



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

PER. SHELF

GIANNINI FOUNDATION OF
AGRICULTURAL ECONOMICS
LIBRARY

JAN 8 1973

JOURNAL OF

Northeastern Agricultural Economics Council



**VOLUME I, NUMBER I
PROCEEDINGS, NOVA SCOTIA
SUMMER 1972**

IMPACT ON NORTHEAST FRUIT AND VEGETABLE PRODUCTION
OF EXPANDING INTERNATIONAL TRADE

Earle E. Gavett 1/
Agricultural Economist
Economic Research Service
United States Department of Agriculture

The Northeast has sharply reduced its acreage of vegetables and production of most fruit except apples from 1950 to 1970. Much of this decline has occurred over time as production shifted from a relatively high cost area to areas having lower costs. We have seen canning factories close down in the Northeast and move operations to the Mid West and Far West as new varieties of sweet corn, snap beans, peas, and other vegetables were developed for those areas.

Mechanization of harvest of these crops permitted relocation into areas having no surplus of seasonal workers. Formerly, this was a major constraint in relocating labor intensive enterprises. As a result, vegetable acreage in the Northeast has dropped from about 1,270,000 acres in 1950 to less than 800,000 acres in 1970. While production per acre increased, total production dropped 20 percent. Strawberry acreage declined more than half and production dropped about half. Apple production, on the other hand, has continued to increase--up 29 percent from the 1950 level (table 1). But, in recent years, we have not been utilizing all of our apples. Markets have become glutted and prices have been too low to warrant harvest and storage expenses; likewise for strawberries and certain other fruits and vegetables.

I have had the opportunity to study the production of fresh winter produce in this country and in Mexico in 1967/68 and 1970/71 (ERS-154 and it's supplement). One might ask how such an experience with winter produce would be applicable to the Northeast which is usually draped under a deep mantle of snow all winter. When we looked at strawberry production at Zamora--we saw bulging cold storages filled with beautiful berries, and were shown bonding certificates for 30,000 tons of berries in warehouses in this country. Prices were depressed and stayed that way most of the 1970/71 season. Fresh market berries did not bring their usual premium because people's desire for strawberries had been largely sated by less expensive frozen berries.

1/ Leader, Farm Labor and Mechanization Group, Production Resources Branch, Farm Production Economics Division, ERS, U.S. Department of Agriculture, for presentation at the Northeastern Agricultural Economics Council Annual Meetings. Nova Scotia College of Agriculture, Truro, Nova Scotia, June 19-21, 1972. The views presented herein are those of the author and are not necessarily the views of the U. S. Department of Agriculture.

Table 1
Acreage and Production of Vegetables, Strawberries and Apples, Northeast Region, 1950-1970

Year	All vegetables		Strawberries		Apple production		
	Acres	Production	Acres	Production	Not utilized	Having value	Total
	harvested	1,000 cwt.	harvested	1,000 cwt.	1,000	1,000	1,000
	1,000		1,000		bushels	bushels	bushels
1950	1,270	150,879	13.6	433	1,695	36,316	38,011
1951	1,193	126,910	13.8	482	4,895	33,751	38,646
1952	1,236	126,360	12.8	390	0	24,916	24,916
1953	1,219	137,305	10.8	360	0	30,663	30,663
1954	1,183	123,321	10.2	309	0	36,510	36,510
1955	1,104	120,443	10.6	368	2,622	37,258	39,880
1956	1,101	142,345	10.9	317	0	29,860	29,860
1957	1,041	124,478	10.2	351	530	36,500	37,030
1958	1,047	135,989	9.9	369	966	41,374	42,340
1959	997	122,148	9.6	303	1,496	43,824	45,320
1960	1,000	131,965	9.6	389	0	35,170	35,170
1961	993	136,046	9.3	382	1,285	46,305	47,590
1962	979	138,798	9.1	355	0	44,630	44,630
1963	922	128,198	8.7	318	366	40,274	40,640
1964	948	123,039	8.9	364	594	45,076	45,670
1965	954	130,062	8.6	316	1,407	45,493	46,900
1966	953	121,237	8.7	290	894	39,726	40,620
1967	919	129,964	8.5	268	259	42,848	43,107
1968	920	124,873	6.8	232	80	39,961	40,041
1969	843	114,775	6.2	213	738	44,640	45,378
1970	792	119,034	5.9	210	2,454	46,475	48,929

Source: SRS, Vegetable-Fresh Market of Tree Fruit, Annual Summaries.

