CHANGING PATTERNS OF TOMATO PRODUCTION IN CALIFORNIA

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Part of the mystique of California is its marvelous climate and outstanding agricultural productivity. Certainly in terms of agriculture the state leads the entire nation in income and its acres grow a wide variety of crops. Among the field crops that are produced, tomatoes rank high with over three million tons being marketed or processed annually. This makes California the number one tomato-growing state in the nation, ranking far ahead of other major producers such as Florida, Ohio and New Jersey.

How did the tomato industry develop in California? What is the pattern of production in the state? What are the production trends and their implications for growers and processors? What is the future projection for the industry? These and other questions will be explored in the following discussion.

Tomato production in this paper will refer to “tomatoes for processing,” which is a special reporting category in the publications of the California Crop and Livestock Reporting Service. The other major category is “fresh market” production, and if reference is made to this crop it will be so stated. Tomatoes for processing will be emphasized here because of their close relationship to the processing industry. Here is where the locational aspect of field and plant becomes critical, i.e. the closer processors are to the field the less time that will be lost in delivery to plants, the lower the fruit loss and the lower the transportation costs. Additional locational considerations, however, are coming to the fore and are included below.

EARLY DEVELOPMENT AND HISTORY

European conquest of the Americas started the dispersal of the tomato from one continent to another. The fruit moved from its humble beginnings as a semi-cultivated weed in the Andean highlands of Peru to a world wide crop of importance. For centuries the berry-type fruit was considered to be poisonous and this led to its use primarily as an ornamental fruit. In Europe in 1600, the French designated the tomato by the exotic name of pome d’amour or “love apple.” The Italians discovered the food value of this fruit and made it an important part of their national

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2 Ibid., p. 649.


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diet. They "... bred new varieties which had thick skins, smooth shapes and meatier dried flesh." In the favorable Mediterranean climatic environment of Italy, the tomato was further propagated and subsequently changed appearance and quality as a fruit. It was reintroduced into America about one hundred years ago and found many climatically suitable homes. The Mediterranean climate of Southern California and the Central Valley proved to be a most receptive commercial environment, for as Wilsie has shown, high summer temperatures do affect fruit setting and fruit development and water requirements.

A brief history of early tomato growing activity states that truck gardeners planted the vegetable in the 1860's with considerable success. Earliest records show that commercial packing started in the 1880's and 234,000 cases were packed in 1889. The 1907 pack was 1.5 million cases. Shipping of fresh tomatoes to eastern markets started about 1900 in small quantities, but by 1905 straight carloads were moving east. In 1916 approximately 1200 cars originated in California for eastern markets. This trend has continued and accentuated. By the beginning of the 1920's expanded commercial growing and processing was being carried out. Early statistics show only very low yields of five tons or less per acre with total value being just over four million dollars. Today's average yields have moved upward to between seventeen and twenty tons per acre and a value of all tomatoes of over one hundred seventy-five million dollars.

PRODUCING AREAS AND PROCESSOR LOCATIONS

The major tomato producing regions of California are the Sacramento Valley, the San Joaquin Valley and the Central Coast. The desert and south coastal areas are minor producing areas although their potential is important for further expansion, particularly for the fresh market product.

The distribution of producing areas is shown on Figure 1. Not all of these areas have an even distribution of tomato production throughout, but under detailed study show certain areas with greater concentrations than others. Also, in most of the tomato growing regions a wide variety of other field crops are grown which are in direct competition for the same land. Therefore, actual fields and producers vary from year to year based on farmers' estimates of demand and prices, and allocations of certain controlled crops such as cotton.

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8 Ibid.

9 California Crop and Livestock Reporting Service, California Vegetable Crops, 1967, p. 23-24. Tomato values are the combined fresh market and processing varieties.

10 University of California Agricultural Extension Service, Kern County's Climates, Soils, Waters, Crops, 1967, p. 32. Also, the Crop District Map, Kern County attached to the above publication.
The planting and harvesting schedule is shown in Table 1. The schedule applies to both the production of tomatoes for processing and fresh market varieties. There are certain peak periods of harvest within this schedule, however. For example, in the Sacramento Valley the harvest season extends from the middle of August to the middle of November, but with a peak from mid-September to mid-October. The Central Coast’s peak harvest is again the latter half of September and the first half of October. The Imperial Valley has maximum in April and May, and the South Coast from mid-September to the first of November.

