



FLORIDAPOLY

“hot,  
Hot,  
HOT!”

“your  
next  
beach  
read!”



# The Florida Citrus Flavor Industry 1900 - 2000

**ROBERT A. KRYGER**

“a  
MASTERPIECE!  
”

“THRILLING!”



# FLORIDA POLYTECHNIC UNIVERSITY





**Cold Capitalism**

The Political Ecology of Frozen Concentrated  
Orange Juice

SHANE HAMILTON  
Agricultural History, 2003

*Frozen concentrated orange juice (FCOJ) was invented in 1945 by government researchers. To Florida orange growers beset by surplus production in*

“Florida orange growers and processors ... used ... Florida’s subtropical climate to squeeze higher profits out of consumers.”

Alissa Hamilton, 2006

Fabricated Fresh: What Industry and the FDA Failed to Tell You About Processed Orange Juice.

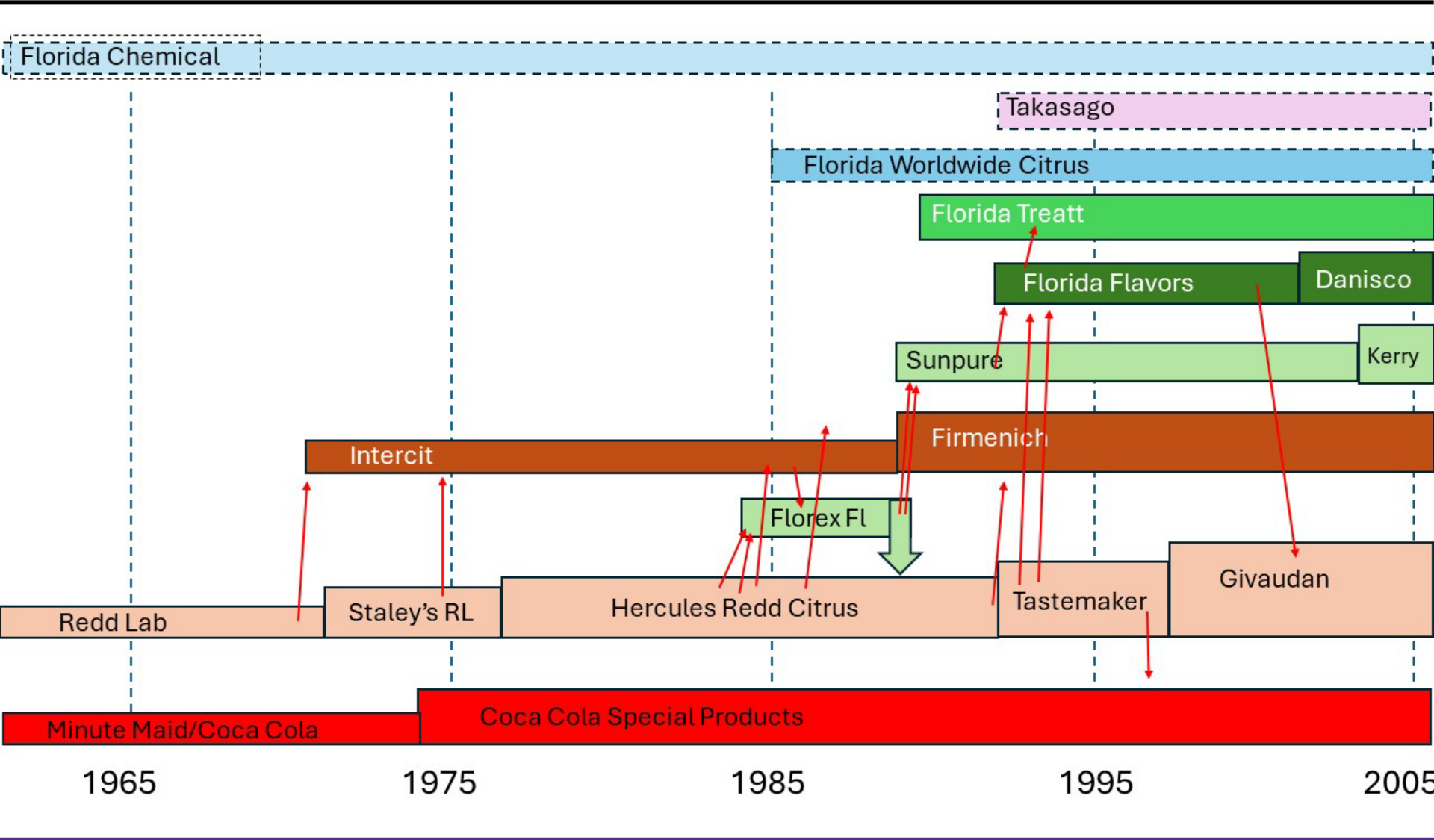


*Oranges and blossoms*

**Florida Citrus**  
*Special Issue*

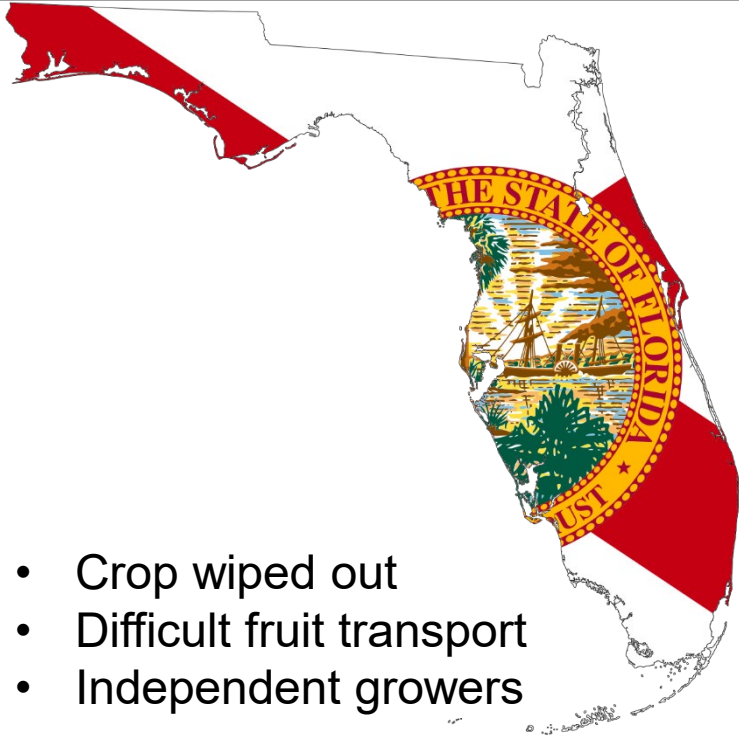


# MAP OF FLORIDA INDUSTRY





# US CITRUS 1900



- Crop wiped out
- Difficult fruit transport
- Independent growers

- Growing industry/Leads nation
- Southern California Fruit Exchange
- Small byproducts industry

Imported OR and LE oils \$17 - \$70/#(\*)





# BIG QUESTIONS

How and why did the citrus flavor industry develop in Florida?

(How and why was FCOJ discovered/commercialized HERE?)

What were the conditions that made it happen? What was the role of government (state & federal), researchers, and commercial interests?

Why was the early role of the national/international flavor companies so limited?

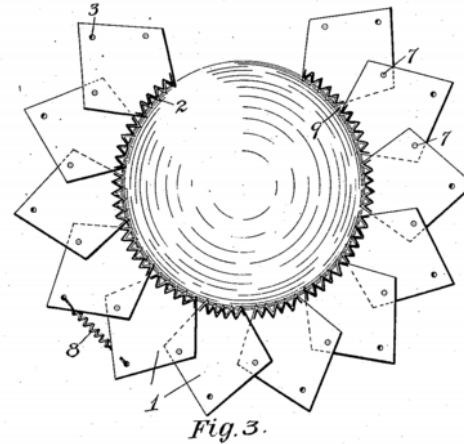
Who were the major contributors? What sort of people were they?





