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United Nations Industrial Development Organization

Distr.  
LIMITED

ID/WG.172/17  
2 August 1974

ORIGINAL: ENGLISH

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AGRIWOODS - Regional Consultation on  
Promotional and Technical Aspects of  
Processing and Packaging Foods for Export  
Casablanca, Morocco, 23-28 June 1974

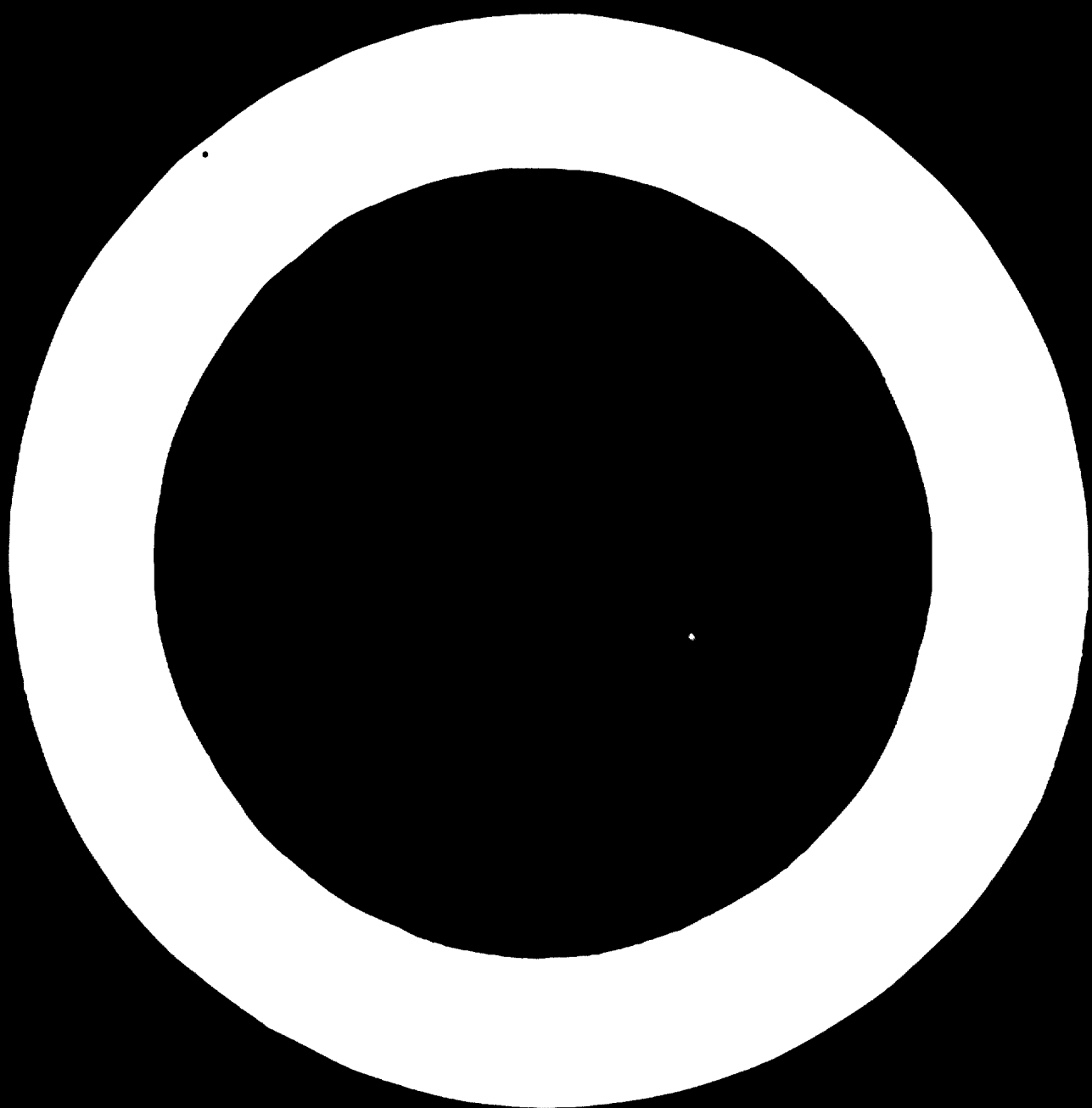
CITRUS JUICE PROCESSING FOR THE WORLD MARKET 1/

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CITRUS JUICE PROCESSING FOR THE WORLD MARKET

IT IS INDEED A PLEASURE FOR ME TO BE HERE TODAY TO SHARE WITH YOU SOME OF MY THOUGHTS WITH REGARD TO THE CITRUS JUICE PROCESSING INDUSTRY AND IN PARTICULAR, PROCESSING FOR THE WORLD MARKET. IT IS MY UNDERSTANDING THAT THE THRUST OF THIS CONGRESS IS TO LEAVE THE PARTICIPANTS WITH SOME PRACTICAL INSIGHTS AND INFORMATION SO AS TO ENABLE THOSE WHO MAY CONSIDER DEVELOPING THEIR FOOD PROCESSING INDUSTRIES WITHIN THE GENERAL TOPICS COVERED HERE, WILL HAVE SOMETHING TO WORK WITH IN THE IMMEDIATE FUTURE.

THE CORPORATION WITH WHICH I AM ASSOCIATED HAS BEEN INTIMATELY INVOLVED IN THE FOOD PROCESSING INDUSTRY FOR SOME 70 YEARS NOW AND HAS GROWN IN SIZE TO ANNUAL CORPORATE SALES OF \$2 BILLION, AND MY PARTICULAR ASSIGNMENT IS AS MANAGER OF THE LEASED MACHINERY AND PROCESSING MATERIALS DEPARTMENT, AND 90% OF THIS BUSINESS TODAY IS DIRECTED TOWARD CITRUS.

IN OUR DOMESTIC OR UNITED STATES OPERATIONS WE HAVE AN ENTIRE DIVISION, THE CITRUS MACHINERY DIVISION, WHICH HAS GROWN UP WITH THE CITRUS INDUSTRY AS IT HAS EXPANDED WITHIN THE UNITED STATES. IT

HAS PARTICIPATED IN THE DEVELOPMENT OF NEW IDEAS AND TECHNOLOGY WITH RESPECT TO MACHINES AND EQUIPMENT AS WELL AS PRODUCT FLOW FOR A LONG PERIOD OF TIME. AS THAT TECHNOLOGY IS DEVELOPED, IT IS MADE AVAILABLE TO THE INTERNATIONAL GROUP IN ORDER THAT WE MAY PASS THIS SAME TECHNOLOGY ABROAD TO OTHER CITRUS PRODUCING COUNTRIES. I OFFER THIS BACKGROUND TO YOU IN THE HOPE YOU WILL RECOGNIZE THAT THE COMPANY HAS BEEN INVOLVED IN THE CITRUS INDUSTRY FOR MANY YEARS AND THAT HOPEFULLY THROUGH THE REMAINING DAYS OF THE CONGRESS THERE WILL BE THE OPPORTUNITY TO SHARE SOME TECHNOLOGY WITH YOU FOR, IN FACT, THAT'S WHAT THE CONGRESS IS ALL ABOUT.

PERHAPS WE MIGHT START WITH A BRIEF HISTORY OF THE ORANGE. MANY OF US HAVE SIMPLY TAKEN FOR GRANTED THAT ORANGE TREES EXIST AND THAT ORANGES ARE AVAILABLE TO US. IN FACT, THE HISTORY OF THE ORANGE HAS BEEN A LONG ONE WITH FIRST KNOWN REFERENCES TO THE ORANGE OCCURRING IN THE SECOND BOOK OF THE FIVE CLASSICS WHICH APPEARED IN CHINA ABOUT 500 B.C. THE MAIN COURSE OF THE MIGRATION OF THE FRUIT FROM ITS ORIGIN NEAR THE SOUTH CHINA SEA WAS FIRST DOWN INTO THE MALAY ARCHIPELAGO, THEN ACROSS 4,000 MILES OF OCEAN CURRENT TO THE EAST COAST OF AFRICA. FROM THERE, THE ORANGE TRAVELED BY DESERT CARAVAN INTO THE MEDITERRANEAN BASIN, OVER THE ATLANTIC TO THE AMERICAN CONTINENTS AND CLOSELY AND SOMETIMES EXACTLY KEPT PACE WITH THE MAJOR JOURNEYS OF CIVILIZATION. THERE WERE NO ORANGES IN THE WESTERN HEMISPHERE THAT WE KNOW OF BEFORE CHRISTOPHER COLUMBUS FIRST LANDED IN THE NEW WORLD. THOSE SEEDS AND SEEDLINGS THAT THE SPANIARDS CARRIED TO THE NEW WORLD HAD COME FROM TREES THAT HAD ENTERED SPAIN AS A RESULT OF THE RISE OF ISLAM. THE WORD ORANGE EVOLVES FROM ANCIENT SANSKRIT. INDIA WAS THE FIRST MAJOR STOP IN WESTWARD TRAVEL OF CITRUS AND THE FIRST MENTION OF ORANGES IN SANSKRIT LITERATURE IS FOUND IN A MEDICAL BOOK WHICH WAS COMPILED APPROXIMATELY 2,000 YEARS AGO.

