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FACT SHEET

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Keys to Profitable Tomato Production in South and West Texas

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The value of the Texas fresh market tomato crop during 1970 totalled $5,752,000. Of a total production of 10,800 acres, 9,300 were produced for the spring market and 1,500 for the fall. The tomato crop is valued at about 4.2 percent of the total Texas vegetable industry.

Production Areas and Seasonal Movement

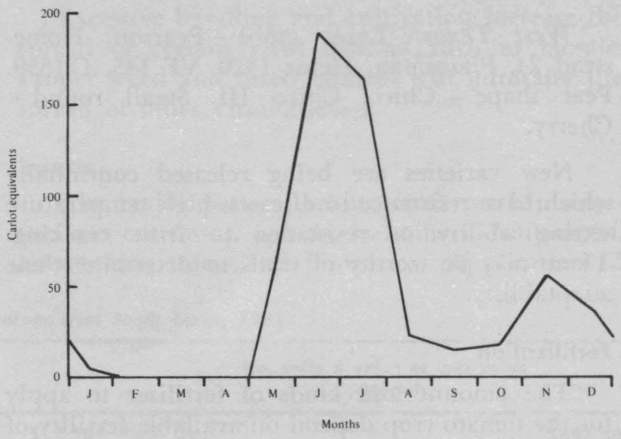
Although tomatoes are grown statewide, most commercial production is located in four areas: South Texas (San Antonio to the Rio Grande Valley), Upper Coast, Central-East Texas and the High Plains.

Production from South Texas is in early spring and late fall. Planting for the early spring crop begins in December and continues through March. Most of the acreage is direct-seeded, but during years of adverse weather some acreage is transplanted with plants from fields having excess stands. Depending upon weather conditions, harvest begins from early April to early May. In most years little production is available until April 20 to 25. Peak production usually occurs in June, with volume declining into August. Hot weather and production from competing areas generally end the harvest in August. Planting of late fall tomatoes gets underway in July in all South Texas areas and continues into September. Harvest begins in early November and continues into December or until a freeze ends harvest.

Late spring production comes from the Upper Coast, Central and East Texas areas. Plantings in greenhouses and hot beds begin during late January in early areas and continue through February in later sections. Plants are set to fields from early March into April. Earliest plantings provide production in late May. Crops in Central and East Texas come into production early in June. Peak harvest occurs the last half of June and early July, with the season ending in August.

Production from the High Plains is during summer and early fall. Direct seeding begins in late April and May, providing supplies from late July through September. Figure 1 indicates the seasonal movement of tomatoes to market from Texas production areas.

Fig. 1. Average unloads in carlot equivalents of Texas tomatoes in 41 major cities by months, 1968-70. Source: Fresh Fruit & Vegetable Unloads for 41 Major Cities, USDA Consumer Marketing Service, Fruit and Vegetable Division, Market News Branch, Washington, D. C.



Climate Requirements

Tomatoes are a warm-season crop, requiring 90 to 120 days from seeding to mature fruit. Best production is when temperatures range from 80 to 85 degrees F. during the day, and 60 to 70 degrees F. during the night. Day temperatures above 90 degrees F. along with night temperatures above 70 degrees F. result in blossom drop and poor fruit set. Hot, dry winds cause blossom drop and blossom-end rot to occur on developing fruit. Since tomato plants are highly susceptible to frost damage, hot caps sometimes are used to protect early plantings. Areas of high humidity require additional protection to control foliage disease. Windbreaks often are desirable in many areas of Texas. Usually a two or four-row windbreak of corn or grain sorghum between each 12 to 16 rows is adequate.

Soils

Selection of land for tomato production is important. Sandy loam and silty loam soils are best suited for tomatoes, and heavy clay soils should

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be avoided if possible. Good surface drainage and a permeable subsoil are necessary. Properly levelled fields free of potholes enhance proper irrigation, aid drainage and promote uniform maturity. Avoid salty fields and those where nematodes are a problem.

Varieties

Except for trial plantings, grow only those varieties which are adapted to your area. Varieties proved successful in Texas include:

South Texas: Large globe – Homestead 24, Supermarket, Homestead Elite, Monte Grande. Pear shape – Chico, Chico III. Small round – Cherry.

West Texas: Large globe – Pearson, Homestead 24, Plainsman, Heinz 1320, VF 145, C-1359. Pear shape – Chico, Chico III. Small round – Cherry.

New varieties are being released continually which have resistance to diseases, high temperature setting ability or resistance to fruit cracking. These may be worthy of trials to determine their adaptability.

Fertilization

The amount and kinds of fertilizer to apply for the tomato crop depend on available fertility of the soil, organic matter content, moisture supply, season, cropping system, variety and returns from the crop. To produce high yields, however, the soil must be well fertilized.

