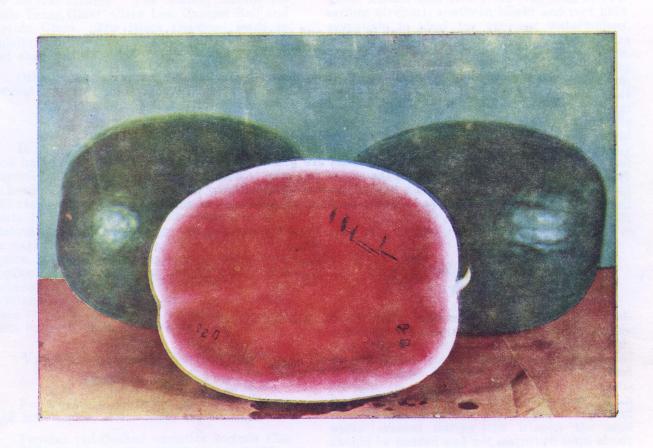
# Growing and Marketing Watermelons



Issued By
The Agricultural Extension Service
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#### INTRODUCTION

Watermelons rank high in value and acreage among commercial vegetable crops. This is the most widely grown vegetable crop in Texas.

Watermelon shipments start from South Texas in May and extend Northward until August. Competing states are Florida, which ships in May, and Georgia, which ships in June and early July.

Texas growers plant from 40 to 60 thousand acres of watermelons per year from which they receive four to five million dollars. Most of the watermelons produced in Texas are grown by individuals who derive most of their income from the sale of this crop. With a tractor and equipment, one farmer with a limited amount of hired labor can grow 50 to 75 acres of watermelons. Edible portions of watermelons contain:

Water	92.1%	Total Carbohydrates	6.9%
Protein	.5%	Fiber	.6%
Fat	.2%	Sugar	.6%
Ash	.27%	Iron	.0002%
Calcium	007%		

Contains vitamins A,  $B_1$ ,  $B_2$ , (riboflavin) and C Calories per pound—140

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## Growing and Marketing Watermelons

#### VARIETIES

#### **Commercial Shipping Varieties**

The most popular variety for commercial production is Black Diamond of which there are several strains. The leading strains include Texas Giant, Clara Lee, Cannon Ball and Florida Giant. The Black Diamond leads in popularity because of its high yield and excellent shipping qualities.

Other varieties grown on a limited commercial scale include Dixie Queen and Watson.

#### Wilt Resistant Varieties

In many sections, the Fusarium wilt disease has become so serious that common commercial varieties such as Black Diamond can no longer be grown profitably. For such areas, wilt-resistant varieties have been developed. Tests by the Texas Agricultural Experiment Station indicate that the Ironsides and Black-lee varieties and wilt-resistant strain of Dixie Queen have given the most satisfactory production. The Chris-Cross variety, which was included in tests for the first time in 1952, was outstanding on the basis of fruit size, total yield and wilt resistance. This one year's results indicate much promise for this variety.

#### Varieties for Local Market and Roadside Stands

For local use, varieties having a thinner rind and tender, sweet flesh are desirable.

Popular red-fleshed varieties include Cletex, Halbert Honey, Kleckley Sweet and Miles (wilt-resistant).

Yellow fleshed varieties include Tendersweet, Texas Golden and Desert King.

#### Ice Box Melons

The Miles variety has proved outstanding in yield and quality. A large percentage of the fruits will be 10 to 15 pounds in size. Under very favorable conditions they will be larger.

The Pride O' Texas variety shows promise on the basis of yield and fruit quality.

New Hampshire Midget is the smallest of the ice box types, and ranges in size from five to eight pounds. The rind is thin and tender and requires very careful handling.

#### SELECTION OF FIELD

A well-drained, deep sandy soil, rich in organic matter and free from wilt fungus (Fusarium niveum), southern blight and root knot nematode is ideal for growing watermelons. Most of the deep, sandy soils in East Texas which have been idle for at least five years, are considered good watermelon land. weeds and good-sized sassafrass and persimmon "bushes" occupying the land indicate that it has been idle long enough so that wilt fungi will not be a serious threat. Use of such idle land is ideal, but watermelons can be worked into a crop rotation successfully, provided they (or similar vine crops such as cantaloupes and cucumbers) do not occupy the same land more often than once in five years. Since limited acreage is a problem on many farms, a well planned five-year crop rotation may be the best solution.