IT IS ONLY IN COMPARATIVELY RECENT CENTURIES IN WESTERN COUNTRIES THAT ORANGES HAVE ACTUALLY BEEN EATEN AS A FOOD. IN THE EARLIEST YEARS, ORANGES WERE PRINCIPALLY DECORATIVE IN NATURE AND TO SOME DEGREE, THE JUICE WAS USED AS A CONDIMENT OR ADDITIVE TO ENHANCE THE FLAVOR OF CERTAIN FOOD DISHES. AND IT WAS DURING THE 17TH CENTURY THAT SAILORS PLYING THEIR TRADE ACROSS THE OCEANS OF THE WORLD DISCOVERED THE VALUE OF FRESH CITRUS IN PREVENTING SCURVY. AFTER THE BRITISH ADMIRALTY ISSUED ORDERS FOR REGULAR RATIONS OF LIME JUICE ON ALL OF HIS MAJESTY'S SHIPS, BRITISH SAILORS BECAME KNOWN THROUGHOUT THE WORLD AS "LIMEYS". CITRUS PROCESSING AND THE INDUSTRY ITSELF IS RELATIVELY YOUNG WHEN LOOKED AT IN TERMS OF THE LIFE SPAN OF THE ORANGE. THAT IS TO SAY, THAT UNTIL PASTEURIZATION, TECHNIQUES OF FOOD PRESERVATION, THE INDUSTRIAL REVOLUTION AND ALL THE OTHER FACTORS THAT HAVE BEEN DEVELOPED OVER THE LAST 150 YEARS, CITRUS PRODUCTS AS WE KNOW THEM TODAY WERE NOT AVAILABLE TO THE CONSUMER. IN FACT, THE FIRST JUICE PLANT IN THE UNITED STATES DID NOT COME ABOUT UNTIL THE YEAR 1899 IN CALIFORNIA. THE FIRST JUICE PROCESSING PLANT IN FLORIDA DID NOT COME INTO EXISTENCE UNTIL 1921.

SINCE WE ARE CONCERNED WITH PROCESSING, IT CERTAINLY FOLLOWS THAT WITHOUT A SUPPLY OF RAW MATERIAL, A CITRUS PROCESSING PLANT DOES NOT COME INTO EXISTENCE. LET'S BRIEFLY THEN LOOK AT WHERE THE SUPPLY OF RAW MATERIAL IS. THE LATEST STATISTICS INDICATE TOTAL WORLD CITRUS PRODUCTION AT SOMETHING OVER 30 MILLION TONS ANNUALLY. OF THIS TOTAL, ORANGES ALONE REPRESENT SOME 28 TO 30 MILLION TONS. THE LARGEST SINGLE GEOGRAPHIC AREA OF GROWTH OVER THE PAST 10 YEARS HAS PROBABLY BEEN IN THE MEDITERRANEAN BASIN WHICH, UNTIL VERY RECENT YEARS, PRODUCED ABOUT 1/4 OF THE TOTAL WORLD PRODUCTION. TODAY, THE MEDITERRANEAN BASIN PRODUCES APPROXIMATELY 1/3 OF THE TOTAL WORLD PRODUCTION OF CITRUS. IF WE WERE TO RANK THE FIRST 10 COUNTRIES IN TOTAL CITRUS PRODUCTION, WE WOULD FIND THE UNITED STATES PRODUCING ALMOST 33% OF THE TOTAL WORLD PRODUCTION. THIS IS FOLLOWED BY JAPAN IN THE NUMBER TWO SPOT

AND BRAZIL VERY CLOSE BEHIND JAPAN HAVING INCREASED THEIR PRODUCTION THE PAST FEW YEARS TO MOVE FROM FIFTH TO THIRD IN RANKING. CLOSELY BEHIND BRAZIL COMES ITALY AND THEN SPAIN. THE REMAINING FIVE COUNTRIES IN ORDER OF PRODUCTION ARE ISRAEL, ARGENTINA, MEXICO, MOROCCO AND TURKEY. THESE 10 COUNTRIES ACCOUNT FOR 90% OF THE TOTAL CITRUS PRODUCTION IN THE WORLD TODAY. I THINK YOU CAN READILY SEE THAT ASIDE FROM MOROCCO, NO OTHER NORTH AFRICAN OR AFRICAN COUNTRY IS LISTED IN THE TOP 10 ALTHOUGH ALGERIA AND EGYPT ARE IN THE TOP 20 IN PRODUCTION.

WHAT IS THE UTILIZATION OF THIS TREMENDOUS PRODUCTION OF CITRUS PRODUCTS? WITH THE EXCEPTION OF THE UNITED STATES WHICH SENDS ABOUT 80% OF ITS TOTAL CITRUS PRODUCTION TO PROCESSING PLANTS AND BRAZIL WHO UTILIZES ABOUT 50% OF ITS PRODUCTION IN PROCESSING PLANTS, THE BALANCE OF THE CITRUS PRODUCING COUNTRIES ARE MARKETING THEIR PRODUCTS AS FRESH CITRUS. 80% OF JAPAN'S PRODUCTION IS CONSUMED AS FRESH PRODUCT. SPAIN EXPORTS IN EXCESS OF 60% OF ITS CITRUS TO THE EUROPEAN ECONOMIC COMMUNITY. MOROCCO EXPORTS SOME 70% OF ITS TOTAL CITRUS PRODUCTION AS FRESH PRODUCT. AND IN THE CASE OF CYPRUS, SOME 75% OF THEIR PRODUCTION IS EXPORTED AS FRESH PRODUCT. SOMEWHERE ALONG THE LINE, THE WORLD PER CAPITA CONSUMPTION OF FRESH CITRUS IS GOING TO STABILIZE. AS THIS OCCURS, THERE WILL BE GREATER AND GREATER NEEDS FOR PROCESSING FACILITIES TO HANDLE THE EXCESS FRESH CITRUS PRODUCTION. AS AN EXAMPLE, I MIGHT MENTION THE SITUATION THAT IS OCCURRING IN JAPAN TODAY. THEIR POPULATION HAS STABILIZED AT ABOUT 110 MILLION PEOPLE, HOWEVER, CITRUS PRODUCTION HAS BEEN INCREASING OVER THE LAST 10 YEARS AND IN FACT COULD REACH 4 MILLION TONS ANNUALLY BY 1978. PEOPLE IN JAPAN SIMPLY CANNOT EAT MORE ORANGES ON A PER CAPITA CONSUMPTION THAN THEY PRESENTLY DO; CONSEQUENTLY, THE UTILIZATION OF THE CROPS WILL SWING MORE AND MORE TOWARDS PROCESSING. THE GOVERNMENT OF JAPAN HAS SUPPORTED RECENT CITRUS JUICE PLANT CONSTRUCTION SO THAT WITHIN THE NEXT FIVE YEARS, SOME 30% OF JAPAN'S CITRUS PRODUCTION WILL GO TO PROCESSING PLANTS AS OPPOSED TO THE FRESH MARKET. THIS MEANS REORIENTATION



AS FAR AS THE CONSUMER IS CONCERNED BUT CERTAINLY THIS IS AN ACHIEVABLE GOAL.

LET ME BRIEFLY SHOW YOU THE SITUATION THAT HAS OCCURRED IN THE UNITED STATES OVER THE LAST 20 YEARS.

U.S.A.  
CITRUS PER CAPITA CONSUMPTION  
FRESH WEIGHT EQUIVALENT

YEAR	FRESH	CANNED	CANNED JUICE	CHILLED	FROZEN	TOTAL
	<u>POUNDS</u>	<u>POUNDS</u>	<u>POUNDS</u>	<u>POUNDS</u>	<u>POUNDS</u>	<u>POUNDS</u>
1950	41.7	1.5	19.8	-	10.8	73.8
1954	42.0	1.9	15.8	-	27.1	86.8
1958	31.0	2.1	14.3	3.8	25.8	77.0
1962	29.5	1.9	10.5	4.5	37.2	83.6
1967	31.6	2.2	11.1	9.3	40.0	94.2
1970	28.6	1.8	13.4	9.8	41.4	95.0
1971	29.3	2.0	15.1	9.8	41.2	97.4

IN 1950, U.S. PER CAPITA CONSUMPTION OF CITRUS WAS 73.8 POUNDS. OF THIS, 41.7 POUNDS WAS CONSUMED AS FRESH PRODUCT, 1.5 POUNDS AS CANNED PRODUCT, 19.8 POUNDS AS CANNED JUICE AND 10.8 POUNDS AS FROZEN CONCENTRATE. 10 YEARS LATER, TOTAL PER CAPITA CONSUMPTION WAS UP ALMOST 10 POUNDS ALTHOUGH THE MIX HAD CHANGED DRAMATICALLY. IN 1962, THE PER CAPITA CONSUMPTION OF FRESH PRODUCT HAD DROPPED FROM 41.7 POUNDS TO 29.5 POUNDS, CANNED JUICES HAD DROPPED FROM 19.8 POUNDS TO 10.5 POUNDS AND FROZEN CONCENTRATE CONSUMPTION HAD RISEN FROM 10.8 POUNDS TO 37.2 POUNDS. BY 1971, PER CAPITA CONSUMPTION HAD RISEN

ANOTHER 15 POUNDS AND UNCLE MOPPEL, THE MIX OF CONSUMPTION SHOWS A DRAMATIC CHANGE. FRESH CONSUMPTION HAD STABILIZED AT ABOUT 21.3 POUNDS, CANNED JUICE HAD RISEN SLIGHTLY TO 15.1 POUNDS, CHILLED JUICE HAD BECOME AN IMPORTANT FACTOR IN THE CONSUMPTION AND FROZEN CONCENTRATE HAD RISEN TO 41.2 POUNDS. WHAT WE SEE THEN IN THE UNITED STATES, CONSIDERING ORANGES, LEMONS, GRAPEFRUITS OR ALL OF THE CITRUS, CONSUMPTION IS ABOUT 70% FROM PROCESSED PRODUCTS. I WOULD SUBMIT TO YOU THAT THE EXAMPLE OF THE UNITED STATES IN THESE CONSUMPTION TRENDS IS SOMETHING THAT WILL OCCUR IN THE BALANCE OF THE WORLD IN AN EVER INCREASING PROPORTION.

