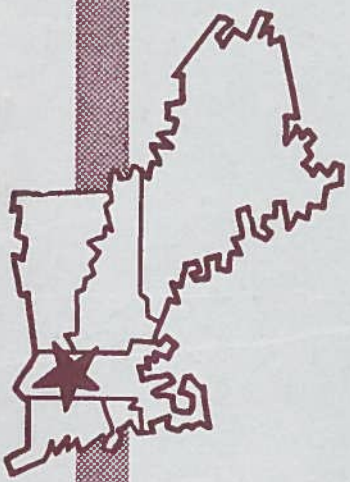
1964 PROCEEDINGS

New England Agricultural Economic Council



JUNE 15, 16, 17

UNIVERSITY OF MASSACHUSETTS

PROCEEDINGS

NEW ENGLAND AGRICULTURAL ECONOMIC COUNCIL

ANNUAL CONFERENCE

University of Massachusetts
Amherst, Massachusetts

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SUGARBEET PRODUCTION IN MAINE

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My report concerns some of the highlights of the research work conducted by the Maine Agricultural Experiment Station which helped in securing a sugarbeet allotment of 55,000 tons of refined sugar a year for the state.

This has been a team effort all the way. The Maine Agricultural Experiment Station contributed by carrying on the economic and agronomic research concerning the feasibility of producing sugarbeets. A sugarbeet steering committee handled the direction of developmental work; the state provided some financial assistance; a consulting firm was hired to study the economic feasibility of a sugarbeet processing facility; various individuals and groups participated in numerous ways. Through a team effort a major new industry is now being developed in Maine. This stands as an example and a constant reminder of how private, local, state and federal joint action can make a substantial contribution to the economy of an area.

Background

A little background concerning events leading to the establishment of a sugarbeet industry may be of interest. Serious economic conditions in the potato industry for several years had created a desperate situation. Potato prices were low, costs and debts high. During the winter of 1960-61 a Mr. Peter Paul Dufour, President of the Chamber of Commerce of St. Agatha, Maine (near Fort Kent) conceived the idea of a sugarbeet industry. He discussed the possibility with the local group and then contacted a congressman to ask about securing an acreage allotment. Interest developed gradually; conferences were held with local people in Aroostook County, with research scientists at the University, with representatives of sugarbeet refineries, and with others. Research work was undertaken by the Maine Agricultural Experiment Station in the summer of 1961. Experimental plots were grown testing various seed varieties and cultural practices. In the summer of 1963 a decision was made by a newly appointed Sugarbeet Steering Committee to make an all-out effort to seek one of the 1966 sugarbeet allotments. More than 160 acres of sugarbeets were grown on a commercial scale for the purpose of adding to our agronomic and economic knowledge and to demonstrate that they can be grown effectively.

Agronomic Conditions Favorable

The agronomic study provided conclusive evidence that favorable conditions of temperature, rainfall, and soils existed in Aroostook County. Production rates were good at 14-1/2 tons of sugarbeets with a sugar content of 18 percent.

An ample supply of land in the County was available with 405,000 acres of cropland of which 135,000 are used for potatoes, 49,000 for oats, 8,000 for freezing peas, with the remainder largely in clover sod or cover crops. Nearly 75 percent or 300,000 acres of cropland are suitable for growing sugarbeets.

Economic Need Great

Allotments in recent years are made on the basis of several criteria, of which economic need ranks high. The potato area in Maine has the need. The economic plight of the potato grower in Aroostook County was perhaps well expressed by a potato grower who commented as follows: "In the last 21 years that I have been growing potatoes I have paid for my farm 7 times." This farmer simply meant that 7 times during the 21 years he was insolvent and 7 times he was able to bounce back and pay off the debt. Such an experience is quite typical and illustrates the ups and downs associated with producing a single, perishable crop like potatoes. And at this time many are insolvent and are faced with the problem of how to bounce back.

An economic study was undertaken which entailed pointing out the need for greater income stability and the opportunity for sugarbeet production to fill this need. Facts were determined concerning, (1) the degree to which Aroostook farmers depend upon potatoes, (2) the variability of farm income, (3) the natural environment for potato production, (4) adequacy and availability of labor supply, (5) farmer competence and experience, (6) availability of land and equipment, (7) a comparison of the profitability of various crops, including sugarbeets as a supplementary source of farm income, and (8) the effect of adding sugarbeet production on the income of a potato grower.

Results Summarized

Highlights of the study are summarized here. The potato industry dominates the economy of Aroostook County with nearly all segments of economic activity related directly or indirectly to it. The area is on a single enterprise base with over

90 percent of the value of farm marketing from the sale of potatoes.

