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COSTS TO GROW AND HARVEST LETTUCE AND ONIONS

SAMPLE ESTIMATES OSWEGO COUNTY, NEW YORK, 1979

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The costs of growing and harvesting farm crops vary widely from farm to farm and year to year. Costs of producing a crop on a particular farm are difficult to determine, especially on farms where several different crops are grown. Yet it is very important that individual farmers keep track of their costs of production as a basis for making better management decisions.

Crop production costs per unit vary from farm to farm for many reasons. The most important factor is usually the differences in yield per acre, or more significantly the difference in bushels or cartons sold per acre. Achieving a high rate of sales per acre has to be the result of many factors.

Experience indicates that costs per acre also vary a great deal even though farmers in the same area may think they are generally following the same production practices. Fertilizer rates and spray applications can be different, but even bigger differences often occur in labor and equipment costs. Up to a point, farms with larger acreages may be able to use labor and equipment more efficiently. Even on farms of the same size, however, the labor costs will be higher on some and lower on others. Machinery and equipment costs will also differ depending on how effectively the machinery is used and maintained.

Successful management of a crop farm in New York requires knowing about many different subjects, and being able to keep on top of each aspect of the business in detail. The good farm manager must know about soils and how to manage them, about crops and how to grow them, about weeds, insects, and diseases and how to control them, about machines and how to get them to work effectively, and about markets and how to buy and sell advantageously. This is a tough assignment for any one individual, and why many successful crop farms in New York are operated by two or more partners. Often members of the same family or relatives each specialize in different phases of the business.

On farms that specialize in growing only one crop, it still is difficult to determine costs of production. The reason is the existence of non-cash costs and the problem of valuing them. Examples of non-cash costs are the labor supplied by family members, the use of owned land, depreciation on equipment, and return on equity capital. For labor, land, and other capital the costs may be based on possible earnings in the next best alternative. Operator and family labor can be valued at what could be earned in some other job. Land charges could be based on what the land could be rented for. Money invested in the business can be charged at the rate that the capital would bring if the assets were sold and the proceeds invested elsewhere. These figures are not always easy to determine.

When two or more crops are grown on the same farm, the determination of production costs requires keeping track of the labor, management, and materials involved in growing each crop and also allocating fixed or overhead expenses to each crop. The records required can be very complicated. If records are available some allocations may not be difficult, such as sharing the tractor depreciation between crops on the basis of hours of use. Allocating management time or building use may have to be quite arbitrary, and is sometimes done on the basis of the value of the crop.

Costs have escalated so rapidly in recent years that it is difficult to keep track of current levels. This analysis reveals that to provide new equipment and buildings on a 100 acre muck farm in Oswego County, New York, in 1979 would have cost almost \$500,000. Fortunately most growers bought their equipment at considerably lower prices many years ago, but they still have to be prepared to replace worn out or outmoded power and machinery in order to stay in business.

On the basis of certain assumptions regarding equipment depreciation and repairs and other costs it appears that costs to grow, harvest, and vacuum cool an acre of lettuce in 1979 in this area amounted to about \$3,000, compared to \$2,500 to grow, harvest, grade and pack an acre of onions on a typical farm. Fixed or overhead costs per acre were the largest category in onion production, while harvesting costs were the largest category and amounted to more than half the total costs per acre in lettuce production.

On a per unit basis costs amounted to \$3.85 per carton of lettuce based on sales of 800 cartons per acre, and \$3.46 per bag for onions based on sales of 750 bags per acre. Many costs tend to stay the same regardless of sales per acre so costs per bag or carton vary with different levels of sales. Costs per carton of lettuce were estimated at \$4.38 for sales of 600 cartons per acre, dropping to \$3.54 when 1,000 cartons were able to be sold. For onions the costs ranged from \$4.88 for sales of 500 bags, dropping to \$3.20 per bag for sales of 1,000 bags per acre.

