

Texas Commercial Vegetable Growers Guide

MELONS

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Two kinds of melons (excluding watermelons) are commonly grown in Texas. The most popular group includes muskmelon which is actually known as "cantaloupe" in Texas. These melons have a netted surface, distinct musky aromas and flesh colors ranging from green to salmon-orange. True cantaloupe are warty and lack fine netting on their surfaces. However, cantaloupe, the popular name for muskmelon in Texas, will be used in this publication.

The second group of melons has light colored skins which are smooth or wrinkled. The melons are not netted, and the fruit lack distinctive musky odors. This group includes honeydew, casaba, persian, juan canary, santa claus, and crenshaw melons with flesh colors from white to green to orange.

Texas ranks second to California in the production of such melons. Figure 1 shows the production trends of the 3 leading states as well as the total United States. These 3 states along with contributions from 21 states make up the total U.S. production. The U.S. produces 2/3 of the melons which it consumes. Approximately 30 percent of the U.S. consumption is from imports from Mexico and other South American countries primarily during the winter months.

Approximately 30,000 acres of melons were planted in Texas in 1986, yielding estimated receipts of \$72 million. Average marketable melon yields are 134 cwt/acre or 335 forty-pound cartons for cantaloupe and 164 cwt/acre or 545 thirty-pound single layer cartons for honeydews. Harvested acreage, yield and value vary widely by season, depending upon weather and marketing conditions.

Cantaloupe, honeydew, crenshaw, casaba and Persian are very close botanical relatives. For this reason, their cultural requirements are similar. The cultural practices prescribed will apply to all melons.

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**Cantaloupes
Top Shipping States**

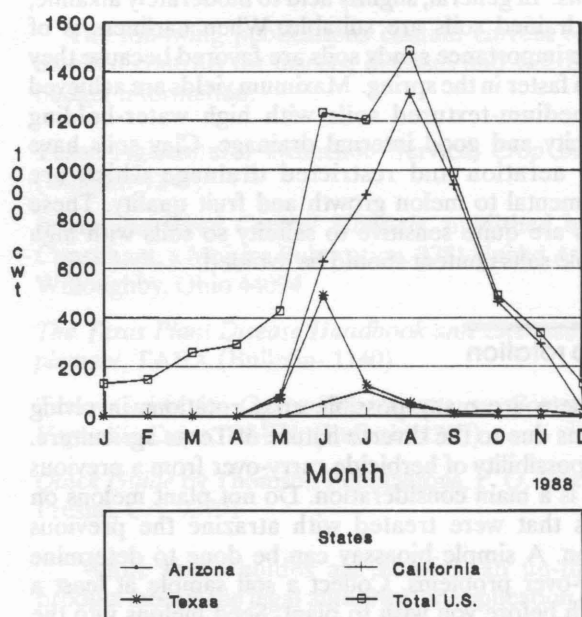


Figure 1.

Areas of productions

Cantaloupe production is divided into spring and summer crops. The spring crop, which accounts for 75 percent of Texas acreage, is planted in South Texas in February and March. The northern half of the state is planted from March through June for summer production. Harvest begins in South Texas in early May, peaking in late May and early June. Harvest continues into September in other portions of the state.

In recent years there has been a small acreage of fall melon production in the lower Rio Grande Valley. Planting is done in August, and melons are usually harvested in November.

Climatic requirement

Melons are a warm season crop. They flourish in extremely hot weather but grow slowly under conditions of lower soil or air temperature. Seed germination is slow and erratic when soil temperature is below 68°F. Fruit maturing when the mean daily air temperature is below 70°F are usually of poor quality. Plants are easily killed by freezing temperature during all stages of development. High humidity and rainfall promote fungal diseases which can defoliate plants, increase fruit cull percentage, and reduce fruit quality. Supplemental irrigation is normally required for successful commercial production.

Soils

Melons can be grown successfully on a wide range of soils. In general, slightly acid to moderately alkaline, well-drained soils are suitable. When earliness is of prime importance sandy soils are favored because they warm faster in the spring. Maximum yields are achieved on medium-textured soils with high water-holding capacity and good internal drainage. Clay soils have poor aeration and restricted drainage which are detrimental to melon growth and fruit quality. These crops are quite sensitive to salinity so soils with high soluble salts content should be avoided.