What is the prospect for fresh strawberries in the Northeast? There will always be a demand for some fresh native berries, but the price they bring will be tempered by the constant supply of frozen whole and sliced berries from Mexico available in the local supermarket at competitive prices. The effect of such competition has sharply reduced the production of processing berries in major producing States (table 2). All this adds up to a soft market for U.S. berries, including those in the Northeast.

What about apples? With this crop, the effects of international trade are more complex. The European Economic Community has established some formidable barriers. European production has been increasing. Imports from New Zealand and Australia have risen sharply. Significant imports are coming from South American countries. And, Mexico has been planting many acres of apple trees.

Did you know that in 1971 Mexico was our chief export market for apples after Canada? With the European Economic Community market declining, Mexico became our number two apple export market last year. That country does not intend to use foreign exchange on items it can produce itself, so it has encouraged the establishment of apple orchards. It will not be long before Mexico will be self sufficient in apples. And, they will be trying to export to us. If so, we are likely to have a substantially higher percentage of our crop not utilized than the 5 percent in 1970.

How can we compete with countries like Mexico? Let us look at some comparative production costs. Tables 3 and 4 present the cost of producing strawberries in Mexico and in the Northeast. Fresh market berries from Mexico cost 46¢ per qt. f.o.b. Laredo, Texas, and 60¢ per qt. in New York City. Northeast berries cost about 40¢ per qt. f.o.b. and 45 to 50¢ per qt. in New York City. Mexico can almost compete with the Northeast for the fresh market berry trade.

Tables 5 and 6 show costs of producing apples in New York and estimated costs of producing apples in Mexico. 2/ Paul Stark, writing in the American Fruit Grower indicates nectarines can be grown for \$2.25 to \$2.35 per box (22 lbs.). These bring \$6 to \$7 per box in Mexico City. 3/ Stark in the Goodfruit Grower stated that Golden Delicious apples bring \$7 to \$8 per box there. 4/ When I was in Mexico City in March 1971, Bartlett pears cost \$1 each. Red Delicious apples were 50 to 60 cents each on the fruit stands.

2/ I am unaware of any production cost data for Mexican apples so reworked a California irrigated apple budget to approximate Mexican conditions.

3/ Stark, Paul J., Mexico Goes Modern, American Fruit Grower, January 1972 issue.

4/ Stark, Paul J., Mexico Could be Major Competitor for Fruit Industry in the Future. The Goodfruit Grower, October 15, 1970 issue.

Table 2.
Strawberries for Processing, Selected States, 1959-1970
1,000 pounds

Year	Florida	California	Oregon	Washington	Michigan	Louisiana
1959	167	74,000	85,100	42,800	10,300	1,450
1960	602	71,000	70,350	41,750	12,500	508
1961	884	72,200	63,480	44,700	7,700	1,183
1962	<u>1</u> /	76,000	80,850	44,650	10,900	2,067
1963	<u>1</u> /	84,100	66,100	40,090	10,500	245
1964	<u>1</u> /	87,500	104,350	39,920	15,220	548
1965	<u>1</u> /	79,000	99,980	27,800	14,420	787
1966	<u>1</u> /	60,500	93,000	33,940	11,160	176
1967	<u>1</u> /	60,700	92,300	32,340	11,100	144
1968	<u>1</u> /	76,630	68,160	34,560	8,910	<u>1</u> /
1969	<u>1</u> /	66,400	66,850	22,520	15,000	<u>1</u> /
1970	<u>1</u> /	73,600	68,400	26,700	10,400	<u>1</u> /

1/ Included in other States to avoid individual disclosure.

Source: SRS, Vegetables-Fresh Market, Annual Summaries.