MANY OF YOU ARE AWARE THAT THE PRINCIPAL EXPORTS FROM YOUR PRODUCING COUNTRIES ARE GOING INTO THE UNITED KINGDOM, THE EEC AND EASTERN EUROPE. THERE IS STILL A PREDOMINANCE OF CONSUMPTION OF THE FRESH PRODUCT AS OPPOSED TO THE PROCESSED PRODUCT; HOWEVER, THAT PROPORTION OF CONSUMPTION OF CITRUS AS FRESH PRODUCT WILL EITHER STABILIZE OR DECREASE AND THERE WILL BE GREATER CONSUMPTION OF PROCESSED PRODUCTS. TOTAL CITRUS PRODUCTION IN THE MEDITERRANEAN AREA CONTINUES TO INCREASE AND AS IT DOES, MARKETING OF THIS PRODUCT BECOMES MORE AND MORE DIFFICULT DUE TO EXCESS CITRUS IN THE FRESH MARKET, PRICE PROBLEMS, INCREASING FREIGHT RATES, STORAGE COSTS AND GROWING CONSUMER AWARENESS OF THE EQUIVALENT HEALTH VALUE IN CONSUMPTION OF PROCESSED PRODUCT. PROCESSING ALLOWS FOR A YEAR-ROUND UTILIZATION OF WHAT IS A SEASONAL PRODUCT. WITH PROPER PROCESSING PLANT FACILITIES, THE QUALITY OF CITRUS CAN BE PRESERVED AND IT BECOMES ONLY A MATTER OF TIME UNTIL THE CONSUMING PUBLIC CHANGES THEIR BUYING HABITS. CERTAINLY, JAPAN, WHICH HAS HISTORICALLY BEEN AN AGRICULTURAL ECONOMY WITH CONSUMER PREFERENCE FOR FRESH PRODUCTS, HAS BEEN INNOVATIVE AND IN THE PAST FEW YEARS THE CONSUMPTION OF ALL PROCESSED FOODS HAS RISEN DRAMATICALLY.

LET'S LOOK BRIEFLY AT PROCESSING HERE IN THE MEDITERRANEAN AREA. THE FOLLOWING CHART IS EXTRACTED FROM THE UNITED STATES DEPARTMENT OF AGRICULTURE FOREIGN AGRICULTURE SURVEY DATED APRIL 1974 AND SHOWS A COMPARISON BETWEEN THE 1971/72 AND 72/73 PRODUCING SEASONS. THE CHART SELECTS THOSE PRINCIPLE COUNTRIES IN THE MEDITERRANEAN BASIN NOW INVOLVED IN PROCESSING.

Citrus Fruits: Quantity produced and processed, and percent processed, by variety and country, 1971-72 and 1972-73

Variety and Country	1971-72			1972-73		
	Produced 1,000 metric tons	Processed 1,000 metric tons	Share Processed Percent	Produced 1,000 metric tons	Processed 1,000 metric tons	Share Processed Percent
<b>Oranges &amp; tangerines:</b>						
Greece .....	390.0	1/35.0	14	431.7	1/70.0	16
Israel .....	1,416.7	455.3	40	1,074.1	474.5	44
Italy .....	1,700.0	425.0	24	1,600.5	395.0	25
Morocco .....	820.8	98.0	12	987.6	1/96.0	10
Spain .....	2,198.0	255.0	12	2,664.9	305.0	11
<b>Total .....</b>	<b>6,315.5</b>	<b>1,288.3</b>	<b>20</b>	<b>6,758.8</b>	<b>1,340.5</b>	<b>20</b>
United States .....	7,889.9	6,114.5	77	9,216.2	7,434.5	81
<b>Lemons:</b>						
Greece .....	132.2	15.0	11	141.5	20.0	14
Israel .....	34.9	12.1	35	41.6	11.6	28
Italy .....	779.3	160.0	21	650.0	140.0	22
Spain .....	95.7	6.0	6	199.3	10.0	5
<b>Total .....</b>	<b>1,042.1</b>	<b>193.1</b>	<b>19</b>	<b>1,032.4</b>	<b>181.6</b>	<b>18</b>
United States .....	575.2	244.0	42	765.7	384.7	50
<b>Grapefruit:</b>						
Cyprus .....	60.4	7.3	12	74.6	11.1	15
Israel .....	328.0	103.9	32	399.7	143.1	36
Morocco .....	15.0	12.0	80	17.0	15.0	88
Spain .....	6.1	3.0	49	5.8	3.5	60
<b>Total .....</b>	<b>409.5</b>	<b>126.2</b>	<b>31</b>	<b>497.1</b>	<b>172.7</b>	<b>35</b>
United States .....	2,379.6	1,392.6	59	2,425.9	1,425.2	59

1/Includes oranges only.

USDA FOREIGN AGRICULTURAL SURVEY - APRIL 1974

YOU WILL READILY NOTE THAT FOR ORANGES AND TANGERINES, WITH THE EXCEPTION OF ISRAEL, PROCESSING IS A RELATIVELY MINOR PERCENTAGE OF THE TOTAL CITRUS PRODUCTION, AS COMPARED WITH THE UNITED STATES. THE ONLY PRODUCT THAT SHOWS SOME SIZABLE PERCENTAGE OF PROCESSING IS IN GRAPEFRUIT, ALTHOUGH THE FIGURES ARE

SOMEWHAT DISTORTED BECAUSE OF LOW PRODUCTION. WHAT I FEEL THE CHART SHOWS US IS THAT THERE IS SIZABLE ROOM FOR EXPANSION OF THE PROCESSING INDUSTRY. CONSUMERS IN EUROPE ARE NOT THAT MUCH DIFFERENT FROM CONSUMERS IN THE UNITED STATES. IT BECOMES A MATTER OF MARKETING EXPERTISE, CREATION OF CONSUMER DEMANDS, AND THE PRODUCTION OF GOOD, HIGH-QUALITY CITRUS JUICE PRODUCTS.

IF YOU WILL AGREE WITH ME THAT THERE IS A MARKET PLACE FOR PROCESSED PRODUCTS OUT THERE SOMEWHERE, THE NEXT LOGICAL STEP IS TO GET INTO BUSINESS. THIS NEXT STEP CAN BE APPROACHED FROM TWO DIRECTIONS. THE FIRST, IS SIMPLY TO DECIDE WE WILL HAVE A JUICE PROCESSING PLANT, THE PLANT IS CONSTRUCTED AND THEN MARKETING FOLLOWS. A SECOND APPROACH WOULD BE FIRST TO DETERMINE WHAT THE MARKET DEMANDS, SETTING UP A MARKETING STRUCTURE FOR THE PRODUCT AND DESIGNING AND BUILDING A PLANT TO MEET THE MARKETING NEEDS. FRANKLY, OUR COMPANY PREFERS DEALING WITH THE CUSTOMERS WHO HAVE TAKEN THE LATTER APPROACH. FOR THE DESIGN OF A PLANT, THE SUPPLY OF APPROPRIATE EQUIPMENT PROPERLY SIZED AND DESIGNED TO PRODUCE A MARKETABLE END PRODUCT MAKES FOR A MUCH EASIER, MORE QUICKLY COMPLETED AND MORE ECONOMICAL INSTALLATION IF THE CUSTOMER KNOWS FROM THE BEGINNING WHAT IT IS HE WANTS TO SELL. TOO OFTEN, REQUESTS FOR PROCESSING PLANTS ARE MADE ON THE BASIS OF UTILIZATION OF CULL AND SURPLUS FRUIT WITHOUT ANY THOUGHT FOR THE END PRODUCT OR THE MARKETABILITY OF THAT PRODUCT.

SO, I WOULD SUGGEST THAT THE FIRST STEP BE A GOOD MARKET SURVEY AND DETERMINATION OF WHAT THE CONSUMER IS GOING TO BUY. LET ME SHOW YOU NOW A CHART INDICATING THE UTILIZATION OF ORANGES IN THE PROCESSING INDUSTRY BY PRODUCT TYPE IN FLORIDA. THIS CHART COVERS THE YEARS 1967/68 THROUGH 1971/72.

FLORIDA  
ORANGES PROCESSED  
BY PRODUCT TYPE  
1967/68 - 1971/72

SEASON	FROZEN CONCENTRATES	CHILLED PRODUCTS		OTHER PROCESSED	TOTAL PROCESSED
		JUICE	SECTIONS & SALADS		
	1000 BOXES*	1000 BOXES	1000 BOXES	1000 BOXES	1000 BOXES
1967/68	61,970	15,975	837	6,764	85,546
1968/69	92,125	17,843	773	9,350	120,091
1969/70	100,739	18,640	841	8,206	128,426
1970/71	103,521	19,772	703	8,834	132,830
1971/72	104,399	19,509	535	7,726	132,169

\*ONE BOX EQUALS 85 POUNDS

WHAT YOU SEE OVER THIS FIVE YEAR SPREAD IS A SIZABLE INCREASE IN THE TOTAL UTILIZATION OF ORANGES IN THE PROCESSING INDUSTRY. IN FACT, THEY HAVE MOVED FROM SOME 85 MILLION BOXES IN 1967/68 TO 132 MILLION BOXES IN 1971/72. WHAT THE CHART ILLUSTRATES QUITE DRAMATICALLY IS THAT 90% OF THIS INCREASE IS DIRECTLY ATTRIBUTABLE TO THE INCREASED PRODUCTION OF FROZEN CONCENTRATE. FURTHER, YOU WILL NOTE THAT 78% OF THE TOTAL ORANGES PROCESSED IN FLORIDA GO INTO FROZEN CONCENTRATE. I WOULD SUBMIT THAT THIS TREND IN THE UNITED STATES IS SOMETHING THAT WILL ULTIMATELY BE SEEN IN THE EUROPEAN MARKET PLACE AND THUS, PROCESSING PLANT FACILITIES IN THE MEDITERRANEAN AREA MUST CONCERN THEMSELVES WITH THE ABILITY TO PRODUCE FROZEN CONCENTRATE FOR THE EUROPEAN MARKET.