Crop rotation

There are many possible crop rotations involving melons due to the diverse nature of Texas agriculture. The possibility of herbicide carry-over from a previous crop is a main consideration. Do not plant melons on fields that were treated with atrazine the previous season. A simple bioassay can be done to determine carry-over problems. Collect a soil sample at least a month before you wish to plant. Seed melons into the questionable soil and observe the plant growth for several weeks. If the melon plants reach the two true-leaf stage without exhibiting stunting or chlorosis, one can assume no herbicide residual problem exists.

To minimize losses to soil-borne diseases and nematodes it is recommended that no vine crop (cantaloupe, honeydew, watermelon, cucumber, squash or pumpkin) be grown on a given field more often than once every 4 to 5 years. A cereal grain, wheat, sudan or other biomass producing crop should be included in the rotation scheme.

Field preparation

Seed bed preparation varies in different regions. However, plowing, disking (often re-disking to break

clods) and floating to maintain correct slope for irrigation and drainage are typical preplanting field operations. Deep plowing or subsoiling hardpans will promote better root development and crop productivity. Land is generally listed into 40-inch beds. Phosphorus fertilizer (either granular phosphorus or liquid nitrogen-phosphorus blends) is banded in every other bed (the one to be planted). Herbicide application and incorporation along with final bed shaping complete preplant operations.

Varieties

Varieties with the best performance record and disease resistance should be selected for specific areas. The improved characteristics of hybrids have meant premium harvests and reduced operating costs for growers. Experienced growers have achieved greater yields, earlier maturity, higher quality and improved disease resistance/tolerance by using hybrids. Knowledgeable growers know they must combine sound cultural practices with individual know-how to maximize the benefit and reap the return of planting the more expensive hybrid melons. General characteristics of various melon varieties are given in Table 1.

Weed control

Weed control is important to reduce competition for water and nutrients. In southwest, central, and northwest Texas production areas, the climate is drier, the soil pH ranges from 7.0 to 8.4 and the weed species (annual grasses and broadleaf weeds) are similar. The acid, sandy soils of east Texas have different weed species and higher rainfall which requires more attention to weed control. Mechanical cultivation should be kept shallow when used. The number of cultivations can be reduced with properly applied herbicides. Contact your local County Extension Agent for advice on weed control or see section on references for specific recommendations on weed control.

Weeds can be suppressed by using black plastic. Clear mulches do not block light and will not control weeds. Plastic mulches reduce weed competition, increase soil temperatures, conserve soil moisture and reduce fruit contact with the soil which results in a higher percent of marketable melons.

Eliminating weeds in and around cantaloupe fields avoids virus and fungal diseases that may be present on host weeds. The area should be kept clean by destroying all melon residues and volunteer plants to break disease cycles.

Table 1. Characteristics of melon varieties

Variety	Hybrid	Powdery mildew resistance	Downy mildew resistance
Cantaloupe			
Mission	yes	++	++
Hiline	yes	++	+
Magnum 45	yes	++	+
Hymark	yes	++	+
Performer	yes	++	+
Laguna	yes	++	+
Challenger	yes	++	+
TAM Uvalde	no	++	+
Perlita	no	+	++
Planters Jumbo	no	-	+
Imperial 45	no	+	-
PMR 45	no	+	-
Honeydew			
TAM Dew Improved	no	++	++
Honey Dew Green Flesh	no	-	-
Honey Dew Orange Flesh	no	-	-
Speciality (Mixed Melons)			
Crenshaw	no	-	-
Casaba Golden Beauty	no	-	-
Juan Canary	no	-	-
Persian	no	-	-
Santa Claus	no	-	-

++ Excellent powdery and downy mildew resistance; + some resistance; - no resistance

Planting

Irrigated melons are planted in either single or double rows on alternate 40 inch beds. Seeding rate is 1 1/2 to 2 pounds per acre for open pollinated varieties. Hybrid seed is considerably more expensive, so seeding rates are commonly lowered from 3/4 to 1 pound per acre, with more attention paid to precision seed placement. Seed is placed at a depth of 1/2 to 1 inch. Irrigation may not be required for stand establishment, if adequate soil moisture is present at spring planting. Plants are thinned at the 2-4 true leaf stage to 8-10 inch in-row spacing for single row plantings and 12-24 inches for double row plantings. Some growers have experimented

with transplants, but most melons are field seeded in Texas.