Many growers may have costs lower than those presented here. The costs of equipment are based on current prices and expected depreciation or obsolescence, and growers who bought their equipment several years ago and have maintained it well should have lower costs. Vigilant scouting may enable alert growers to reduce their pesticide applications below the number specified. Better management of field operations may save time for labor and equipment compared to the rates used in these calculations. In any case, growers should look on these costs as something to be surpassed rather than a standard to be achieved.

Method of Analysis

The following costs are based on a hypothetical farm located on muck soils in Oswego County. Cropland consists of about 100 acres, of which half are planted to onions and the other half to lettuce.

Information on practices and costs was obtained from a panel of five growers. They provided much of the information on the cultural practices, the equipment used, and the time required for various operations, and the herbicides and pesticides applied. Additional information was obtained from knowledge of recommended practices, and prices obtained from equipment dealers and farm supply stores in the area.

Labor

On this farm the operator provides the management and does most of the skilled work, including equipment maintenance and tractor driving. The unskilled work is done by local or Puerto Rican seasonal workers. The lettuce is harvested by experienced workers from Texas. The following were typical costs for direct labor in 1979.

Skilled labor		\$5.00 per hour
Unskilled seasonal help		
Hourly rate	\$2.90	
Unemployment insurance	.15	
Social security	.18	
Workmen's compensation	.12	
Camp costs	.25	3.60 per hour
Lettuce harvesting crew		.80 per carton

Power, Equipment, and Buildings

Power and equipment costs consist of both a fixed and variable component. The fixed or overhead costs are those that do not change significantly according to how much the equipment is used. Interest on the investment, insurance, and to a large extent depreciation and maintenance fall in this category. Building costs are largely fixed. Variable or operating costs are those that tend to be related to how much the item is used. Fuel, lubricants, and some repairs fall in this category. Variable costs are an important cost of truck and tractor operation.

Tractor operating costs

Class 5	65-89 PTO HP	\$4.80 per hour
Class 1	10-19 PTO HP	2.40 per hour

Truck operating costs

3 ton	.60 per mile
Pickup	.30 per mile

Fixed expenses for power, equipment, and facilities will depend on the prices paid for the items and the upkeep costs. On this farm it is assumed that the buildings, equipment, and machinery are purchased at current new or replacement prices. The total investment that a grower might have to make if starting in business in 1979 is likely to be much higher than other growers would have had, but might be partly offset by lower depreciation and repair costs.

Machinery, equipment, and facilities

New or replacement cost	\$476,970	
Annual depreciation	32,435	
Interest, insurance, repairs	37,254	
Total fixed costs		\$69,684

Fixed costs allocation

	Farm	Onions	Lettuce
Total	\$69,684	\$48,828	\$20,861
Per acre	\$6,968	\$977	\$417

Land

There are few sales of whole farms on which to base land values. Some land is rented, most of it with buildings of various capacities. The rental value is assumed for bare land in relatively large acreage.

Land rental \$175

MACHINERY, EQUIPMENT, AND FACILITIES FIXED EXPENSES

Item	New Value or Replacement	Years of Life	Depreciation	Repairs Interest Insurance	Total Fixed Costs	Share to Onions	Share to Lettuce
<u>Tractors</u>							
1 80-90 HP F	\$20,000	10	\$2,000	\$3,000	\$5,000	\$2,500	\$2,500
1 60 HP	14,000	10	1,400	2,100	3,500	1,750	1,750
1 Crawler (used)	4,500	5	900	65	1,575	788	787
5 Small tractors	7,500	10	750	1,125	1,875	937	938
<u>Seeders</u>							
1 Planet Junior (used)	600	10	60	30	90	90	--
1 Stanhay 6 row	4,000	10	400	200	600	--	600
1 Drench system	1,250	10	125	62	187	187	--
<u>Tillage</u>							
1 Plow 3 bottom rollover	4,500	20	225	225	450	225	225
1 Ridgeformer	3,500	20	175	175	350	--	350
Other tillage	5,000	20	250	250	500	250	250
<u>Spray and Fumigation</u>							
1 Boom type sprayer 70'	9,000	10	900	450	1,350	1,350	--
1 Sprayer 30'	3,000	10	300	150	450	225	225
<u>Irrigation</u>							
1 Pipe set	3,000	10	300	150	450	--	450
1 Pump and well	5,000	20	250	250	500	--	500

MACHINERY, EQUIPMENT, AND FACILITIES FIXED EXPENSES (contd.)