HISTORICALLY, PRODUCTION OF CITRUS PRODUCTS IN THE MEDITERRANEAN BASIN HAS BEEN IN CANNED HOT PACK SINGLE STRENGTH JUICE OR IN CANNED OR DRUMMED HOT PACK CONCENTRATES. THESE PRODUCTS HAVE HAD PRESERVATIVES AND SUGARS ADDED BECAUSE BASICALLY THIS HAS BEEN THE MARKET DEMAND. HOWEVER, WHEN BRAZIL'S PRODUCTION OVER THE LAST FIVE YEARS BEGAN TO INCREASE AND THEY BEGAN TO EXPORT FROZEN CONCENTRATE IN BULK INTO THE EUROPEAN MARKET, THE MANUFACTURING AND PROCESSING FACILITIES IN THE MEDITERRANEAN AREA HAD TO TAKE NOTE. OBVIOUSLY, CONSUMER DEMAND IN THE EUROPEAN COUNTRIES OR IN THE MARKET PLACE BEGAN TO CHANGE.

EARLIER, WE SHOWED YOU A CHART OF PROCESSING OF KEY COUNTRIES IN THE MEDITERRANEAN AREA. LET'S FOR A MOMENT FOCUS ON WHAT HAS HAPPENED IN ISRAEL AS FAR AS THEIR CITRUS EXPORTS BY PRODUCT OVER THE PAST THREE YEARS.

ISRAEL: CITRUS EXPORTS, BY PRODUCT, FISCAL YEARS 1971/73  
(IN METRIC TONS)

COMMODITY	1970/71	1971/72	1972/73
GRAPEFRUIT SEGMENTS	17,739	18,622	22,305
NATURAL ORANGE JUICE (UNSWEETENED)	41,958	50,842	52,200
NATURAL GRAPEFRUIT JUICE (UNSWEETENED)	20,299	25,870	27,489
CONC. ORANGE JUICE (UNSWEETENED)	8,625	16,368	17,894
CONC. GRAPEFRUIT JUICE (UNSWEETENED)	1,065	1,600	2,329
ORANGE JUICE, SUGAR ADDED UP TO 5%	13,330	12,368	10,731
GRAPEFRUIT JUICE, SUGAR ADDED UP TO 5%	7,809	6,765	5,300

I THINK IF YOU WILL NOTE THE LAST TWO ITEMS ON THE CHART, THAT IS ORANGE JUICE WITH SUGAR ADDED AND GRAPEFRUIT WITH SUGAR ADDED, YOU WILL NOTE THAT THERE HAS BEEN A PREDOMINATE DECREASE IN THE EXPORTATION OF THESE TWO PARTICULAR PRODUCTS. CONVERSELY, ALL OTHER PRODUCTS HAVE SHOWN AN INCREASE. NATURAL ORANGE JUICE,

THAT IS, SINGLE STRENGTH UNSWEETENED, HAS INCREASED FROM SOME 42,000 METRIC TONS IN THE YEAR 70/71 TO 52,200 METRIC TONS IN 72/73 PROCESSING YEAR. THE SAME IS TRUE FOR GRAPEFRUIT JUICE MOVING FROM 20,299 TONS TO 27,489 TONS. PROBABLY THE MOST DRAMATIC INCREASE, HOWEVER, IS IN THE CONCENTRATED ORANGE JUICE UNSWEETENED WHICH HAS MOVED FROM 8,600 TONS IN 1970/71 TO 17,594 TONS, OR MORE THAN DOUBLED IN THE THREE YEAR PERIOD.

NOT ONLY WILL YOU NEED TO SURVEY YOUR MARKET TO DETERMINE WHAT PRODUCTS ARE GOING TO BE MOST MARKETABLE, BUT YOU WILL ALSO NEED TO DEVELOP A MARKETING ORGANIZATION. BY THIS I MEAN SOME MEANS TO MOVE YOUR PRODUCT FROM THE PROCESSING PLANT TO THE CONSUMER MARKETS. IN MANY COUNTRIES, SUCH MARKETING IS DONE THROUGH GOVERNMENT OR QUASI GOVERNMENT ORGANIZATIONS. THE OPPORTUNITY ALSO EXISTS TO MARKET THROUGH LARGE WHOLESALE BROKERS IN THE EUROPEAN CONTINENT OR DIRECTLY TO SMALL RETAIL STORES. IN SOME CASES, MARKETING CAN BE DIRECTLY TO GOVERNMENT BUYING ORGANIZATIONS AS IS THE CASE IN EASTERN EUROPE. AT ANY RATE, IT IS NECESSARY TO DEVELOP THAT VITAL LINK IN THE MARKET PLACE THAT IS GOING TO HANDLE THE IMPORTATION OF YOUR PRODUCTS AND ENSURE THAT THEY ARE MARKETED IN THE MOST ADVANTAGEOUS MEANS. SUCH ORGANIZATIONS SHOULD BE IN A POSITION TO HANDLE THE ADVERTISING AND PROMOTION OF PRODUCTS TO PROMOTE YOUR BRAND NAME AND LEAVE YOU WITH THE SOLE OBJECTIVE OF MANUFACTURING HIGH-QUALITY PRODUCTS. YOU MAY, IN FACT, FIND THAT THE IMPORTER OR BROKER WILL DICTATE TO YOU EXACTLY WHAT FORMULATIONS AND PRODUCTS THEY WANT TO HANDLE. YOU MUST, THEREFORE, ESTABLISH THESE REQUIREMENTS BEFORE SETTING UP YOUR PROCESSING PLANT SO AS TO HAVE THE FLEXIBILITY AT ALL TIMES TO PRODUCE PRODUCTS THAT WILL SELL QUICKLY AND READILY AND AT A PROPER ECONOMIC RETURN TO YOU.

WHILE YOU ARE PERFORMING THE MARKET RESEARCH FUNCTIONS, THERE IS THE NEED TO ENSURE THAT A GOOD CONTINUING SOURCE OF RAW MATERIALS WILL BE AVAILABLE. THEREFORE, THIS PARTICULAR REQUIREMENT NEEDS TO BE EXPLORED ALONG WITH YOUR MARKET RESEARCH. THERE CAN BE NOTHING WORSE THAN A PROCESSING PLANT OBTAINING AN ORDER FOR SOME 10,000 TONS OF END PRODUCT AT A GOOD PRICE AND THEN BEING UNABLE TO DELIVER THE END PRODUCT DUE TO A SHORTAGE OF RAW MATERIALS.

THE AVAILABILITY OF RAW PRODUCTS AND THE MANNER IN WHICH IT IS OBTAINED VARIES FROM COUNTRY TO COUNTRY. I WOULD SUSPECT THAT WITH THE EXCEPTION OF THE UNITED STATES AND IN PARTICULAR, THE STATE OF FLORIDA AND BRAZIL, THE VAST MAJORITY OF CITRUS AVAILABLE TO A PROCESSING PLANT IS PACKINGHOUSE CULLS OR SURPLUS AND UNMARKETABLE FRUIT INITIALLY PRODUCED FOR THE FRESH MARKET. FOR EXAMPLE, HERE IN MOROCCO, THE PROCESSING INDUSTRY IS PRIVATELY OWNED. BECAUSE OF THIS, THEY ARE DEPENDENT UPON FRUIT SUPPLIES THAT THE OCE IS UNABLE TO MARKET FOR VARIOUS REASONS IN THE EXPORT OR DOMESTIC MARKET. QUITE OFTEN, THERE IS NO GUARANTEE OF THE QUANTITY OF FRUIT THAT WILL BE AVAILABLE FOR PROCESSING IN ANY ONE SEASON. THERE MAY IN FACT BE A SHORTAGE OF FRUIT ONE YEAR AND A SURPLUS THE NEXT. THIS CALLS FOR SOME JUDICIOUS PLANT MANAGEMENT. MY UNDERSTANDING OF THE SITUATION IN ISRAEL IS SUCH THAT THE PROCESSING PLANTS ARE ALLOWED A QUOTA ANNUALLY BASED ON THE PREVIOUS YEAR'S PRODUCTION. IN THAT SENSE, THERE IS A DEGREE OF SURETY AT LEAST AS THE SEASON COMMENCES THAT A CERTAIN PERCENTAGE OF THE TOTAL CROP WILL BE MADE AVAILABLE TO EACH AND EVERY PROCESSING PLANT.

IT BEHOVES THE POTENTIAL CITRUS PLANT PROCESSOR TO BE QUITE FAMILIAR WITH HIS SOURCES OF SUPPLY, HIS ABILITY TO OBTAIN FRUIT ON A TIMELY BASIS, OF GOOD QUALITY AND WITH A CERTAIN DEGREE OF STABILITY AS FAR AS OBTAINABILITY IS CONCERNED. UNFORTUNATELY, THE OPTIONS ARE NOT ALWAYS AVAILABLE TO YOU.



CERTAINLY, WHEREVER POSSIBLE, THIS SHOULD BE CONSIDERED AND EVERY ATTEMPT MADE TO ACHIEVE THE BEST SUPPLY POSSIBLE.