Extreme price and income gyrations make it most difficult, if not impossible, to assure adequate financial returns each year on a potato farm. The best laid production plans are shattered by price and income uncertainties. This is truly an economy where farmers may go from rags to riches and then in reverse, from one year to the next. Few farming areas in the United States today depend solely on the production of a single perishable crop. Farmers in this area desperately needed a supplementary farming enterprise which would support and stabilize farm income to soften the chaotic economic conditions.

The demand for potatoes being highly inelastic results in wide fluctuations from year to year in farm prices and resultant farm income. In the last 17 years farm prices have varied from a low of $.74 to a high $3.03 per hundredweight of potatoes. Farm receipts from the sale of potatoes varied in a similar fashion from a $23 million crop in 1954 to a $100 million in 1948. In 1959 the crop returned about $40 million whereas the following year, 1960, it was nearly $70 million with little difference in acreage grown. A further complicating factor is the wide price variation within a given season. Prices for the 1961 potato crop varied from $.80 a hundredweight in October to $1.85 in June; in 1958 from $.85 in October to $3.35 in June. The time of year when the individual grower sells had an important influence on farm income.

As already pointed out, the natural environment is in harmony with the requirements for proper growth of the potato plant which is similar for sugarbeets. In recent times there has never been a potato crop failure. Yields have been high and relatively uniform. In the last 17 years yields have varied from a low of 206 to a high of 288 hundredweight per acre with virtually no irrigation used.

An adequate supply of labor is available for an added sugarbeet crop. An excellent, regular farm labor force is augmented during peak labor needs with migratory labor from Canada and school age youth. No labor problem was experienced even in the year that there were 200,000 acres of potatoes - 70,000 acres above the level of recent years.

Seasonal labor is available to supplement the local farm labor supply for carrying out the production jobs that demand high inputs of labor. Much of the adult seasonal labor has been supplied by migratory workers from Canada. A total of 7,350 laborers were imported in 1963 of which 6,800 were involved in the harvesting operation. An additional 3,000 of Canadian Indians also came in for the harvest. School youth are employed in the potato harvest, and add another 15,000 to the labor force.

The management know-how in producing potatoes can be readily adapted to the production of sugarbeets. The many years of experience that growers have had in producing potatoes, a row crop, will be valuable. Short time, rush periods of activity in planting and harvesting potatoes have been common pressures to the potato grower.

In summary there should be no serious problem of labor supply in producing sugarbeets. A few conflicts will develop and some new techniques will need to be learned by potato growers. New technology that results in greater mechanization will reduce the need for manual labor. Sugarbeets fit well in either a three-year or a four-year rotation with sugarbeets following potatoes and a green manure crop following sugarbeets.

Much of the machinery and equipment now on potato farms can be readily used in producing sugarbeets. These available items include tractors, trucks, plows, harrows, cultivators, and sptayers. Not one of these items has been fully used on potato farms. Short periods of peak use are followed by periods of relative inactivity. Performance rates in doing various jobs reveal clearly, that within the limits of available cropland on a particular farm, an acreage of sugarbeets can be handled by most farmers without purchasing added units in these equipment items.

In general the only additional pieces of equipment that must be added are specialized sugarbeet planters, thinners, and harvesters at an estimated cost of $6,000 to $7,000.

Costs and returns, quantities of inputs and outputs were determined for the major crops now being grown in Aroostook County - potatoes, peas, and oats. Net returns per acre were minus $68 for potatoes, $18 for peas and $1.36 for oats. Sugarbeets provide a net return much larger than peas and oats and even more than for potatoes in the past several years of low potato prices. Net returns per acre to the farmer-operator for his management and risk was $76 for sugarbeets.

The cost and returns in growing and harvesting sugarbeets in Maine compares favorably with results from other beet producing areas (Table 1). Production costs at $1.49 per acre were similar to the cost figures available from Ohio and Michigan and slightly under the New York estimate.

Net returns to growers of sugarbeets in Maine were $76 an acre which was similar to Michigan and Ohio, slightly higher than returns in California, and about two times the New York figure.

The net income expectations from sugarbeet production in Maine is favorable due primarily to good yields and high sugar content which averaged 18 percent in the field trials in 1963. No difficulty should be encountered in obtaining 14- to 18-ton yields and 16 to 18 percent sugar content based on the results from several years of experimental plots and the field trials of last year. Fifteen ton yields and a $15 price for 18 percent sucrose content were believed to be conservative assumptions. In addition to the net return per acre of $76 the sugarbeet tops have considerable value for feed or for plowing under as a green manure crop.