### LAND PREPARATION AND FERTILIZATION

Land should be prepared far enough in advance of the planting season to allow for decomposition of litter and vegetative matter. Vegetative matter turned under in the late fall or early winter will add humus to the soil and increase its capacity to hold water and fertilizer. Early land preparation will also aid in controlling cutworms. To minimize wind and water erosion during the winter, the land should be bedded and not disturbed until about 10 days before planting time. If barnyard fertilizer is to be used, it should be sprinkled with superphosphate and placed in the watermelon row about December 1. The manure can be covered satisfactorily by throwing two furrows on it with a turning plow. These furrows leave an ideal ridge for planting. An additional application of from 150 to 300 pounds per acre of 5-10-5 fertilizer as a side dressing when the vines are from two to four feet long will increase the size of the melons and yield per acre.

Most growers are applying 300 pounds per acre of 5-10-5 prior to planting and side-dressing with 150 pounds. Many successful growers, however, are finding about 600 pounds per acre more profitable.

#### GOOD SEED

Poor seed often are responsible for low yields of watermelons; therefore, growers should obtain seed from a reliable source. Certified watermelon seed come from fields where careful inspections have been made during the growing season to eliminate anthracnose and wilt. In most cases, certified seed have been treated with a good disinfectant in storage and are shipped in sealed bags.

#### SEED TREATMENT

The fungi which cause damping off, wilt and anthracnose may be carried on untreated watermelon seed. Bichloride of mercury (corrosive sublimate) is especially effective against anthracnose and will destroy the germs of damping off and wilt if they are on the seed. Dissolve one ounce of bichloride of mercury in seven and one-half gallons of warm water, or one tablet in one pint of water. Soak the seed five minutes, then rinse thoroughly and dry. If old seed sacks are to be used for seed storage, treat them in the same solution. The solution should be mixed in glass jars or earthen or wooden containers. Bichloride of mercury is poisonous and should be handled carefully.

Dry seed treatment gives protection against damping off. Shake the seed and the dust together to insure a good coating of the chemical. One to two teaspoonsful of Cuprocide, Arasan, Semesan or Spergon per pound of seed will provide a good coating for the seed.

#### SAVING SEED ON THE FARM

Watermelon growers should obtain certified seed or select and save their own. Fields from which seed are to be saved should be at least half a mile from other watemelon fields to eliminate crossing. Allow the melons to become full ripe, cut into halves and scrape out the seed. Seed should be taken only from the best melons. Place the seed in barrels where, in three to five days, the pulp will ferment and rise to the top. Sound seeds settle to the bottom. Skim the refuse from the top of the barrel every day until fermentation is completed. Wash the seed, spread out to dry. Store in a cool, dry place. An acre of good melons will yield 100 to 125 pounds of seed.

#### PLANTING

The commercial crop is usually planted in hills, 12 by 12 feet apart. This spacing will give about 300 hills per acre. One pound of seed will plant an acre, using about 10 seeds

per hill. The young plants are easily injured by frost, so seed should not be planted until the soil is warm and the danger of frost is past. The depth of planting varies from one-half to one and one-half inches, depending on the type of soil and the season of the year. To hasten germination, soak the seed until they begin to sprout, then plant.

#### THINNING

When the young plants have developed their first true leaves, thin to two or three plants per hill. Later (2 to 3 weeks) thin to one plant per hill. Remove plants by cutting off rather than pulling up. Pulling the plant damages the root system of the remaining plant.

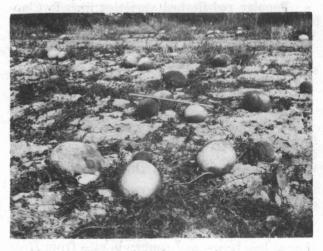
During the thinning operations, inspect the plants carefully for cut worms, cucumber beetles and aphids. These insects are especially injurious to young plants, but are easily controlled with recommended insecticides.

#### **CULTIVATION**

Watermelons should be cultivated only often enough to control weeds. Watermelons have many shallow roots which often extend farther out than the end of the vines; therefore, cultivation should be shallow. For ease in cultivating, weed eradication and shading, the plants should be turned toward the rows.