Cantaloupes grown under dryland conditions are generally planted on wider row and plant spacing to better utilize moisture. Some growers plant two rows then skip two rows; others plant two rows then skip three rows, either on 38 or 40 inch centers. The skip between planted rows allows space for spraying and harvesting operations.

Dryland production of melons is risky, but the investment per acre is lower since inputs of seed, fertilizer, herbicides, insecticides, and fungicides are approximately half the costs of solid planted irrigated crops.

When plants begin to vine, unplanted beds are broken open and the field is reworked with the plant row in the center. This operation, which is referred to as break-over, facilitates furrow irrigation and allows most of the fruit to develop on the bed tops rather than in the furrows.

Fertilization

Cantaloupe require considerably lower levels of soil fertility than most other vegetable crops. In general 80-100 pounds of phosphorous (P_2O_5) and 100-120 pounds of nitrogen are sufficient to obtain good yields. Most mineral soils contain adequate potassium. On the neutral or acid sands of Central and East Texas, potassium addition may also be required. Application rates should be based on soil test recommendations. Phosphorus, either dry or liquid, should be applied preplant. Alkaline mineral soils chemically tie up phosphorus, so banding is preferable to broadcast application. In soils which have previously been heavily fertilized with phosphorus, a soil test may reveal enough residual availability to reduce or eliminate the need for additional application. Nitrogen is commonly applied in two sidedressings, the first at the 2-4 leaf stage and the second when the vines begin to run. Although many commercial growers apply 150 pounds of nitrogen or more per acre, researchers have not been able to document a crop response above 100-120 pounds N/A and the higher nitrogen rates may delay harvest and reduce the sugar content of the fruit. Micronutrient deficiencies are seldom observed in Texas grown melons so routine addition of trace elements is not recommended. Cost effectiveness of foliar applications of nutrients seldom justify applying nutrients solely by foliar sprays.

Pollination and fruit set

Pollination is essential to cantaloupe production. Earliness, fruit size and shape, uniform set and yield are all dependent on good pollination. Strong, vigorous bee colonies should be present in and around the field at the first sign of female flowers. Hybrids have a high yield potential, so it is advisable to use more than 1 colony per acre. It takes several visits by bees to one flower (usually 12-15) to successfully "set" each fruit. Benefits from having adequate bee colonies are: 1) reduced blossom setting period, 2) higher percent marketable crop with less culls, 3) concentrated harvest period, and 4) reduced fruit drop and higher yield. Strong bee colonies are generally 2-storied with an actively laying queen, 600-800 square inches of brood, adequate bees to cover the brood, a large field force (workers) and an adequate honey supply. The grower and beekeeper should cooperate closely to time colony placement with the onset of flowering and to minimize bee kill from insecticide applications and other cultural hazards.

Irrigation

Melons have deep, extensive root systems, so irrigations can be more widely spaced than with many other vegetable crops. Three to five furrow irrigations are commonly applied per crop. Preplant irrigation may be required for stand establishment. In the early seedling stage, watering should be avoided as it will cool the soil and encourage shallow rooting and damping off. Irrigation usually begins at the pre-vining stage. The last watering is applied about a week before harvest begins. Later furrow irrigation interrupts harvesting and reduces fruit quality. Watering should be done early where sprinkler irrigation is used to allow the foliage to dry thoroughly during the heat of the day to minimize foliage diseases.

Drip irrigation has been utilized successfully in several areas. Increased attention may be focused on this practice as water supplies become scarce. Good yields and plant growth have been produced.