Item	New Value or Replacement	Years of Life	Depreciation	Repairs Interest Insurance	Total Fixed Costs	Share to Onions	Share to Lettuce
<u>Trucks, Wagons, Forklifts</u>							
2 Army trucks	\$10,000	5	\$2,000	\$1,000	\$3,000	\$1,500	\$1,500
1 Truck 3 ton	13,600	8	1,700	1,360	3,060	1,530	1,530
1 Pickup	10,000	5	2,000	1,000	3,000	1,500	1,500
3 Wagons, pipe and flattop	1,500	10	150	150	300	150	150
1 Fieldlift	25,000	10	2,500	2,500	5,000	2,500	2,500
1 Storage lift	32,000	10	3,200	3,200	6,400	6,400	--
<u>Harvesting</u>							
1 Undercutter	5,000	10	500	500	1,000	1,000	--
1 Harvester 4 row	17,500	10	1,750	1,750	3,500	3,500	--
1 Carton stitcher	1,200	10	120	120	240	--	240
1,800 boxes @ \$24	43,200	10	4,320	4,320	8,640	8,640	--
40 Pallets @ \$8	320	4	80	32	112	56	56
<u>Packing Line</u>							
1 Grading line	15,000	10	1,500	1,500	3,000	3,000	--
<u>Buildings</u>							
Storage and packing 50' x 150'	96,000	30	3,200	9,600	12,800	9,600	3,200
Machinery shed and shop 24' x 40'	10,000	20	500	1,000	1,500	750	750
Misc. tools and equipment	5,000	5	1,000	500	1,500	750	750
Total	\$478,170		\$32,555	\$37,374	\$69,924	\$49,178	\$20,751

Lettuce Costs

Lettuce ground is prepared for next year's crop each fall by disking several times, fumigating about one-quarter of the acreage, replacing tile, and cleaning the main ditches as needed.

In the spring, lettuce is planted at the rate of a few acres every 2 or 3 days from early April to mid-July. Land to be planted is generally disked twice, plowed, and disked again. Fertilizer is drilled in and preplant herbicide applied. The ground is disked then ridged, and lettuce seeded on the ridges. Premerge herbicide is applied.

The newly seeded land is irrigated with a sprinkler system to insure germination. Shortly after the plants emerge a crew of seasonal workers blocks the field and later hand weeds the crop. Insecticide and fungicide is applied, usually by helicopter. Further weed growth is controlled by another application of herbicide.

Harvesting is carried out by a seasonal crew who cut the lettuce and pack the cartons, usually 24 heads each. Cartons must be made up and carried to the field. Another field crew loads the packed cartons onto wagons or trucks and hauls them to the vacuum cooler. The lettuce is vacuum cooled usually by a custom operator, and shipped to market.

<u>Lettuce Costs</u>	<u>Per Acre</u>	<u>Per Carton (Various Yields)</u>		
		<u>600</u> <u>Cartons</u>	<u>800</u> <u>Cartons</u>	<u>1,000</u> <u>Cartons</u>
Operating costs				
Growing	\$ 643.49	\$1.072	\$.804	\$.643
Harvesting	1,740.60	2.176	2.176	2.176
Interest (6 mos. 10%)	111.35	.149	.139	.133
Land use	175.00	.292	.219	.175
Fixed expenses	<u>415.02</u>	<u>.692</u>	<u>.519</u>	<u>.415</u>
Total	\$3,085.46	\$4.381	\$3.857	\$3.542