Table 3.--Strawberries: Cost of growing, harvesting, and marketing per acre and export flat, Mexico, 1970/71 season

(Yield: 610 12-pint export flats)							
Item	Annual hours	Labor 1/	Equip- ment	Material	Cost of materials	Combined costs	Total cost
		Dollars	Dollars		Dollars	Dollars	Dollars
Operation:							
Plow-----	0.91	0.41	4.91			5.32	
Subsoil (3 times)-----	.74	.33	4.48			4.81	
Disk (3 times)-----	1.45	.65	9.25			9.90	
Level (2 times)-----	.69	.31	4.51			4.82	
Fumigate-----	.32	.14	1.76	PCNB, 22 lbs. @ \$1.09 lb..	23.98	25.88	
Mark rows-----	.32	.14	1.09	Aldrin 45 lbs. @ 65¢ lb.	29.25	30.48	
Press beds-----	.40	.18	2.09			2.27	
Make ditches-----	.32	.14	1.85			1.99	
Irrigate (50 times)-----	42.31	14.81	23.28	Water	.40	38.49	
Haul plants-----	.45	.16	.50	Plants, 25,000 @ \$7.00 thous.	175.00	175.66	
Set plants (dir. sys.)	70.00	19.60	---			19.60	
Haul fertilizer(4 times)	1.38	.48	1.52			2.00	
Fertilize by hand (4 times)-----	10.36	2.90	---	15-30-15 890 lbs. @ \$0.073 lb. Ammonium sulfate, 350 lbs. @ \$0.029 lb.	64.97 10.15	78.02	
Cultivate by mule (6 times)-----	15.55	4.35	5.05			9.40	
Weed and cut runners (5 times)-----	248.64	69.62	---			69.62	
Spray, motorized back pack (10 times)-----	37.57	10.52	4.14	Insecticides, fungi- cides, & nutritional materials	100.98	115.64	
Road repair-----	.61	.27	3.06			3.33	
Scare birds-----	20.24	5.68	---	Shotgun shells	1.50	7.18	
Other labor expenses---	---	13.07	---	Soil tests	5.00	18.07	
Total growing cost---		143.76	67.49		411.23		622.48
Cash overhead:							
Rent, land-----						64.78	
Interest on production capital (12 pct.7 mo.):						43.57	
Miscellaneous-----						24.99	133.34
Total cash cost-----							755.82
Noncash overhead:							
Equipment investment (\$143.94):							
Depreciation-----						15.89	
Interest (12 pct.)						8.04	24.53
Total all production costs							780.35
Prorated fresh market cost-----							312.14
Total production cost per export flat-----							2/.51
Marketing							
Harvesting-----							2/.18
Packing & selling-----							.56
Mexican export cost to Laredo, Tex.-----							.74
Sales commission and promotion-----							
Total shipping and selling-----							1.51
Total f.o.b. marketing-							2.25
Total producing and marketing-----							2.76

1/ Labor: Machine operators, \$0.45 per hr; truck drivers, \$0.35 per hr; irrigators, \$0.35 per hr; field hands, \$0.28 per hr. 2/ Prorated fresh market cost. 3/ Hauling and other expenses. 4/ Includes picking labor.

Source: Supplement to USDA-ERS, A.E.R. 154, Sept. 1971.

Table 4.--Estimated detailed costs of growing and harvesting one acre of strawberries in the Northeast

