



## FIELD SEEDING OF TOMATOES IN SACRAMENTO COUNTY

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The practice of seeding canning tomatoes directly into the field increased from a few trial plantings to 172 acres planted in 1948 and 949 acres planted in 1949 with a much larger acreage indicated for 1950. The purpose of this leaflet is to give growers information on management as well as on costs. A survey was made of the cost of establishing the stand in each field seeded field in Sacramento County in 1948 and again in 1949.

Field seeding of tomatoes often makes possible a saving in cost of production. The cost will vary with different conditions and in different seasons. Yields have been as good or better than in transplanted fields. This may be accounted for by healthier plants and closer spacings. Close spacing brings on the harvest sooner and lessens the danger of leaving a picking in the field at the close of the season. Also when replanting is necessary in transplanted fields the replants are usually set out too late to produce a full yield.

Growers are advised to proceed with small acreages until they have gained experience and have learned what the problems are under their own conditions. If a field seeded stand fails, it may be reseeded or transplants may be used. The cost figures show that this would mean a loss of 5 or 6 dollars an acre for planting plus any additional operations. It is well to have a source of transplants in case they are needed.

The two main causes of failure in field-seeded tomatoes are lack of moisture for germination, and crusting of the soil before plants are up. Weeds are a serious problem, but the result of a bad weed condition is usually increased costs rather than failure. The best fields for field seeding are, therefore, those which irrigate easily, which do not crust badly and which are not too weedy.

Pre-emergence weed spray has proven very valuable in cutting cost of weed control in weedy fields. To minimize the chance of damage to stand from spray residue only the light weed oils used on carrots are recommended. Cost of the application is held to a minimum by spraying only a one-foot strip over the row. Rate of application is based on 70 gallons per acre for total coverage. Thus for a one-foot strip with 5 foot row spacing, the rate per acre is one fifth of 70 which is  $12\frac{1}{2}$  gallons. For best results finish off the seed bed with a flat roller and delay planting for 10 to 15 days to allow weeds to start. Fields have been successfully sprayed even after the first few tomatoes were up; however, it is not wise to wait this long. Where holding seed bed moisture is more of a problem than weeds, do not wait for weeds to sprout. In this case spraying will not pay unless weeds come up before tomatoes.

### LAND PREPARATION:

If plants will come up without irrigation or if rain machine irrigation will be used finish the ground as for flat planting. If only furrows are to be used, and an early irrigation may be necessary to supply moisture for germination or to soften a crust, shallow furrows are made before or during the seeding operation. Since conserving surface moisture is important, spring tillage should be as shallow and limited as possible. If moisture is needed, pre-irrigate, or furrow irrigate after planting. Pre-irrigation has given better results in Sacramento County.

### SEED TREATMENT:

Seed treatment for disease control is not important as an excess of seed is planted and disease is not spread to other plants as it is in plant beds. However, seed treatment to cut down loss from wireworms in infested land is useful. Use 8 oz. of 25% Lindane for 100 pounds of seed. This is slightly less than one level teaspoon of the powder per pound of seed.

### PLANTING:

The best time is between March 25 and April 15. Fields seeded as late as May 1st, have produced fair yields. Earlier planting means slower germination and emergence, higher weeding costs and more chance of damage to seedlings by weather, disease or insects. The most common planter is two planet junior drills on a frame on the tractor, or on a sled. If the rows are to be seeded alongside of furrows the sled is best. Ordinary seed is used. However, if a precision planter is available, pelleted seed may be used, but moisture conditions must be very good. Row spacing is the same as for transplanted tomatoes, five to six feet apart. With the planet junior planter, use No. 9 to No. 13 flat plates to get from 1/4 to 1/3 of a pound of seed per acre which should give from six to ten seeds per foot of row. The depth of planting will vary from 1/2 to one and 1/4 inch depending on moisture and type of soil. Three-fourths of an inch is average. Drills should be adjusted to firm the soil well around the seed. When moisture has been lost near the surface or if the seed bed is rough the use of clod pushers is often an advantage.

### PRACTICES AFTER PLANTING:

Emergence time varies from one to four weeks depending mostly on temperature and moisture. Irrigations may be necessary to get the seed up or to give the seedlings a good start, especially if strong winds have been prevalent. Also, irrigation can be used to soften a hard crust. If plants make very slow growth after coming up lack of moisture may be the cause. Fields have been improved by sprinkling even though moisture seemed adequate. Cultivate for weeds as often as necessary. A light dusting with 5% DDT or DDD may be necessary when plants are small, to prevent damage from flea beetles, darkling ground beetles or cutworms. For only darkling ground beetles and cutworms agricultural bait is often quite effective.

### THINNING:

Thin with long-handled hoes when plants are six to eight inches high; however, if thinning or hoeing is necessary when plants are small short-handled hoes are used. For Pearson, a good spacing is fifteen to twenty-four inches. If possible, leave single plants, but a few doubles or triples are not serious. After thinning, field seeded plantings are managed the same as transplanted fields.

Cost figures in the following tables are all costs from planting through thinning. They include all materials, labor, and interest and depreciation on equipment. Land preparation is not included; however, a record of the operations was made. The average land preparation is as follows: Fall plowing; twice over with disk and harrow; once or twice over with float; once over with roller, but roller used in less than half the fields. Costs following thinning are not included as a field seeded field is managed the same as a transplanted field after the plants are set out and established.

These figures have the weakness of any survey-type study in that some inaccuracy is certain to be present; however, as a whole they give a true picture of the cost of establishing field-seeded tomato stands in Sacramento County in 1948 and 1949.