SAMPLE COSTS TO GROW AND HARVEST LETTUCE

Oswego County, New York, 1979

Operation	Hours Per Acre	Cash and Labor Costs Per Acre			Total Per Acre	Your Cost
		Labor	Fuel and Repairs	Materials Quantity Cost		
<u>Fall Cleanup and Maintenance</u>						
Disk (3 times)	1.5	\$ 7.50	\$ 6.00		\$ 13.50	\$
Fumigate					50.00	
Replace tile				Custom operation 12.5 acres per year at \$200 per acre	96.25	
Lime				One-eighth the acreage each year, 1,400 feet tile per acre 55¢/ft.	4.63	
Clean main ditches				One ton per acre on 1/4 the acreage @ \$18.50 per ton spread	10.00	
				One-fifth the acreage @ \$50 per acre, backhoe rental \$55/hour		
Total		\$ 7.50	\$ 6.00		\$174.38	\$
<u>Planting</u>						
Plow	1.0	\$ 5.00	\$ 4.80		\$ 9.80	\$
Disk (2 times)	1.0	5.00	4.80		9.80	
Drill fertilizer (2 men)	.5	4.30	4.80	15-15-15 600 lbs. \$ 48.00	57.10	
Disk and level	.5	2.50	4.80		7.30	
Spray weeds - preplant	.5	2.50	1.40	Preplant 3 gals.	33.90	
Ridge	.8	4.00	3.84		7.84	
Seed - precision plant	.8	4.00	1.92		5.92	
Spray weeds - premerge	.5	2.50	1.20	Premerge 8 qts.	33.70	
Total		\$29.80	\$27.56		\$165.36	\$

SAMPLE COSTS TO GROW AND HARVEST LETTUCE (contd.)

Oswego County, New York, 1979

Operation	Hours Per Acre	Cash and Labor Costs Per Acre			Total Per Acre	Your Cost
		Labor	Fuel and Repairs	Materials Quantity Cost		
<u>Growing</u>						
Irrigate (2 men, 1 time)	2.25	\$ 16.20	\$1.00		\$ 17.20	\$
Block (5 men, 1 time)	4.0	72.00			72.00	
Hand weed (5 men, 1 time)	5.0	90.00			90.00	
Sidedress N.	1.0	5.00	2.40	Am. Nitrate 100 lbs. \$10.00	17.40	
Spray insects, diseases	Helicopter @ \$3.75 per acre			Insecticide 9 times 45.00	94.75	
Mulch, cultivate, shield spray	1.0	5.00	2.40	Herbicide 2 pts. 5.00	12.40	
Total		\$188.20	\$5.80		\$ 303.75	\$
<u>Harvest</u>						
Make cartons (90¢ each)	Cartons, staples, labor, equipment, insurance			800	\$ 720.00	\$
Harvest crew (80¢/carton)				800	640.00	
Field load & haul (4 men)	4.0	\$ 57.60	\$3.00		60.60	
Vacuum cooling (40¢/carton)				800	320.00	
Total		\$ 57.60	\$3.00		\$1,740.60	\$
				Total Operating Costs	\$2,044.35	\$

Onion Costs

Land is prepared in the fall by disking once over, replacing tile and cleaning main ditches as necessary.

Onions are planted in late April and early May and harvested in September. In the spring the onion ground is plowed, disked and leveled. Fertilizer is drilled in. The land is disked twice and floated. Pelleted seed is used and insecticide and fungicide applied at seeding. Rows of barley are planted for a windbreak.

Premerge herbicide is sprayed on following seeding. A crew of seasonal workers hand weed the field several times. A wide boom ground rig applies herbicide and fungicide about once a week during the growing season. Weeds are controlled by both granular and liquid herbicide two or three times each. The crop is also cultivated at least once. Sprout inhibitor is applied by helicopter just prior to harvest.

The first operation in harvesting involves pulling the onions. A hand crew opens lanes in the field and the ends. A mechanical harvester requiring a crew of 5 men picks up the onions and loads them in field boxes. Boxes are stacked in the field for drying. One man is required to draw boxes to the field.

After drying in the field the onions are loaded and hauled by a four man crew to storage. The crop is graded and packed in 50 pound sacks or pallet boxes by a crew of about 10 persons as the market demands.