When it is necessary to add nitrogen, phosphorus and potash, apply a complete fertilizer containing a small part of the nitrogen and the balance of the necessary nutrients before planting. If the plants are to be set close together or large quantities of fertilizer are used, broadcasting is recommended . If rows are wide apart or moderate amounts of fertilizer are used, distribute the fertilizer in rows or in bands near the seed or plant row. At the setting of the first fruit cluster, apply a sidedressing of nitrogen. If the plants show signs of nitrogen deficiency later in the season, apply additional nitrogen sidedressings if climatic conditions are favorable for further production.

Direct-seeded tomatoes should receive phosphate (60 to 100 pounds of P_2O_5 per acre) banded 2 inches directly below the seed at planting time. No potash is recommended since most soils in South and West Texas are high in potassium. Use 40 to 60 pounds of actual nitrogen sidedressing when first blooms appear. Apply additional nitrogen as a sidedressing when needed.

Planting

Tomatoes normally are planted one row per bed on 40-inch centers at the rate of 1 to 1½ pounds of seed per acre. Seeding and phosphate banding should be one operation to insure proper placement and seed depth. Seed usually are planted ¾ to 1 inch deep in moisture, whereas ½ to ¾ inch depth is sufficient when the crop is to be watered up. Always use good quality, treated seed.

Thin the plants 14 to 16 inches apart when they are about 4 to 6 inches tall.

For August transplanting in South Texas, the plants should be 4 to 5 inches tall. For spring transplanting, larger plants (5 to 8 inches) may be used to promote earlier harvest. Following transplanting, two to three irrigations at 3 to 5-day intervals are required. A sidedressing of 20 to 30 pounds of nitrogen applied about 10 days after transplanting is recommended to promote vigorous plant growth.

Irrigation

A direct-seeded tomato crop requires 12 to 16 inches of water per acre. Most tomatoes are planted in moist soil or planted dry and irrigated up. An irrigation generally is needed following thinning or blocking when seedlings are 4 to 6 inches high. The most critical time for ample soil moisture is during bloom and early fruiting stages. Moisture stress during this period may result in poor fruit set or development of blossom-end rot. If watering is desirable after harvest begins, apply it in every other furrow to allow harvesting to continue.

Weed Control

Applications of Enide, Dymid or Prefar at the rate of 4 to 6 pounds per acre incorporated 2 to 3 inches deep will control most weeds. Use Prefar, Dacthal or Treflan applications after transplanting or thinning but before weeds emerge. Use ½ to ¾ pound per acre of Treflan or 6 to 12 pounds per acre of Dacthal on a broadcast basis.

Cultivation

Avoid deep cultivation because this results in root pruning and a loss of soil moisture. Large cultivator knives, 18 to 22 inches long, may be mounted on cultivator legs for shallow cultivation under plants after they are down.

Diseases

Many diseases threaten tomato production in Texas. Some diseases affect the entire plant, while others attack only the foliage or the fruit. Most diseases are caused by bacteria, fungi, nematodes or viruses. Many, however, are non-parasitic in na-

ture and are caused by unfavorable environmental conditions (physiological leaf roll, blossom-end rot, sunscald or growth cracks).

Crop rotation and resistant varieties help prevent soil-borne diseases such as nematodes, Fusarium and Verticillium wilt, southern blight and bacterial wilt.

The soil should be fumigated before planting to control root knot and other nematodes. For transplant production, the seedbed should be fumigated with steam, methyl bromide, formaldehyde or chloropicrin to control nematodes and soil-borne diseases. Another method is to grow the plants in a sterile artificial medium such as peatlite.

Disease-free seed, grown in areas where diseases are not prevalent and treated with a proper fungicide, help control damping off and bacterial spot.

Drenching transplants with fungicides, such as Captan or a fixed copper, will control diseases in the seedling stage.

A regular spray program is necessary to control foliage diseases such as late blight, early blight, gray leaf spot, leaf mold and anthracnose. Fungicides, such as maneb (different formulations), Polyram, Dyrene, Captan, Zineb and copper-containing fungicides – applied at recommended rates in enough water to obtain good coverage – should be applied at 10 to 14 day intervals (shorter intervals if necessary). Begin applications at bloom and continue until shortly before harvest. Spreader-stickers help to obtain better coverage. Always check the label for recommended rates.

Adequate watering and fertilization will reduce losses caused by blossom-end rot and fruit rot. Where fruit rot is a problem, plants should be staked or mulched with paper or plastic and watered properly to keep the fruit dry.

Excessive handling and cultivation increase the spread of certain virus diseases such as mosaic. Proper weed and insect control will minimize the spread of other virus diseases.