PRODUCTION AND COST OF ESTABLISHING STAND OF ALL  
FIELD SEEDED TOMATO FIELDS IN SACRAMENTO COUNTY IN 1948

PRODUCTION						COST						
Field #	Acres	Planting Date	Start Picking	Days to Harvest	Yield Tons Per Acre	Planting	Cultivation	Rolling	Hoing & Thinning	Replant (plants)	TOTAL Successes	COST Failure
1	10	Mar. 10	Sept 12	186	14	8.22	4.00		10.20	10.20	32.62	
2	22	Mar. 15	Sept 10	179	23	7.63	6.00		20.40	3.50	37.53	
3	40	Apr. 1	x			5.39		1.86				7.25
4	37	Apr. 15	Sept 10	148	23	7.63	4.00		10.20		21.83	
5	26	Apr. 15	Sept 28	154	14	6.81	3.60		6.88		17.29	
6	15	Apr. 24	Aug. 14*	116	25	5.95	2.78		12.00		20.73	
7	22	Apr. 27	Oct. 15	174	10	7.20	1.60	.93	10.00		19.73	
8	60	May 5	Oct. 3*	151	8	4.00	4.00		10.00		18.00	
AVERAGE: 7 Successful Fields				157	17	6.78	3.71	.93	11.38	6.85	23.96	

\*First pick green tomatoes

In field #3, which was disked up, germination was good. The main trouble seemed to be crusting although darkling ground beetles were causing damage.

Costs for 1948 were lower than can be expected most years as the late rains made it unnecessary to make early irrigations.

PRODUCTION AND COST OF ESTABLISHING STAND OF ALL FIELD SEEDED TOMATO FIELDS IN 1949

Field #	Acres	PRODUCTION				COST						TOTAL COST	
		Planting Date	Days to Harvest	Start Picking	Yield Tons/A	Planting	Irrigation	Cultivation	Hoeing & Thinning	Replant	Other	Successes	Failures
1	28	Mar. 15	189	Sept 20	17	4.17	14.00	2.80	15.00	10.00		45.97	
2	35	Mar. 20	177	Sept 13	16	5.43	22.00	5.36	10.36	4.60		47.75	
3	21	Mar. 27	175	Sept 18	22	4.17		2.00	8.00			14.17	
4	27	Mar. 28	146	Aug. 21	32	4.17		2.00	7.60	3.00	3.87	20.64	
5	41	Mar. 29	170	Sept 15	25	4.17		2.00	10.00	4.00		20.17	
6	40	Apr. 1	146	Aug. 25	10	6.05		2.76	8.00		3.30	20.11	
7	30	Apr. 1	149	Aug. 28	21	3.45		1.34	4.50		.54	9.83	
8	30	Apr. 1	x			4.38	5.20						9.58
9	13	Apr. 2	150	Aug. 30	20	5.11		7.64	11.50	17.23		41.48	
10	40	Apr. 2	x			12.10**	7.00				2.46		21.56
11	41	Apr. 2	144	Aug. 24	10	4.05		2.00	7.00		4.00	17.05	
12	18	Apr. 4	158	Sept 9	22	6.15	14.00	3.00	4.40	9.91		37.46	
13	25	Apr. 5	188	Oct. 10	10*	4.38	7.50	5.34	40.00	6.50	4.18	67.90	
14	14	Apr. 6	161	Sept 14	6*	6.24		4.50	27.00			37.74	
15	20	Apr. 6	182	Oct. 5	15	4.75	7.50	3.34	24.00		2.94	42.53	
16	14	Apr. 8	161	Sept 16	10	6.49		4.50	35.00			45.99	
17	50	Apr. 9	149	Sept 5	20	4.38		3.00	4.57			11.95	
18	45	Apr. 9	160	Sept 16	15	6.32	15.00	5.20	10.90		6.42	43.84	
19	20	Apr. 10	149	Sept 6	21	4.38	15.00	3.34	21.00			43.72	
20	25	Apr. 11	165	Sept 23	18	4.38		3.34	21.00	5.00		33.72	
21	22	Apr. 15	x			6.05	7.00	2.00					15.05
22	40	Apr. 15	173	Oct. 5	15	7.62	13.50	3.00	12.00			36.12	
23	80	Apr. 15	x			7.62	4.00						11.62
24	150	Apr. 17	x			2.84	7.54				.44		10.82
25	80	Apr. 17	148	Sept 12	20	6.41		2.00	5.00	6.39		19.80	
Ave. 20 Successful Fields			162		17.25	5.11	13.56	3.42	14.34	7.40	3.61	32.90	
5 Unsuccessful Fields						6.60	6.15			1.45			13.73

\*Pear Shape      \*\*Planted Twice

A dry seed bed and inability to supply water was the cause of failure in three of the five unsuccessful fields. Wireworms and ground beetles caused one of the other fields to fail. In one field the cause of failure is not known.

**IRRIGATION:** By rain machine in all but two fields; cost figured at \$7.00 for one inch or less and \$7.50 for more than 1".

**CULTIVATION:** Times over varied from one to four; cost per cultivation determined by acres covered per day.

**HOEING AND THINNING:** Was done in one operation in 15 fields; five were hoed twice before thinning was complete.

**REPLANTING:** Was usually done by hand but by tomato planter in parts of some fields.

**OTHER:** These costs include weed spraying, weed burning, rotary hoe, corrugated roller, and insect control. The cost of pre-emergence burning was \$3.30. The average cost of pre-emergence spray in three fields was \$3.81.