The Effect of a Sugarbeet Enterprise on Farm Income of a Potato Grower

In the final analysis the impact that sugarbeet production will have on the farm income of a potato grower is of paramount importance. If his financial position is not improved, then there is no place for the crop and indeed farmers will refuse production. On the other hand, if it offers an opportunity for increasing and stabilizing his farm income, with no other equally good opportunity, then an acreage allotment will be readily taken up.

A farm with 152 acres of cropland and 72 acres of potatoes was used to determine the effect on income of adding a 40-acre sugarbeet enterprise (Table 3). The adjustments necessitated by adding this new enterprise resulted in an increased net return of $3,357 to the farm operator. The effect on farm income was to increase the net returns to the operator to $2,179 from a minus $1,178.

The net return to the operator from the present farm operation of 72 acres of potatoes and 40 acres of oats was calculated to be a minus $1,178 assuming the 1958-62 average price of $1.43 per hundredweight. All costs were considered except the operator's time and totaled $26,736. Receipts were $22,625 from the sale of table potatoes and $1,253 from potatoes sold for starch. A return of $1,680 was realized from the sale of oats. Grassland was plowed under as a green manure crop.

The impact of adding 40 acres of sugarbeets to this potato farm business was measured by considering only the changes in costs and returns that would occur. Some of the fixed cost items in growing sugarbeets were not considered in such a calculation since they are already covered by the potato enterprise. These fixed costs include property taxes, upkeep of buildings, fire insurance, electricity and telephone, and depreciation on potato machinery and equipment also used on sugarbeets. Forty acres of sugarbeets were substituted for 40 acres of oats. A four-year crop rotation was set up as follows: 36 acres potatoes, 36 acres potatoes,

40 acres sugarbeets, and 40 acres green manure crop. Potatoes were assumed to be grown for two years on the same land and to precede the sugarbeet crop.

It was also assumed that all labor used on sugarbeets was additional hired labor at the rate of $1.25 per hour. On most farms a portion of this would ordinarily be supplied by the operator and his regular labor force. Performance rates for various job operations in producing potatoes and sugarbeets permit handling the added work load. The most critical time period occurs during the spring when ground preparation for and planting of 72 acres of potatoes and 40 acres of sugarbeets which must be accomplished in approximately 30 work days from May 7 to June 10. The period from October 10-31 provides ample time for the harvest operation. An adequate supply of local and migrant labor is available to meet seasonal needs in Maine.

Economic Impact

The combination of a favorable natural environment, an adequate supply of labor, availability of much of the necessary equipment, and farmer experience, technical knowledge and skills in growing a row crop, serve as a strong base to suggest a successful sugarbeet farm enterprise and a sugar industry.

These results in combination with other information provided the evidence needed to gain a sugarbeet acreage allotment. The impact upon the state's economy include the following:

- 33,000 acres of sugarbeets
- 55,000 tons of sugar
- $17,500,000 sugarbeet refinery investment, now being constructed under the supervision of the Great Western Refining Company
- $2,000,000 net income to growers
- $1,200,000 payroll, 275 employees
- 2,000 new jobs in related industries in Maine
- $1,500,000 annual to transportation industry
- $200,000 local property taxes on site of facilities
- $800,000 cost of supplies

There has been no research effort in which I have been involved that has returned to me so much satisfaction. Such tangible results as these are seldom immediately evident to the research worker.

TABLE 1

Estimated Costs in Growing and Harvesting Sugarbeets*
Maine 1963

Cost Item	Practice	Cost Per Acre
GROWING:		
Seed	4# Monogerm $.69 per pound	$ 2.76
Fertilizer	800# 12-12-12 at $76.75 per ton	30.70
Weed Control	Tillam - Rate 4#/Acre (1-1/3 # in 1 ft. band on row)	6.05
Insecticide	2 qts. DDT - 25% emulsion	.84
Fungicide	2# M22	1.74
Labor (Table 2)	22.3 hours at $1.25 per hour	27.88
Tractor (Table 2)	7.4 hours at $1.30 per hour	9.62
Machinery 1/	Exclusive of harvesting machinery	6.00
Land	Value $1.50/Acre - 6% Int. + $6 Tax	15.00
Overhead	6% of other growing costs	5.66
Total		106.25
HARVESTING: 2/		
Dig & Scalp	Contract 2-row harvester - 15 ton per acre yield at $1.35 per ton	20.25
Haul	Contract 15 ton per acre at $1.50 per ton	22.50
Total		42.75
ALL COSTS		149.00
GROSS RETURNS 3/	15 Ton, $15.00 per ton	225.00
NET RETURNS:		
Per Acre		76.00
Per Ton of Sugarbeets Harvested		5.07
Per Hour of Labor (Exclusive of harvesting labor)		3.41

1/ "Sugarbeets in New York State," by C.D. Kearl, AE Ext. 190, March 1962 and "Costs and Adjustment Opportunities in Sugar Beet Production in the Red River Valley," by Jensen and Frances, Series #523, July 1962.