![Areas of Concentration of Tomato Raising and Producing Plants in California 1968](image)

**Figure 1**
Table 1
PLANTING AND HARVESTING SCHEDULE FOR TOMATOES IN CALIFORNIA*

<table>
<thead>
<tr>
<th>Season</th>
<th>Planting Date</th>
<th>Begin</th>
<th>Most Active</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Spring</td>
<td>Aug.-Jan.</td>
<td>Dec. 1</td>
<td>May 1 - June 1</td>
<td>July 10</td>
</tr>
<tr>
<td>Early Summer</td>
<td>Feb.-April</td>
<td>June 1</td>
<td>July 1 - Aug. 31</td>
<td>Aug. 31</td>
</tr>
<tr>
<td>Early Fall</td>
<td>May - July</td>
<td>Sept. 1</td>
<td>Sept. 1 - Oct. 31</td>
<td>Jan. 10</td>
</tr>
</tbody>
</table>


The distribution by city of processing plants for tomatoes in California is shown in Table 2. They are also plotted on Map 1. The most important item to observe is the decreasing correlation of processors’ locations and producing areas. In other words, plant locations tend to reflect older patterns of production as can be noted in Figure 2.

The number of plants processing tomatoes and tomato products fluctuates. A plant may specialize in a full line of tomato products or produce only one item. Business decisions and year to year fluctuations of production can influence which plants are processing what products. This is particularly true of corporations with multiple canneries.

Table 2
LOCATION AND NUMBER OF TOMATO PROCESSING PLANTS IN CALIFORNIA BY CITY – 1968*

<table>
<thead>
<tr>
<th>City</th>
<th>No.</th>
<th>City</th>
<th>No.</th>
<th>City</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antioch</td>
<td>2</td>
<td>Martinez</td>
<td>1</td>
<td>San Leandro</td>
<td>1</td>
</tr>
<tr>
<td>Atwater</td>
<td>1</td>
<td>Merced</td>
<td>1</td>
<td>Santa Clara</td>
<td>1</td>
</tr>
<tr>
<td>Buena Park</td>
<td>1</td>
<td>Modesto</td>
<td>3</td>
<td>Santa Cruz</td>
<td>1</td>
</tr>
<tr>
<td>City of Industry</td>
<td>1</td>
<td>Oakland</td>
<td>2</td>
<td>Selma</td>
<td>1</td>
</tr>
<tr>
<td>Cupertino</td>
<td>1</td>
<td>Oroville</td>
<td>2</td>
<td>Stockton</td>
<td>7</td>
</tr>
<tr>
<td>Escalon</td>
<td>1</td>
<td>Oxnard</td>
<td>2</td>
<td>Sunnyvale</td>
<td>2</td>
</tr>
<tr>
<td>Fullerton</td>
<td>1</td>
<td>Patterson</td>
<td>1</td>
<td>Thornton</td>
<td>1</td>
</tr>
<tr>
<td>Gilroy</td>
<td>1</td>
<td>Richmond</td>
<td>1</td>
<td>Tracy</td>
<td>1</td>
</tr>
<tr>
<td>Gridley</td>
<td>1</td>
<td>Riverbank</td>
<td>1</td>
<td>Turlock</td>
<td>1</td>
</tr>
<tr>
<td>Hollister</td>
<td>2</td>
<td>Sacramento</td>
<td>4</td>
<td>Vacaville</td>
<td>1</td>
</tr>
<tr>
<td>Lodi</td>
<td>1</td>
<td>San Jose</td>
<td>7</td>
<td>Woodland</td>
<td>1</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Canners League of California, California Fruit and Vegetable Canners, May 1968.
Another major influence on plant location in addition to those already mentioned is the ability to dispose of waste. Water supply is intimately tied in with this problem and was in itself a major item to consider in the past. The limitations on waste processing facilities in Stockton temporarily limited the erecting of new processing plants there. Modesto, on the other hand, had forseen the potential problem and expanded its waste processing capacity. This has placed Modesto in a much better position to

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11 Discussion with Mr. Robert Marsh, Canners League of California.
attract new canners. Most cities recognize this deficiency and are taking steps to remedy it. Even with this, however, metropolitan areas are unattractive to processors because of the already high demands being placed on their disposal facilities.
ACRES OF PRODUCTION OF TOMATOES FOR PROCESSING IN CALIFORNIA 1960

- Less than 1,000 acres
- 1,000–4,999 acres
- 5,000–9,999 acres
- 10,000–14,999 acres
- 15,000 acres or more

Figure 4
ACRES OF PRODUCTION OF TOMATOES FOR PROCESSING IN CALIFORNIA 1967

Less than 1,000 acres
1,000 - 4,999 acres
5,000 - 9,999 acres
10,000 - 14,999 acres
15,000 acres or more

Figure 5
Figure 3 shows some significant developments in tomato production. Harvested acreage has a general trend upward from 1920 and before, but the erratic nature of the line itself indicates some problems. The same pattern is reflected in the total production line. While erratic movement of the acreage and production lines is indicated, the average yield shows a rather gradual, but steady climb. Moreover, the yield tends to remain fairly constant from high peaks to low troughs in the other two lines.