Harvesting and handling

Cantaloupe are commercially harvested between 'half slip' and 'full slip'; the term 'slip' refers to a circular break at the spot between a fruit and its vine joint. When this layer of cells is fully developed the fruit actually separates, or slips from the vine. Workers harvest melons which will detach cleanly from the vines with very light pressure. Melons which have completely detached from the vine can be sold in local trade but will not ship well and are usually not marketed in the wholesale chain. Harvesting is done by hand every day or every other day, depending on weather conditions and the volume of melons maturing. A typical cantaloupe field will be harvested 6-12 times over a 10 day to 3 week period.

Honeydew melons will not slip until they are over-ripe so they are harvested on the basis of size, shape and color. As a honeydew matures it rounds out from an oblong immature shape, begins to turn from green to white and loses its waxy appearance. Honeydews are harvested commercially when they have filled out, the ground spot has turned creamy white, and the waxy bloom has faded. Fields are usually harvested 3-5 times on 4-7 day intervals.

Mechanical harvest aids (conveyor belts) are used to move melons directly into bulk trailers on most large plantings. Workers use shoulder bags in fields with light volume or where wet soil restricts machine operations.

Harvesting is done in the morning while the melons are cool in order to minimize the cooling required before packing. Night harvesting with lighted equipment is widely used in California and has been tried in Texas. Night harvesting is not widely practiced here in Texas.

Grading and packing

Virtually all Texas melons destined for the wholesale market are run through a packing shed for cleaning, grading, packing and cooling. Grading consists of removing cull fruit and sorting by size. Field heat is removed by hydro-cooling or forced-air cooling. Hot water and/or chlorine dips are used to reduce in-transit decay. Fungicide dips are occasionally used as well. Cantaloupe are packed by count into 'half carton' boxes holding approximately 40 pounds. Melon counts range from 30 per box (the smallest size marketed) to 9 per box (largest) with 23, 18 and 15 being the preferred counts (sizes). Honeydew melons are packed in cartons holding approximately 30 pounds. Counts range from 4 to 12 per box. Casabas, crenshaws, Persians, juan canary and Santa Claus have no official grades and are called "unclassified." Shipping containers vary. Bliss cartons weighing 25-35 pounds are used for sized crenshaws, casabas and Persians. Extreme care should be taken during harvesting and packing operations to avoid bruising, which increases decay in transit and storage.

Cold storage is not advised. Melons are sensitive to extremes of hot or cold temperatures. When fully ripe, melons are best stored at 40-50°F with a relative humidity of 80-85 percent.

Cantaloupe picked at half-slip are sufficiently mature to enter the wholesale market; they produce ethylene, a gas which speeds the ripening process. TAM Dew honeydew melons also produce enough ethylene to complete ripening. However, green flesh honeydews do not ripen well after harvest. It is a common practice to gas these melons with ethylene in special sealed rooms to promote more uniform ripening.

Marketing

Most Texas melons are sold on the wholesale market at prevailing prices based on a supply-demand system. The South Texas Melon committee, a federal marketing order, covers 19 South Texas counties, including the Rio Grande Valley. All cantaloupe and honeydew

producers in this area must meet certain packaging and quality standards. For more information on the marketing order, contact the USDA marketing field office in McAllen, Texas.

Some Texas melons are marketed through roadside stands or farmers' markets. The large, urban farmers' markets in Dallas, Fort Worth and Houston are used by many melon growers. Others have established specialty melon sales to restaurants and cafeterias.

Nutrition

Cantaloupe contain excellent amounts of vitamins A and C. The caloric value ranges from 26 to 42 per 3 1/2 ounces for all varieties.

References

The following publications contain current recommended controls for insects, diseases and weeds, plus budget information:

Texas Agricultural Extension Service, *Crop Budgets* (Bulletin-1241)

Insect and Weed Control Manuals, published by Ag-Consultant, a Meister Publication, 3781 Euclid Avenue, Willoughby, Ohio 44094

The Texas Plant Disease Handbook and Chemical Supplement, TAEX (Bulletin- 1140)

Texas Guide for Controlling Insects on Commercial Vegetable Crops, TAEX (Bulletin-1305)

Quick Guide by Thomson Publications, P. O. Box 9335, Fresno, CA, 93791

While these guides are helpful, an up-to-date product label is the legal authority for application of any chemical to a vegetable crop in Texas.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.