#### PRUNING

Successful growers find it profitable to "prune" the melons to get fruits of marketable size. This does not mean pruning the vines,



More melons were left in this unpruned field than were harvested.

but reducing the number of melons per vine. The usual practice is to wait until there is a good set then remove all but two or three of the best melons from each vine. All poorly-shaped and defective melons should be removed. "Pruning" causes all the vigor of the vine to go into the development of two or three large, well-shaped marketable melons.

#### IRRIGATION

Young watermelon plants do not require much water. As the plant develops, water requirements increase greatly. During the latter part of the growing season, moisture requirements are high. A number of growers have profited by irrigating during this critical period. In 1952, irrigation trials with a number of varieties of watermelons were conducted at the Gilmer Experiment Station to study the effects of supplementary irrigation. Results are given in Table 2.

Table 2
IRRIGATION TRIALS WITH
WATERMELONS

(Gilmer Experiment Station, Gilmer, Texas)

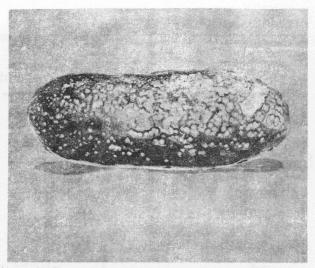
Variety	Irrigated Pounds per acre of marketable melons	Non-irrigated Pounds per acre of marketable melons	
Watson Black			
Diamond	20,840	11,120	
Florida Giant	20,320	15,020	
Black Diamond	19,640	9,720	
Dixie Queen	16,160	10,320	
Texas Giant	15,300	10,440	
Congo	7,620	3,820	

Supplemental irrigation was applied with a portable sprinkler irrigation unit. Two applications with three inches of water per application were applied on June 26 and July 14, 1952.

### PESTS WHICH DAMAGE WATERMELONS

Cut Worms Early plowing and bedding of the land is best for starving out the cut worms. They may be destructive in fields which are plowed later than January and in fields which are streaked-off and planted to control erosion. If cut worms appear in a field, dust the plants with five percent DDT.

Cucumber Beetles Striped or spotted cucumber beetles may damage or kill young watermelon plants. As soon as these beetles



This watermelon has diseased spots of anthracnose.

threaten damage, dust the plants with one and one-half percent Lindane dust.

Lice Lice (aphids) often damage watermelons, especially late ones. The plants should be dusted thoroughly with one percent or one and one-half percent Lindane as soon as the lice appear and before they become abundant and curl the leaves. Usually it is impractical to try to control numerous lice on large melon plants.

Fusarium wilt The fungus which causes Fusarium wilt is so abundant in many fields that susceptible varieties of watermelons such as Black Diamond and Common Dixie Queen cannot grow well. The stems wilt and the water-conducting tissue turns brown in the tap roots, and the plant dies. Table 1 describes resistant varieties which can produce good crops of melons in infested fields.

Anthracnose This disease is caused by a fungus which lives on the seed and may also live in the soil one or two seasons. It is common in wet years, but in dry seasons the disease is not serious. Anthracnose appears on the old leaves as small dark brown or black spots. It then appears on the melons and causes sunken spots in the rind. Even though symptoms may not be visible on the melons at harvest time, they may appear in transit or at the market. Buyers and inspectors discriminate against melons showing the slightest evidence of this disease because it may become so destructive.

Ready-mixed dusts can be purchased through local dealers. Watermelon dusts used in the control of Anthracnose should contain specific quantities of certain chemicals. Look on the labels to see if the dust contains any one of the following materials: 8 percent Parzate, 5 percent Zineb or 6 percent Copper. These materials are mixed with dust carriers to make

