

SPRING BUSH TOMATO PRODUCTION

Spring bush tomatoes are grown mainly in the mild coastal areas of the county. They often follow other winter vegetable crops such as celery or cabbage. Production costs per acre of the spring bush crop are considerably less than for spring staked tomatoes.

VARIETIES: Strains of Pearson and Stone selections are the main varieties grown. Small acreages of Moran, Earliana, #498 and Pennheart are also used.

PLANTING AND CAPPING: Hot house plants are planted 2' to 4' apart in 4' to 6' spaced rows in February and March. These are usually covered with hot caps. The plants fill out the caps in 5 to 8 weeks when the plants are slowly brought out by slitting the top of the cap. This prevents sun & wind burn. Non-capped plantings are made comparable to the capped method in the warmer sections of the county.

FRUIT SET AND USE OF HORMONES: Temperatures averaging lower than 55° F. in late April and May may prevent or reduce fruit set. "CPA" (sodium-parachlorophenoxy-acetate) hormone applied at 50 P.P. M. as an atomizer spray on only the flowering clusters has assured fruit set.

SOIL REQUIREMENTS: Tomatoes are deep rooted, therefore the deep or medium depth soils are preferred. Both sandy loam and heavier loams soils are used successfully however, plants grow faster and mature earlier in light soils.

FERTILIZER REQUIREMENTS: Many types of fertilizers are used, but the main element needed is nitrogen. This is applied at the rate of 100 to 200 pounds per acre. Many growers also use animal fertilizer. Occasionally phosphorus, and potash are also applied.

WATER APPLICATION: Irrigation is done by the furrow method. Frequent irrigations are needed for rapid vine growth. Intervals between irrigations range between 7 to 14 days, depending on weather, growth and soil type.

DISEASE PROBLEMS: Tobacco mosaic, spotted wilt, curly top virus diseases and Fusarium and Verticillium wilts are main tomato diseases. Planting on new ground reduces root rot wilt losses. Pearson variety is partially tolerant to fusarium and verticillium. There is no entirely satisfactory control of the virus diseases.

PEST CONTROL: The most common pests are: corn ear worm, horn worm, pin worm, potato tuber worm, tomato russet mite and serpentine leaf miner. DDT-sulfur dusts give good control of worms and mites, while toxaphene-sulfur controls leaf miner, worms and mites fairly well.

HARVESTING: Picking begins in late June and early July, and may continue through August. Mature green and light pinks are used for out-of-state shipments. Dark pink and ripe fruits are marketed locally. Picking may take place at 2 to 5 day intervals.

PACKING: Most of the crop is sorted, graded and packed in flats or lugs for both local or out-of-state shipments. A limited amount of fruit may be packed into 5 pound baskets. Sizes most commonly packed are 4 x 5, 5 x 6, 6 x 7.

MARKETING: A major portion of the spring bush crop is grown for local-instate shipments. A limited amount is shipped out-of-state by rail or truck. When prices become unfavorable or quality declines, processors handle the vine ripened fruit.

3.474
300c.
5/10/51

San Diego County
Agricultural Extension Service
University of California
Bldg. No. 1, 4005 Rosecrans St.
San Diego 10, California

SAN DIEGO COUNTY TOMATOES SPRING STAKED
Bernarr J. Hall, Farm Advisor

WHAT DOES IT COST YOU TO GROW TOMATOES?

Yield-40,000# or 1600-25# flats-Staked & Hot caps

Items	Sample Costs			Your Costs		
	Per Acre	Per 100#	Per Flat	Per Acre	Per 100#	Per Flat
LAND PREPARATION- Labor and field power-plow, disc, harrow, float chisel etc. 6-10x	20.00	.05	.01			
Transplanting & Hot caps	18.00	.05	.01			
CULTURAL-Labor & material						
Irrigation 6-16x	30.00					
Cultivation 6-15x	20.00					
Hoe & Cap removal 1-4	22.00					
Fertilizing 2x	6.00					
Pest Control 3-15	18.00					
Stake, tie and train	180.00					
Miscellaneous	40.00					
Total Cultural	316.00	.79	.20			
MATERIALS						
Irrigation Water 16"-24"	40.00					
Fertilizer	125.00					
Plants 6,000	18.00					
Pest Control	40.00					
Caps 6,000	90.00					
Flats & Packing @ 26¢	416.00					
String & Misc.	30.00					
Total Materials	759.00	1.89	.47			
HARVESTING						
Picking @ .7¢ #	280.00					
Haul to shed	40.00					
Pack & sort	200.00					
Removal of stakes & vines	30.00					
Total Harvest	550.00	1.38	.34			
CASH OVERHEAD COSTS						
General Expense	83.15					
Taxes	4.00					
Repairs	4.00					
Insurance	20.00					
Total Cash Overhead	111.15	.28	.07			
Depreciation-(stakes & equip.)	70.00	.18	.04			
Rent-Land	42.00	.10	.03			
Total All Costs	1886.15	4.72	1.18			

The above costs for growing early spring staked market tomatoes are based on estimates obtained from growers based on an average yield of 20 tons per acre. It includes hot caps, staking and trellising, packing and all costs ready to ship. Rates of cost are based on contract or piece work and current price of materials. Use the last three columns for estimating your costs.