# PRESSING ORANGE OIL

1911 –  
Aristide W. Giampietro



1916 –  
Samuel. C. Hood / USDA



April 2, 1912,  
Tampa Daily Times

Washington, D. C.

December 16, 1916

THE PRODUCTION OF SWEET-ORANGE OIL AND A  
NEW MACHINE FOR PEELING CITRUS FRUITS.

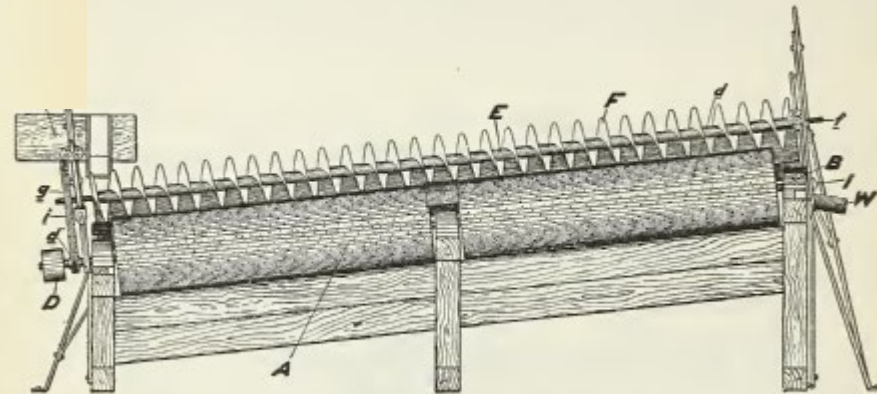
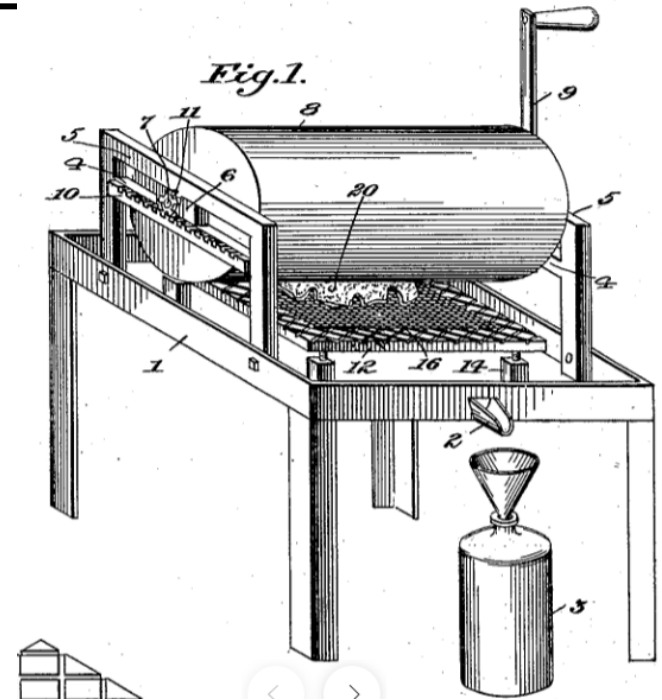


FIG. 7.—Side view of the peeling machine, with the cover removed.



# PRESSING ORANGE OIL

1930 –  
Wilbur A. Pipkin  
J.J.R. Bristow  
C. E. Lund



## BY-PRODUCTS AND SALES CORPORATION, Tampa, FL

- 3500# oil first year
- Processing in Tampa, Howey-in-the-Hills and Lake Wales
- First producers of GR oil - \$15/#



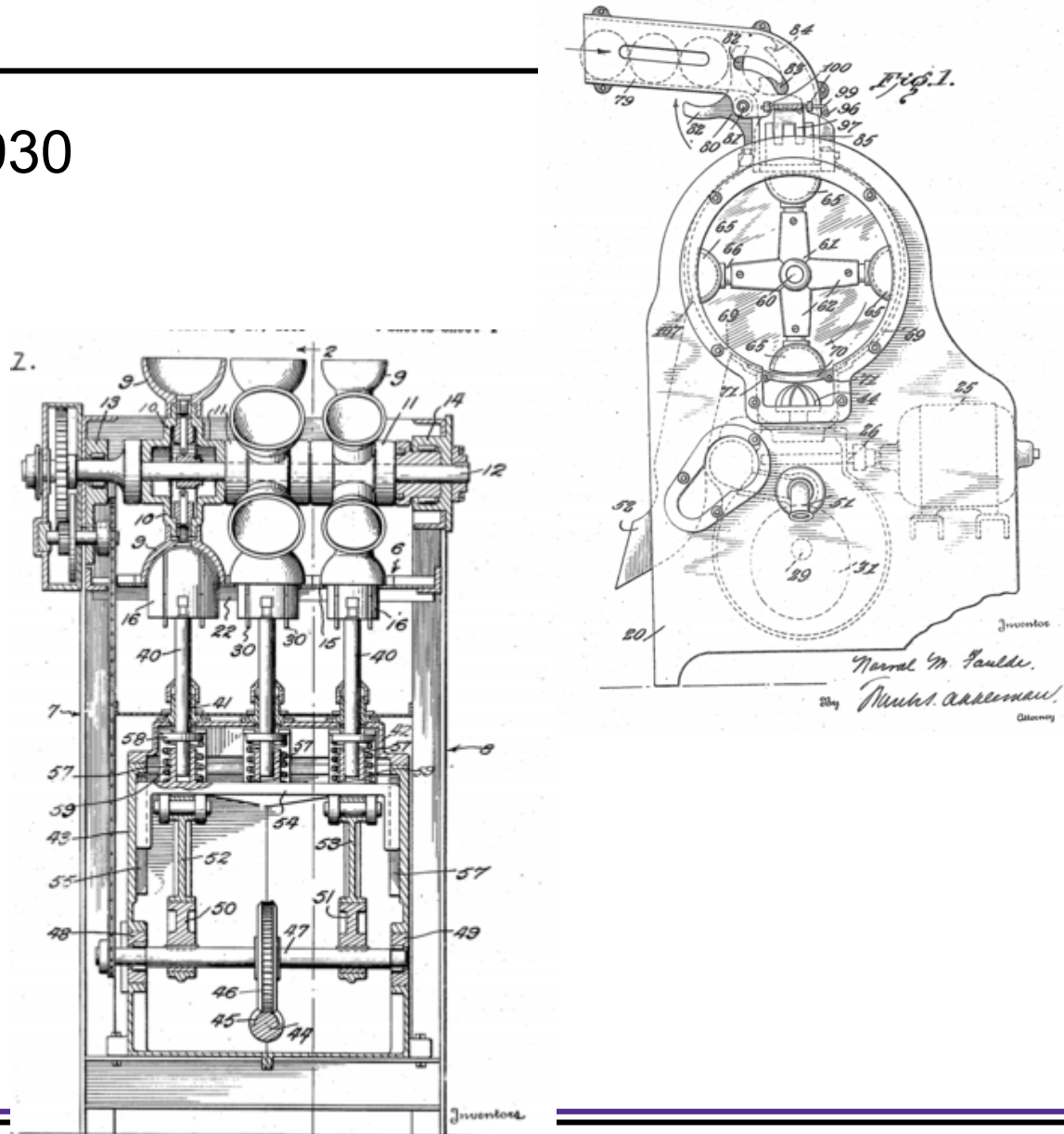


# FAULDS EXTRACTOR

Norval Merritt Faulds - 1930

B. C. Skinner  
J. J. R. Bristow  
Charles Walker

Late 1930's ...  
Rotary Juice Press Inc.



