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# FARMING IN THE MATANUSKA AND TANANA VALLEYS OF ALASKA



Most concentrated farm area in the Matanuska Valley lies south of the town of Palmer, located in the left middle distance in this view. Talkeetna mountains in the background afford shelter from extremes of continental climate that develop in the interior of Alaska. Slope on the right marks the foot of the Chugach range which hems in the Valley on the east.

University of Alaska

**ALASKA AGRICULTURAL EXPERIMENT STATION**

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PALMER, ALASKA

In cooperation with the

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH ADMINISTRATION

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## SUMMARY

This is the third survey of Alaskan farms in recent years. These studies have been conducted to discover: (1) types of farm organization; (2) methods of operations; and (3) production requirements of particular farm enterprises. The main objective has been to compile data on which to base plans for improving farm income.

**IN THE TANANA VALLEY** farms are small, part-time specialized units. Potato farms are most numerous. Potato and vegetable farmers seldom bother with milk cows or poultry to supply their own needs. Three dairies supply all local Grade A milk. A few poultry flocks supply fresh eggs to local retail stores.

**THE MATANUSKA VALLEY** possesses a more permanent agricultural economy than other farm communities in Alaska. It is characterized by: (1) many part-time farms; (2) a high

proportion of small farms among the relatively few full-time enterprises; (3) many year-to-year changes as individual farmers struggle to increase their profits; and (4) a movement away from self-sufficiency and diversification toward more specialization and commercialization.

**DAIRY FARMING** is rapidly expanding in the Matanuska Valley. Large markets for dairy products are well established. Most dairy farms operate on a full-time commercial basis. Factors restraining dairy expansion are: (1) limited amounts of cropland for growing forage, and (2) large capital requirements for buildings, equipment and animals. Many operators of Grade A enterprises cannot increase their herds because their crop acreages are too small to produce sufficient feed. Operators of other types of farms desiring to enter the dairy business face a similar obstacle in not having enough cleared land. Potentially productive uncleared fields are found on nearly all farms, but costs of land clearing, initial seedbed preparation and immediate fertilizer needs are expensive. Several changes have occurred in dairy farming since 1947: (1) more forage is now used is silage and less as hay; (2) more farmers are seeding improved pasture; (3) less cropland is now used for purposes other than producing dairy feeds; (4) milking herds have increased in size; and (5) more herd replacements are raised at home. Most of these changes mean greater specialization and greater efficiency in dairy production. This probably accounts for the greater net returns attained by dairy farmers in 1950 than in former years.

**POTATO FARMING** is second only to dairying in terms of numbers of farms. Potatoes are the most important cash crop in Alaska. Many potato growers are part-time farmers deriving a sizeable portion of their income from non-farm employment. Changes have also occurred in potato farming since 1947: (1) potato farms now have a smaller total cropland acreage, those with large acreages having since changed to dairy farming; (2) potato enterprises are now smaller; (3) a greater proportion of cash income is obtained from non-farm employment and as a result, (4) there are now more part-time potato farms; and (5) less grain is produced than in 1947.

**POULTRY FARMING** in the Matanuska Valley is characterized by small flocks, a high proportion of part-time units, small cropland acreages and relatively large investments in buildings and equipment. Poultry farming provides a stable income and a good annual distribution of labor.

# FARMING IN THE MATANUSKA AND TANANA VALLEYS OF ALASKA

*Clarence A. Moore*<sup>1</sup>

There is an urgent need for basic cost comparisons on agricultural enterprises in Alaska. Homesteaders hewing farms from the raw wilderness as well as new-comers purchasing developed or semi-developed farms have drifted into farming with little knowledge of production requirements or returns that can be expected from farming. They consequently find it difficult to plan either their production needs or the size of enterprise that might be expected to return a fair living. This lack of basic data results in less efficient use of resources and lower farm returns than might otherwise prevail.

This 1950 study of farm operations in the Tanana and Matanuska Valleys is the third made in recent years<sup>2</sup>. The main objective of these annual studies has been to compile reliable data on which plans for improving farm income can be based, thereby encouraging the development of a sound and permanent agricultural economy.

Survey methods and procedures, as well as types of data collected, followed patterns used in former years. Eighteen farmers in the neighborhood of Fairbanks and 79 in the Matanuska Valley furnished records of their operations in 1950. About 3 of every 4 farmers consulted in both areas had cooperated in previous studies of this nature. In the following discussion data collected in 1950 are compared with information gathered in 1947 and 1949; these comparisons reveal several fundamental trends considered important in Alaska's developing agricultural economy.

## THE MATANUSKA VALLEY

Site of the 1935 colonization project, the Matanuska Valley has a more stable and more permanent agricultural economy than other farm areas in the Territory. Most farms organized for commercial production are located in this area. Farm organization, methods, and practices fluctuate more from year-to-year than in well-established agricultural regions in the States. Farmers are making important changes, some based on tried and proved practices. Other changes are on a "hit-or-miss" basis in response

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<sup>2</sup> Results of earlier studies may be found in the following reports: Mimms, O. L., Paschal, J. L., Fuhrman, W. U., "Some Economic Aspects of Farming in Alaska With Chief Attention to the Matanuska Valley" (Progress Report), Bureau of Agricultural Economics and Alaska Agricultural Experiment Station, FM-74, January, 1950. Moore, C. A., Alaska Farms: Organization and Practices in 1949, Alaska Agricultural Experiment Station, Mimeograph Circular 1, March, 1951.

to fluctuations in current market and production conditions which may be inconsistent with long-term cost-price relationships. Alaskan farmer responses in this respect are no different from farmer reactions to current conditions elsewhere.

### The Farmer—His Family and Tenure

Farmers in the Matanuska Valley are mostly middle aged (chart 1). Ninety percent were between 30 and 60 years old. Their average family size was slightly over 4 persons, which was about the same as in the United States. About 75 percent indicated previous farming experience before coming to Alaska while 13 percent had none and 12 percent failed to answer<sup>3</sup>. Most of those with farming experience either had grown up on farms or had

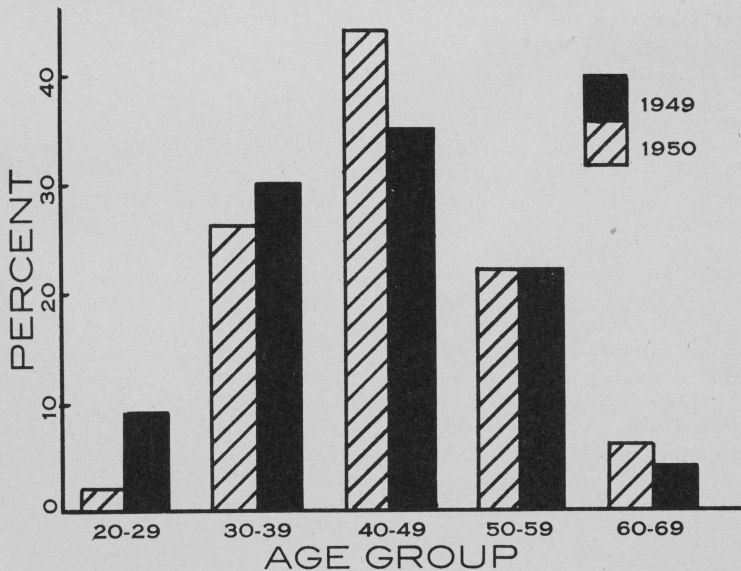


Chart 1.—*Age of Matanuska Valley farmers: Age distribution by classes of farmers interviewed in 1949 and 1950*

worked as farm laborers. Before coming to Alaska very few were responsible for organizing and supervising farm operations in their adult years.