(over)

SPRING STAKED TOMATO PRODUCTION

Spring tomato plantings comprise a considerable portion of San Diego's county annual tomato production. The portion of staked plantings in the spring crops is increasing due to longer harvest period and the higher yields over bush tomatoes.

VARIETIES: Pearson strains are used for this crop although there are limited acreages of Stone selections.

PLANTING AND CAPPING: Hot house plants are used almost entirely. Plants are set 18" to 30" apart in rows 5' to 7' apart on one edge of the furrow. Hot caps are used for 4 to 7 weeks, and tents are sometimes used to replace the caps. The tents are left on the plants 3 to 4 weeks, depending on the weather. When the plant has filled the tent the paper covers are opened up slowly to prevent sun or wind burn. In warm areas limited uncapped plantings are made comparable to capped plantings.

FRUIT SET AND USE OF HORMONES: Temperatures averaging lower than 55 degrees occurring in late April and May are often responsible for set failures. CPA (sodium-parachlorophenoxyacetate) hormone applied as an atomized spray on only the flowering clusters has assured fruit set.

SOIL AND WATER REQUIREMENTS: Tomato plants are deep-rooted, therefore, medium to deep soils are preferred. Both sandy and heavy soils are used. Irrigation water is applied in furrow averaging 7 to 14 day intervals. Frequency of irrigation depends on soil type and depth, temperature, plant size and spring rains.

FERTILIZER NEEDS: Nitrogen is the main element needed by this crop. 100 to 200 pounds of actual nitrogen may be needed by this spring's staked crop. Phosphorus and potash are used by some growers.

STAKING AND TYING: The common method of staking tomatoes is to place 6 to 8 foot bamboo poles or 1" x 1" x 6' stakes at each plant. Heavier 2" x 4" posts are spaced from 15 to 25 feet for the reinforcement of the trellis wires. One to three strands of wire are placed 15" to 18" apart on the stakes. Tying is a continual process that starts when the plants are from 6 to 9 weeks old. The stems are tied to the stake and wires. Where one top wire is used, binder twine is wrapped around the plant between the individual stakes at 6" intervals.

DISEASE CONTROL: Spotted wilt, tobacco mosaic, curly top, viruses and Fusarium and Verticillium wilt are the main tomato diseases. Preventative measures are the only means of reducing virus diseases. Pearson variety shows some resistance to Verticillium and Fusarium.

PEST CONTROLS: Corn ear worm, hornworm, pinworm, potato tuber worm, tomato russet mite and the serpentine leaf miner are the principal pests. 5% and 10% DDT-sulfur dusts give good control for mite and worms. 20% toxaphene-sulfur dust controls leaf miner, worms and mite.

HARVESTING: Picking begins in late June, continuing thru August, depending on the market price. Both unstemmed and stemmed tomatoes are picked with the latter being classed as a fancy pack. Mature green and light pinks are used primarily for distant shipments while the local markets prefer the pink and ripe fruits.

PACKING: Flats and lugs are the main containers used. A few 5 pound baskets and a limited amount of ungraded shipments are made. The packed sizes for lugs or flats are, 4 x 5, 5 x 6, and 6 x 7 per layer.

MARKETING: The spring crop of tomatoes is grown for both local and out-of-state shipment. With the increased population, a greater portion of the crop is sold within the state where the pink and ripe fruits are generally preferred by the consumer.

3.474
300c.
5/10/51

Agricultural Extension Service
Bldg. No. 1, 4005 Rosecrans St.
San Diego 10, California

SAN DIEGO COUNTY TOMATOES-FALL-BUSH COSTS

Bernarr J. Hall, Farm Advisor

WHAT DOES IT COST YOU TO GROW TOMATOES?