# PRESSING ORANGE OIL

## Quote from Ernest Guenther (1948)

We are witnessing here one of the most fascinating chapters in the history of the essential oil industry. From the drudgery of primitive hand pressing of citrus fruit as practiced not long ago... to the modern, most ingeniously constructed, high-capacity machinery employed in California and Florida, there has indeed been an enormous and quite rapid progress[62].



# WHO INVENTED FCOJ?

Patented Nov. 9, 1948

2,453,109

## UNITED STATES PATENT OFFICE

2,453,109

### METHOD OF PREPARING FULL-FLAVORED FRUIT JUICE CONCENTRATES

Louis G. MacDowell, Lakeland, and Edwin L. Moore and Cedric D. Atkins, Winter Haven, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Application August 7, 1945,  
Serial No. 609,473

“Cutback  
Juice”

Orlando Sentinel  
9/12/1968

Concentrate Perfecter's  
'Royalties' Would Have  
Netted Him \$141,968,321

By BLANTON McBRIDE  
Sentinel Citrus Writer

In 1948, the U.S. patent office finally granted a patent for a

juice when the water is simply replaced.

It was while working with





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# CITRUS CONCENTRATES INC.

B. C. Skinner (d. 1981)

J. J. R. Bristow (d. 1965)

< 1942

52,000 gallons

By 1945

28,000,000 gallons

## Dunedin Concern Will Can Orange Concentrate

DUNEDIN, Oct. 8.—(Special.)—B. C. Skinner, official of the Dunedin Food Machinery company, today announced that a plant would be estab-

10/9/1936 Tampa Tribune

Read **Walter Winchell**  
Your Broadway Reporter  
On Page 15 Today

# St. Petersburg Times

**WEATHER**  
FLORIDA—Partly cloudy to cloudy today and Monday; scattered showers with slowly rising temperatures over north portion today. Slightly cooler northwest and extreme south portion Sunday. Details on page 4.

VOL. 56, NO. 342      COMPLETE ASSOCIATED PRESS, UNITED PRESS AND INTERNATIONAL NEWS SERVICE      ST. PETERSBURG, FLORIDA, SATURDAY, DECEMBER 13, 1941      TWENTY-FOUR PAGES      ★ FIVE CENTS

## War Time and Peace Time Industry for Dunedin, Pinellas and Florida

# U. S. PUTS UP \$1,500,000 FOR NEW CITRUS CONCENTRATES PLANT

**American Forces Seize Offensive In Far East War**  
The Times 24-Hour War Roundup  
United States air and sea forces seized the offensive in the Pacific yesterday, shooting down 11 Japanese planes in the Philippines, routing Japanese warships which fled without a fight and throwing into action a fleet of submarines from which Adm. Thomas C. Hart of the U. S. Asiatic fleet said "big results are expected."  
By Route the Germans were...  
also have suffered a major de-

**13 Boxes of Oranges Make One Box of Concentrates**



**Move Will Stabilize Prices, Put New Life In Citrus Industry**  
First Order for \$1,000,000; Work To Start at Once in Dunedin; Old Plant Will Keep Output Going Until New One Ready; Product Now Going to England Under Lend-Lease Act

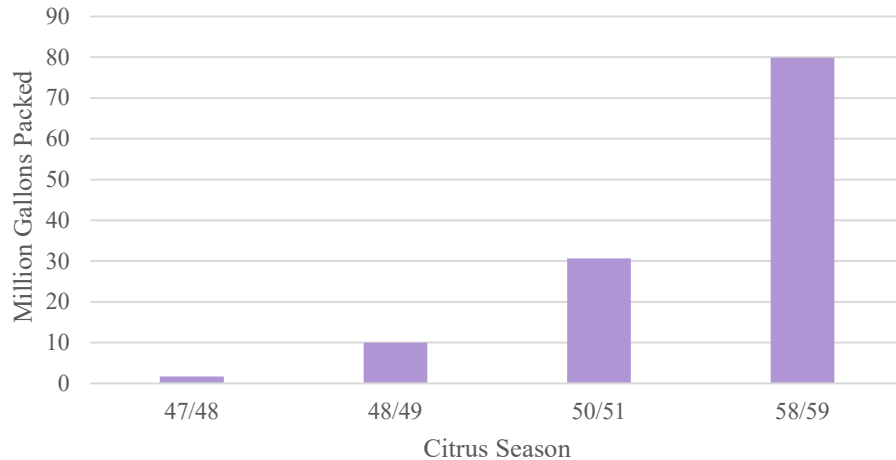
12/13/1941

# SUMMER 1945

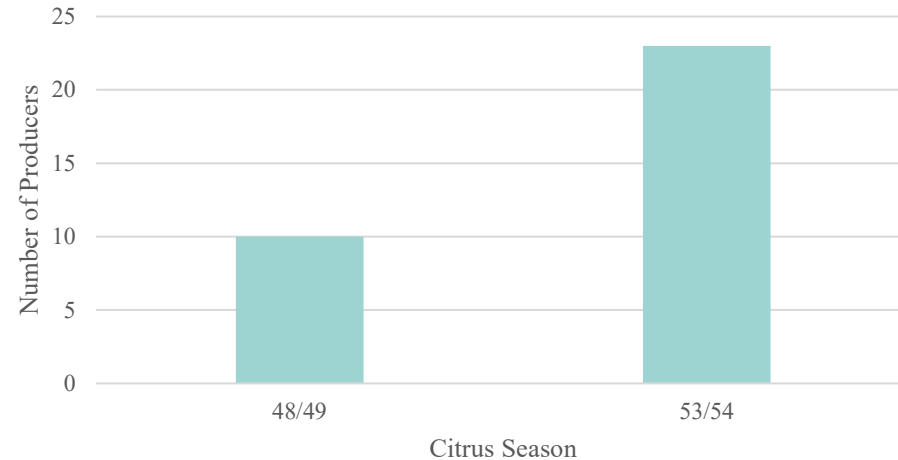
## First commercial test of FCOJ product at Peoples Drug Store in Washington DC

- Produced by Citrus Concentrates Inc.
- Managed by Knight & Middleton
- FCC “on-site” to observe.

Florida FCOJ Production



Growth of Florida Producers





# ESSENCE HISTORY

## 1932 - Ulysess G. Todd

“Fruit Juice Concentrator” – commercialized by Pfaudler Corp.

May 3, 1932.