The farmer's relation to and degree of possession of the land he farms is an important factor in the interest he takes in maintaining his farm's productivity. The socio-economic origin and environment of the farming

<sup>3</sup> In answer to a question about where their experience was gained, Wisconsin was mentioned 9 times, and Minnesota and Michigan 7 times each; these were the States from which colonists were picked in 1935. Other states listed more than once were Iowa 6, Indiana 5, North Dakota, California and Idaho, 4 times each; Oregon, Washington and Kansas, 3 times each; Nebraska, Utah, and Montana, 2 times each. States listed only once were Arizona, Wyoming, New York, Ohio, Arkansas, Virginia, Texas, Illinois, New Mexico, and Missouri. Canada, Russia and Germany were mentioned one time each. Alaska's farming population is thus seen to have come from diverse sources.

community has set the land tenure patterns for Matanuska Valley operators. Most farmers own all or most of the land they farm. There have been few outright rentals or leases of entire farms in the Valley. Several farmers have recently shown interest in leasing dairy farms. Among those visited in 1950, 2 dairy farms and 1 poultry farm were operated under lease arrangements. Of 31 small-tract rental agreements on which data were obtained, 26 were cash rentals, 1 an improvement rental, and 4 were share-

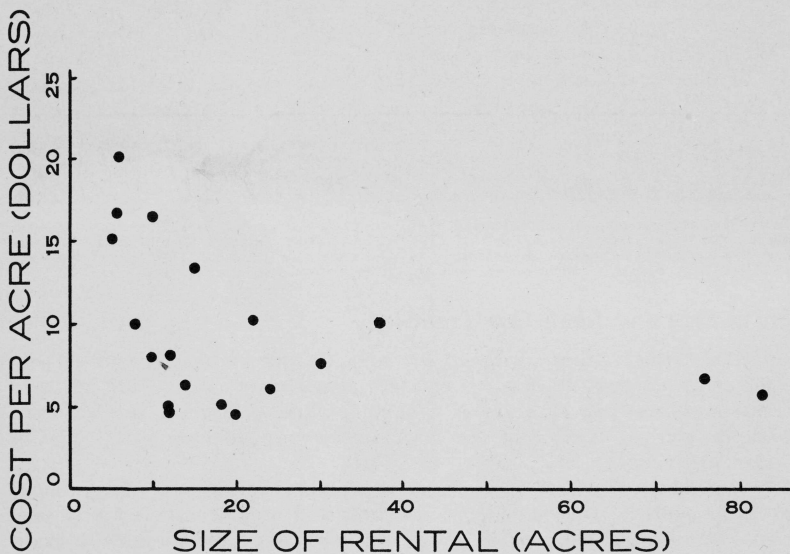


Chart 2.—Land rental rates: Cost per acre for 19 rental agreements in the Matanuska Valley, 1950

crop rentals. Prices quoted on 19 cash rentals varied from \$4.50 to \$20 with a median of \$8 per acre; prices tended to be high for small rentals and low for larger acreages (chart 2). Most rented fields were used for growing forage and grain crops.

Another important tenure factor is the farmer's opportunity for off farm employment. Non-farm employment opportunities have increased in recent years. More farmers have therefore been working in non-farm occupations during slack farming seasons; some have entirely quit farming in favor of more remunerative employment. Of the 79 farmers contacted in 1950, 37 percent were farming part-time as compared to only 25 percent in 1949. Those who received more than 25 percent of their total cash income from non-farm sources are termed part-time farmers in the following discussion.



Dozing is the first step in land clearing. This operation costs \$70 to \$125 an acre depending on the type of cover removed and the weather. Most farmers like to shear off trees and brush when the ground is frozen. In following this practice they claim that less humus is scraped up into the stump rows for later burning.

## Farm Size and Land Use Trends

The farms studied averaged 169 acres in size (table 1); only 28 percent, or an average of 48 acres per farm, was in cropland. Half of these farms had less than 40 acres of cropland, while 75 percent had less than 60 acres in crops. Only 8 of the 79 operators reported more than 100 acres under cultivation.

Half of the cropland on all farms was planted to hay and silage. Small grain accounted for 17 percent of the total and seeded pasture for 19 percent. Thus about 86 percent of the cropland was used to produce grain and forage in 1950. Six percent was used for potato production and 2 percent for vegetables. Potato acreage per farm was lower in 1950 than in either 1949 or 1947.

As indicated in table 1, farmers are putting more of their forage crops into silos. In 1950, 21 percent of total cropland was used for silage as compared to 17 percent in 1949 and 5 percent in 1947. Meanwhile hay acreages declined from 48 percent in 1947 to 32 percent in 1949, and 29 percent in 1950<sup>4</sup>. Farmers are also making greater use of improved pastures. Seeded pasture increased from 11 percent of total cropland in 1947 to 17 percent in 1949, and 19 percent in 1950.

Most important among factors determining the size and extent of an individual's farm operations is the amount of cleared land available for crop production and improved pastures. Lack of cleared land has especially handicapped dairy development in the Matanuska Valley. Some cash crop and poultry farmers want to change to dairy farming but cannot until they expand their acreage of cropland sufficiently to produce enough feed for a dairy herd. Other farmers already in Grade A production have herds

<sup>4</sup> See "Better Forage for Alaska" by Sweetman, W. J., Hodgson, H. J., and Mick, A. H., Alaska Experiment Station Circular No. 12, for recommendations on how to make better and lower cost forage.