<u>Onion Production Costs</u>	<u>Per Acre</u>	<u>Per Bag (Various Yields)</u>		
		<u>500 Bags</u>	<u>750 Bags</u>	<u>1,000 Bags</u>
Growing and harvesting	\$ 906.40	\$1.813	\$1.208	\$.906
Interest (6 mos. 10%)	48.20	.096	.064	.482
Grading and bagging	456.00	.650	.650	.650
Land use	175.00	.350	.233	.175
Fixed costs	<u>983.56</u>	<u>1.967</u>	<u>1.311</u>	<u>.984</u>
Total	\$2,569.16	\$4.876	\$3.466	\$3.197

SAMPLE COSTS TO GROW AND HARVEST ONIONS

Oswego County, New York, 1979

Operation	Hours Per Acre	Cash and Labor Costs Per Acre			Total Per Acre	Your Cost
		Labor	Fuel and Repairs	Materials Quantity Cost		
<u>Fall Cleanup and Maintenance</u>						
Disk (1 time)	.5	\$ 2.50	\$ 2.40		\$ 4.90	\$
Replace tile				One-eighth acreage each year, 1,400 ft. tile per acre @ 55¢	96.25	
Clean main ditches				One-fifth acreage each year @ \$50 per acre	10.00	
Total					\$111.15	\$
<u>Planting</u>						
Plow (1 time)	1.0	\$ 5.00	\$ 4.80		\$ 9.80	
Disk and level	.5	2.50	2.40		4.90	
Drill fertilizer (2 men)	.5	4.30	1.20	15-15-15 800 lbs. \$ 64.00	69.50	
Disk (2 times)	.5	5.00	4.80		9.80	
Float	.5	2.50	2.40		4.90	
Seed (onion)	1.0	5.00	4.80	Pelleted seed 15 lbs. 190.00 Insecticide 1 qt. 9.00 Fungicide 3 lbs. 4.50	213.30	
Barley seed (10-12 lb./A)					\$312.20	\$
Total						
<u>Growing</u>						
Weed spray - emergence	.25	\$ 1.25	\$.60	Herbicide 3 gals. \$ 47.10	\$ 48.95	\$
Hand weed (5 men, 3 times)	1.0	54.00			54.00	
Spray insect and disease	.1	6.50	62.40	Insecticide 13 qts. 30.00 Fungicide 30 lbs. 45.00	143.90	
Insecticide 13 times						
Fungicide 10 times						

SAMPLE COSTS TO GROW AND HARVEST ONIONS (contd.)

Oswego County, New York, 1979

Operation	Hours Per Acre	Cash and Labor Costs Per Acre			Materials Quantity	Cost	Total Per Acre	Your Cost
		Fuel and Repairs	Labor	Kind				
<u>Growing (contd.)</u>								
Weed control - spray (2 times)	.1	\$.96	\$ 1.80	Herbicide 5 lbs.	\$ 14.75	\$ 16.71	\$	
Weed control - granular (2 times)	1.5	3.60	7.50	Herbicide 60 lbs.	51.00	62.10		
Irrigation - wind control	1.0	2.50	7.20			9.70		
Cultivate (1 time)	.5	1.20	2.50			3.70		
Apply sprout inhibitor	Helicopter @ \$4.50 per acre			Sprout Inhib, 3 qts.	10.40	14.90		
Clip barley (3 times)	.5	1.20	2.50			3.70		
Total						\$ 357.66	\$	
<u>Harvesting</u>								
Pull onions	1.5	\$ 7.20	\$ 7.50			\$ 14.70	\$	
Open fields (4 men)	7.0	25.20				25.20		
Drawing boxes (1 man)	1.0	2.40	3.60			6.00		
Harvesting (5 men)	12.5	12.00	52.00			64.00		
Loading & hauling (4 men)	4.0	5.00	14.40			19.90		
Total						\$ 129.80	\$	
<u>Grading & bagging (10 people)</u>	50.0	\$10.00	\$180.00	Bags 38¢ each	266.00	\$ 456.00	\$	
				Total Operating Costs		\$1,366.81	\$	