Average yield-22,000# 880-25# flats

Items	Sample Costs			Your Costs		
	Per Acre	Per 100#	Per Flat	Per Acre	Per 100#	Per Flat
LAND PREPERATION- Labor and field power-plow, disc, float, harrow etc.	20.00	.09	.02			
Transplanting-5' x 3'	11.00	.05	.01			
CULTURAL-Labor & field power						
Irrigation- 6-20 x	30.00					
Cultivation 4-8 x	12.00					
Hoeing 2 x	8.00					
Pest Control 3-6 x	9.50					
Miscellaneous	4.00					
Total Cultural	63.50	.29	.07			
MATERIALS						
Irrigation Water 16"-24"	36.00					
Fertilizer	80.00					
Plants - 3000	7.50					
Pest Control	20.00					
Flats and Packing Material	288.80					
Total Materials	432.30	1.96	.49			
HARVESTING						
Picking	154.00					
Haul to Shed	22.00					
Sort and Pack	123.20					
Total Harvest	299.20	1.36	.34			
CASH OVERHEAD						
General expenses	41.30					
Taxes	1.00					
Repairs	2.00					
Insurance	9.00					
Total Cash Overhead	53.30	.24	.06			
Depreciations	4.00	.02				
Rent-Land	42.00	.19	.05			
Total all Costs	925.30	4.20	1.05			

The above sample costs are based on estimates obtained from growers assuming an average production of 11 tons per acre actually marketed. It is the crop that is grown for the late fall market. No stakes, hot caps or trellising are included in costs. All costs for packing are included. Costs per acre are much lower than the staked method. Yields are also much lower. Cost rates are based on contract or piece work rates and the current market price of materials.

Use the last three columns for estimating your costs.

(See other side)

FALL BUSH TOMATO PRODUCTION

Fall bush tomato production has been one of the important methods employed in San Diego County. It is especially favored in the mild coastal sections.

VARIETIES: Pearson strains and selections of Stone are grown mainly. Pearson is preferred on land with previous tomato history because of disease tolerance.

PLANTING SEASON: Outside seed beds are planted in May. Field planting is done in July with plants 6" to 8" tall. The degree of fall frost hazard determines the planting date. Slightly early plantings are made in the colder locations in order to obtain earlier maturity ahead of frost. Rows are 4 to 6 feet apart and plants spaced 3 to 4 feet in the rows.

SOIL REQUIREMENTS: Deep to medium depth soils are preferred. Many coastal hillside areas are used; hillside planting necessitates more careful land preparation.

WATER APPLICATION: Frequent irrigations are needed; generally one to two weeks apart, depending on weather, growth and soil type. Blossom end rot may occur from uneven or inadequate irrigation. Furrow irrigation is generally practiced. Average land fall should be not over 4 to 8 inches per 100 feet of row.

FERTILIZATION: Nitrogen, the main element required, is used at the rate of 100 to 200 pounds per acre, most of which is applied at planting time. Phosphorus and potash are included by some of the growers.

DISEASES: Principal diseases are viruses, root rots and blights. Fungicidal sprays are helpful in blight control. No controls of viruses and root rots are known; such as curly top, tobacco mosaic, spotted wilt, Fusarium and Verticillium wilts. Therefore the only safeguards are preventive measures.

PESTS: The main pests are hornworms, pinworms, potato tuber worm, tomato fruit-worm (corn earworm), tomato russet mite and the serpentine leaf miner. Five to 10 per cent DDT-sulphur dusts provide control for worms and mites. A 20% toxaphene dust is fairly effective against the leaf miner and the worms.

HARVESTING & MARKETING: July planted bush tomatoes are harvested in September through December. Weather is the limiting factor - frost and rain. Wet weather favors blight and Botrytis. Dark mature green and light pinks are harvested, graded and packed for distant shipments by truck and rail. Pinks and ripers are usually sold locally in a well graded pack. When unfavorable market prices are experienced processors utilize the remainder of the crop.

3.474
300c.
5/31/51

San Diego County
Agricultural Extension Service
University of California
Bldg. No. 1, 4005 Rosecrans St.
San Diego 10, California

SAN DIEGO COUNTY-FALL-STAKED TOMATO COSTS

Bernarr J. Hall, Farm Advisor

WHAT DOES IT COST YOU TO GROW TOMATOES?

