lower than in the previous experiment. After the roots were treated, they were sliced into sections and the egg masses were removed. Egg masses within ¼ inch of the surface (shallow) were kept separate from those found at greater depths in the root tissue (deep), as shown in the table. Egg masses from both heat-treated and untreated roots were again mixed with soil in which tomato seedlings were planted. Six weeks later, the tomato roots were examined for root-knot galls. Results from this experiment are presented in the table:

OCCURRENCE OF GALLS IN HEATED AND UNHEATED TOMATO ROOTS

Root number	Unheated		Heated	
	Shallow	Deep	Shallow	Deep
1	+++	+++	0	0
2	++	++	+	0
3	+++	+	0	0
4	+++	+++	0	0
5	+++	+++	0	0
6	+++	+++	0	0
7	++	+++	0	0
8	+	+++	+	+
9	++	++	0	0

0 = no galls
+ = few galls (1 to 10)
++ = moderate number of galls (10 to 50)
+++ = numerous galls (50 to 500)

Data presented in the table again confirmed the results obtained by heat treatment. In an earlier heating experiment conducted in cooperation with this grower, all nematodes were killed. In tests reported here, temperatures between 108°F and 110°F killed eggs and larvae within the sweet potato roots. Temperatures above 112°F resulted in a high percentage of rotted roots before slips were produced. In one experiment where a 114°F-temperature was maintained for 26 hours, 60% of the roots rotted.

Summary

Dry heat treatment is a simple, effective, and reasonably safe procedure, provided that the prescribed temperature for treatment is held above 108°F and below 111°F. These experiments demonstrate that the heat treatment will control nematodes inside sweet potato roots, and furnish the grower with a convenient tool to help prevent reinfestation of fumigated soil. In addition, these heat-treating experiments helped to increase the slip production in both the whole and cut roots.

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California

CANNED FRUITS IN INTERNATIONAL

BEATRICE M. BAIN • SIDNEY HOOS

THE UNITED STATES is world leader in both production and consumption of canned fruits, in total and per capita. U.S. exports of canned fruit have increased sharply both in quantity and dollar value during the past decade. More than 12% of total U.S. canned deciduous fruit sales now occur in the export markets (table 1). Furthermore, U.S. exports of canned fruit are "dollar sales"—moving without direct government price support or subsidy.

California, the leading producer and exporter of canned deciduous fruits in the nation, also accounts for most exports from the country. Of the 200 farm crops and products produced commercially in California, over 100 have export markets. Canned fruits as a group rank third in the State's total value of farm exports. Canned peaches, the top canned fruit in international trade, is one of the largest-value individual farm products exported from California. In the marketing year just closed, almost 5 million cases of California cling peaches alone were exported (table 2).

Canned peaches have constituted 40% of the export of all U.S. canned deciduous fruits for the last five years. During this time, West Germany has replaced the United Kingdom as the leading single export market for U.S. canned peaches. The annual increases in shipments going to the European Economic Community (EEC) were spectacular in volume, and nearly 80% of the EEC imports of canned peaches from the U.S. went to West Germany (table 3).

Leading export markets

The United Kingdom had been traditionally the most important single export market for canned fruits, with U.S. products taking a large share of that market after the lowering of import restrictions in the mid-1950's. Since 1958, 23% of all U.S. canned peaches and nearly 23% of all fruit cocktail exported have been shipped to the U. K. (table 4).

CALIFORNIA AGRICULTURE
Progress Reports of Agricultural Research, published monthly by the University of California Division of Agricultural Sciences.

William W. Paul ..... *Manager*
Agricultural Publications

Jerry Lester ..... *Editor*
California Agriculture

California Agriculture will be sent free upon request addressed to: Editor, *California Agriculture*, 207 University Hall, 2200 University Avenue, Berkeley, California 94720.

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With international trade channels in a state of flux, tariff and nontariff barriers to be considered, and export competitors to be recognized, California canning fruit growers, canners, and exporters are facing competitive challenges for export outlets. If our important export markets in Western Europe are to be retained and enlarged, the reliability of the Canadian market to remain, and new markets in the Far East to be expanded, California must produce and sell competitively priced, high-quality canned fruits abroad.

TRADE

Currently, the duty imposed is 12% *ad valorem*, on single fruits in syrup (with a small additional sugar duty) and 15% *ad valorem*, on fruit cocktail. Although important Commonwealth preferences still prevail in the U. K., other licensing provisions have been steadily liberalized for the importation of canned fruit products from the U.S. during the past few years.