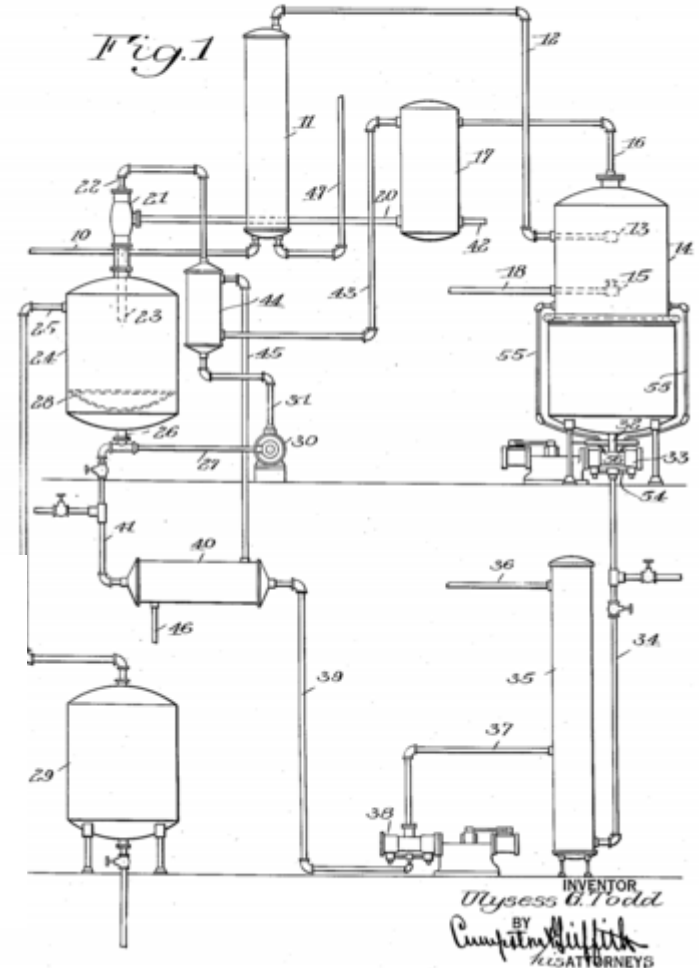
U. G. TODD

1,856,979

EXTRACT AND BEVERAGE AND METHOD FOR MAKING THE SAME

Filed Nov. 16, 1926

2 Sheets-Sheet 1



## 1934 – NY State Researchers:

### Apple Juice Concentrate

D. C. CARPENTER AND E. C. SMITH, New York State Agricultural Experiment Station, Geneva, N. Y.

THE demand for natural fruit flavors for use in the beverage industry, chiefly for the production of carbonated fruit juices, has made necessary the working out of methods of preparing fruit juice concentrates that would possess all the aroma and flavoring sub-

*The production of apple juice concentrate for use in carbonated beverages is studied in small-scale equipment in which esters originally present in the juice are returned to the concentrate. On the basis of comparison used and within the experimental errors involved, a high recovery of esters is found.*

*Reconstituted juice prepared from concentrate*

of formic, acetic, and caproic acids, respectively, together with furfural and acetaldehyde. These authors were unable to confirm the statement often found in textbooks designating isoamyl isovalerate as “apple oil,” even though the odor of this ester is much like the charac-



FLORIDAPOLY

# ESSENCE HISTORY

Engineering and Process development

## Experimental Unit for Recovery of Volatile Flavors

1951

Based on earlier work w/ H. P. Milleville

G. W. MACPHERSON PHILLIPS, RODERICK K. ESKEW, JOSEPH B. CLAFFEY, RUDOLPH A. DAVIS, AND RICHARD P. HOMILLER  
EASTERN REGIONAL RESEARCH LABORATORY, PHILADELPHIA, PA.

Integrated Process for Frozen Concentrated Apple Juice

“150 Fold Apple Essence”

Quickly applied to Pineapple by Hawaiian Pineapple Company/Libby, McNeill & Libby

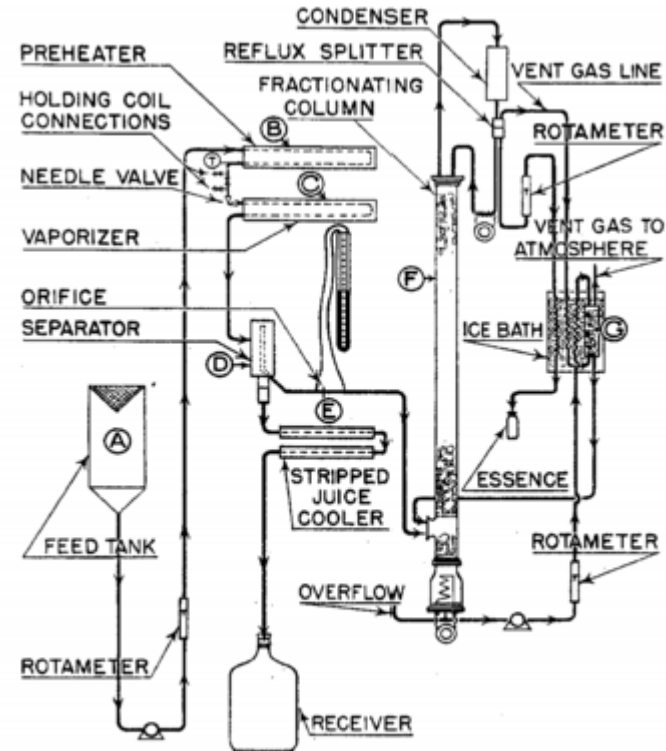


Figure 1. Experimental Unit for Recovery of Volatile Flavors



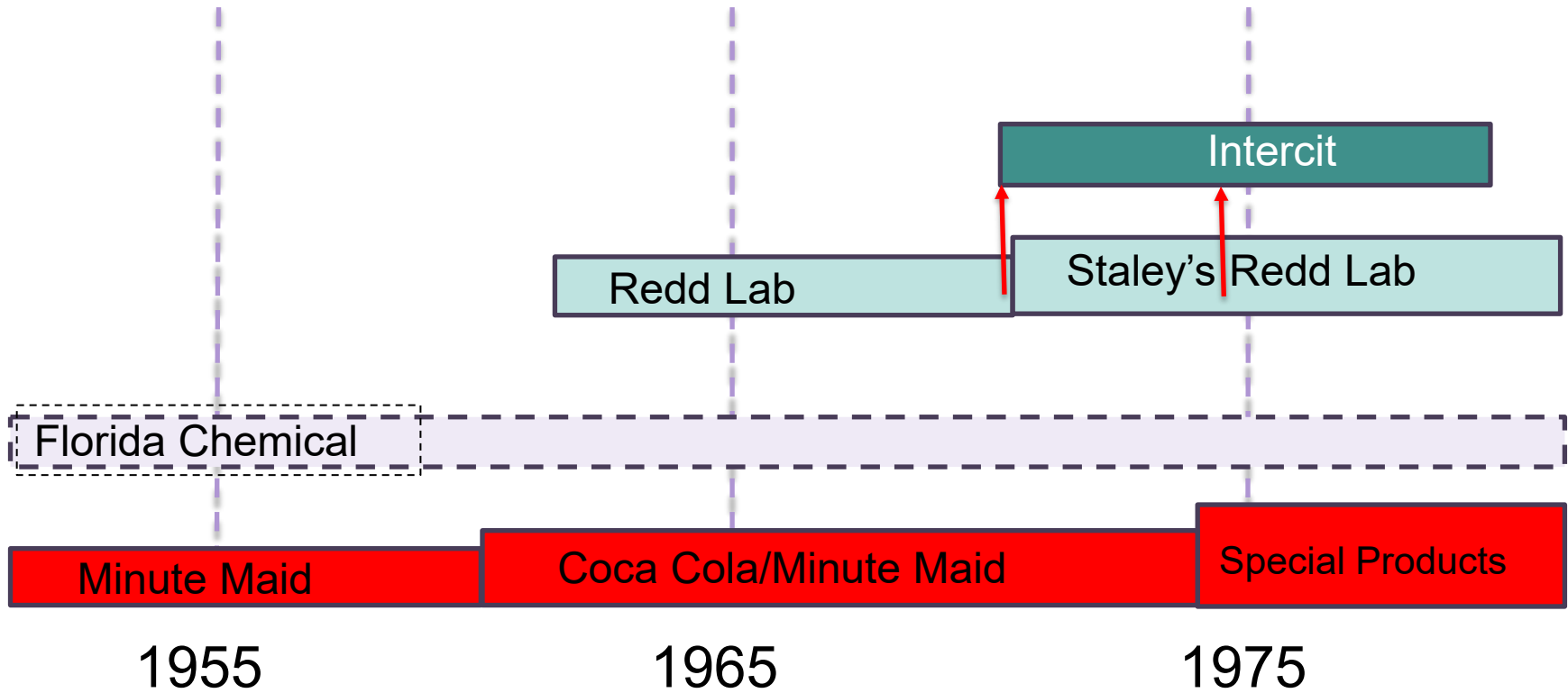
# CITRUS ESSENCE: 1950s – 60's

- USDA/ California
- Libby, McNeill & Libby (Ocala)
- Minute Maid/Coca Cola
  - w/ Carl Huffman et al.
- General Foods/ BirdsEye
- Redd & Hendrix – Winter Garden Citrus Coop (failure)
- Florida Citrus Commission