Table 1.—Land use: Average acres per farm, proportion of farms reporting, and proportion of cropland in specified crops by types of farm, Matanuska Valley, 1947, 1949 and 1950 <sup>a</sup>

Land use	Type of farm									All farms		
	Dairy			Potato			Poultry					
	1947	1949	1950	1947	1949	1950	1947	1949	1950	1947	1949	1950
Number of farms -----	30	27	33	12	20	23	11	8	9	78	77	79
Cropland	<i>Average acres per farm</i>											
Potatoes -----	3	2	1	12	10	6	2	4	2	5	5	3
Vegetables & fruit -----	1	1	(c)	1	1	1	1	1	1	1	1	1
Small grain -----	12	10	12	15	7	4	11	5	13	10	6	8
Hay <sup>b</sup> -----	42	25	23	19	9	10	11	10	2	26	15	14
Silage -----	7	20	22	--	1	2	--	--	4	3	8	10
Green manure <sup>b</sup> -----	--	--	(c)	--	--	1	--	1	(c)	--	--	1
Idle & fallow -----	1	1	(c)	5	4	3	2	2	3	4	4	2
Seeded pasture -----	12	14	17	3	3	4	1	2	2	6	8	9
Total cropland -----	78	73	75	55	35	31	28	25	27	55	47	48
Other land -----	83	156	139	129	150	138	65	54	74	100	137	121
Total land in farms -----	161	229	214	184	185	169	93	79	101	155	184	169
Cropland	<i>Percent of farms reporting</i>											
Potatoes -----	60	44	24	100	100	100	64	100	89	76	75	61
Vegetables & fruit -----	33	22	24	75	65	70	45	62	44	50	53	47
Small grain -----	60	70	73	92	65	43	55	38	78	58	52	56
Hay <sup>b</sup> -----	100	93	91	92	70	87	73	75	44	87	81	78
Silage -----	57	96	97	--	10	30	--	--	22	22	42	52
Green manure <sup>b</sup> -----	--	--	3	--	5	13	--	25	11	--	6	9
Idle & fallow -----	17	19	6	17	55	39	45	50	56	33	39	25
Seeded pasture -----	77	89	91	50	45	43	27	50	44	49	68	66
	<i>Percent of total cropland</i>											
Potatoes -----	4	3	1	21	28	19	7	16	8	9	11	6
Vegetables & fruit -----	1	1	--	2	3	3	2	4	4	2	2	2
Small grain -----	16	14	16	27	20	13	39	20	48	18	13	17
Hay <sup>b</sup> -----	54	34	31	34	25	32	41	40	7	48	32	29
Silage -----	9	28	29	--	3	7	--	--	15	5	17	21
Green manure <sup>b</sup> -----	--	--	--	--	--	3	--	4	(c)	--	--	2
Idle & fallow -----	1	1	--	10	12	10	7	8	11	7	8	4
Seeded pasture -----	15	19	23	5	9	13	4	8	7	11	17	19

<sup>a</sup> Data for 1947 are from the report by Mimms, O. L., Paschal, J. L., and Fuhrman, W. U., "Some Economic Aspects of Farming in Alaska", Tables 6 and 8, pp. 31 and 34. Values given therein are rounded to the nearest whole number.

<sup>b</sup> In 1947 crops plowed under for green manure were included with hay.

<sup>c</sup> One-half acre or less.



too small to yield adequate returns to cover expenses and family living costs; before they can increase their herds they must increase their acreage of cropland to produce feed required by a larger herd.

What hinders the expansion of cropland acreages on farms? A few operators have cleared and are using all potential cropland on their farms; there is little possibility that they can purchase an additional acreage near enough to farm economically. Most farmers, however, have some potential cropland still in timber or brush. The most important factor which prevents an increase in cropland acreages is therefore not a limited land supply but the high cost of clearing and improving it. For example, 22 farmers who cleared fields in 1950 reported dozing costs that averaged \$75 an acre; some of this land had been previously slashed. Moreover, dozing is only one step in creating productive cropland. Initial preparation includes heavy breaking, together with picking up sticks and stumps and hauling them off the land. In addition, most fields need heavy applications of fertilizer the first year. To convert raw timberland into cropland is both an expensive and time-consuming task. It is estimated that productive cropland costs from \$100 to \$200 per acre at recent price levels. About half of the farmers visited in 1950 had cleared a total of 259 acres that year. Although dairy farmers had cleared more land than other types of farms in 1948 and 1949, there was little difference among farming types in the clearing accomplished during 1950.

### Capital Investments

Livestock, farm service buildings, power and equipment comprise those overhead costs and long-term investments referred to as capital goods. They represent large sums of money spent so infrequently — at intervals from 3 to 30 years — that many farmers sometimes overlook annual charges that must in the end be paid from farm earnings.

The guide to maximum economy in the use of any capital good is not alone that it will pay for itself by the service it renders in production, but that it will enhance net returns to a greater extent than alternative goods or possibilities that may be employed in its place. In a farm business, capital goods used in production must fit into the general farm organization pattern for best results. To employ the largest type of tractor on a 5-acre garden plot, or to build an enormous barn in which to house 3 milk cows is readily discerned as uneconomic use of resources and is therefore poor management. A farmer may have too much or too little space to house his cattle, too many or too few dairy animals for available cropland, too much or too little machinery for the farming he does. He may be using machinery that is obsolete for his purposes; or he may have too much money tied up in a modern machine when an older, less costly machine would serve just as well. Successful farmers are constantly alert for possibilities of increasing their earnings by practicing economy in the use of all farm resources.

Dairy animals and poultry are the only livestock grown on a commercial scale in the Matanuska Valley. The greatest change in capital investments is that revealed by livestock farm records which show a trend toward greater commercialization and less diversification. In 1947, 82 per-

cent of those farmers interviewed kept one or more milk cows (table 2); in 1949 only 74 percent kept milk cows and by 1950 the proportion was down to 71 percent. Approximately 38 percent of farmers other than dairymen were keeping milk cows in 1949, as compared to 24 percent in 1950. A similar trend is noted in poultry. Seventy-four percent of all farmers in 1947 kept poultry, as against 49 percent in 1949 and 53 percent in 1950. In other words, the trend since 1947 has been toward fewer farmers keeping cows and hens solely to supply milk and eggs for the farm table. This, in turn, indicates continued organization of farms along more commercial, less self-sufficient lines.

There was no significant difference in the proportion of farmers owning different kinds of equipment in 1949 and 1950. Over 75 percent of the Matanuska Valley farmers owned trucks, wheel-type tractors and tractor

Table 2.—*Livestock: Average number per farm and proportion of farms reporting specified kind, Matanuska Valley, 1947, 1949 and 1950*

Kind	Dairy farms			All farms		
	1947 a	1949 b	1950 b	1947 a	1949 b	1950 b
Number of farms-----	30	27	33	78	77	79
	<i>Average number per farm</i>					
Milk cows-----	12	13	14	6	5	7
Dairy heifers-----	3	4	4	2	2	2
Dairy calves-----	2	3	5	1	2	3
Poultry-----	78	49	30	98	74	73
	<i>Percent of farms reporting</i>					
Milk cows-----	100	100	100	82	74	71
Dairy heifers-----	80	96	97	60	60	57
Dairy calves-----	67	89	82	45	53	63
Beef animals-----	13	11	21	12	12	23
Bulls-----	53	18	21	23	12	10
Poultry-----	67 <sup>c</sup>	33	39	74 <sup>c</sup>	49	53

a "Some Economic Aspects of Farming in Alaska", Table 10, p. 37. All data are rounded to whole numbers; as of January 1.

b As of December 31.

c Does not include poultry other than chickens.

plows; and nearly the same number owned spring- or spike-tooth harrows (table 3). About half had disk harrows and cultivators. Approximately 40 percent owned automobiles, grain drills, wheel hoes, grain binders, and potato diggers.