The EEC (considered as a unit) is the present destination of the largest quantity of U.S. canned fruits. Since 1958, 48% of all canned peaches sent abroad and nearly 20% of the fruit cocktail have been imported by the Common Market countries. Although much smaller in total quantity, over 46% of all canned apricots exported also find markets in the EEC. Canada is now the primary export market for fruit cocktail (33%) and canned pears (36%). But in total volume of the four products (peaches, pears, apricots, and fruit cocktail) the EEC has imported just under 40% since 1958. The economic resurgence of Western Europe —with increased industrialization, income, and general prosperity—is the basic reason; but reductions of import barriers have been an important factor in implementing trade growth (table 5).

Trade liberalization

Liberalization of trade in canned fruits has assisted the movement of steadily growing quantities of U.S. canned fruit exports. Trade barriers have not been eliminated but have been decreased. The effort now being made in current negotiations is to see to it that (1) levies are not increased or added, (2) existing nontariff barriers of special interest to canned fruits are eased, and (3) additional regulations of a restrictive nature are not imposed.

In addition to the United Kingdom and Western Europe, Japan is the other notably important growing market for canned fruit. Here again, the fact of industrialization, increased standard of living, and changes in consumer tastes and preferences have enabled canned fruits to show substantial gains. Although still a relatively small outlet, trade figures show a tripling of Japanese imports of U.S. canned fruits during the past several years. Japan's tariff position is in a transition stage, and imports are still under licensed control. But liberalization of the last few years may continue if balance-of-payments difficulties can be avoided. United States trade is handled by a bilateral agreement, with import duties of 30 to 35% *ad valorem* on the canned fruits mentioned and quotas on all but fruit cocktail.

The Canadian market for U.S. canned fruits has shown a slow general upward trend. Canada as a trading partner has taken about 20% of our exports of these canned fruit products throughout the past five years. Canada ranks third in single-country imports of U.S. canned peaches, but first in fruit cocktail and canned pears. The Canadian tariff on U.S. canned fruits currently ranges from 2 to 2½ cents per pound on the four canned fruit items mentioned.

International competitors

The United States accounts for more than 40% of world exports of canned fruits at the present time. While this country's share of world trade has been trending upward during the past five years, the U.S. share of world production for all canned deciduous fruit has been relatively steady or even declining slightly. The export value of the leading canned fruits of the U.S. showed a slackening of the upward trend by 1963 (table 6).

The most important other producers and net exporters are Australia and the Republic of South Africa. The EEC countries as a whole are not net exporters, although Italy by itself is one. Spain is an important producer but must be classed—together with Greece, North Africa, and the Central and South American countries—as a potential competitor in canned fruits as greater technical processing know-how becomes assimilated into the producing industry in each country, and a general freeing of trade

channels for all commodities takes hold. Japan has only recently become an exporter of canned fruits in world markets in just this way.

Australia-South Africa

Currently, only Australia and the Republic of South Africa are real competitors for the U.S. in the important canned fruits we have been considering (tables 7 and 8). Australia exports more than 60% of her production and South Africa, nearly 80% of its total. The canned fruit industries in these two countries are almost literally built on their export trade. Current estimates indicate that 1964 Australian exports of canned apricots will be down, peaches will remain about the same, but pears will go higher with a prospective record pack.

TABLE 1, CANNED DECIDUOUS FRUIT: UNITED STATES SHARE OF WORLD PRODUCTION AND TRADE, 1958–1962

Crop year	U. S. share in per cent		Per cent exported of total U. S. Sales
	World production	World trade	
1958	69	28	6.5
1959	74	34	7.7
1960	72	37	9.1
1961	72	42	11.1
1962	71	46	12.5

TABLE 2, CALIFORNIA CANNERS' PACK AND UNITED STATES EXPORTS OF SELECTED CANNED FRUITS, 1963–64*

	Calif. Pack	U. S. Exports
	thousand cases (24 No. 2½ basis)	
Apricots	4,629	180
Cling peaches	25,089	4,900
Pears†	5,025	150
Fruit cocktail	12,565	2,750

* Estimate for marketing year July 1963–June 1964.
† Pacific Coast total rather than California alone.

TABLE 3, DESTINATION OF SELECTED UNITED STATES CANNED FRUITS, ANNUAL AVERAGE, 1958–1963

	Canada	United Kingdom	EEC	All other	World total
	thousand cases (24 No. 2½ basis)				
Canned Peaches	511.6	994.1	2,078.9	742.9	4,327.6
Canned fruit cocktail	761.9	516.7	453.0	567.9	2,299.5
Canned apricots	44.6	19.3	104.9	56.7	225.6
Canned peors	88.2	29.2	18.4	106.4	242.2

TABLE 4, UNITED STATES EXPORTS OF CANNED PEACHES AND FRUIT COCKTAIL TO MAJOR IMPORT AREAS

Marketing year	Canoda	United Kingdom	EEC	All other	World total
	thousand cases (24 No. 2½ basis)				
Canned peaches					
1960–61	613	1,125	1,724	671	4,133
1961–62	606	1.404	2,413	892	5,315
1962–63	559	1,128	3,577	1,180	6,443
1963–64					4,900*
Canned fruit cocktail					
1960–61	805	392	381	497	2,075
1961–62	857	830	505	571	2,764
1962–63	755	998	781	727	3,259
1963–64					3,055*

* Estimated.