“There is little evidence that frozen concentrated orange juices produced using such flavor-enhancement materials as essence, essence and cold-pressed oil, juice emulsion or juice oil have better flavor than concentrates made using cutback juice and cold-pressed orange oil.” (1964) FCC



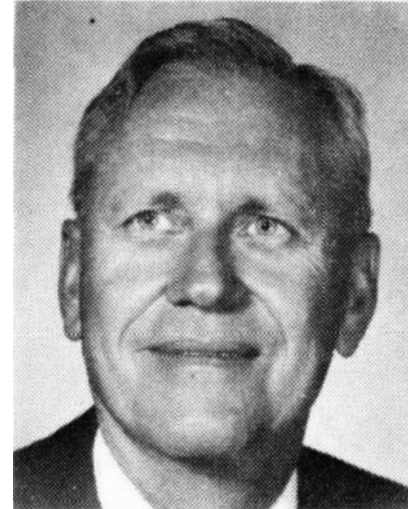
# THE CRITICAL BEGINNINGS





# FLORIDA CHEMICAL CO.

FLORIDA POLY



- H.E. "Bert" Schulz (d. 2009)

Florida Molasses Co./ Florida Chemical

Florida Foods/ Vacuum Foods/ Minute Maid/Coca Cola

1940

1950

1960



# COCA COLA SPECIAL PRODUCTS

FLORIDAPOLY

- Carl Huffman (d. 1992)
- Wes Bucek (d. 2009)
- Albert Kruger (d. 2005)

- HVE Essence
- Folding Oils
- FTNF Flavors
- Fractions/Isolates



- Essence
- Freeze Concentration
- ???

Florida Chemical

Minute Maid

Coca Cola/Minute Maid

Special Products

1955

1965

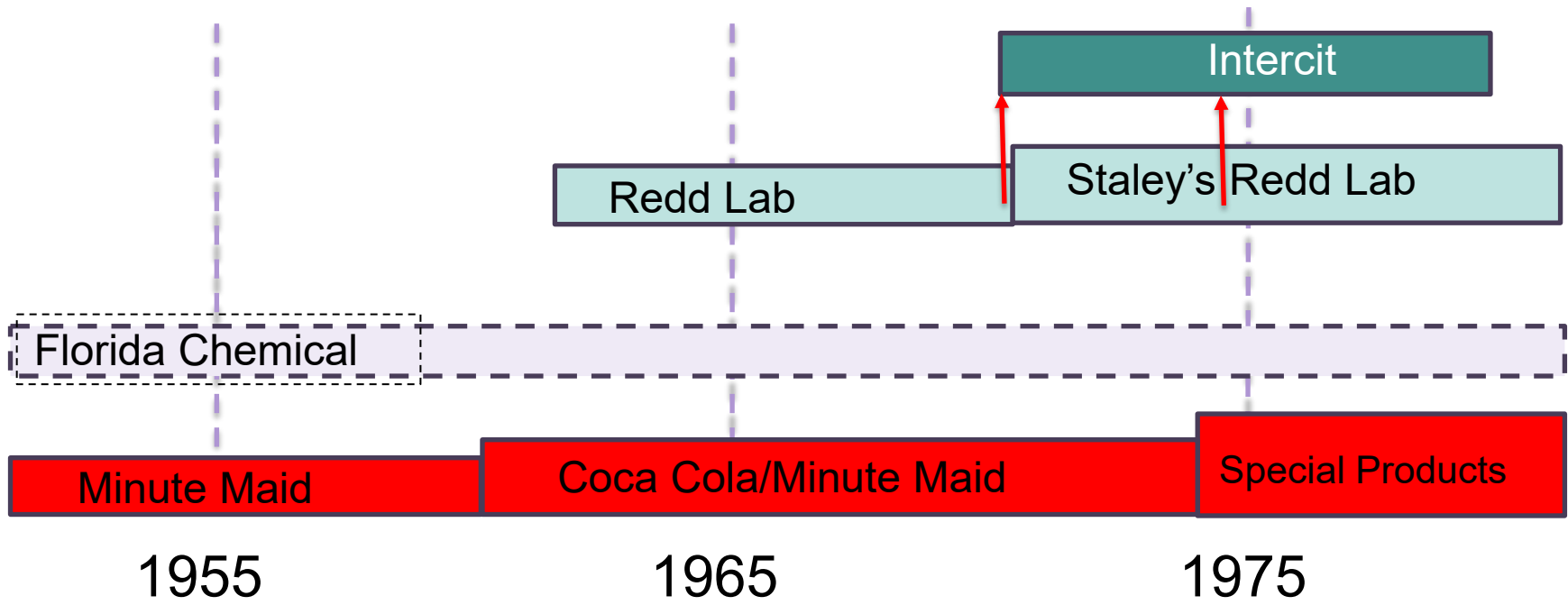
1975



# REDD LABORATORIES



- James Redd (d. 1999)
- Charles Walker (d. 1998)