Kinds and number of buildings on farms were about the same in 1950 as in 1949. Among the 79 farms were 73 barns, 51 upright silos, 6 trench silos, 80 poultry houses, 22 greenhouses, 5 granaries, 21 milk houses separate or in addition to the barn, and 41 sheds of various kinds. Average investment in livestock, equipment and buildings on December 31, 1950, was \$13,688 for all farms in the survey. Average valuation for livestock was \$3,670. Dairy farm investments in livestock were naturally much greater than for other types of enterprises. Service building and equipment average investments (exclusive of livestock) were \$6,663 and \$3,355 for all farms, respectively (table 4). Values on individual farms varied from \$351 to \$8,082 for equipment and from \$375 to \$19,373 for service buildings.

**Crop Yields, Farm Income and Expenses**

Average crop yields in 1950, together with comparisons for 1949 and 1947, are given in table 5. Oat yields reported by individual farmers usually have ranged from 30 to 40 bushels per acre, wheat from 15 to 25 bushels, and barley from 20 to 30 bushels. In 1950 mixtures of wheat and oats for grain yielded 30 bushels per acre on 20 acres. Fifty-six acres of oat-pea mixture were threshed, yielding 41 bushels per acre. Oat-pea and

Table 3.—*Equipment and buildings: Proportion of farms reporting specified kinds, Matanuska and Tanana Valley, 1949 and 1950*

Kind	Matanuska Valley		Tanana Valley
	1949	1950	1950
	Percent	Percent	Percent
Equipment			
Automobile -----	34	39	39
Truck -----	82	78	78
Tractor			
Wheel -----	94	81	61
Track -----	4	6	17
Tractor plows -----	82	77	61
Grain drill -----	40	39	22
Potato planter -----	30	27	39
Harrows			
Disk -----	61	56	72
Spring & spike -----	82	73	67
Packers -----	39	33	5
Breaking plows -----	21	15	--
Wheel hoes -----	49	37	28
Cultivators -----	53	52	33
Mowers -----	29	23	22
Hay rakes -----	36	26	22
Silo filler -----	22	22	--
Grain binder -----	43	43	11
Thresher -----	5	4	--
Potato digger -----	44	39	44
Potato picker-upper -----	13	14	--
Electric motors -----	39	29	--
Manure spreader -----	29	27	11
Fertilizer spreader -----	26	34	22
Buzz saw -----	25	18	17
Wagons & trailers -----	9	14	22
Milking machine units -----	34	32	--
Garden planters -----	9	11	--
Ensilage cutters -----	--	8	--
Service buildings			
Barn -----	87	78	17
Upright silo -----	39	42	--
Trench silo -----	11	8	--
Poultry house -----	74	67	22
Greenhouse -----	32	25	--
Milk house -----	(a)	27 <sup>b</sup>	--
Sheds, granaries, etc. -----	40	46	61
Garage -----	17	19	17

a Not reported separate from barns in 1949.

b Separate from barns.

oat-pea-vetch mixtures cut from hay usually have produced from 1 to 1½ tons per acre and when cut for silage, from 4½ to 5½ tons. Over 2½ tons of hay per acre were cut from one 15-acre plot of bromegrass in 1950.

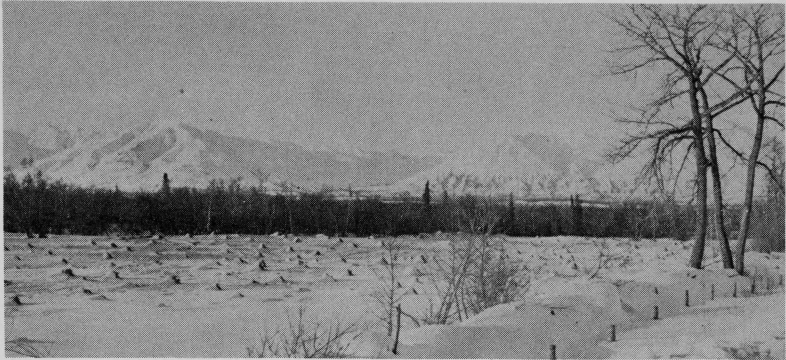
The 1950 potato crop averaged 7½ tons per acre of which 5¾ tons were saleable. This was slightly higher than that obtained in 1949. It exceeded the 1947 yield, when potatoes suffered from a late dry spring, by 44 percent. Carrots were reported to yield from 4 to 7 tons per acre, cabbage from 3 to 8 tons, turnips and rutabagas about 10 tons, and lettuce from 3 to 7 tons per acre. Because only small acreages were involved, these figures for vegetable yields in 1950 must be used with caution; they serve as a guide which will become more reliable as data are accumulated from year to year.

Publicity depicting Alaska as the "last frontier" and emphasizing its favorable aspects has created a desire in many Stateside residents to see and live in this new land. Many visitors are farmers by trade and their interest in farm returns, as well as the interest of others already in the Territory, has given rise to many conflicting opinions that cannot be rationalized until adequate cost records have accumulated.

Table 4.—*Equipment and buildings: Average farm capital investments in the Matanuska and Tanana Valley, 1950*

Capital investment	Matanuska Valley, by type of farm					Tanana Valley, all farms	
	Dairy	Potato	Poultry	Others	All farms		
	<i>Dollars</i>					<i>Dollars</i>	<i>Dollars</i>
Power & equipment							
Maximum -----	7,772	6,147	8,082	5,411	8,082		
Minimum -----	1,022	940	2,507	351	351		
Average -----	3,749	2,837	4,312	2,500	3,355	3,717	
Service buildings							
Maximum -----	19,373	13,239	6,770	10,853	19,373		
Minimum -----	3,680	956	2,766	375	375		
Average -----	8,881	5,023	5,433	4,315	6,663	2,180	

Farm return figures are in themselves apt to be misleading. Several other factors must be considered in studies of farm incomes and profits. Most difficult of these factors to isolate and compare with Stateside farm enterprises are the elements of risk. Alaskan crops are particularly vulnerable to adverse weather conditions during their short growing season. The considerable proportions of crops lost each year is difficult to estimate; more important, there is no way to insure against either partial or complete crop failures in Alaska. The market for Alaskan grown products is also risky. Vegetable producers are especially harassed by changing demands for locally grown products and by over-production within season. Dairy and potato farmers have better established outlets. Even so, Alaskan farmers have no price supports to counter-act risks of extreme price declines. Other things being equal, greater incentive either in the form of cash returns, in farm products used in the home, or in other less tangible assets are necessary to induce farmers to invest their capital and efforts in Alaska where great risks are involved in farming.



Oat-pea shocks were left in this field to "freeze dry". They were chopped loose with an axe and hauled to the barn as needed. This kind of management produces expensive, low grade roughage.