Items of expense	Amount per acre	Price per unit (Dollars)	Cost Per acre (Dollars)
First Year Growing Costs			
Weed control (pre-planting): 1/			
Amino Triazole (applied as spray in August before plants are set following spring)-----	10 lbs.	3.00/lb.	\$30.00
Spraying (includes machine, power & operator)-----		2.50/acre	2.50
Plowing (includes machine, power & operator)-----		5.00/acre	5.00
Dalapon (applied one spray 6 weeks after Amino Triazole):	15 lbs.	.92/lb.	13.80
Spraying (includes machine, power & operator)-----		2.50/acre	2.50
Disking (two weeks after Dalapon applied)-----		3.00/acre	3.00
Fertilizer:			
10-10-10 (applied after plowing)-----	800 lbs.	2.75/80 lbs.	27.50
20% Superphosphate (applied after plowing)-----	700 lbs.	1.85/80 lbs.	16.19
20% Nitrogen Fertilizer (applied as top dressing in Aug.):	100 lbs.	4.25/80 lbs.	5.31
Hand application of above fertilizer-----	5 hrs.	1.85/hr.	9.25
Disease Control:			
Dieldrin-----	59 lbs.	9.95/50 lbs.	11.74
Labor (application of Dieldrin)-----	1 hr.	1.85/hr.	1.85
Soil preparation:			
Disking (includes machine, power & operator)-----		3.00/acre	3.00
Harrowing (includes machine, power & operator)-----		2.00/acre	2.00
Plants:	5000	17.50/1250 plants	68.00
Planting-labor (man-boy method)-----	2 men-2 boys 8 hrs. each	1.85/hr	44.42
Weed Control:			
Crag Sesone (applied as spray 3 weeks after setting plants)	4 lbs.	2.27/lb.	9.08
Spraying (includes machine, power & operator)-----		2.50/acre	2.50
Cultivation (before application of Eptam & Simazine)----		2.50/acre	2.50
Eptam & Simazine (granules applied in late May with cyclone seeder)-----	100 lbs.	30.00/100 lbs.	30.00
Labor (application of Eptam & Simazine & raking between plants)-----	3 hrs.	1.85/hr.	5.55
Cultivation (after application of Eptam & Simazine)		2.50/acre	2.50
Cultivation (late July)-----		2.50/acre	2.50
Hoing and weeding (entire season)	40 hrs.	1.85/hr.	74.00
Deblossoming-----	12 hrs.	1.85/hr.	22.20
Disease & Insect Control (2 spray treatments):			
Malathion (25% wettable powder)-----	12 lbs.	.50/lb.	6.00
Methoxychlor (50% wettable powder)-----	6 lbs.	.82/lb.	4.92
Captan (50% wettable powder)-----	14 lbs.	.64/lb.	8.96
Spraying (includes machine, power & operator)-----	2 times	2.50/acre	5.00
Mulching:			
Mulching straw-----	2½ tons	20.00/ton	50.00
Labor for mulching-----	8 hrs.	1.85/hr.	14.80
Family vehicle (hauling fertilizer, plants, chemicals, mulch, etc.)-----	200 miles	.12/mile	24.00
Land charge (covers taxes, return to land, mainten., etc.)	1 acre	8.00/acre	8.00
Total cost Excluding Return on Investment			\$518.55
Return on Investment (518.55÷2=259.28 x 8%)			20.74
Total First Year Growing Cost			539.29
Second Year Growing Costs			
Labor for removing mulch-----	3 hrs.	1.85/hr.	\$ 5.55
Weed Control:			
Weeding labor (April-May)	24 hrs.	1.85/hr.	44.40
Disease & insect control (3 spray treatments): 2/			
Malathion (25% wettable powder)-----	18 lbs.	.50/lb.	9.00
Methoxychlor (50% wettable powder)-----	9 lbs.	.82/lb.	7.38
Captan (50% wettable powder)-----	21 lbs.	.64/lb.	13.44
Spraying (includes machine, power & operator)-----	3 times	2.50/acre	7.50
Transportation costs (hauling materials)-----	50 miles	.12/mile	6.00
Land Charge (covers taxes, return to land, mainte., etc.):	1 acre	8.00/acre	8.00
Total cost excluding return on investment-----			\$ 101.27
Return on Investment (539.29 x .08)+(101.27÷2 x .08)	43.14 +	4.05 =	47.19
Total Second Year Growing Cost-----			\$ 148.46
Total First Year Growing Cost-----			\$ 539.29
Total Cost of Growing One Acre of Strawberries Up To Harvest Time-----			\$ 687.75
Harvesting			
Picking, sorting, crating, and loading-----	3000 qts.	.10/qt.	\$300.00
Quart containers-----	3000	\$18.00/M	54.00
Crates(16 qt.)-----	188	.45 ea.	84.60
Supervision and Misc. labor-----	3000 qts.	.02/qt.	60.00
Total harvesting costs-----			498.60
Total Cost-----			\$1,186.35
Cost per quart-----			.40

1/ Pre-planting weed control is used to control perennial plants (quackgrass, Johnson grass, nutgrass, and sheep sorrel). If the weeds are not present, no pre-planting weed control will be needed. Therefore \$56.80 could be deducted from the total cost.