ALONG WITH SUPPLY, THE PROCESSOR SHOULD CONSIDER THE VARIETY AND THE QUALITY OF THE FRUIT RECEIVED. CERTAIN VARIETIES ARE GOING TO PRODUCE HIGHER JUICE CONTENT THAN ARE OTHERS. CERTAINLY, YOU ARE AWARE THAT THE VALENCIA ORANGE IS A GOOD JUICE PRODUCER AS OPPOSED TO THE NAVEL ORANGE WHICH IS PRINCIPALLY A FRESH EATING ORANGE. CERTAINLY, A PROCESSING PLANT THAT HAS AN OPTION AS TO THE VARIETY OF ORANGE THAT WILL BE PROCESSED SHOULD TAKE THE FRUIT WITH THE HIGHEST JUICE CONTENT. WITHIN GEOGRAPHICAL AREAS AND EVEN WITHIN COUNTRIES, CERTAIN AREAS WILL PRODUCE BETTER FRUIT THAN OTHERS, FRUIT WITH HIGHER JUICE CONTENT THAN OTHER AREAS WITHIN THE SAME COUNTRY. THEREFORE, IT BEHOVES THE PROCESSOR TO SELECT THAT FRUIT THAT WILL RETURN HIM THE GREATEST ECONOMICS FOR HIS MONETARY INVESTMENT.

AT THIS POINT, LET'S ASSUME THAT WE HAVE LOOKED AT THE MARKET PLACE AND DETERMINED THAT THERE IS DEFINITELY A NEED FOR ADDITIONAL PROCESSED CITRUS PRODUCTS AND WE HAVE ALSO DETERMINED THROUGH A STUDY WITHIN OUR OWN COUNTRY THAT THERE IS A SUPPLY OF RAW MATERIAL TO MEET THE MARKET DEMAND. THIS BRINGS US THEN TO THE ULTIMATE DECISIONS AS TO THE ERECTION OF A PROCESSING PLANT, ITS DESIGN AND THE EQUIPMENT THAT WILL GO INTO THAT PLANT. NOW, THE REAL EXPERTISE COMES INTO PLAY FOR THE MONETARY COMMITMENT IS SIZABLE. REGARDLESS OF THE SIZE OF THE PROCESSING FACILITY, AN INVESTMENT IS REQUIRED. AND I THINK IT GOES WITHOUT SAYING, THAT ANY INVESTOR WHETHER IN A PRIVATE SECTOR OR IN THE GOVERNMENT SECTOR MAKES SUCH INVESTMENTS WITH THE ULTIMATE THOUGHT OF A RETURN OR PROFIT ON THAT INVESTMENT REGARDLESS OF HOW YOU MIGHT MEASURE THAT PROFIT. AND HERE, BECAUSE THIS IS CRUCIAL, I WOULD HIGHLY RECOMMEND THAT THE PROCESSOR SEEK OUT AND ENLIST THE AID OF THOSE COMPANIES WHO HAVE DISPLAYED THEIR EXPERTISE WITHIN THE INDUSTRY THROUGHOUT THE YEARS. TOO OFTEN, CITRUS PROCESS-

ING PLANTS ARE PUT TOGETHER PIECEMEAL, BIT BY BIT, FROM VARYING SUPPLIERS AND WITH THE OVERALL COORDINATION THE RESPONSIBILITY OF SOMEONE WHO HAS NO EXPERIENCE IN THE CITRUS INDUSTRY. THE ASSISTANCE I SPEAK OF MAY REQUIRE ADDITIONAL CAPITAL INVESTMENT INITIALLY, HOWEVER, IN THE LONG TERM, THIS INVESTMENT WILL PROVE ITSELF MANY FOLD.

ONE OF THE FIRST THINGS YOU MUST CONSIDER IS THE PLANT SITE. IS IT CLOSE TO THE SOURCE OF SUPPLY? IS THE TRANSPORTATION INFRA-STRUCTURE ADEQUATE NOT ONLY FOR THE DELIVERY OF RAW MATERIALS BUT ALSO THE SHIPMENT OF THE FINISHED PRODUCT? IS THERE ADEQUATE WATER AVAILABLE? ARE THERE ADEQUATE LAND FACILITIES FOR SEWAGE DISPOSAL? IS THERE AN ADEQUATE LABOR FORCE IN THE AREA? IS THERE ADEQUATE POWER RESOURCES AVAILABLE TO THE PROCESSING SITE? HAVE YOU CONSIDERED PLANT EXPANSION THAT IS FIVE YEARS FROM NOW, TEN YEARS FROM NOW? LET ME CITE AS AN EXAMPLE A SITUATION OF PLANT SITE DECISIONS THAT COULD HAVE BEEN MADE IN A PARTICULAR PROCESSING PLANT IN JAPAN THREE YEARS AGO. PRIOR TO 1971, IN THE CITY OF WAKAYAMA, THERE EXISTED A JUICE PROCESSING PLANT. THE DECISION WAS MADE TO BUILD A BRAND NEW PLANT ON THE OUTSKIRTS OF THE CITY IN AN INDUSTRIAL PARK AREA. THE PLANT WAS BUILT, OPENED IN 1972 AND THE FIRST SEASON PROCESSED SOME 10,000 TONS OF CITRUS. IN THE SECOND YEAR, THIS PLANT EXPANDED ITS PRODUCTION TO 20,000 TONS PER SEASON. THIS YEAR, THERE IS AN ADDITIONAL 20,000 TONS TO BE PROCESSED BUT THE PLANT, BECAUSE OF ITS SITE LIMITATIONS IS UNABLE TO HANDLE THE ADDITIONAL CAPACITY. FURTHER, THE DELIVERY OF THE RAW MATERIAL TO THE PROCESSING PLANT IS EXTREMELY DIFFICULT BECAUSE OF THE CROWDED URBAN ROADS. THEREFORE, A BRAND NEW PLANT SOME 20 KILOMETERS AWAY FROM THE CITY AND UP IN THE CITRUS GROWING AREA WILL BE BUILT. HERE IS THE CASE WHERE A SINGLE COMPANY WILL HAVE TWO MODERN PROCESSING PLANTS WHERE HAD SOME FORESIGHT BEEN GIVEN TO THE DECISION THREE YEARS AGO, COULD HAVE BUILT ONE SINGLE PLANT CLOSE TO THE CITRUS GROWING AREA AND OUT OF THE URBAN AREA. I WOULD PRESUME THAT THE COST OF THE SINGLE PLANT

TO HANDLE 40,000 TONS OF CITRUS ANNUALLY WOULD BE HALF OF THE COST OF TWO EQUAL SIZE PLANTS OF 20,000 TONS PER SEASON CAPACITY. NOTWITHSTANDING THE TREMENDOUS INFLATION AND COST OF MANUFACTURING GOODS PRESENTLY BEING EXPERIENCED IN JAPAN, THIS NEW PLANT IS GOING TO BE EXTREMELY COSTLY. AGAIN, I POINT OUT THE FOREGOING ONLY TO BRING TO YOUR ATTENTION THE NEED FOR GOOD PLANNING, PLANNING THAT TAKES YOU INTO THE FUTURE ABOVE AND BEYOND YOUR IMMEDIATE REQUIREMENTS.

YOU WILL NEXT WANT TO CONSIDER THE TYPE OF BUILDING FOR YOUR PROCESSING PLANT, KEEPING IN MIND THAT THIS IS FOOD PROCESSING HENCE, SANITATION IS ALL IMPORTANT. REMEMBER, YOU ARE NOT JUST BUILDING A WAREHOUSE. IT IS NECESSARY TO CHECK VERY CLOSELY AND COORDINATE WITH THE LOCAL HEALTH AUTHORITIES TO ENSURE THAT YOUR BUILDING CONSTRUCTION MEETS ALL OF THE NECESSARY CODES. FRANKLY, NOT ALL COUNTRIES IN THE WORLD UTILIZE ALL THE SAME STANDARDS. FRANKLY, I HAVE BEEN IN SOME PROCESSING PLANTS WHERE I AM SURE, HAD THE CONSUMERS OF THE PRODUCTS PRODUCED IN THOSE PLANTS HAD THE OPPORTUNITY TO GO THROUGH OR SEE THE OPERATIONS, THEY WOULD NO LONGER BUY THE PRODUCT. MANY TIMES, HEALTH CODES AND STANDARDS ARE DEVELOPED SUBSEQUENT TO THE ESTABLISHMENT OF CERTAIN FOOD PROCESSING INDUSTRIES. VERY OFTEN, THEN, RE-DESIGN, RE-BUILDING AND MODIFICATIONS ARE NECESSARY TO MEET NEW CODES. IT IS NOT TOO DIFFICULT TO ANTICIPATE WHAT THOSE CODES MAY BE AND TO BUILD THE PLANT PROPERLY IN THE FIRST PLACE.

NEXT, WE COME TO THE HEART OF THE WHOLE EXERCISE, THE SELECTION OF EQUIPMENT. AS YOU MAY WELL IMAGINE, THERE ARE MANY ALTERNATIVES. BUT I WOULD SUGGEST THAT YOU GIVE FIRST CONSIDERATION TO A SUPPLIER WHO CAN SUPPLY YOU WITH TOTAL ENGINEERING AS WELL AS TOTAL CAPABILITY IN THE MANUFACTURE, DESIGN AND INSTALLATION OF ALL OF THE PIECES OF EQUIPMENT IN A PROCESSING PLANT. I'M NOT SURE IF THERE IS A FRENCH EXPRESSION OR AN ARABIC EXPRESSION FOR

THE OLD ENGLISH SAYING "PENNY WISE - POUND FOOLISH". I SUSPECT THERE IS. BUT TOO OFTEN THIS WISE ADVISE IS OVERLOOKED IN AN EFFORT TO SAVE MONEY ON PLANT INSTALLATIONS.