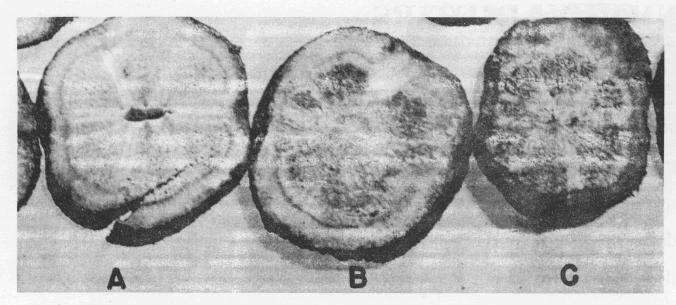
### TABLE 1--DESCRIPT

Variety	Wilt resistant	Maturity	Common weight of fruits, lbs.	Shape
Black Diamond*	No	Midseason	25-60	Round
Blacklee*	Yes	Midseason	15-35	Long
Brownlee	Yes	Midseason	15-35	Long
Chris-Cross*	Yes	Midseason	20-60	Round
Congo	Slightly	Midseason	15-35	Long
Desert King	No	Late	15-30	Round
Dixie Queen (common)	No	Early	20-50	Round
Dixie Queen W.R.*	Yes	Midseason	20-30	Round
Hawkesbury	Yes	Early	20-35	Long
Ironsides*	Yes	Midseason	20-40	Long
Kleckley No. 6	Slightly	Midseason	20-40	Long
Klondike R-7	Yes	Midseason	15-30	Long
Leesburg	Yes	Midseason	20-40	Long
Miles	Yes	Midseason	15-35	Round
Missouri Queen*	Yes	Midseason	20-35	Round
New Hampshire Midget	No	Early	5-8	Round
Stone Mountain No. 5	Yes	Midseason	15-25	Round
Sugar Loaf	No	Midseason	20-70	Long
Texas Golden	No	Midseason	20-40	Long
Tom Watson*	No	Late	20-50	Long

<sup>\*</sup>Best commercial varieties

# TION OF VARIETIES

Rind color	Flesh color	Flesh Texture	Flavor	Remarks
Green	Red	Coarse	Good	Subject to pimples
Green	Red	Fine	Excel.	Slightly later than Black Diamond
Green	Red	Fine	Good	Brown seed
Striped	Red	Fine	Good	Promising new variety
Striped	Red	Fine	Good	Lacks uniformity in shape
White	Yellow	Fine	Good	Resists sunburn
Striped	Pink	Fine	Good	Whiteheart often serious
Striped	Pink	Fine	Good	Whiteheart often serious
White	Pink	Fine	Good	Harvest for early market
Green	Red	Fine	Excel.	Excellent wilt-resistant variety
Green	Red	Fine	Good	Fruits may be pointed
Striped	Red	Fine	Good	Cracking of ripe fruits
Green	Red	Fine	Good	Sunburns badly
Striped	Red	Fine	Good	Very sweet flesh
Striped	Pink	Fine	Fair	Moderate wilt resistant
Gray	Red	Fine	Good	Handle like cantaloupes
Green	Pink	Stringy	Fair	Brittle rind
Gray	Red	Fine	Good	Good for late market
Green	Orange	Fine	Good	Specialty market
Green	Red	Fair	Fair	Late



Cross-section of tap roots of black diamond watermelons showing. A. Yellowish-white, healthy color; B. Moderate browning of woody center caused by Fusarium wilt; and C. Dark browning of center due to wilt.

up an effective dust mixture. Fifteen to 20 pounds of dust per acre are needed. Make the first application of dust to the melons when spots first appear on the leaves. The plants should be dusted every seven days as long as the weather remains rainy. Liquid sprays applied with a power sprayer are also effective against Anthracnose. Dithane and Parzate sprays used at the manufacturer's recommended rates will control the disease.

Downy Mildew This disease is caused by a fungus which makes dark brown spots on the leaves. It spreads rapidly in rainy weather and may destroy nearly all of the leaves. The sprays and dusts recommended for Anthracnose also control Downy Mildew.

Southern Blight This disease is white mold living in the soil which kills watermelons and most other non-woody fruit and vegetable crops. The mold may rot the stems near the surface and may rot the melons where they touch the soil. When the soil is wet, a layer of white mold often forms around the bases of the stems. Crop rotation with corn, sorghum, sudan grass or bermuda grass for two or more years will aid in controlling Southern Blight.

Nematode Root Knot Watermelons, like most other crops, are suceptible to the parasitic nematode-worms in the soil which cause root knots. The knotted roots cannot obtain fertilizer and water from the soil. Diseased plants usually are dwarfed and produce few, if any, marketable fruits. Crop rotation with sorghum, corn, sudan grass and bermuda grass for three years or longer is a practical method of controlling root knot nematodes.