Another factor to consider in comparing Alaska's farm returns with Stateside farm returns is the higher level of prices in Alaska. It costs more to grow crops and livestock products in Alaska. The successful farmer must obtain a greater margin between production costs and market prices to adequately compensate for his higher living costs. Although this factor is less difficult to gauge than weather or market risks, it requires basic and reliable price statistics which are unavailable at present. Alternative opportunity for employment, size of enterprise, and managerial ability are factors that also influence fluctuations in Alaskan farms and therefore affect comparisons between areas and types of farms. Off-

Table 5.—Crops: Farms reporting, total acreage and average yields, Matanuska and Tanana Valleys, 1947, 1949 and 1950

Crop	Matanuska Valley 1950		Average yields per acre					
	Farms reporting	Total acres	Matanuska Valley			Tanana Valley		
			1947 <sup>a</sup>	1949	1950	1949	1950	
Potatoes								
Total ----- Tons	40	200	5.2	7.3	7.5	4.2	6.9	
U.S. No. 1 --- do	40	200	---	5.5	5.8	3.3	5.2	
Grain								
Oats ----- Bushels	28	366	32	37	33	--	--	
Wheat ---- do	16	122	15	25	20	--	--	
Barley ---- do	8	22	21	21	26	--	--	
Wheat & oats do	1	20	--	--	30	--	--	
Oat-pea grain do	4	56	--	--	41	--	--	
Oat-pea hay ---- cwt	42	848	22	30	29	24	28	
Grass hay ---- do	1	15	--	--	53	--	--	
Oat-pea silage ---- do	23	456	104	92	93	--	--	
Carrots ---- do	5	6	90	130	99	50	68	
Cabbage ---- do	4	5	63	146	141	160	152	
Turnips & rutabagas ---- do	2	1	--	--	226	--	100	
Beets ---- do	2	2	--	--	126	--	--	
Lettuce ---- do	6	4	64	100	125	--	96	
Celery ---- do	--	--	177	320	--	--	--	

<sup>a</sup> "Some Economic Aspects of Farming in Alaska", Table 9, p. 36.

Table 6.—Financial summary: Average income and expenses by type of farm, Matanuska and Tanana Valleys, 1950

Item	Matanuska Valley, by type of farm				Tanana Valley potato farms <sup>a</sup>
	All farms	Dairy	Poultry	Potato	
	Dollars	Dollars	Dollars	Dollars	Dollars
<b>AVERAGE EXPENSES</b>					
Cash					
Feed -----	1,510	2,197	3,436	269	37
Livestock & poultry -----	697	1,069	490	582	47
Labor -----	607	979	351	419	864
Machinery -----	575	543	672	627	872
Building improvements -----	434	708	153	304	439
Fuel & oil -----	364	504	336	263	222
Seed -----	335	560	136	204	289
Custom work -----	332	347	174	387	159
Fertilizer -----	311	387	124	325	463
Equipment repair -----	256	367	202	196	174
Interest -----	153	231	102	89	68
Taxes -----	106	167	45	59	87
Rent -----	101	191	82	38	42
Veterinary & breeding -----	93	192	32	25	2
Electricity -----	88	128	117	41	--
Hauling milk -----	87	207	--	8	--
Insurance -----	56	76	46	40	32
Auto & truck license -----	11	12	11	10	8
Miscellaneous -----	164	188	265	116	156
Total -----	6,280	9,053	6,774	4,002	4,005 <sup>e</sup>
<b>AVERAGE INCOME</b>					
Cash					
Milk -----	5,189	10,568	---	188	---
Potatoes -----	1,421	560	1,183	3,233	4,307
Eggs -----	737	302	4,266	158	---
Livestock & poultry -----	522	647	1,189 <sup>b</sup>	188	23 <sup>c</sup>
Vegetables & fruit -----	316	59	84	398	490
ACP payments -----	81	112	20	45	23
Custom work -----	64	32	331	37	10
Co-op overage & dividend -----	60	100	45	10	---
Machinery & buildings -----	42	20	68	63	---
Grain & hay -----	31	17	---	80	---
Timber -----	21	---	145	18	---
Rent -----	3	4	---	4	---
Non-farm -----	1,096	355	1,909	1,754	1,363
Total -----	9,583	12,776	9,240	6,176	6,216
Non-cash					
Increase in livestock -----	687	981	360	689	45
Increase in equipment -----	194	59	238	303	598
Increase in building -----	159	89	217	336	---
Produce used at home -----	650 <sup>d</sup>	650 <sup>d</sup>	650 <sup>d</sup>	650 <sup>d</sup>	262
Total -----	1,690	1,779	1,465	1,978	905
Gross income -----	11,273	14,555	10,705	8,154	7,121
<b>NET RETURNS</b> -----	4,993	5,502	3,931	4,152	3,116

<sup>a</sup> The annual average was computed from the combined 1949 and 1950 data.

<sup>b</sup> One farmer was raising poultry for meat instead of egg production.

<sup>c</sup> Includes eggs, milk and meat sales.

<sup>d</sup> An assumed value based on previous studies; includes game and fish consumed.

<sup>e</sup> Includes \$44 in non-cash expenses attributed to decrease in building inventories.

farm employment opportunities in the Matanuska Valley have been good in recent years. The small size of farm businesses and the difficulties encountered in farm expansion create tremendous pressures toward off-farm employment. All of these many tangible and intangible elements must be kept in mind when comparing Alaskan farm incomes with farm incomes elsewhere.

Average expenses in 1950 amounted to \$6,280 per farm on all farms studied (table 6). Largest expense items were for feed, livestock and poultry, labor and machinery. Feed costs accounted for about a fourth of all farm expenses. Average gross returns for all farms was \$11,273, 85 percent being in the form of cash income. Fifteen percent was non-cash income from increases in livestock, equipment and building inventories and in the value of farm produce, game and fish used in the home. Milk sales accounted for 54 percent of the average cash income for all farms and potato sales for 15 percent as compared to 38 and 30 percent, respectively, in 1949. These changes spotlight the increase in dairying and decrease in potato farming in the Matanuska Valley.

Net returns on the farms studied averaged \$4,993 per farm, excluding the rental value of the farm dwelling. Non-farm income accounted for about a fifth of the average total net income for all farms.

## THE TANANA VALLEY

In 1950 records were collected from 18 farms (the 2 commercial dairies and the hog "ranches" feeding garbage collected from nearby military installations were not included in the study). Although these records are too few in number to reflect significant trends or to furnish adequate cost and income averages, they are valuable in describing agriculture as it exists in that area. A notable fact about farms in the vicinity of Fairbanks in 1950 was their similarity in scope and organization to that found in 1949. In both years some 30 part-time and full-time units marketed between \$150,000 and \$200,000 worth of farm produce. As stated in the 1949 report, the type and size of farm organization has limited possibilities of expanding at present; no appreciable development has therefore occurred outside the area previously described. Several farmers and homesteaders were interested in developing small Grade A dairies to increase supplies of locally produced whole milk.