2/ Three spray treatments were used in preparing this budget. However, the grower may need to spray more or less than three times. The number of spray treatments depends on the location, season, etc.

Source: Adapted from West Virginia Circular 114, May, 1965.

Table 5.
Apples: Cost of Producing in New York, 1969/70
(Yield - 323 bu. of packable fruit)

Item	Average per acre Dollars
Growing: <u>1/</u>	
Orchard overhead-----	37.62
Fertilizer and spreading - lbs. N 57 P 11 K 15 ----	8.55
Spray and dust materials -----	75.11
26.1 hours of labor -----	74.28
7.9 hours of tractor work -----	16.64
Other equipment (including auto and truck) -----	34.23
Interest -----	8.29
All other -----	20.32
Total growing -----	275.04
Harvesting: <u>1/</u>	
46.8 hours of labor -----	133.21
2.6 hours of tractor work -----	5.05
Auto and truck -----	15.44
Other equipment -----	22.14
All other -----	9.37
Total harvesting -----	185.21
Storage: <u>2/</u>	
Common, 216 bushels @ \$0.33 -----	71.28
Controlled atmosphere, 107 bushels @ \$0.67 -----	68.48
Total storage -----	139.76
Packing and selling: <u>2/</u>	
323 bushels @ \$1.25 -----	403.75
Total cost per acre <u>3/</u> -----	1,000.66
F.O.B. cost per bushel -----	3.10

1/ From N. Y. AE Res. 325 Dec. 1970.

2/ Podany, J. C. & R. W. Bohall Regional Costs of Harvesting Storing and Packing, Apples, USDA/ERS-496, Nov. 1971

3/ Excludes charges for land depreciation, and interest on investment.

Table 6.
Apples--Estimated costs of producing in Central Mexico,
1970/71

(Sample costs to produce apples in Mexico. Costs are based on a mature orchard containing 201 trees per acre, planted 12'x18', sprinkler irrigated. Total labor costs average \$0.28 per hour. Yield is assumed to be 10 tons per acre (455 bu.) after 10% cullage.)

Item	Sample costs per acre Dollars
Pre-harvest Cash Costs:	
Prune - 1/3 hr. @ \$0.28 - per tree -----	16.88
Brush disposal -----	.84
Fertilize - materials -----	12.00
application -----	.84
Spray - materials -----	54.40
application -----	4.48
Tillage -----	15.00
Irrigate - power cost, 2-1/2 acre feet -----	43.75
labor -----	5.60
Bees - 2 hives per acre -----	8.00
Thin - 50¢ per tree -----	14.07
Prop and tie - remove props -----	3.64
Hand weeding -----	1.96
Repairs - except tractor -----	30.00
Miscellaneous labor and materials -----	8.63
Business expenses and management -----	21.50
Total pre-harvest cash costs -----	241.59
Harvest, pack and sell:	
Pick - 455 bushels @ \$0.03 -----	13.65
Pack - 455 bushels @ \$0.04 -----	18.20
Materials - 455 bushels @ \$0.30 -----	136.50
Overhead and selling 455 bushels @ \$0.10 -----	45.50
Export costs - 455 bushels @ \$0.80 -----	364.00
Sales commission - 455 bushels @ \$0.20 -----	91.00
Total harvesting, packing and selling -----	668.85
Total cost per acre <u>1/</u> -----	910.44
F.O.B. cost per bushel -----	2.00

1/ Excludes charges for land, depreciation, and interest on investment.