CITRUS IS A RELATIVELY FRAGILE FRUIT AND THE PROCESS FROM HARVEST THROUGH TO THE CANNED OR PACKAGED END PRODUCT INVOLVES MANY INTRICATE STEPS. FIRST, YOU MUST CONSIDER HOW YOU ARE TO RECEIVE THE FRUIT. IN WHAT MANNER OF TRANSPORT AND IN WHAT SIZE OR SHAPE CONTAINER WILL IT BE DELIVERED TO YOUR PROCESSING PLANT? HOW WILL IT BE HANDLED ONCE IT IS RECEIVED? THEREFORE, ADEQUATE RECEIVING EQUIPMENT AND STORAGE EQUIPMENT MUST BE CONSIDERED FIRST. YOU WILL NEED EQUIPMENT TO PRE-GRADE THE FRUIT, WASH IT PROPERLY TO REMOVE FIELD DIRT AND GRIME AS WELL AS ANY HERBICIDES OR FUNGICIDES THAT MAY HAVE BEEN APPLIED IN FIELD SPRAYING. YOU WILL NEED TO PROPERLY SIZE THE FRUIT AND THEN TO DISTRIBUTE IT PROPERLY AND EFFICIENTLY TO THE EXTRACTION EQUIPMENT. THE VERY HEART OF THE PROCESSING PLANT MAY VERY WELL BE YOUR EXTRACTION EQUIPMENT FOR HERE YOU WILL DETERMINE TO A GREAT EXTENT THE QUALITY AND YIELD OF JUICE TO BE OBTAINED AND, THEREFORE, THE ULTIMATE ECONOMICS OF THE PROCESSING PLANT. THOUGH THERE ARE A NUMBER OF OPTION AVAILABLE TO YOU AS FAR AS EXTRACTION EQUIPMENT IS CONCERNED, I WOULD BE REMISS IN MY DUTIES IF I DIDN'T SAY THE CHOICE IS REALLY ONLY ONE, TAKING ALL THINGS INTO CONSIDERATION. FROM THE EXTRACTION EQUIPMENT, YOU MUST CONSIDER EQUIPMENT FOR FINISHING, EVAPORATION, FILLING, CASING AND STORAGE. ALL OF THIS EQUIPMENT MUST BE DESIGNED WITH THE TOTAL INTEGRITY OF THE PLANT ALWAYS IN MIND.

OUR COMPANY REFERS TO THIS APPROACH AS SINGLE SOURCE RESPONSIBILITY. I BELIEVE THAT I CAN SAFELY SAY THAT IT IS THE ONLY COMPANY IN THE WORLD TODAY THAT IN FACT MANUFACTURES 95% OF THE EQUIPMENT UTILIZED IN A JUICE PROCESSING PLANT JUICE LINE. BECAUSE OF THIS, EACH PIECE OF EQUIPMENT IS CONSIDERED IN RELATIONSHIP TO ALL OTHERS SO AS TO ENSURE TOTAL ECONOMIES, COMPATIBLE EN-

ENGINEERING AND ULTIMATE PRODUCT QUALITY THROUGHOUT.

NOW THAT YOU HAVE CONSIDERED PLANT SITE, PLANT CONSTRUCTION, AND EQUIPMENT IT'S TIME TO TURN YOUR THOUGHTS TO THE LABOR SUPPLY AND, IN PARTICULAR, THOSE INVOLVED IN PLANT MANAGEMENT AND QUALITY CONTROL. IF YOU HAVE TAKEN THE TIME TO PROPERLY DESIGN YOUR PLANT AND TO SELECT THE BEST EQUIPMENT, IT IS IMPERATIVE THAT YOU ALSO SPEND THE TIME IN SELECTION OF THOSE PERSONNEL WHO WILL BE MANAGING YOUR OPERATION. IN TODAY'S MARKET PLACE, THERE IS A HIGH DEGREE OF SOPHISTICATION, NOT ONLY WITH THE INTERMEDIATE BUYERS, BUT ALSO WITH THE CONSUMERS. YOUR PRODUCT MUST MEET THE HIGH QUALITY STANDARDS SET BY THE MORE DEVELOPED COUNTRIES WHO HAVE BEEN IN THAT MARKET PLACE FOR MANY YEARS. THERE IS NO QUESTION IN MY MIND THAT YOU SHOULD HAVE A GOOD FOOD TECHNOLOGIST WHO WILL BE THE KEY MAN IN MAINTAINING THAT QUALITY WITHIN YOUR END PRODUCTS. YOUR PLANT MANAGER AND ENGINEER SHOULD CERTAINLY HAVE EXPERIENCE IN FOOD PROCESSING PLANTS, HOWEVER, NOT NECESSARILY IN CITRUS PROCESSING PLANTS. IF YOU FIND THAT WITHIN YOUR OWN LABOR MARKETS, THESE TYPE PERSONNEL ARE UNAVAILABLE, YOU MAY HAVE TO SEEK PERSONNEL FROM OUTSIDE YOUR COUNTRY. OFTEN PEOPLE WHO HAVE RETIRED FROM THE INDUSTRY ARE AVAILABLE FOR SHORT TERM EMPLOYMENT TO ASSIST IN START UP AND TRAINING OF THE INDIGENOUS LABOR SUPPLY. I BELIEVE WITH PROPERLY DIRECTED INQUIRIES, THROUGH GOVERNMENT ORGANIZATIONS, INTERNATIONAL ORGANIZATIONS OR THROUGH CONTACTS WITHIN THE INDUSTRY, SUCH PERSONNEL CAN BE LOCATED AND EMPLOYED.

UP TO THIS POINT, WE HAVE CONCERNED OURSELVES ONLY WITH THE POSSIBILITY OF PRODUCING AN END CITRUS PRODUCT. THERE IS ANOTHER FACET TO WHICH YOU MAY WISH TO GIVE FURTHER CONSIDERATION. RECOGNIZING THAT CITRUS IS A SEASONAL PRODUCT AND THAT BECAUSE OF YOUR GEOGRAPHICAL LOCATION, CITRUS PROCESSING WOULD PROBABLY NOT KEEP THE PLANT RUNNING MORE THAN SIX OR SEVEN MONTHS DURING THE YEAR; YOU MAY, THEREFORE, WISH TO LOOK AT IMPROVING THE ECONOMICS

OF THIS PLANT INVESTMENT BY CONSIDERING THE PROCESSING OF SOME OTHER PRODUCT IN THE ALTERNATE SEASON. FOR EXAMPLE, THERE IS A GOOD DEMAND IN THE WORLD MARKET TODAY FOR TOMATO PRODUCTS SUCH AS JUICES, TOMATO PASTE AND CONCENTRATES. SINCE THE TOMATO SEASON IS NORMALLY IN THE SUMMER MONTHS AND THE CITRUS PROCESSING IN THE WINTER MONTHS, THERE IS THE OPPORTUNITY TO UTILIZE THE PROCESSING PLANT FOR TOMATOES. THOUGH NOT ALL THE EQUIPMENT IS COMPATIBLE, SOME IS AND IF CONSIDERATION FOR ALTERNATE PROCESSING IS GIVEN AT THE PLANNING AND DESIGN STAGES, YOU HAVE THE OPPORTUNITY TO MAXIMIZE THE ECONOMICS OF YOUR INVESTMENTS. AGAIN, THIS TAKES PLANNING, AND THE PARAMETERS DISCUSSED EARLIER WITH REGARD TO ALL FACETS OF SUPPLY OF RAW MATERIAL AND END MARKET REQUIREMENTS MUST BE TAKEN INTO CONSIDERATION. IT IS EVEN MORE IMPORTANT IF YOU ARE CONSIDERING MULTI-PRODUCT PLANTS, TO ONCE AGAIN SEEK OUT THOSE AGENCIES OR COMPANIES WHO HAVE THE EXPERTISE, HAVE HAD THE EXPERIENCE IN DESIGNING THESE TYPE OF PLANT FACILITIES AND TOO BECAUSE OF THEIR EXPERTISE AND EXPERIENCE CAN BE OF GREAT ASSISTANCE IN YOUR DECISION MAKING PROCESS.

THERE IS ONE OTHER BROAD AREA REQUIRING SOME THOUGHT IN YOUR PLANNING AND THAT IS UTILIZATION OF SPECIALTY PRODUCTS OBTAINABLE THROUGH-A JUICE PROCESSING PLANT. SPECIFICALLY, I REFER TO THOSE PRODUCTS SUCH AS DRIED PEEL, OIL RECOVERY, D'LIMONENE, STABILIZED JUICE SAC PULP AND THE RECOVERY OF WATER EXTRACTED SOLUBLE SOLIDS. THE UTILIZATION OF ANY OR ALL OF THESE SPECIALTY PRODUCTS CAN AND WILL PRODUCE ADDITIONAL INCOME FOR YOUR PROCESSING PLANT AT RELATIVELY LOW CAPITAL INVESTMENTS. THE ECONOMICS, OF COURSE, ARE DEPENDENT UPON THE TONNAGE OF FRUIT YOU MIGHT PROCESS IN YOUR PLANT THROUGHOUT THE SEASON.

AS AN EXAMPLE OF THE POTENTIAL ECONOMIC RETURN FOR THESE SPECIALTY PRODUCTS I WOULD LIKE TO SHOW YOU AN EXAMPLE BASED ON A TYPICAL EXTRACTION PLANT IN THE UNITED STATES. YOU MUST KEEP IN MIND THAT THE DOLLAR VALUES

INDICATED ARE FOR CURRENT PRICES AND CERTAINLY ARE DEPENDENT UPON FINDING A SUITABLE MARKET FOR THESE SPECIALTY PRODUCTS.