Part of the answer to roller coaster acreage and production figures has to do with what is happening in other crop markets, the grower’s estimation of his own competitive position, what other growers are planting and pre-season guaranteed prices from packers. In 1968 one packer offered $39 per ton for tomatoes for processing and this brought in a number of new producers. Further, reductions in cotton acreage stimulated a search for other crops in Kern County and other counties of the Central Valley. Yields on the other hand, are a result of consideration given to how to get the best unit product and these criteria continue to apply regardless of the number of acres planted.

Changing Growing Patterns

The pattern of change is the nub of one of the major problems mentioned at the outset. Table 3 shows the harvested acreage production figures for tomatoes for 1953, 1960, and 1967 by county. The seven year interval is enough to reflect a pattern of change and bring the figures as nearly up to date as is possible at this writing. The figures also are the basis for Figures 2, 4, and 5 that follow.

The figures themselves make a number of important points. Many producing counties have stayed within a narrow range of acres planted in tomatoes for processing in the three years shown; some show a low total, some are in the middle range. Yuba County shows a relatively low total production. Alameda County is an example of counties of the middle range. The significance of this consistency generally lies in a lack of competitive position of tomatoes. Other crops use the same land with as high or higher return and grower familiarity with the traditional crops play a role. Also, large mechanized units elsewhere make expansion a risk. The trend is definitely toward larger units that de-emphasize hand labor.

The most important trend to be observed on this table is the large increase in acreage in San Joaquin, Fresno, Merced, and Stanislaus counties and the continued high production in Yolo, Sacramento and Solano counties. San Joaquin has the largest acreage by far. This trend shows up mostly since 1960. Fresno County has the highest rate of growth in this period as reflected by these figures. Some counties have had definite decreases, such as Monterey and Ventura.

12 Discussion with Mr. Bruno Felice, California Canners and Growers.
13 Interview with Mr. John O. Hoyt, County Director and Farm Advisor, Kern County.
Table 3
HARVESTED ACREAGE OF TOMATOES FOR PROCESSING
1953, 1960 and 1967*

<table>
<thead>
<tr>
<th>County</th>
<th>1953</th>
<th>1960</th>
<th>1967</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda</td>
<td>3,495</td>
<td>2,980</td>
<td>2,780</td>
</tr>
<tr>
<td>Contra Costa</td>
<td>1,460</td>
<td>950</td>
<td>1,720</td>
</tr>
<tr>
<td>Monterey</td>
<td>2,020</td>
<td>6,360</td>
<td>4,440</td>
</tr>
<tr>
<td>Napa</td>
<td>580</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>San Benito</td>
<td>765</td>
<td>1,830</td>
<td>6,610</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>2,010</td>
<td>4,130</td>
<td>7,960</td>
</tr>
<tr>
<td>Sonoma</td>
<td>205</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Butte</td>
<td>245</td>
<td>1,270</td>
<td>970</td>
</tr>
<tr>
<td>Colusa</td>
<td>200</td>
<td>960</td>
<td>3,300</td>
</tr>
<tr>
<td>Sacramento</td>
<td>8,335</td>
<td>9,560</td>
<td>9,120</td>
</tr>
<tr>
<td>Solano</td>
<td>3,720</td>
<td>9,370</td>
<td>9,230</td>
</tr>
<tr>
<td>Sutter</td>
<td>4,665</td>
<td>6,970</td>
<td>10,240</td>
</tr>
<tr>
<td>Yolo</td>
<td>14,815</td>
<td>32,500</td>
<td>31,370</td>
</tr>
<tr>
<td>Yuba</td>
<td>935</td>
<td>100</td>
<td>710</td>
</tr>
<tr>
<td>Fresno</td>
<td>-</td>
<td>60</td>
<td>15,830</td>
</tr>
<tr>
<td>Kern</td>
<td>-</td>
<td>-</td>
<td>2,750</td>
</tr>
<tr>
<td>Madera</td>
<td>65</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Merced</td>
<td>1,555</td>
<td>3,340</td>
<td>13,200</td>
</tr>
<tr>
<td>San Joaquin</td>
<td>30,465</td>
<td>35,700</td>
<td>48,590</td>
</tr>
<tr>
<td>Stanislaus</td>
<td>3,390</td>
<td>4,290</td>
<td>7,450</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>620</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Orange</td>
<td>1,325</td>
<td>1,730</td>
<td>4,190</td>
</tr>
<tr>
<td>Riverside</td>
<td>85</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>San Bernardino</td>
<td>160</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>San Diego</td>
<td>235</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Santa Barbara</td>
<td>30</td>
<td>1,410</td>
<td>-</td>
</tr>
<tr>
<td>Ventura</td>
<td>2,260</td>
<td>6,320</td>
<td>3,080</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>80</td>
<td>3,160</td>
</tr>
<tr>
<td>STATE</td>
<td>83,000</td>
<td>130,000</td>
<td>186,000</td>
</tr>
</tbody>
</table>