Farmers in the Fairbanks area were either relatively young or past middle age, and almost half of them were single men. Eight out of 18 farmers queried in 1950 were less than 40 years old while 9 were over 50; 8 of the 10 full-time farmers were over 50 years old. Only 10 farmers were married and 4 of these had no children. Fourteen farmers had some



A fairly well-developed homestead on the Kenai Peninsula near Homer. Further development is hampered by limited marketing opportunities. Natural grass cover interspersed with scattered spruce groves on the slopes in the back-ground is characteristic of this area.

experience before coming to Alaska but only a few had actually been in charge of planning and operating a farm<sup>5</sup>. Seventeen farmers owned all or most of the land they farmed.

## Farm Size and Land Use Trends

Records indicate only a slow increase in the amount of cleared land in farms in the Fairbanks area. Of 18 farmers, 8 cleared a total of 78 acres in 1950. On the other hand, some land that had already been in production was being abandoned as indicated by considerable cropland lying idle on the farms studied; a few farmers queried in earlier studies had entirely quit farming and their farms were partially or completely idle.

Tanana Valley farmers reported a total of 4,050 acres in their farms, for an average of 225 acres per farm; this average was distorted upward by several large holdings of brush and timber land. Only 12 percent, or 484 acres, of this total was cropland. The average was 27 acres per farm as compared to 30 acres for farms visited in 1949 (table 7). Idle and fallow land was slightly greater in 1950, leaving only 16 acres per farm actually cultivated as compared to 21 acres in 1949.

Although 15 of the 18 farmers grew potatoes only 9 were classified as potato farms. Fifteen farmers grew vegetables although only 5 received more than half of their income from truck crops. Four farms were of other

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<sup>5</sup> Those with some farming experience had either lived on a farm in their youth or had operated farms in Iowa, Minnesota, Wisconsin, Idaho, North Dakota, California, Washington, Illinois, Arkansas, Kansas, Texas, Nebraska, New Jersey, Michigan, and Sweden.



**Inventories and Crop Yields**

types. The potato acreage per farm was lower than in 1949. Grain and hay acreage was reported by 4 and 7 farmers, respectively. Some of the grain was fed to poultry and some, along with the hay that was produced, was fed to a few goats, sheep and work horses.

Few Tanana Valley farmers kept livestock and poultry to supply meat, milk, butter and eggs for the farm table. A third of the farms had chickens on hand in December 1950, mostly in small flocks containing less than 50 hens. One farm was based on a specialized egg-laying flock of about a thousand hens. Five farmers had a total of 40 goats (one operator had 19 and the other 4 had from 2 to 9 goats each); several of these individuals expressed an interest in the economic feasibility of producing goat milk and meat for farm and possible commercial use. One farmer had a family milk cow and one had about 20 sheep, presumably for market meat production.

Other than dwelling houses, the most frequently reported buildings were sheds and root cellars (table 3). Equipment inventories increased in both 1949 and 1950. Most farmers owned trucks, tractors, plows, disk harrows, and spring- and spike-tooth harrows. Eleven had wheel-type and 3 had track-type tractors; two farmers depended entirely on horses. Seven farmers owned potato planters and 8 had potato diggers.

Yields in 1950 were somewhat higher than in 1949. Field run potatoes, for example, averaged 6.9 tons per acre as compared with 4.2 tons in 1949 (table 5). Cabbage yields were about the same in both years while carrots produced almost a ton per acre more than in 1950. Hay yields were slightly higher in 1950.

Table 7.—*Land use: Average acres per farm by types of farms, Tanana Valley, 1949 and 1950*

Land use	Type of farm						All farms	
	Potato		Vegetable		Others		1949	1950
	1949	1950	1949	1950	1949	1950		
Number of farms-----	10	9	4	5	3	4	17	18
	<i>Acres per farm</i>							
Cropland								
Potatoes -----	13	10	1	1	--	--	8	5
Vegetables & fruit --	1	2	6	7	1	2	3	3
Grain -----	--	2	--	--	4	--	1	1
Hay -----	3	1	--	2	9	8	4	3
Green manure-----	2	5	--	1	7	1	2	3
Fallow -----	8	2	--	2	--	--	4	1
Idle -----	4	7	9	9	5	14	5	10
Seeded pasture-----	3	--	8	5	--	--	3	1
Total -----	34	29	24	27	26	25	30	27
Other land -----	134	207	101	169	146	216	129	198
Total land -----	168	236	125	196	172	241	159	225

## TYPES OF FARMING<sup>6</sup>

The 79 farms studied in the Matanuska Valley in 1950 were classified according to their source of cash farm receipts. As in the 1949 study, when one enterprise contributed more than 50 percent to cash receipts, the farm was classed by that enterprise. Records were thus obtained from 33 dairy farms, 23 potato farms, 9 poultry farms, and 14 other types including 3 vegetable and 2 potato-vegetable farms (table 8). There were too few records available for vegetable and potato-vegetable types of farming to justify separate analyses.

The overall expansion of dairying in the Valley resulted in an increase in number of dairy farms in 1950. The number of potato farms also increased in 1950, while, as has been indicated, a notable reduction occurred in the number of potato-vegetable farms. Several former potato and potato-vegetable units were being reorganized for dairy operations. But the loss to the potato farm group in 1950 was more than compensated for by a movement from potato-vegetable farming to strictly potato farming.

More opportunity for off-farm employment has been an important factor contributing to changes in types of farming. Vegetable farming requires much labor throughout the summer. On the other hand, a homesteader or farm resident can prepare his land and plant potatoes in May and thereafter be relatively free for off-farm employment until the September harvest period. Poultry farming for egg production is also adaptable to off-farm employment. A higher proportion of both potato and poultry type farms were classified as part-time in 1950 than in 1949.

### Dairy Farming

Commercial dairy operations have been rapidly expanding in the Matanuska Valley. There were 35 Grade A dairies in 1947, 43 early in 1950 and 51 by June 1951. Other farmers are planning to meet Grade A specifications in the future, while a number of those already in production are building toward larger and better herds. This trend is due not only to a huge, well-established market but also to other fundamental advantages of livestock enterprises. Dairy farming is, for example, well adapted to full-time commercial operations. Labor requirements, cash expenses and cash income are distributed fairly well throughout the year. Thus the dairy farmer can plan and effectively utilize available family labor on a year-round basis; he can also efficiently balance the flow of his income and expenses. Those farmers growing their own roughage have managed to obtain favorable returns for their efforts.

Total Grade A fluid milk sold from Valley farms was about 2½ million pounds in 1947, over 3 million pounds in 1949 and more than 4 million pounds in 1950. Although the greatest portion of this increase is attributed to the increasing numbers of cows milked, average production per cow has also increased due to better feed management practices and herd improvements. Average annual production in 1947 was 7,200 pounds per

<sup>6</sup> Comparative data for Tanana Valley and Matanuska Valley potato growers are presented under the heading "Potato Farming". Otherwise, all discussion in this section refers to Matanuska Valley farms.