TABLE ONE INDICATES THE PARAMETERS OF THE DISCUSSION AND INDICATES THAT THE PROCESSING PLANT IN QUESTION WILL HANDLE SOME 90,000 TONS OF INCOMING PRODUCT PER SEASON. THE BREAKDOWN OF THIS 90,000 TONS WOULD BE 82,000 TONS OF ORANGES, 3,800 TONS OF GRAPEFRUIT AND 4,300 TONS OF LEMONS.

TABLE I - CITRUS PROCESSING PLANT, IN-LINE JUICE EXTRACTORS

THE NEXT TABLE SHOWS THE POTENTIAL DOLLAR VOLUME AND RECOVERY OF COLD PRESSED CITRUS OIL. THE EQUIPMENT INVOLVED IN THE RECOVERY OF COLD PRESSED CITRUS OIL WOULD BE THAT NECESSARY TO PROCESS THE OIL AFTER RECOVERY FROM THE FMC IN-LINE JUICE EXTRACTORS. AN OIL EMULSION EFFLUENT IS DELIVERED TO A SCREW TYPE FINISHER FROM WHENCE PEEL FRIT SOLIDS ARE REMOVED. THE OIL SLURRY IS THEN DELIVERED TO THE CENTRIFUGE OR DESLUDGER THEN TO A POLISHER FOR FINAL OIL RECOVERY. OUR BEST ESTIMATES ARE THAT FROM ORANGES, SOME 3.6 KILOGRAMS PER TON OF OIL CAN BE RECOVERED IF YOUR DESLUDGERS OR CENTRIFUGES OPERATE AT 80% RECOVERY. THEREFORE, 82,000 TONS OF ORANGES WOULD DELIVER 294,500 KILOS OF COLD PRESSED OIL AT A MARKET PRICE OF \$0.66 PER KILO AND AN ANNUAL TOTAL VALUE OF \$194,370. YOU WILL NOTE THAT OIL RECOVERY FOR GRAPEFRUIT IS SOMEWHAT LOWER; HOWEVER, THAT IS DUE TO THE TOTAL AVAILABLE OIL IN THE FRUIT. FOR LEMONS, OF COURSE, EVEN THOUGH THERE IS A MUCH SMALLER QUANTITY OF LEMONS PROCESSED, THE VALUE OF LEMON OIL IS EXCEEDINGLY HIGH AT \$11.00 PER KILO AND THEREFORE, THE RETURN IS EXCEPTIONAL. IF A MARKET COULD BE FOUND FOR ALL OF THE COLD PRESSED OIL RECOVERABLE FROM THESE 90,000 TONS OF CITRUS PROCESSED, THE MARKET VALUE IS SOME \$367,000.

TABLE 2 - COLD PRESSED CITRUS OIL RECOVERY

TABLE 1

CITRUS PROCESSING PLANT  
IN-LINE JUICE EXTRACTORS

7	MODEL	291
4	MODEL	391
<u>3</u>	MODEL	491
14		

FRUIT VARIETY

PROCESSED - TONS

1. ORANGES	82,000
2. CALEBUNNITT	3,860
3. LEMONS	<u>4,320</u>
TOTAL	90,180



TABLE 2

COLD PRESSED CITRUS OIL RECOVERY

FRUIT VARIETY	TONS	OIL RECOVERED-EC BY		TOTAL	\$/EC	TOTAL ANNUAL VALUE \$
		FROM MILLERS PER TON	CENTRIF. PER TON			
1. ORANGES	62,000	4.5	3.6	296,500	.66	\$ 194,370
2. GRAPEFRUIT	3,060	2.0	1.6	6,180	1.67	11,560
3. LEMONS	<u>4,320</u>	4.3	3.4	<u>15,600</u>	11.00	<u>161,480</u>
TOTAL	90,180			315,360		\$ 367,410

(1) BASED ON 60% RECOVERY IN CENTRIFUGE SYSTEM

EQUIPMENT COST - \$ 140,000

RECENTLY, THERE HAS BEEN A DEMAND FOR D'LIMONENE, THE BASIC CONSTITUENT OF CITRUS OIL. IN FACT, CITRUS OIL IS 90% D'LIMONENE. THE BASIC DEVELOPMENT OF THE D'LIMONENE INDUSTRY IN RECENT YEARS HAS BEEN A RESULT OF THE DEPRESSED MARKET FOR ORANGE OILS. A STEAM DISTILLATION PROCESS STRIPS THE D'LIMONENE FROM THE OIL AND IT CAN THEN BE USED AFTER FURTHER PROCESSING IN A NUMBER OF OTHER INDUSTRIES. THE FOLLOWING TABLE INDICATES THE VALUE OF D'LIMONENE RECOVERABLE FROM THIS SAME 90,000 TONS OF CITRUS. YOU WILL QUICKLY SEE THAT THE VALUE IS ABOUT HALF THAT OF THE COLD PRESSED OIL, HOWEVER, THERE MAY INDEED BE A BETTER MARKET FOR THIS PRODUCT THAN FOR COLD PRESSED OIL.

TABLE 3 - D'LIMONENE RECOVERY

ANOTHER POTENTIAL SPECIALTY PRODUCT WOULD BE STABILIZED JUICE SAC PULP. THIS IN FACT IS THE PULP RECOVERED FROM A FINISHER AFTER JUICE EXTRACTION THROUGH THE FMC EXTRACTORS. THE PULP IS PRINCIPALLY JUICE SACS AS ALL OTHER EXTRANEIOUS MATERIAL HAS ALREADY BEEN FINISHED IN THE PRE-FINISHER TUBE IN THE EXTRACTORS. THIS PULP DOES HAVE A VALUE AS YOU CAN SEE FROM THE FOLLOWING CHART. IT DOES HAVE A MARKET IN THE BEVERAGE INDUSTRY TODAY IN THE UNITED STATES AND ALSO COULD BE USED AS A PRODUCT TO FEED BACK TO CONCENTRATE THAT HAS BEEN RECONSTITUTED IN YOUR OWN PROCESSING PLANT. PRESENT VALUES IN THE UNITED STATES ARE SHOWN ON THE FOLLOWING CHART ON A PER KILO BASIS AND A TOTAL ANNUAL VALUE FOR THE RECOVERABLE JUICE SACS FROM THE 90,000 TONS OF FRUIT IS ABOUT \$900,000.

TABLE 4 - RECOVERY OF STABILIZED JUICE SAC PULP

THE NEXT TABLE REFERS TO THE RECOVERY OF WATER EXTRACTED SOLUBLE SOLIDS THROUGH WHAT IS CALLED A "PULP WASH" SYSTEM. IN THIS SYSTEM, THE OBJECT IS TO RECOVER THOSE SOLUBLE SOLIDS THROUGH A WATER EXTRACTION PRINCIPLE FROM THE PULP DISCHARGE IN THE FINISHING PROCESSES. WHAT IN FACT YOU ARE

TABLE 3

D-LINDORSE RECOVERY

FRUIT VARIETY	TONS	D-LINDORSE RECOVERED-EC		TOTAL	VALUE \$/KG	TOTAL ANNUAL VALUE \$
		FROM INLINES PER TON	FROM PNC UNIT PER TON			
1. ORANGES	82,000	4.5	4.3	351,783	.27	\$ 94,981
2. GRAPEFRUIT	3,860	2.0	1.9	7,340	.55	4,037
3. LEMONS	<u>4,320</u>	4.3	4.1	<u>17,487</u>	6.60	<u>115,414</u>
TOTAL	90,180			376,610		\$ 214,432

(1) BASED ON 95% RECOVERY IN PNC  
D-LINDORSE RECOVERY UNIT

EQUIPMENT COST - \$ 60,000

TABLE 4

RECOVERY OF STABILIZED JUICE SAC PULP

<u>FRUIT VARIETY</u>	<u>TONS</u>	<u>PULP RECOVERED-RC PER TON</u>	<u>TOTAL</u>	<u>VALUE \$/RC</u>	<u>TOTAL ANNUAL VALUE \$</u>
1. ORANGES	82,000	146	5,445,500	.155	\$ 844,000
2. GRAPEFRUIT	3,060	103	181,600	.155	28,150
3. LEMONS	<u>4,320</u>	92	<u>181,600</u>	.155	<u>28,100</u>
TOTAL	90,180		5,808,500		\$ 900,250

EQUIPMENT COST: \$ 65,000

DOING IS RECOVERING SUGAR, WHICH CAN BE ADDED BACK TO YOUR PLANT PRODUCTION OR CAN BE SOLD SEPARATELY TO BEVERAGE INDUSTRIES REQUIRING CITRUS SOLUBLE SOLIDS. YOU CAN SEE FROM THE FOLLOWING TABLE THAT AN ADDITIONAL \$500,000 OF SALEABLE PRODUCT IS AVAILABLE TO YOU IN YOUR PROCESSING PLANTS.

TABLE 5 - RECOVERY OF WATER EXTRACTED SOLUBLE SOLIDS

IN EACH OF THE FOREGOING TABLES, WE ASSUMED VALUES TO THOSE SPECIALTY PRODUCTS AVAILABLE TO YOU IF YOU TREATED EACH OF THEM INDEPENDENT OF ONE ANOTHER. IN THE NEXT TABLE, WE HAVE ATTEMPTED TO SHOW A COMPILATION OF VALUES OF THE VARIOUS PRODUCTS WHICH WHEN MANAGED PROPERLY WOULD OPTIMIZE THE RETURN FOR THE SPECIALTY PRODUCTS. NOTE THAT THE HIGHEST VALUE FOR COLD PRESSED OIL LIES IN LEMON AND GRAPEFRUIT. THEREFORE, WE HAVE SHOWN THE MAXIMUM RECOVERABLE COLD PRESSED OIL FROM THESE TWO CITRUS VARIETIES AND HAVE SHOWN A VALUE OF \$173,000 FOR THIS OIL. ON THE SECOND LINE WE SHOW D'LIMONENE FROM ORANGES. WE HAVE SELECTED D'LIMONENE AS OPPOSED TO COLD PRESSED ORANGE OIL SINCE THE MARKET TODAY IS BETTER EVEN THOUGH THE PRICE IS LOWER FOR D'LIMONENE. D'LIMONENE FROM THIS PRODUCTION MODEL WOULD RETURN SOME \$94,981.