# REDD'S BACKGROUND

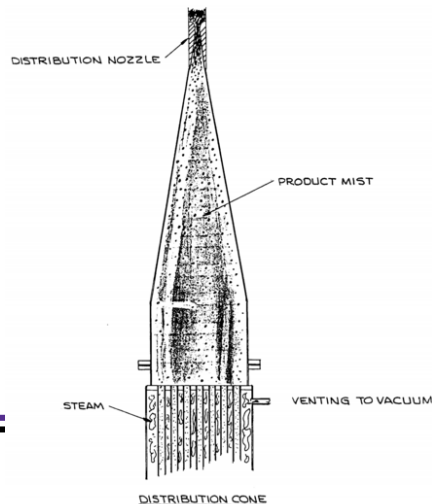
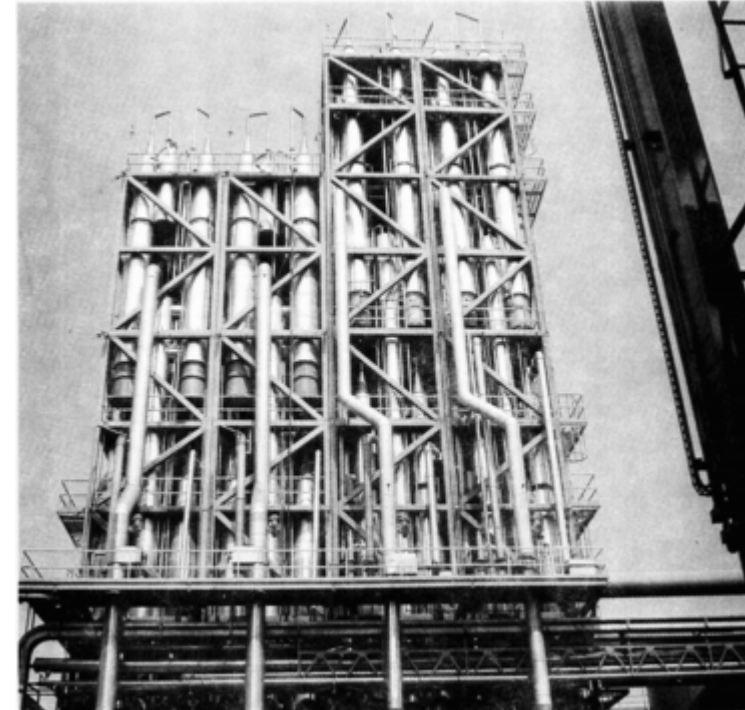
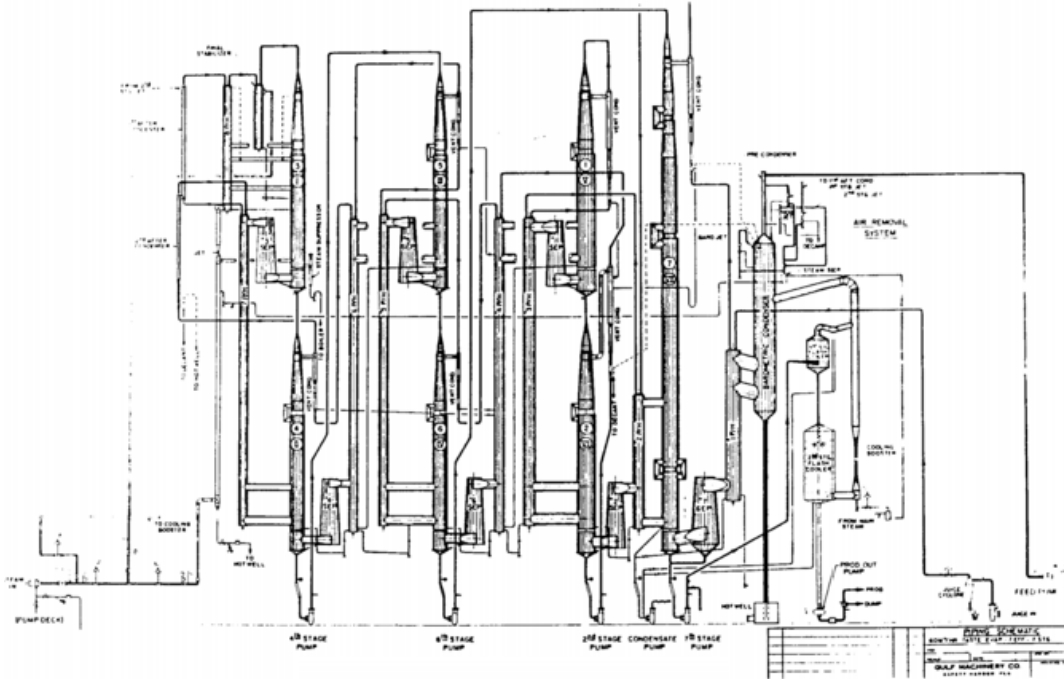
- 1936 – 43 UF – Undergrad/PhD Chemistry
  - w/ Professor Arthur Stahl on freeze concentration
  - PhD on terpene chemistry
- 1943 – 45 Citrus Experimental Station
- 1945 – 47 Wm. P. McDonald Citrus Corp.
- 1947 – 51 Director, Citrus School @ FSC
- 1951 – 61 Consulting Engineer



- Vitamin P/Citrus  
Flavonoids
- George Sperti/Freeze  
Concentration
- High-vacuum  
evaporator problems
- Essence collection  
experiments
- QC Training
- Plant Equipment  
Support



# TASTE EVAPORATOR

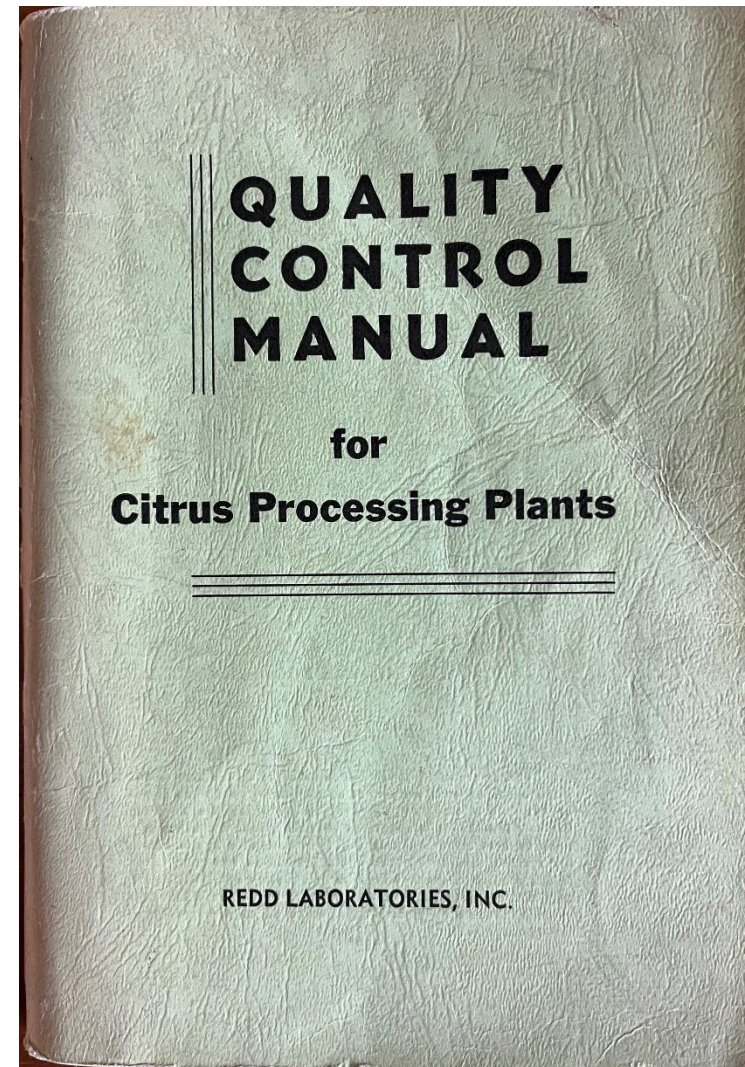


TASTE Evaporator design “solved” the fundamental essence problem.



## “Consulting, Analytical and Manufacturing Chemist Serving the Food Industry.”

- Consulting/Equipment Installs/Training
- Essence Units
- Essence Contracts
- 1966 Quality Control Manual – 1<sup>st</sup> Edition
- Redd Orange Citrus Concentrate Plant
- Beverage Bases w/ citrus flavoring ingredients
- Specialized pulp products
- Established a sales effort in Japan for citrus products.
  
- Some small-scale folding of orange oil.





# 1974 PRODUCT LIST

- Aromas
  - OR, GR, TA, LE, LI
  - Aroma Concentrate (75% alc)
- Essence Oil
  - OR, GR, TA, LE, LI
  - 3x, 7x, 7x “enriched”
- CPO
  - OR, GR, TA
  - 5x, 7x, 5x & 7x “enriched”
- FTNF Flavors (oil, ethanol-based)
- Terpenes

TDS NO. 5001  
040275



## TECHNICAL DATA SHEET

**Staley**  
PRODUCT NO. 5001 - NATURAL ORANGE FLAVOR (OIL)

PRODUCT DESCRIPTION. Natural Orange Flavor No. 5001 is a special blend of oil soluble flavor fractions designed to provide a "fresh orange juice" flavor system. All these flavor components are 100% natural and are carefully fractionated to concentrate flavor strength. Redd Laboratories' exclusive folding process retains the fresh topnotes normally lost with conventional methods. Careful blending and standardization of these components guarantee a uniform product regardless of type of fruit, maturity or processing variations. Fresh flavor character and concentration are the major attributes that make 5001 our premium natural orange oil flavor.

FLAVOR PROFILE. Natural Orange Flavor 5001 contains delicate flavor components from both orange cold pressed and essence oils, resulting in a truly balanced fresh orange flavor system. The product has been concentrated to a five-fold strength to assure high flavor levels without any undesirable "terpene bite" or aftertaste.

SUGGESTED USAGE.