This disease can cause Stem-end Rot heavy loss of watermelons in transit. It occurs in the field, but most of the infection takes place after harvest and the rot develops mostly during shipment. This disease is caused by a species of fungus (Diplodia). Spores of the fungus are common in the air of fields and loading areas but an uninjured melon on the vine is not susceptible. However, when its stem is cut or its rind injured a small amount of sap collects on the injured surface. The sap-covered injured surface is a favorable place for the germination of spores and for the fungus to enter the melon. An affected stem soon gets soft, shrivels and turns brown. Next the fruit begins to decay. Within a few days the decayed part turns brown to black. White mold with black pimples may occur on the rotted area.

To protect watermelons from stem-end-rot, they must be harvested and handled carefully, removed promptly from the field and the stem ends treated while they are being loaded for shipment. Workmen cutting the melons from the vine should avoid touching decayed fruit so that the fungus will not get on their hands or knives. The melons should be cut from the vines so as to leave the longest stems possible.

The truck or trailer bed, sides and top should be carefully padded to prevent injury to the rind. A tier of melons is loaded four layers deep in one end of the car with all stems toward the center of the car. While the loader stacks melons in the other end of the car, another workman recuts all of the stems. He catches the stem pieces as they are cut and removes them from the car. Then, using a long paint brush, he paints each freshly cut stem with a copper sulphate paste made as follows:

Place three and one-half quarts of water in an enamel kettle and dissolve eight ounces of laundry or corn starch in one pint of cold water, without lumps. Then stir the starch suspension into the blue water and boil it for one or two minutes to thicken it. Cool the blue paint and store it in glass fruit jars. The blue paint on the stem ends prevents rotting. It also advertises to buyers that loaders have done good work.

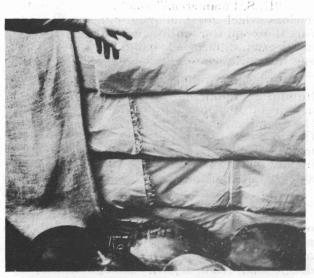
Pimples Sometimes small green pimples develop in the surface of the rind and decrease the sale value of the melons. The cause is unknown. The condition is serious mainly because it may be mistaken for an early symptom of Anthracnose. However, the green pimples retain their original appearance, do not make diseased spots, and are not associated with any disease of the leaves.

Sunburn The dark green-rind varieties of melons may have their market value decreased by sunburn in hot weather unless protected. The sunburn turns the tops and sunny sides yellow, white or brown and the flesh may be burned an inch deep. The best melon growers paint a thick mixture of lime and flour in water on the tops and sunny sides of their melons. The thick paste is applied with a paint brush. This whitewash is easy to wipe off before marketing the melons.

Crows Crows may cause losses by pecking holes in watermelons. They usually do not bother melons which have been whitewashed. Laying vines over melons may protect them. Growers with small acreages set poles about 10 feet tall at an angle in the soil, about 100 to 200 feet apart in a field and tie strings from one pole to the other. Shiny can lids or bottles are tied on the ends of strings about three feet long and hung from the tops of the poles. Wind moves the bottles and lids, which shine in the sunlight and frighten the crows away.

#### HARVESTING AND HANDLING

One experienced person should do the job of selecting and cutting the melons from the vines in the field. The melons are cut from the vines and stood on end. Several watermelon "toters" carry the melons to the trailer. They then are hauled to a shady place and stacked according to size, with a range of approximately six pounds between the melons in the different stacks. This makes it easy to load according to the size needed. To avoid skinning melons, the sides and top of the trailer and the farm truck should be covered with old sacks. Better still, use excelsior pads on the sides and place five or six inches of hay on the floor. Watermelons should not remain in the field stack over 48 hours, as the stems will begin to



The top and sides of the trailer and farm truck should be covered with excelsior pads so that the melons will not be skinned in transit.

dry and truck or carlot buyers will not take them. The melons should be harvested and loaded on the car or truck the same day.

A car of over-ripe melons can "back-fire" on the shipper almost as quickly as a car of green melons. To keep satisfied customers, growers should strive to sell only melons at the right stage of maturity. To reach consumers in salable condition, melons must be in good condition at the time of shipment.

Watermelons should not be picked before they are ripe. It takes five to seven days by rail and two days by truck for East Texas melons to reach mid-western and eastern markets. If the melons are not ripe, the market gets a bad reputation. A few early cars of green watermelons usually cost the growers within a few days.