THERE IS ALSO A SMALL AMOUNT OF D'LIMONENE THAT COULD BE RECOVERED FROM THE LEMON OIL EFFLUENTS AND THIS WOULD HAVE A VALUE OF \$23,000. WATER EXTRACTED SOLUBLE SOLIDS OR PULP WASH WOULD RETURN ANOTHER \$800,900 AND THE STABILIZED JUICE SAC PULP COULD POTENTIALLY RETURN \$90,000. THEREFORE, WITH A CAPITAL INVESTMENT TODAY OF SOME \$385,000, A POTENTIAL MARKET VALUE OF PRODUCT RECOVERED THROUGH THESE VARIOUS SYSTEMS COULD BE \$986,000.

TABLE 6 - TOTAL VALUE OF SPECIALTY PRODUCTS

TABLE 5

RECOVERY OF WATER EXTRACTED SOLUBLE SOLIDS  
4 STAGE WASHING SYSTEM  
98% RECOVERY

FEED MATERIAL	TONS	RE-FEED TONS	WATER GALS	SOLUBLE SOLIDS % FEED	TOTAL SOLUBLE SOLIDS RECOVERED LBS	VALUE \$/T	TOTAL ANNUAL VALUE \$
1. CRACKERS	62,000	100	11.5	6.7	340,000	.06	\$ 493,120
2. GOVERNMENT	3,000	100	10.0	4.1	15,705	.06	13,840
3. LUMBER	4,300	0	0.0	2.1	3,000	.06	2,940
TOTAL	69,300				372,705		\$ 509,900

RECOVERY COST: \$ 100,000

TABLE 6

TOTAL VALUE OF SPECIALTY PRODUCTS

<u>PRODUCT</u>	<u>QUANTITY</u> <u>MG</u>	<u>EQUIPMENT</u> <u>COST</u> <u>\$</u>	<u>VALUE</u> <u>\$</u>
1. COLD PRESSED OIL, LEMON & GRAPEFRUIT	20,860	\$ 140,000	\$ 173,040
2. D'LIMONENE FROM ORANGES	351,783	60,000	96,981
3. D'LIMONENE FROM LEMON CONF. EFFLUENTS	3,406	-	23,010
4. WATER EXTRACTED SOLUBLE SOLIDS	573,730	100,000	304,900
5. JUICE SAC PULP, WASHER & STABILIZED	500,830	<u>53,000</u>	<u>90,031</u>
<b>TOTAL</b>		<b>\$ 363,000</b>	<b>\$ 685,962</b>

I DO WISH TO POINT OUT THAT THE INDICATED EQUIPMENT INVESTMENTS ARE BUDGETARY AND WOULD BE EFFECTIVE IF YOU HAPPENED TO BUY TODAY. THE SAME IS OBVIOUSLY TRUE FOR THE MARKET VALUE OF THE END PRODUCTS. BOTH PARAMETERS ARE VARIABLES THAT MAY CHANGE IN THE FUTURE. THE POINT IS, HOWEVER, THAT WITH JUDICIOUS PLANT MANAGEMENT AND WITH AN EYE TO MAXIMIZED INVESTMENT OF THE TOTAL JUICE PROCESSING PLANT, NOT ONLY IN EQUIPMENT BUT ALSO IN PRODUCT, THERE ARE ADDITIONAL MONETARY ECONOMICS AVAILABLE TO YOU.

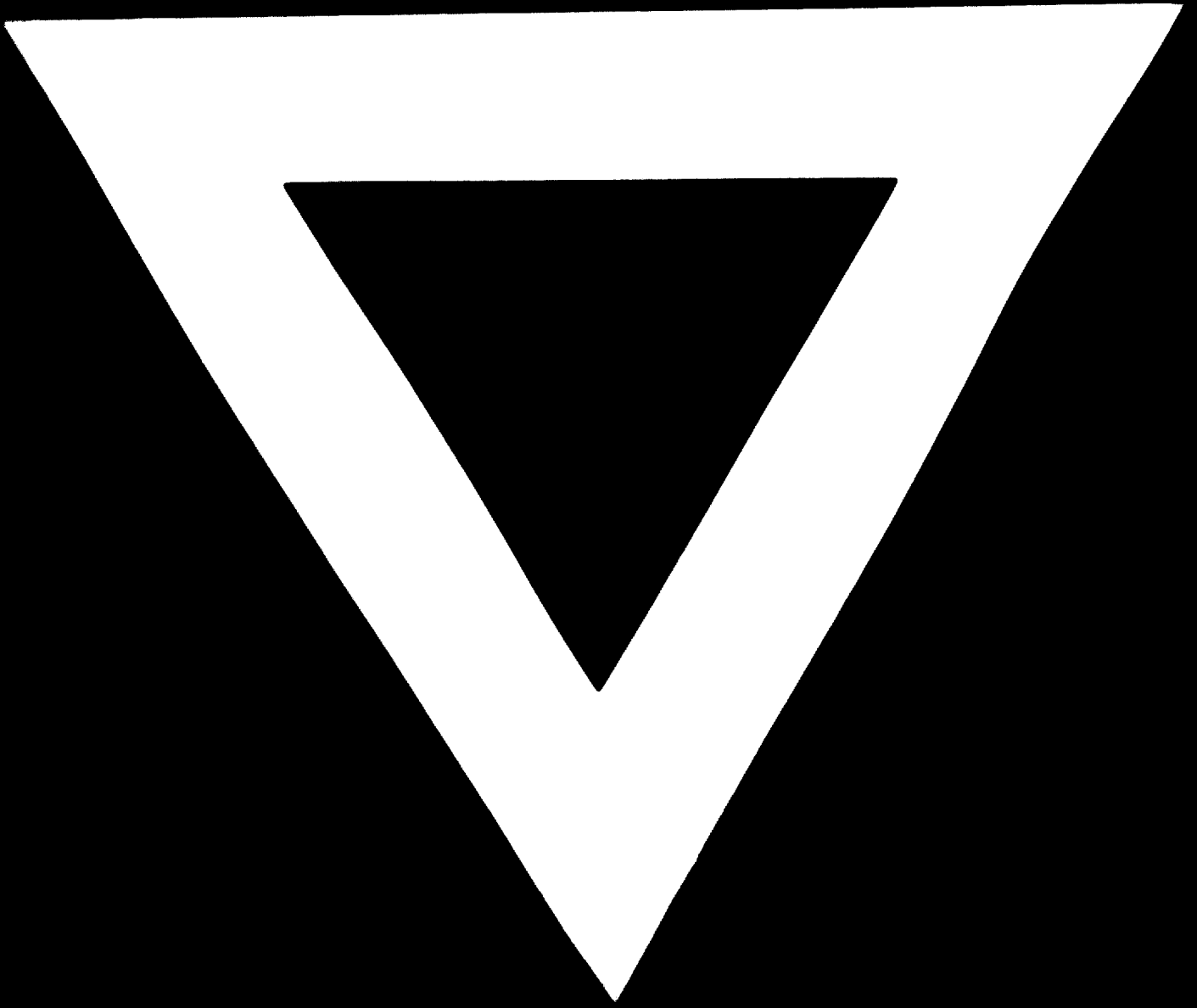
IN CONCLUSION, GENTLEMEN, I WOULD LIKE TO REITERATE THAT PROCESSING CITRUS PRODUCTS FOR THE WORLD MARKET TODAY IS A VERY SOPHISTICATED BUSINESS VENTURE. IT IS A HIGHLY COMPETITIVE MARKET REQUIRING HIGH QUALITY PRODUCTS MARKETED COMPETITIVELY AND BACKED UP BY GOOD TECHNOLOGY AND GOOD PLANT MANAGEMENT. THERE IS STILL ROOM FOR MORE PROCESSORS IN THAT MARKET PLACE AND AS YOU PLAN FOR THAT POSSIBILITY, REMEMBER TO KEEP THESE THINGS IN MIND.

1. DETERMINE THAT THERE IS A MARKET FOR THE END PRODUCT AND WHAT THAT END PRODUCT IS TO BE.
2. ENSURE THAT YOU HAVE GOOD RAW PRODUCT SUPPLIES ON A CONSTANT BASIS.
3. IN CONJUNCTION WITH AVAILABLE EXPERTISE, ESTABLISH THE PARAMETERS FOR YOUR PLANT CONSTRUCTION, DESIGN, EQUIPMENT, AND FLEXIBILITY.
4. ENSURE THAT YOU HAVE QUALIFIED TECHNICAL PERSONNEL AND PLANT MANAGEMENT IN ORDER TO MAXIMIZE THE ECONOMICS OF THE INVESTMENT.
5. PLAN AHEAD. THINK BEYOND THE FIRST AND SECOND YEARS, KEEPING IN MIND POTENTIAL EXPANSION, COMPATIBILITY WITH OTHER PRODUCT PROCESSING AND WHERE YOU WANT TO BE 10 YEARS FROM TODAY. DO IT RIGHT THE FIRST TIME.



I WOULD LIKE TO EXTEND MY APPRECIATION TO THE UNIDO ORGANIZATION AND THE OCE FOR THE INVITATION TO SPEAK WITH YOU TODAY. IF WE CAN BE OF ANY ASSISTANCE TO YOU IN YOUR FUTURE PLANNING, WE WOULD BE PLEASED TO WORK WITH YOU.





**74. 10. 11**