Table 8.—*Types of farms: Numbers and proportion that were part-time units, Matanuska Valley, 1949 and 1950*

Type of farm	Number of farms		Proportion of part-time units	
	1949	1950	1949	1950
	<i>Number</i>		<i>Percent</i>	
Dairy -----	27	33	4	3
Potato -----	20	23	40	57
Potato-vegetable -----	12	(a)	17	(a)
Poultry -----	8	9	38	56
Other -----	10	14	50	71
Total -----	77	79	25	37

a No separate analyses were made for 2 potato-vegetable and 3 vegetable farms included in the 1950 survey.

cow; in 1949 and 1950 this value increased to 7,900 and 8,300 pounds per cow respectively<sup>7</sup>. Of this annual production around 3,000 pounds per farm was used in the home and for feeding calves.

Most dairy farmers produced all their roughage requirements. About 75 percent grew small grains which they ground and mixed with commercial dairy concentrates. Average feeding per animal unit was 2,100 pounds of concentrate, 6.1 tons of silage and 1.8 tons of field-cured hay. From 3 to 5 months of pasture were available for most dairy herds. Rough estimates place the total digestible nutrients available per cow at about 7,600 pounds.

*Organization.*—The 33 dairy farms included in the 1950 survey had an average of 75 acres of cropland as compared to 73 acres in 1949 and 78 acres in 1947. As shown in table 1, most of this cropland was used to produce grain, roughage and pasture. Most significant of the trends noted in land use on dairy farms during the three year period are: (1) a continuous increase in the proportion of cropland used for silage; (2) an increase in the proportion of cropland seeded to pasture; (3) an increase in number of dairy farmers growing grain, even though the acreage each farmer devoted to grain production has remained about the same; (4) a decrease in the proportion of cropland used for field-cured hay; and (5) a decrease in cropland used for purposes other than production of dairy feeds, (in other words, a decrease in acreage devoted to potato and vegetable production and a decrease in idle cropland). These changes in land use are movements toward greater specialization in dairy farming and greater efficiency in dairy production.

Because the number of dairy farms has increased from 35 to 51 in a 3-year period and most newcomers usually start out with only a few cows, one might be led to expect that the number of milk cows per farm might be decreasing. The records indicate, however, an overall movement in the direction of larger commercial dairy herds in the Valley. The average number of milk cows was 14 per farm on December 31, 1950 (table 2) as

<sup>7</sup> The latter figures were based on the average of the beginning and ending inventories of milk cows and since a number of farmers increased their milking herds early in the year, these values may be biased slightly upward.



Antiquated hay-baler was the only one available in the Matanuska Valley in 1950. Here it is used to put up first cutting of bromegrass hay in early July. Baled bromegrass is sold to local farmers and to hunting guides who maintain pack horses. Prices range from \$70 to \$90 a ton.

compared to 13 the preceding December and 12 per farm in 1947. Numbers of dairy heifers and dairy calves on farms have also increased, accompanied by a marked increase in the proportion of farms on which heifers and calves were reported. Decreasing numbers of herd bulls in 1947, 1949 and 1950 (table 2) show the effect of the Experiment Station's artificial insemination program; by 1950 an estimated 85 percent of all dairy farmers were cooperating in this program which was initiated in early 1948. Decrease in size of poultry flocks on dairy farms and the fewer number of dairymen keeping poultry in 1950 is another indication of movement toward more specialized dairy farming in the Valley.

Dairy farmers had an average investment of \$3,749 in equipment and of \$8,881 in service buildings in 1950 (table 4). Newcomers whose investments were lower than the 1949 average were the major cause of reductions in inventory values for both equipment and service buildings in 1950; proof of this lies in the fact that dairy farmers studied in both 1949 and 1950 increased their inventory values of both equipment and service buildings during the year. Investment in equipment on dairy farms was higher than the average for all farms studied, and greater than the average for potato and miscellaneous types of farms; it was less than the average investment in equipment on poultry farms. Average service building evaluations were also greater for dairy than other types of farms, being 63 percent more than for poultry farms which were the next highest type. Barns to house livestock during long severe winters, storage buildings for feed and supplies, and milk rooms that meet Grade A specifications account for most of this higher building investment.

*Grain Production.*—Detailed information on grain production requirements and practices were obtained from 25 farms. Some additional information concerning varieties, fertilizer applications, yields and crop disposal was gleaned from other records.

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The 79 farmers grew 623 acres of grain in 1950; 58 percent of this acreage was in oats, 23 percent in wheat, 4 percent in barley and 15 percent in mixed grain. By varieties, 53 percent of the oat acreage was planted to Victory, 40 percent to Swedish Select and 7 percent to Gopher; 83 percent of the wheat acreage was seeded to Khogot and 17 percent to Marquis; 59 percent of the barley acreage was planted to Trapmar, 26 percent to Olli and 15 percent to Markhinetz. Average seeding rates for wheat, oats and barley grain were 88, 94 and 104 pounds per acre respectively; most frequently used seeding rate was 100 pounds per acre. Commercial fertilizers were applied at an average rate of 134 pounds per acre on 245

Table 9.—*Grain: Labor distribution and tractor-hours required per acre by operation, Matanuska Valley, 1949 and 1950*

Operation	Usual time of performance	Size		Man-hours used per acre		Tractor-hours used per acre	
		Times of	over crew	1949	1950	1949	1950
	Date	Number		Hours		Hours	
<b>Preharvest</b>							
Plowing -----	May 1-25	1	1	0.9	0.8	0.9	0.8
Disking -----	do	1-3	1	0.3	0.4	0.3	0.4
Seeding <sup>a</sup> -----	do	1-2	1	0.3	0.3	0.3	0.3
Harrowing -----	May 1-Jun.10	1	1	0.6	0.6	0.6	0.6
Total preharvest -----				2.1	2.1	2.1	2.1
<b>Harvest</b>							
Binding -----	Sept. 1-10	1	2	1.7	1.4	0.9	0.8
Shocking -----	Sept.15-Oct.20	1	1-3	2.1	1.6	---	---
Threshing <sup>b</sup> -----	After Oct. 1	1	3-8	5.3	3.6	0.5 <sup>c</sup>	0.2 <sup>c</sup>
Total harvest -----				9.1	6.6	1.4	1.0
<b>TOTAL</b> -----				11.2	8.7	3.5	3.1

<sup>a</sup> Includes fertilizing and packing.

<sup>b</sup> Includes hauling from field to thresher.

<sup>c</sup> In addition, an average of 1.3 truck-hours and 0.5 thresher-hours were used per acre in 1949 and 1.2 truck-hours and 0.5 thresher-hours in 1950.

acres, or 39 percent of the total land in grain. Average acre applications of available plant nutrients amounted to 10 pounds of total nitrogen, 37 pounds of available phosphoric acid and 4 pounds of water-soluble potash <sup>8</sup>.