Figures 3, 4, and 5 show these trends. In examining these maps keep in mind that compression of categories (there are only five used) has tended to over-emphasize some minor variations in absolute numbers of acres. Such is the case of Contra Costa and Butte. Over all, however, the trend toward the middle and lower San Joaquin and Sacramento valleys is most apparent. As was noted above, the largest acreage and the highest rates of growth are found in this region. Basically, the growth is attributed to great expansion of production on the west side of the valley.14 The west side locations are the areas that prove very adaptable to machine production, have adequate water and are where tomatoes are a relatively new crop not competing with other entrenched production. Also, in the intervals
shown, new strains of tomato plants have been developed that overcome
the hazard of too hot temperatures, distance from field to processing plant
and tomato shape for mechanical harvesting. These have all been signifi-
cant trends since field labor became a problem and increased demand
pointed out the need for more production.

Kern County represents one of the newer production centers and an
adjustment to lower cotton acreage allocations. High summer tempera-
tures of the Southern Valley can injure the fruit, however. Careful
plant selection and night harvesting have made production profitable. This
area, however, is still one of experimentation.

The three maps reflect other points. The weaker producers of tomatoes
for processing have either expanded acreage, dropped out of production or
turned to the fresh market variety of fruit. Also, the overall expansion of
production, particularly in the Central Valley, reflects a better competitive
position with other areas. Large canners with nation wide processing are
favoring California production even though the largest markets are in the
central and eastern United States. Lastly, the great expansion on the west
side of the Valley is basically a reflection of large growers and corporated
ownership and production.

To briefly summarize these comments, the writer would like to re-
emphasize the great growth in the Mid-Central Valley in the production of
tomatoes for processing, and to point out the overall trend in the area
under cultivation from 83,000 acres in 1953 to 186,000 acres in 1967. As
was stressed earlier, however, there is a disparity between established plant
location and new producing areas. This will require either plant re-ori-
tentation to producing areas or higher losses from longer hauls to processing
plants. A promising compromise might be put to new plants in production
expansion areas and retain older plants for other products.

**TRENDS AND THE FUTURE**

In the final analysis, a crop of tomatoes offers the farmer one of the
best returns he can get on his investment. In some areas tomatoes are
considered a specialty crop that is taking the place of sugar beets, field corn,

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14 Mr. Robert Marsh, *op. cit.*
16 Interview with Mr. Frank Anderson, Kern County grower and Mr. John O. Hoyt, *op. cit.*
21 Interview with Mr. Bruno Felice, California Canners and Growers.
hay or alfalfa. Further, the tomato plant is a heavy water user and this resource is more plentiful in all areas of California than ever before.23

Labor is also less of a problem today than in the past. The bracero program is over, but the tomato picking machine has replaced this former source of hand labor. The economies of the machine over hand labor become more and more apparent every year.24 The average cost per ton of tomatoes harvested by machine has been calculated to be $9.84. A ton of hand harvested tomatoes in San Joaquin County for the same period was $17.07, and in Yolo County $17.19.25 Further, one machine and related equipment uses fifteen to twenty skilled or semi-skilled workers and replaces one hundred or more unskilled field workers. Also, tomato sorters can save upwards of fifty percent on labor over older methods.26

Tomato picking machines range from $23,000 upward, depending on which model the farmer buys and how much related equipment is included in the price.27 Another machine which is coming into extensive use is the "tomato sorter."28 Labor costs are reduced with this machine, but it costs $70,000. Amortization takes about three years. Large capital outlays such as this represent heavy indebtedness for most growers. Financing is available through banks or from processors. Banks give high priority to farm loans for tomato planting and harvesting equipment.

With the equipment and land costs continually rising the corporate farm and the large grower are becoming more and more important. These are the two producers that can best accumulate the financial, technical and managerial skills for intensive development.29 Small growers, on the other hand, are being forced out of tomatoes and into other crops or they sell or lease to larger units.

The future of the tomato industry in California is bright. Consumption is increasing and the potential expansion areas for growing are excellent. The shift of production to the Central Valley and the Southern counties will probably be accentuated and processors will be moving to the Valley. Over ninety-five percent of the crop for processing is contracted for ahead of time. Further cooperation between growers and processors is likely.30 Growers are committing themselves to long range capital outlays in machinery and scientific development. They must continue to grow tomatoes every year in order to amortize their investment and maximize the use of equipment and highly trained personnel.

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25 Ibid., p. 8.
27 The major models are produced by Blackwelder, Button, Food Machinery and Humme.
28 *California Rancher*, *op. cit.*, p. 16.
30 "Tomato Harvesters are Working Throughout Kern's Ripening Fields," *The Bakersfield Californian*, August 6, 1966, p. 3A.