Source: Adapted from University of California, Agricultural Extension Service, Kern County Budget for Techachapi Area, 1967.

It is obvious from these budgets that the inexpensive labor available to Mexican producers has enabled them to compete with us. Let us compare picking costs. In New York, Del Kearl reports 47 hours of labor were needed to harvest 323 bushels at a cost of \$133.21. In Mexico, on dwarf and semi-dwarf trees I estimate almost 46 hours per acre to harvest 455 bushels at a cost of \$13.65. New York picking labor earned \$2.84 per hour. Mexican pickers were paid \$0.28 per hour.

Total costs f.o.b. the orchard near Rochester, New York were \$3.10 per bushel as compared with \$2.00 f.o.b. Laredo, Texas for Mexican apples. Of course Laredo is a long way from New England markets. Let us add transportation costs and see how our competitive stance changes. From Rochester, N. Y. to New York City, freight rates are \$0.66 for a delivered cost of \$3.76 per bushel. From Laredo, Texas to New York City, the freight rate of \$1.82 hikes the delivered cost for Mexican apples to \$3.82. Not much different from New York apples.

Let us consider another market--Chicago. New York apples delivered to Chicago would cost \$3.94. Mexican apples can be delivered there for \$3.39, thus, able to displace New York apples from that market.

The total costs cited here do not include land charges, depreciation, or interest on the investment, but both budgets include comparable items.

It is apparent that inexpensive labor has enabled Mexican fruit and vegetable growers to sustain heavy transportation charges and still compete with U.S. growers in their markets. What about the future?

Table 7 compares Mexican hourly wage rates with those for New England. I have projected these rates to 1975 under the assumption that Mexico will continue increasing its minimum wage rate every two years, and that the Fair Labor Standards Act is amended to provide covered agricultural workers with a minimum rate of \$2.00 by 1975. While the percentage change is greater for Mexican wages, the absolute change from 1970 is 42 cents per hour in New England as compared with 14 cents in Mexico.

In addition to the wage rates increasing sharply, we have other labor costs that should also be considered. Perhaps they can be best illustrated by the use of a few slides.

Production practices are quite different growing strawberries above and below the border. In Florida, growers plant through a plastic mulch and use pine straw to keep weeds down in the middles. This cost the Florida grower \$109 per acre, as compared with a \$70 weeding bill for the Mexican grower. Can you find a weed here? Scaring birds cost \$27 in Florida, but less than \$6 in Mexico. Spraying cost the Florida grower \$13 for labor, \$14 for equipment, and \$93 for materials for a total of \$120 per acre. For Mexican growers they used \$10 for labor, \$4 for motorized back pack, and \$101 for materials or \$115 per acre. Both sprayed about 10 times.

Table 7.
Labor: Rates per hour without board and room,
New England and Mexico, 1960-1971 with projections to 1975

	:	:
Year	:	New England Mexico
	:	:
	:	Dollars
1960-----	:	1.16 0.09
1961-----	:	1.19 .09
1962-----	:	1.22 .11
1963-----	:	1.27 .11
1964-----	:	1.28 .13
1965-----	:	1.33 .13
1966-----	:	1.41 .16
1967-----	:	1.54 .18
1968-----	:	1.61 .21
1969-----	:	1.72 .21
1970-----	:	1.83 .28
1971-----	:	1.91 .28
1972e-----	:	2.00 .35
1973e-----	:	2.08 .35
I974e-----	:	2.16 .42
1975e-----	:	2.25 .42

e= Estimated.

Source: USDA, SRS, Farm Labor, selected issues, and the Yearbook of Labor Statistics, 1970, International Farm Organization, Geneva, Switzerland.

Fertilizer, petroleum and domestically produced spray materials are substantially cheaper in Mexico as these industries are nationalized. Agricultural chemicals that are brought in from the States are taxed sharply. Growers only use them when all else fails. Escaping the ravages of the cyclamen mite as shown here, warrants such an expenditure.

Growers in the United States must abide by the provisions of the Occupational Safety and Health Act and, for example, protect workers exposed to pesticides. In Mexico, there is no similar law protecting workers.