	<u>% By Weight</u>	<u>ML. Per Gal.</u>	<u>Fl. Ozs. Per 100 Gals.</u>
5001 Natural Orange Flavor	.01	.4	1.33

Natural Orange Flavor No. 5001 should be added to single strength juice or juice-drink beverages at the above level and mixed in thoroughly. For better dispersion and flavor uniformity, emulsion systems are recommended.

TYPICAL ANALYSIS.

Aldehydes	3.5%
Specific Gravity	.85
Flavor Score (1-9 Points)	8
Color	Light Amber

PACKAGING. Natural Orange Flavor No. 5001 is packaged under nitrogen in epoxy-lined metal containers.

5-Gallon Pail	35 Lbs. Net Wt.
52-Gallon Drum	390 Lbs. Net Wt.

STORAGE. Room temperature (75°F) is sufficient for shipping and short term (two-week) storage. Prolonged storage should be at 40°F. Once opened, containers should be used as soon as possible.

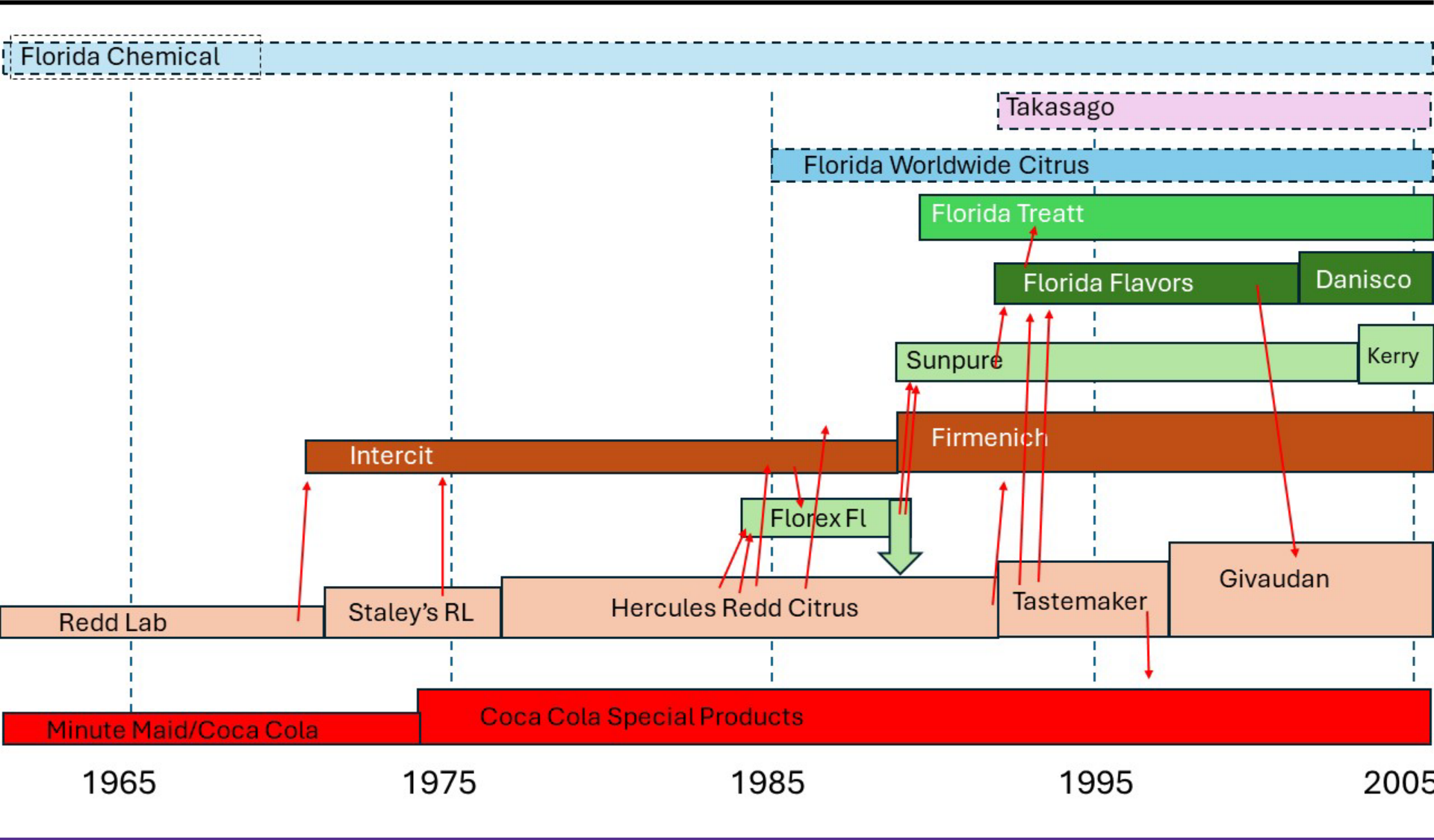
\* Trademark of A. E. Staley Manufacturing Co.

(See Notice on Reverse)





# MAP OF INDUSTRY





# FIRST F&F COMPANY IN FLORIDA?

FLORIDAPOLY

- Warren Burns, 1917
- VP of Compagnie Morana of NY
- New Port Richey, 33 acre tract
- 1909 Compagnie Morana formed
- 1920 Acquired by Van Ameringen
- 1929 Van Ameringen –Haebler Formed
- 1958 VA-H merges with Polak & Schwarz
- 1961 – IFF goes public

sanitary systems.

Warren E. Burns is vice-president of the Compagnie Morana of New York city, importers and manufacturers of essential oils, used in the manufacture of soaps and perfumes. This is one of the largest concerns of its kind in the United States. He is also treasurer of the Commonwealth Chemical Corporation of Hoboken, N. J., manufacturers of dye intermediates and toluol products, now working on large government projects. Mr. Burns visited New Port Richey November 5 and purchased from the Port Richey Company a tract of about thirty-three acres on the west side of the picturesque Cootee

## Experiment on Essential Oils

Most of the natural oils used in the manufacture of perfumes and soaps are extracted from flowers raised in the south of France, such as tuberoses, jasmine and bergamot. Oil of orange and oil of lemon are also imported from Sicily. All of these oils are produced from the fruit of citrus trees, but the expense of transportation and duties make the importation very expensive. It is Mr. Burns' intention to experiment on his property here and in a small laboratory on his place, under government supervision, to see if the same flowers can be raised here and give the same value in their yield. He is confident that the oils can be extracted from citrus fruits.

Mr. Burns also proposes to set out a citrus grove on the property just acquired, the clearing and improvement work being already under way.

The coming of the Burns to New Port Richey is of more than local flavor, for if his experiments along the lines of perfume-growing flowers is the success he believes it will be, a new field of endeavor is open to every section of the State.



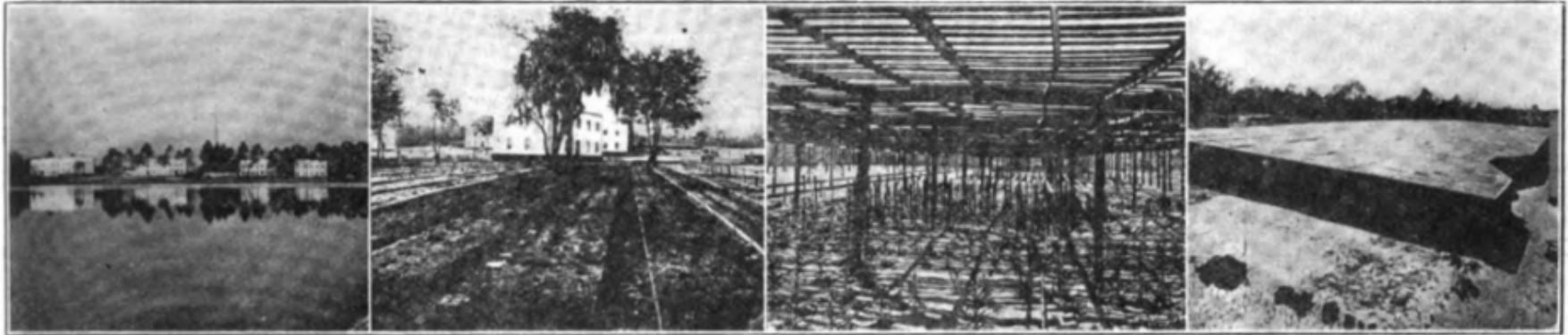
# FIRST F&F COMPANY IN FLORIDA?

