown statewide with the largest acreage located in two major areas: the Rio Grande Valley and the Winter Garden-San Antonio. Small acreages for local markets and direct sales outlets are concentrated around urban areas and on truck farms throughout Texas. Sweet corn production in cotton-producing areas is hampered by heavy pressure from the corn earworm.

The Rio Grande Valley acreage is planted from early January through March and harvest begins in mid-April. Seeding begins in the Winter Garden in late February or early March and continues into April in San Antonio and the Coastal Bend with harvest beginning the last of May. Growers on the Upper Coast and in Central Texas and East Texas plant in March and April and begin shipping in early June. Heaviest shipments occur in May and June.

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#### Climate Requirements

Sweet corn is a warm season crop intolerant of frost. The rate of growth and maturity is fastest with high day and night temperatures. Optimum average monthly temperature is 68° to 72° F. Few varieties make significant growth below 50° F. The optimum soil temperature range for germination is 75° to 95° F. Few seeds germinate when the soil temperature is below 50° F. Sweet corn growth is dependent on the time of exposure to air temperatures above 50° F. The time required to mature sweet corn from seed varies from about 65 to 90 days depending on the variety and temperature conditions.

Sweet corn is a short-day plant, and the tassel of most varieties develops faster at day lengths of fewer than 12 to 14 hours. High temperature before harvest does not affect kernel sugar content. After ears are harvested kernel sugar is converted to starch at a rate which increases with increasing temperature. This causes corn harvested during high temperature conditions to be less sweet than corn harvested in cooler weather. For highest quality, harvest sweet corn in the cool of early morning and keep as cool as possible until sold.

#### Soils

A deep, sandy loam topsoil well supplied with organic matter favors rapid growth and development and maximum yield of early varieties. Loams and clay loams are ideal for later varieties which remove more water and fertilizer from the soil. Sweet corn grows well from pH 5.5 to 7.0, but for best growth and fertilizer efficiency, lime highly acid soils to bring them into the 6.0 to 6.5 pH range. To be effective lime must be preplant incorporated into the soil 4 to 12 inches.

## Varieties

Restrict large-scale plantings to varieties of proven adaptability in a given area. New varieties are best confined to trial plantings of an acre or less in size. Successful varieties for Texas include:

Variety name	Approximate days to maturity	Color
Aztec	68	Yellow
Cherokee	79	Yellow
Guardian	79	Yellow
Honeycomb**	79	Yellow
Merit	80	Yellow
Calumet	81	Yellow
Bonanza	82	Yellow
Capitan	82	Yellow
Aristogold*	85	Yellow
Silver Queen	92	White

\*Far West Texas

\*\*High Plains

## Fertilization

The amount of fertilizer applied before planting sweet corn depends on the levels of essential elements present as indicated by a soil test. Also consider the soil type, previous cropping history, number of plants per acre, methods of fertilizer application, rainfall and variety.

Generally sweet corn removes 50 to 60 pounds of N, 15 to 25 pounds of P<sub>2</sub>O<sub>5</sub> and 18 to 25 pounds of K<sub>2</sub>O per acre. Banding 80 to 120 pounds of N, 50 to 60 pounds of P<sub>2</sub>O<sub>5</sub> and 40 to 50 pounds of K<sub>2</sub>O in soils deficient in potassium, 2 to 3 inches to one side and 1 to 2 inches below the seed at planting time is sufficient under most conditions. A side dressing of 25 to 30 pounds of actual N per acre before tassel elongation usually is needed to assure adequate N especially under cool, wet conditions or if the foliage appears yellow before tasseling. This is especially true for late varieties grown on sandy soils where nitrogen is leached easily during periods of high rainfall.

## Planting

Sweet corn usually is seeded one row per bed on 40-inch centers. Eight to 15 pounds of seed per acre are required depending on plant spacing and seed size. A plant spacing of 6 to 9 inches in the row generally results in the highest yield of large ears of early varieties. For maximum ear size on later varieties which sometimes bear two ears per stalk, space plants 10 to 12 inches apart in the row. Large seed produce more vigorous plants, earlier maturity and greater yield. Do not plant seed deeper than 1½ to 2 inches. Treat seed to resist damage from seed-corn maggot and soil fungi.

For direct-to-consumer sales outlets, plant one variety of sweet corn in small blocks at 10- to 14-day intervals or plant early, medium and late varieties on the same day to insure a continuous supply of a manageable quantity of corn at harvest time.

When planting sweet corn for the pick-your-own market, divide the field into blocks (figure 1). Plant the blocks in a staggered pattern so that at harvest time customers can easily tell which planting is mature. Plant vacant blocks to other crops before or after the corn. If chemical weed control is used on the corn, assure compatibility with other crops to be planted on the same land.

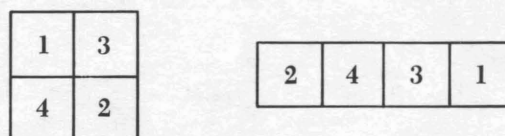


Figure 1. Planting in blocks at 10- to 14-day intervals spreads maturity and makes supervision of pick-your-own customers easier at harvest time.

## Irrigation

Early sweet corn varieties require 12 to 16 inches of water per acre while late varieties may use 20 to 25 inches. Give careful attention to maintaining near optimum soil moisture for highest yield and quality. Assure adequate moisture at germination, silking and during ear enlargement. The water-absorbing roots are shallow, seldom deeper than 12 to 18 inches. Late varieties root deeper and require more water less often to develop larger plants and ears.