#### U. S. STANDARDS FOR WATERMELONS

According to U. S. Standards "U. S. No. 1" shall consist of watermelons of similar varietal characteristics which are mature but not overripe, fairly well formed and free from sunscald, decay, anthracnose and from damage caused by other diseases, whiteheart, sunburn, hollow heart, hail, insects, or mechanical or other means.

"In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent, by count may be below the requirements of this grade, but not more than one-half of this tolerance or five percent may be badly misshapen or seriously damaged by any means, and not more than one percent shall be allowed for decay.

"U. S. Commercial" shall consist of watermelons which meet all requirements of U. S. No. 1 except for anthracnose spots. In this grade each watermelon shall be free from damage by anthracnose.

"In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent by count may be below the requirements of this grade but not more than one-half of this tolerance, or five percent may be badly misshapen or seriously damaged by any means, and not more than one percent shall be allowed for decay.

"U. S. No. 2" shall consist of watermelons of similar varietal characteristics which are mature but not over-ripe; which are not badly misshapen and which are free from sunscald, decay, and from serious damage caused by whiteheart, sunburn, hollow heart, hail, anthracnose or other disease, insects or mechanical or other means.

"In order to allow for variation incident to proper grading and handling, not more than a total of 10 percent by count, may be below the requirements of this grade but not more than one percent shall be allowed for decay.

#### SIZE

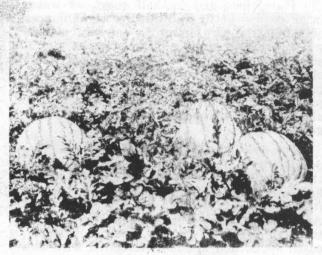
"Where the size of watermelons is stated in terms of average weight, unless otherwise specified, the melons in any lot averaging less than 30 pounds shall not vary more than four pounds below the stated average, and the melons in any lot averaging 30 pounds or more shall not vary more than six pounds below the stated average.

"Size may also be stated in terms of minimum weight."

"In order to allow for variations incident to proper sizing, not more than five percent by count of the watermelons in any lot may be below the size requirements."

Melons of 28 pounds and up are favored for commercial shipments in Texas.

Railroad cars are loaded with 700 to 900 melons, depending on the size of the car. Most cars are loaded, four layers deep. A covering of hay, six inches deep, is placed on the floor of the car, and the sides are padded with excelsior pads to prevent skinning and bruising. A tight pack of melons in the car is essential to avoid load shifting and damaging. An experienced loader, a representative of the State-Federal Fruit and Vegetable Inspection Service or a railroad representative can advise on load-



Chris-cross watermelons (wilt resistant) in a commercial field in Shelby County, Texas.

#### TABLE OF WEIGHTS

Average weight	Minimum Weight (Unless otherwise specified)	Tolerance permitted for melons below the minimum weight
20	16	5%
22	18	5%
24	20	5%
26	22	5%
28	24	5%
30	24	5%
32	26	5%
34	28	5%
36	30	5%
38	32	5%
40	34	5%
42	36	5%

ing details. Melons in transit to distant markets will shrink about four percent. Large trailer trucks have a capacity of 25 to 35 thousand pounds of melons.

#### SALES

Some of the common methods of selling melons in East Texas are:

Watermelon Growers' Association Associations of growers frequently sell direct to a reputable receiver. The receiver has a representative at the shipping station who loads the cars and pays the association for the melons. Associations can build up a good reputation in market channels and bring a higher average price to the membership,

Watermelon Shipping Center Sales In leading watermelon shipping centers, there are usually several buyers. Some of these represent eastern connections and buy on account



Railroad cars are loaded with 700 to 900 melons, depending on the size of the car. Most cars are loaded, four layers deep.

for these firms, while others are independent buyers and buy and sell on a day-to-day basis. In such markets, competition between buyers is advantageous.

Truck Buyers Trucks move a large part of the watermelon crop in Texas. Truck buyers come into the various growing centers and buy on a competitive basis with carlot buyers. There is a growing tendency for eastern and mid-western firms to have local representatives to buy watermelons for them and the melons are moved by truck into eastern markets.

Consignment Very few Texas watermelons are consigned. Except under conditions of known receivers, it is not advisable to consign melons.