FLORIDAPOLY

June, 1924

*AMERICAN DRUGGIST*

15



Left to right—Plant of Essential Oil Co. of America, Groveland, Fla.—Flower Beds—Shaded Rose Beds—Shaded Violet and Orchid Beds

## Florida Features Essential Oil Industry

By HARRY P. LEONARD

Secretary Chamber of Commerce, Leesburg, Fla.

- 170 acres of flowers planted
- “more than \$250,000 spent to date”



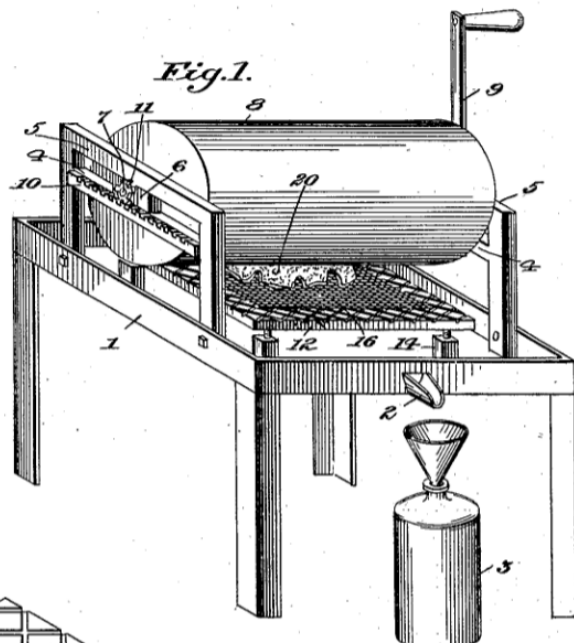
# FIRST COMMERCIAL OIL FOLDING

FLORIDAPOLY

March 2, 1930, Tampa Trib

## BY-PRODUCTS AND SALES CORPORATION

- J.J.R. Bristow (d. 1965)
- W.A. Pipkin (d.1985)



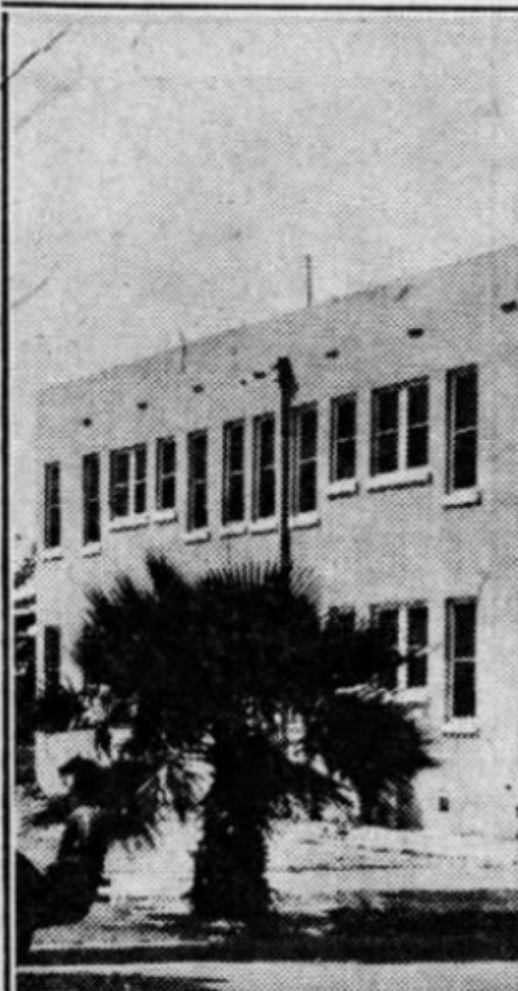
## NEW PLANT HERE DISTILLS CITRUS OILS FROM PEEL

### By-Products Taken From Wasted Material

Citrus peel, long regarded as waste material, now are being converted into salable by-products by a new manufacturing plant here. The new industry is the By-Products and Sales corporation with its manufacturing plant and laboratory at the Tampa Union Terminal in the Estuary. It is exclusively a by-product plant, extracting raw orange and grapefruit oils from waste citrus and finding a ready market for its extracts to other manufacturers for use in flavoring compositions, soft drinks, soaps, perfumes and other products.

While already proving a boon to the citrus industry of the state by converting into cash money a large

## Apartment





# FIRST DISTILLATION OF EB

Allen Kryger?

WRITE EACH DAY ON THE FIRST UNUSED PAGE.

SUBJECT Frac Dist of OEO  
DATE 6/17/76 PROJECT NO. \_\_\_\_\_

Compose to obtain fract from OEO  
high in Esters butyrate

290 ml OEO distilled in small  
Evap at 27 1/2" - distill off  
1st fract 40 ml collect (1) the  
Rest was discarded.

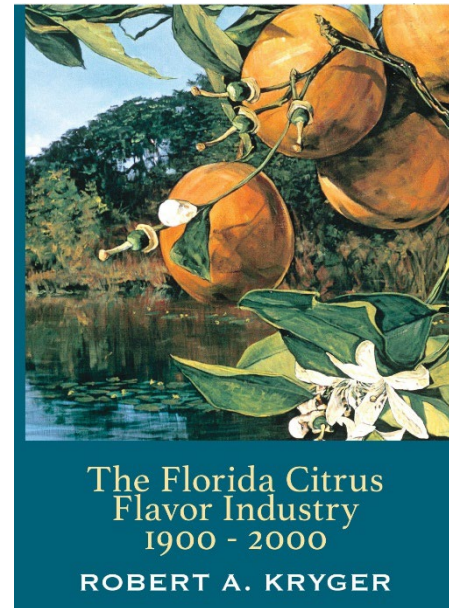
- A-Phase/O-Phase Process in routine use by early 80's
- 1979/80 - Joe Johnson develops Aroma Plus with these EB fractions.

[www.floridaflavorhistory.org](http://www.floridaflavorhistory.org)

- Contact me if you have info/pix/documents... or a different opinion.

Help me get this information into the appropriate libraries.

Who is going to write the history of the citrus industry in Florida?





# ACKNOWLEDGEMENTS

Seth Walker, D. E. Timmons, Charlie Hendrix,  
James Redd, Robert Braddock & Barry (Adrienne)  
Wilson

port and contributions of many people. Of these, a handful contributed particularly generously of their time, expertise and experience including: Tim Anglea, Ed Baranski, Beverly Bateman, Jeff Dodson, Gil Escobar, Luis Haro, Rex Harper, Don Hendrix, Paul Schulz, JD Vora, and Brett Welch. Other industry professionals who contributed important facts, memories, documents or interviews include: Randy Aulick, Elizabeth Baldwin, Wesley Beck, Eric Bennett, Niv BenYehuda, Hugo Bovill, Bob Braddock, Robert Brausch, Robin Bryant, Kristen Carlson, David Cline, Cathy Conway, Sean Frielich, Dan Gunter, Joe Johnson, Dennis Kujawski, Chris Li, Peary Marro, Susan Martin, David McKeithan, Carlos Odio, Sue Percival, Anne Plotto, Dave Rosen, Jerry Sachs, Colin Scott, Charles Thomas, Jan Van Iperen, David Walker, and Mark Walsh. I am very grateful to them also. It is my sincere hope that the