## Weed Control

The rapid growth of sweet corn accompanied by one or two timely shallow cultivations may provide adequate weed control.

When chemical weed control is deemed necessary effective herbicides are available to control weeds in sweet corn. Eradicane® at 3 to 4 pounds active ingredient (3¾ to 4¾ pints/acre) applied preplant and incorporated into the soil provides adequate weed control. In some cases where heavy populations of broadleaved weeds are present Atrazine (Aatrex®) or a combination may be needed. Do not use Atrazine if corn is to be followed by a different vegetable the current season. Follow mixing instructions on the label to prevent settling out of herbicide. Read and follow label instructions for specific weeds and grasses to be controlled and application instructions.

Chemicals which require incorporation must be mixed thoroughly into the soil for best results. This requires power-driven cultivation equipment set to cut to a depth of 2 to 3 inches or tandem disks set to

cut to a depth of 4 to 6 inches. Dry soils and tractor speeds of 4 to 6 miles per hour are conducive for best mixing.

### **Cultivation**

If crusting or surface cracking occurs or weeds appear, cultivating with sweeps or a Lilliston rolling cultivator no deeper than 1 or 2 inches destroys weed seedlings and restores permeability to the surface soil. Late cultivation does not increase yield and may prune roots near the surface.

### **Diseases**

Several sweet corn diseases limit production. Maize Dwarf Mosaic Virus (MDMV) is a virus disease that causes leaf mottling and stunting of affected plants. Severely infected plants fail to form marketable ears. Under cool weather conditions, diseased plants may turn red. The virus is transmitted by aphids from johnsongrass to sweet corn. Downy mildew is a fungus disease that overwinters in the soil and attacks plants at the seedling stage or later in the growing season. Affected seedlings have a condition known as crazy top. Older affected plants do not form marketable ears. A white, downy-like growth is sometimes visible on the underside of leaves.

Other diseases are bacterial wilt, which is transmitted by insects, corn smut, stalk and root rot, seedling damping-off, ear rot, rust and numerous leaf spots. These diseases are controlled with a combination of practices. Use adapted varieties resistant to MDMV, downy mildew and bacterial wilt. Crop rotation reduces losses from downy mildew, stalk rot and other soilborne diseases. Southern corn leaf blight, if common in the area, can be reduced by periodic application of foliar fungicides. Rusts, although present in most sweet corn plantings, seldom do measurable economic damage. Some varieties are resistant to this disease and should be used where rusts are a major problem.

### **Insects**

Wireworm, southern corn root worm, seed-corn maggot, corn leaf aphid, fall armyworm, corn earworm, southwestern corn borer and lesser cornstalk borer sometimes damage sweet corn. Use seed treated with an insecticide and fungicide. Where wireworm or seed-corn maggot are present in damaging numbers, apply granular diazinon broadcast and disk into the soil before planting. Aphids seldom reach populations that reduce yield but malathion at 0.93 pounds per acre will effectively reduce large populations. Control fall armyworm and corn earworm with carbaryl (Sevin®) at 1 to 2 pounds active chemical per acre. Also use lannate or methyl parath-

ion at labeled rates for certain larval pests. Begin watching for activity of these insects from the time the plants are knee high. Chemicals and rates mentioned are EPA approved at the time of this printing; however, they are subject to change, so growers should read and carefully follow pesticide label.

### **Harvesting and Packing**

Most sweet corn varieties are ready for harvest about 21 days after appearance of the silk.

Sweet corn can be picked with mechanical harvesters or by hand. Kernel sugar content is at its maximum level until the kernel pericarp becomes rigid. Unharvested sweet corn passes from the pre-milk or blister stage to over maturity for canning in 11 days at a mean temperature of 75° F., 9 days at 80° F. and 7 days at 85° F. For direct sales operations schedule plantings to obtain harvest maturity each 7 days during the season.

Most Texas sweet corn is harvested by hand. Mechanical harvesters are available if the acreage is large enough to justify the cost of the machine.

Cool the harvested ears as quickly as possible to reduce the conversion of sugars to starch. Passing the ears through 40° F. water from a hydrocooler effectively removes field heat. For long distance shipping after the ears are cooled, pack in waxed cartons, wooden crates or mesh bags with 5 dozen ears per container. Ship topped with ice or in refrigerated trucks. Hold stored sweet corn at 32° F. and 90 percent relative humidity.

Sweet corn stored at 32° F. for 24 hours loses 8 percent of its sugar, while corn stored at 86° F. for the same length of time loses 50 percent of its sugar.

When harvesting for direct sales outlets, harvest only 1 day's supply and keep as cool as possible after harvest.

Yields from irrigated sweet corn in Texas range from 150 to 200 bushels per acre.

### **Marketing**

Texas-grown sweet corn is sold on the fresh market. Movement by truck to northern and eastern markets has been common in the past, but in recent years production and harvesting costs have curtailed out-of-state shipments. Almost all sweet corn produced in Texas is consumed in Texas.

Roadside stands or local farmers markets are more popular for merchandizing sweet corn from small acreages.

Sweet corn is an excellent crop for roadside stands and other direct marketing outlets. The quantity demanded each day by the marketing outlet varies considerably with the location and size of the outlet and buying habits of local customers.

Other publications that may be helpful are available from your local county Extension agent.

B-1305 *Texas Guide for Controlling Insects on Commercial Vegetable Crops*

MP-902 *Texas Guide for Reducing Vegetable Disease Losses*

B-1368 *Suggestions for Weed Control with Chemicals in Horticultural Crops*

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