An even greater growth rate has been shown in the South African canned deciduous fruit industry. While canned pears are the major export item from Australia, canned peaches are by far the leading canned fruit exported by South Africa. Present domestic consumption in South Africa accounts for only about 18% of the total production of canned fruit. Increasing exports are anticipated, as large packs are continuing and South African exports compete keenly with the United States and Australia in the leading import markets (table 8).

Controlled trade

Trade in canned fruits is controlled in both Australia and South Africa. The Australian Canned Fruits Board regulates trade and establishes minimum export prices for deciduous fruits and has done so for many years. However, new legislation was passed in 1963 which provides for a levy on canned fruit consumed domestically—to provide funds for the Board to engage in promotional and other marketing activities overseas. This new marketing act permits the Board to engage in promotional sales at special prices or at concessional rates in countries other than the United Kingdom. In the Republic of South Africa, all exports of canned fruit are also under strict control of an administrative board which regulates quantity, kind, and price. In addition, special agreements on price exist with the South African sugar association.

Australia and South Africa have a preferred position in the United Kingdom. Canned fruits from both countries enter duty free. Although South Africa withdrew from the Commonwealth and became a republic, the former special conditions—including arrangements with the Commonwealth Fruit Products Conference—are still effective.

Quotas lifted

The United Kingdom quota on canned fruit from the dollar area was lifted in August, 1961. Australia and the U.S. have each supplied about 24% of the canned peaches imported by the United Kingdom over the last five years, but South Africa has supplied nearly 43%. The concentration of South African shipments to the U. K. market, however, may not be as important to California producers as the fact that Australia is seeking to diversify its export markets in canned fruit. In 1963, Australia moved to realign its grade designations to match those of the United States. Thus, "choice" has been renamed "fancy," "standard" quality is now "choice," etc. (new grade designations without changes in specifications). Australia now has a three-year trade agreement with Japan, and while exports to Western Europe were not large, they have been increasing over the past two years; and larger shipments have also been going to Canada.

TABLE 5, CANNED DECIDUOUS FRUITS: TOTAL IMPORTS, BY AREA, 1958–1962

	Canada	Europe	World total
	million cases (24 No. 2½ basis)		
1958	1.3	12.4	14.0
1959	1.8	14.0	16.0
1960	1.9	15.6	17.6
1961	1.9	19.4	21.4
1962	1.8	22.0	23.9

TABLE 6, CANNED FRUITS: VALUE OF UNITED STATES EXPORTS, 1958–1963

Calendar year	Peaches	Fruit cocktail	Pine-apple	Other	Total
	million dollars				
1958	17.0	14.5	15.1	10.4	57.0
1959	16.2	13.2	13.9	9.4	52.7
1960	20.6	14.6	11.6	9.0	55.8
1961	23.8	17.6	10.6	9.3	61.3
1962	32.3	20.3	17.3	8.8	78.7
1963	25.2	22.9	12.8	8.3	69.2

TABLE 7, AUSTRALIAN EXPORTS OF SELECTED CANNED FRUITS

Calendar Year	Peaches	Pears	Apri-cots	Mixed fruit	Total
	thousand cases (24 No. 2½ basis)				
1959	993	1,790	267	63	3,113
1960	1,100	2,016	278	99	3,493
1961	793	1,871	76	121	2,861
1962	1,564	2,242	317	158	4,281
1963	1,650	2,100	350	250	4,350

TABLE 8, REPUBLIC OF SOUTH AFRICA EXPORTS OF SELECTED CANNED FRUITS

Calendar Year	Peaches	Pears	Apri-cots	Mixed fruit	Total
	thousand cases (24 No. 2½ basis)				
1959	1,158	359	424	321	2,262
1960	2,237	380	909	418	3,944
1961	2,129	528	748	231	3,636
1962	2,014	535	514	215	3,278
1963	3,182	752	822	203	4,959

Export prices

United States exporters of canned fruit must look to Australian developments for their strongest competition. Australia's canned fruit prices are already very competitive in leading foreign markets.

Faced with the competitive thrust of both Australia and South Africa in the next few years, increased U.S. export prices for leading canned fruits may be our deterrent to increased canned fruit exports. Thus, tariff and import constraints may not be the only barriers to growth as U.S. canned fruit exports compete in world markets.

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