In U.S. apple growing, we are reducing our spray schedules from one of a preventative maintenance program to one of combatting actual infestations. We are deeply concerned about residues. Concern in the same magnitude has not yet surfaced in Mexico.

In this country, we have the Department of Labor, H.E.W., OEO, State health departments and others inspecting fields for portable sanitary facilities, and labor camps for screens, toilets, showers, ventilation, and other standards prescribed for housing and caring of workers. This is desirable. What is of concern is that we may force a domestic producer out of business by hiking his labor costs via higher wage rates, costly housing standards, and improved safety equipment and working conditions, if we import food produced by growers not subject to such conditions.

What can we do to compete with foreign production such as from Mexico? Mechanize wherever feasible to reduce our labor inputs. And, for tree fruits for fresh market, plant dwarf or semi-dwarf trees and head them low so that most fruit can be picked by workers standing on the ground. In a study at Washington State, apple pickers increased output per hour from 11.7 to 18.1 boxes per hour in dwarf orchards as compared with standard orchards. ^{5/} Also, women and older people were able to participate in the harvest. We cannot afford to have people spending a third of their time climbing and moving ladders to crawl up into a 25 foot tree to pick some 350 bushels per acre, when it is possible to harvest 1,000 or more bushels per acre with no apples over 7 feet from the ground.

We have been changing our technology over time as indicated by the increase in production per man-hour (table 8). But, these changes have not occurred fast enough to counteract rising labor costs. The future does not look very profitable for the Northeast producer who is unwilling or unable to adopt the new technology. On many of their farms, houses and factories will replace fruits and vegetables. Northeast acreage and production will continue to slide. And we will fight for the betterment of the remaining U.S. farmworkers.

^{5/} Miller, Marlen F. and Walter R. Butcher, Factors Affecting Labor Productivity in Apple Picking, Washington Agr. Exp. Bul. 752, March 1972.

Table 8.
Productivity of Labor on Vegetables and Fruits and Nuts,
Northeast Region, 1950-1970

Year	: Man-hours	:	Index 1967=100		
:	1,000	:	Hours	: Production : Prod./hour	
<u>Vegetables</u>					
1950	121,632		191	115	60
1951	108,551		170	101	59
1952	105,363		165	101	61
1953	106,168		166	108	65
1954	96,217		151	99	66
1955	87,980		138	97	70
1956	89,280		140	111	79
1957	79,888		125	101	81
1958	80,946		127	107	84
1959	73,802		116	97	84
1960	75,728		119	105	88
1961	74,054		116	106	91
1962	73,056		114	107	94
1963	67,435		106	99	93
1964	64,806		102	96	94
1965	67,198		105	101	96
1966	62,444		98	94	96
1967	63,836		100	100	100
1968	61,762		97	96	99
1969	56,387		88	89	101
1970 <u>1/</u>	55,827		87	91	105
<u>Fruits and Nuts</u>					
1950	63,408		172	107	62
1951	59,287		161	102	63
1952	48,830		133	80	60
1953	50,885		138	91	66
1954	52,939		144	102	71
1955	53,336		145	106	73
1956	48,224		131	89	68
1957	49,273		134	94	70
1958	52,375		142	113	80
1959	50,858		138	112	81
1960	45,746		124	101	81
1961	46,794		127	113	89
1962	43,734		119	108	91
1963	39,135		106	99	93
1964	41,210		112	115	103
1965	40,842		111	114	103
1966	37,165		101	98	97
1967	36,797		100	100	100
1968	35,326		96	96	100
1969	36,429		99	106	107
1970	36,797		100	112	112

1/ Preliminary.

Producer groups have recommended that Congress impose higher tariffs to keep out some foreign production. If wage rates continue to change as rapidly as they have in the past 5 years, Congress would have to change the tariff rate each year to protect producers. It is quite unlikely that Congress would change tariffs yearly. The negotiation of quotas is an alternative approach and the one that has been used with some success on fresh tomatoes and more recently on fresh strawberries. However, getting foreign producers to stay within their quotas may be a very difficult task.