Insects

The major pests attacking fresh market tomatoes are cutworms, aphids, leafminers, fruitworms, hornworms, mites and pinworms. Application of

Table 1. Estimated costs and returns per acre of early spring tomatoes from South Texas, 1971

Item of expense	No. units & value or cost value per unit					
Production receipts	155 lugs (40 lb.)	@	$ 4.50*			$697.50
Cash expenses:						
Tractor & equipment	15 hr.	@	0.80	$ 12.00		
Tractor labor	17 hr.	@	1.50	25.50		
Other labor (thinning, irrigation)	10 hr.	@	1.40	14.00		
Seed	1½ lb.	@	10.00	15.00		
Fertilizer (60-80-0)	140 lb.	@	0.11	15.40		
Insecticide	4 appl.	@	3.00	12.00		
Fungicide (Maneb)	4 appl.	@	4.00	16.00		
Herbicide (Prefar)	1½ lb.	@	3.00	4.50		
(Treflan)	1 pt.	@	3.00	3.00		
Irrigation water	3 appl.	@	3.00	9.00		
				$126.40		
Interest on operating capital—8% for 6 mo.				5.09		
Total cash and cash interest expense					$131.49	
Land expense						
Taxes	1 yr.	@	11.00	11.00		
Interest on land @ 6% on $400	1 yr.	@	24.00	24.00		
Overhead expense				25.00		
Total land and overhead expense					60.00	
Total cash and fixed expenses					$191.49	
Harvesting and marketing expense:						
Harvesting and hauling	155	@	1.20	186.00		
Packing (includes carton)	155	@	1.35	209.25		
Selling	155	@	0.25	38.75		
Total harvesting and marketing expense					$434.00	
Total expenses						$625.49
Return to management						$ 72.01

*Average price for Texas early spring tomatoes for 1968-70 from Bulletin 60, "Texas Vegetable Statistics," Texas Crop and Livestock Reporting Service, Austin.

Table 2. Cost of producing and marketing Texas early spring tomatoes as influenced by marketable yield per acre.

Marketable lugs per acre	Cost per 40 lb. lug		
	Production costs*	Harvesting, packing and selling costs*	Total f.o.b. cost
75	$2.55	$2.80	$5.35
100	1.92	2.80	4.72
125	1.54	2.80	4.34
150	1.27	2.80	4.07
175	1.09	2.80	3.89
200	0.96	2.80	3.76

*Based on cost estimates in table 1.

sevin at the rate of 1.6 to 2.4 pounds actual ingredient per acre or Rothane at 1 pound actual ingredient per acre controls hornworms, fruitworms, pinworms and cutworms. Aphids and leafminers can be controlled with ½ pound actual ingredient per acre of diazinon, Cygon, Ethion or parathion. Spider mites can be controlled satisfactorily by applications of Systox at ¼ pound actual ingredient per acre, Kelthane at 0.4 pounds actual ingredient per acre or Tedion at ½ pound actual ingredient per acre. Follow label directions concerning insecticide rates, time of application and safety precautions.

Harvesting and Packing

Tomatoes for fresh market usually are hand harvested. Green-wrap tomatoes are harvested when they are full size but have no pink color. Vine-ripened tomatoes are picked when they "break" or when the stem end begins to change from green to light pink. The tomatoes are placed in field containers for transporting to a grading station or a packing shed. Then they are cleaned, graded, sized and packed in wooden or fiberboard boxes containing 20 to 40 pounds of fruit. The containers are moved to market in refrigerated cars or trucks.

Trade names are used occasionally for better understanding of information presented. No endorsement of named products is intended nor is criticism implied of similar products not mentioned.

Marketing

Most Texas-grown tomatoes sell on the open market at prevailing prices. Some tomatoes are sold directly to local retail stores by small producers. Little contracting of Texas tomatoes is practiced.

Cost and Returns

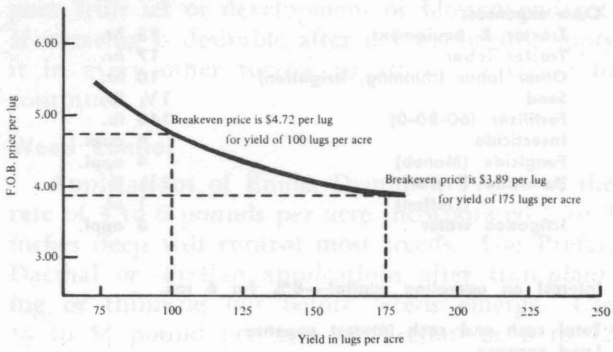
Table 1 gives the estimated cost and return of tomatoes produced during early spring in the South Texas area on a per-acre basis. Cash expense, land expense and overhead costs are $191.49 per acre. Return to management, based on average yields and average f.o.b. price per lug, is $72.01 per acre.

The total cost of producing, harvesting, packing and selling tomatoes, as influenced by yield per acre, is given in table 2. Production costs per lug decrease with increasing yields, while harvesting and marketing costs remain the same.

Figure 2 shows the f.o.b. price per lug necessary to break even at various yields. A yield of 100 lugs per acre requires a price of $4.72 per lug to break even, whereas a higher yield of 175 lugs per acre requires a lower price of $3.89 per lug to break even.

The curve in figure 2 can be used by individuals to estimate potential returns based on the expected yield per acre.

Fig. 2. Price per carton f.o.b. of South Texas tomatoes required to break even for different yields, based on figures in table 1.



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