TABLE 1--Continued

2/ "Costs Analyzed for Growing, Harvesting and Hauling Sugar Beets," by R.H. Blooser, Ohio State University, 1962, and "The Sugarbeet Industry in California," by Hills and Reed, Leaflet 121, 1960.

3/ Mr. Philip Jones, U.S. Beet Sugar Association, Washington, D.C., estimates $15.00 per ton return to growers which includes a $2.40 per ton Sugar Act subsidy payment. Sucrose content of sugarbeets produced from field trials in 1963 was 18 percent. The price is based on the Standard Rocky Mountain Type Contract - which includes the growers' share of beet pulp and molasses by-products.

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*A Report of the Farm Production Feasibility of Sugarbeets in Aroostook County, Maine, Maine Agricultural Experiment Station, Misc. Report 110, November 1963.

TABLE 2

Man and Tractor Time Per Acre Growing Sugarbeets
(Exclusive of Harvesting)

Operation	Rate	Times Over	Man Hours: Number of Men	Man Hours: Once Over	Man Hours: Total	Tractor Hours: Once Over	Tractor Hours: Total
Field Cultivate	2.0 Acres/hr.	1	1	.5	.5	.5	.5
Harrow	2.5 Acres/hr.	2	1	.4	.8	.4	.8
Picking Stones (Hand)	--	1	2	2.0	2.0	1.0	1.0
Plant	2.0 Acres/hr.	1	1	.5	.5	.5	.5
Cultivate	2.0 Acres/hr.	4	1	.5	2.0	.5	2.0
Block (Machine)	2.0 Acres/hr.	1	1	.5	.5	.5	.5
Weed (Machine)	2.0 Acres/hr.	1	1	.5	.5	.5	.5
Hand Weeding & Thinning	--	1.5	8	12.0	12.0	--	--
Spray	5.0 Acres/hr.	3	1	.2	.6	.2	.6
Unproductive (15% of productive man and tractor time)					2.9		1.0
Total					22.3		7.4

TABLE 3

Effect on Farm Income of Adding a 40 Acre Sugarbeet Enterprise to a 72 Acre Potato Farm
Aroostook County, Maine

Item	Present Potato Farm	Adjustments with Sugarbeets	Combined Potato-Sugarbeet Farm
Potato Acreage	72	--	72
Oat Acreage	40	(-40)	--
Hay (Plowed Under)	40	--	40
Sugarbeets	--	+40	40
Cropland (Acres)	152	--	152
Potato Yield (Cwt.)	293	--	293
Sugarbeet Yield (Tons)	--	15	15
Labor (Man Equivalent)	2.3 (28 mo.)	.3 (4 mo.)	2.6 (32 mo.)
Costs:			
Seed	$ 3,456	$ 110	$ 3,566
Fertilizer	3,960	1,228	5,148
Spray Materials	792	104	896
Weed and Top Kill	432	242	674
Hired Labor	4,104	1,115	5,219
Picking Labor	2,952	--	2,952
Land and Buildings	3,960	--	3,960
Trucks and Tractors	2,016	--	2,016
Equipment	1,152	240	1,392
Gas, Oil and Grease	864	192	1,056
Insurance	504	--	504
Baskets and Barrels	286	--	286
Electricity and Telephone	290	--	290
Miscellaneous	648	80	728
Seed, Fert., Gas, and Labor and Harvesting for Oats	1,320	(-1,320)	--
Harvesting Beets	--	1,824	1,824
Total Costs	$26,736	$3,963	$30,699

TABLE 3--Continued

Item	Present Potato Farm	Adjustments with Sugarbeets	Combined Potato-Sugarbeet Farm
Returns:			
Potatoes (21,096 cwt.)			
Table (15,822 cwt. x $1.43)	$22,625	$ --	$22,625
Starch (4,176 cwt. x $ .30)	1,253	--	1,253
Oats (2,400 bu. x $ .70)	1,680	(- 1,680)	--
Sugarbeets (600 T. @ $15)	--	9,000	9,000
Total	$25,558	$7,320	$32,878
NET RETURN TO OPERATOR 1/	(-$1,178)	$3,357	$ 2,179

1/ Returns to the operator for his labor and management.