Yield 52,241 pounds or 2133 flats-24.5#

Items	Sample Costs			Your Costs		
	Per Acre	Per 100#	Per Flat	Per Acre	Per 100#	Per Flat
LAND PREPARATION 6 - 10 X plow, disc, float, level, harrow, chisel etc.	25.41	.05	.01			
Transplanting	14.81	.03	.01			
CULTURAL -Labor & Field Power						
Irrigation labor 6-26 x	48.24					
Cultivation 4-16 x	22.93					
Hoeing 1-4 x	25.86					
Pest Control-labor-3-15 x	18.15					
Stake, tie and train	181.52					
Miscellaneous	58.44					
Total Cultural	355.14	.68	.17			
MATERIALS						
Irrigation Water 16"-24"	57.06					
Fertilizer (complete)	126.69					
Plants 3000-6000	13.84					
Pest Control	43.91					
Flats & Packing material	662.29					
String & Misc.	36.53					
Total Materials	940.32	1.80	.44			
HARVESTING						
Picking	356.68					
Pack & Sort	303.10					
Haul to shed	45.43					
Removal of Stakes & vines	68.64					
Total Harvest	773.85	1.48	.36			
CASH OVERHEAD						
General Expense	105.47					
Taxes	4.00					
Insurance	20.43					
Total Cash Overhead	129.90	.25	.07			
Depreciation (stakes etc.)	69.61	.13	.03			
Rent-Land	45.48	.09	.02			
TOTAL ALL COSTS	2354.52	4.51	1.10			

The above figures are the average costs of 10 growers in San Diego County for the late fall crop of staked tomatoes 1949. Yields ranged from 20,000 to 80,000 pounds per acre. Costs varied from \$1200.00 to \$3500.00 per acre. Costs per pound ranged from 2½ to 6½ cents per pound.

Fill in the last three columns with estimates of your own costs.

This leaflet is one in a series covering costs and methods of production of crops in San Diego County-prepared and distributed by the San Diego County Farm Advisors Office.

FALL STAKE TOMATO PRODUCTION COSTS

Tomato production for fresh market comprising approximately 3000 acres, is the largest acreage of any vegetable crop in San Diego County. Tomatoes are grown continuously through the year, although certain marketing periods are desired by most growers. This study deals only with the fall staked tomatoes which are grown on the coast or semi-coastal frost-free areas.

SOIL REQUIREMENTS: Tomatoes are grown on medium to deep soils in the county, although the deeper soils are preferred. Plantings are limited largely to the frost-free sections where air drainage allows for higher fall and winter temperatures. Nitrogen is the main fertilizer element required. Occasionally other elements such as phosphorus and potash are used by some growers.

VARIETIES: Principle varieties are various strains of Pearson and Stone. Seed is planted in field beds in May. Within 6 to 8 weeks after seeding the plants are ready for transplanting to the field in late June or July.

PLANTING: Plants are generally hand set in furrows on hillside locations. Mechanical planters are used on level land. Plants are placed at the side of the furrow as water is applied. From three to six thousand plants are set per acre and spacings generally range from 18 to 36 inches, with rows 5 to 7 feet apart.

WATER REQUIREMENTS: Frequent irrigations are applied. The amount of water necessary depends upon the soil type, the temperature and the plant size. Water is usually applied in furrows.

STAKING AND TYING: The common method of staking tomatoes is to place a 6 to 8 foot bamboo pole or 1" x 1" x 6' stake at each plant. Heavier posts are spaced from 15 to 25 feet apart in the row for the reinforcement of the trellis wires. Three strands of wire are placed 15 to 18 inches apart on the stakes. Plant tying is a continual process that starts after the plants have been set out from 4 to 6 weeks. The stems are tied to the stake and wires. Where one or two wires are used, the plants are held upright with binder twine wrapped around the plants between the individual stakes at about six-inch intervals.

DISEASES AND PEST CONTROL: Principal diseases are blights, root rots, and viruses. Blights may be reduced with fungicidal sprays. No control is known for viruses, but preventative measures will reduce infection. Land without a tomato cropping history should be sought in reducing root rots such as Fusarium or Verticillium wilts.

The main pests are hornworms, pinworm, potato tuber worm, tomato fruit worm (corn ear worm), tomato russet mite and serpentine leaf miner. DDT-sulfur dusts provide good control of worms and the russet mite. A 20% toxaphene sulfur dust is fairly effective against the serpentine leaf miner, worms and russet mites.

HARVESTING AND PACKING: Picking starts in September and may continue through the first of the year. Both stemmed and unstemmed tomatoes are harvested. Stemmed tomatoes are classed as a fancy pack and require more labor in picking and packing. Mature greens and light pinks are preferred for distant market shipment. The dark pink and ripe tomatoes are used mainly for local markets. Baskets, flats and lugs are used as containers. The main sizes packed in flats or lugs are 4 by 5, 5 by 6, and 6 by 7. Some ungraded tomatoes are also shipped.

MARKETING: Tomatoes are grown both for local and out-of-state shipment. Intra-state shipments comprise the major portion of the crop. When unfavorable fresh market prices are experienced, processors utilize the tomatoes for canning, pickling and by-products.