Amounts of labor and power used in specific operations for grain production in 1949 and 1950 are given in table 9. Man-hours required to produce an acre of grain decreased from 11.2 in 1949 to 8.7 in 1950. Preharvest labor requirements were the same in both years, but less time was necessary for harvest in 1950 than in 1949, an indication of increasing efficiency. Tractors were used slightly over 3 hours per acre, with two-thirds of the time spent on preharvest operations. Trucks were used about one and one-third hours. Threshers were used for ½ hour per acre in both 1949 and 1950.

Table 10 presents amounts and costs of seed, fertilizer, labor and specified items of machinery time required to produce grain during 1949 and 1950. Records provided by the study were considered insufficient in

<sup>8</sup> See Alaska Experiment Station Circular 13 for general fertilizer recommendations for Alaska.

number to supply overhead costs for grain. This summary therefore excludes equipment costs for other than tractor, truck and thresher time calculated at custom rates; it also excludes charges for land, buildings and other fixed overhead costs that are usually assessed against farm operations. Of these total direct grain production costs, 33 percent in 1949 and 37 percent in 1950 were for items for which a farmer normally pays cash; these costs in 1950 were about \$5.00 per acre less than in 1949. Even though the acre costs were lower in 1950, yields in 1949 were considerably higher so that the average cost of 100 pounds of grain was \$3.34 in 1950 as compared to \$3.00 the year before.

Table 10.—*Grain: Seed, fertilizer, labor and power requirements and costs of producing an acre of grain, Matanuska Valley, 1949 and 1950*

Cost	Average requirement per acre		Average cost per acre	
	1949	1950	1949	1950
	<i>Cwt</i>		<i>Dollars</i>	
Cash				
Fertilizer -----	0.4	0.5	2.40	2.67
Seed -----	1.0	0.9	7.35	6.80
	<i>Hours</i>			
Threshing-custom -----	0.5	0.5	4.20	4.27
Total -----			13.95	13.74
Non-cash				
Labor <sup>a</sup> -----	10.7	8.2	16.05	12.30
Tractor -----	3.5	3.1	8.75	7.75
Truck -----	1.3	1.2	3.25	3.00
Total -----			28.05	23.05
<b>TOTAL -----</b>			<b>42.00</b>	<b>36.79</b>

<sup>a</sup> Custom threshing is listed as a cash item, and includes the operator's time.

*Hay and Silage production.*—Of the total forage crop acreage harvested in 1950, 42 percent was processed into silage while 58 percent was field-cured for hay; in 1949 only a third of the forage acreage was made into silage. Along with the increased use of silage in recent years has been a mounting interest in the comparable costs of feeding silage and field-cured hay; comparison of records collected in 1949 and 1950 furnishes information on the variable production costs involved.

Common seeding rates for oat-pea mixtures were 100 pounds of oats to 20 or 30 pounds of peas. For an oat-pea-vetch mixture the rates were 100 pounds of oats, 15 to 20 pounds of peas, and 5 to 10 pounds of vetch. There were no noticeable differences in seeding rates in 1949 and 1950. Commercial fertilizers were applied on only 42 percent of the total forage acreage. Applications averaged 68 pounds for all acreage in forage crops as compared to only 53 pounds in 1949. Calculated on the basis of acres actually treated, fertilizer applications averaged 144 pounds which included 27 pounds of total nitrogen, 24 pounds of available phosphoric acid and 5 pounds of water-soluble potash.



Alaska's dairymen are expanding their acreages of improved seeded pasture. This brome-grass pasture is an experimental field at the Fairbanks Experiment Station. (Courtesy the Soil Conservation Service)

Average labor required to produce an acre of shocked field-cured oat-pea hay was slightly over 9 hours in 1950 as compared to over 10 in 1949 (table 11); about one-fifth of this labor was used for preharvest operations. A little more labor is apparently required to produce, harvest and

Table 11.—Hay and silage: Labor distribution and tractor-hours required per acre by operation, Matanuska Valley, 1949 and 1950

Operation	Usual time of performance	Size		Man-hours used per acre		Tractor-hours used per acre	
		Times over	crew	1949	1950	1949	1950
	Date	Number		Hours		Hours	
<b>Preharvest</b>							
Plowing -----	5-1—6-10	1	1	0.9	1.0	0.9	1.0
Disking -----	5-1—6-10	1-3	1	0.3	0.2	0.3	0.2
Harrowing -----	5-1—6-30	1-2	1	0.3	0.2	0.3	0.2
Seeding <sup>a</sup> -----	5-10—6-20	1	1	0.7	0.5	0.7	0.5
Total -----				2.2	1.9	2.2	1.9
<b>Harvest</b>							
Binding -----	8-15—10-15	1	2	1.7	1.9	0.9	1.1
Shocking hay ---	8-20—10-20	1	1-6	2.5	2.3	---	---
Storing hay ----	10-1 & later	1	1-4	3.8	3.1	(b)	(b)
Storing silage --	9-1—10-20	1	2-9	7.0	5.4	(b)	(b)
Total -----							
Hay -----				8.0	7.3	0.9	1.1
Silage -----				8.7	7.3	0.9	1.1
<b>TOTAL</b>							
Hay -----				10.2	9.2	3.1	3.0
Silage -----				10.9	9.2	3.1	3.0

<sup>a</sup> Includes fertilizing and packing.

<sup>b</sup> Trucks were used 1.9 hours per acre for hauling hay in 1949 and 1.1 hours in 1950. For silage, truck-hours per acre were 1.3 in 1949 and 1.7 in 1950.

Table 12.—*Hay and silage: Seed, fertilizer, labor and power requirements and costs of producing an acre of hay or silage, Matanuska Valley, 1949 and 1950*

Cost	Average requirement per acre		Average cost per acre	
	1949	1950	1949	1950
	<i>Cwt</i>		<i>Dollars</i>	
Cash				
Fertilizer -----	0.53	0.68	2.46	3.78
Seed -----	1.25	1.25	12.09	9.25
Total -----			14.55	13.03
	<i>Hours</i>			
Non-cash				
Hay				
Labor -----	10.2	9.2	15.30	13.80
Tractor -----	3.1	3.0	7.75	7.50
Truck -----	1.9	1.1	4.75	2.75
Total -----			27.08	24.05
Silage				
Labor -----	10.9	9.2	16.35	13.80
Tractor -----	3.1	3.0	7.75	7.50
Truck -----	1.3	1.7	3.25	4.25
Total -----			27.35	25.55
TOTAL				
Hay -----			42.35	37.08
Silage -----			41.90	38.58

put up an acre of silage. Tractors were used an average of about 3 hours each year in making both shocked field-cured hay and silage. Truck usage varied somewhat but averaged about 1½ hours per acre.

Although average costs were somewhat lower in 1950 than in 1949, in neither year was there a significant difference between the cost of producing, harvesting and storing silage and shocked field-cured hay (table 12). Both cost about \$42 per acre in 1949, exclusive of overhead charges; in 1950 hay cost \$37 and silage cost \$38.50 per acre. In both years, cash costs were about one-third of the total. In 1950, a ton of hay cost about \$25.60 and a ton of silage about \$8.30.

*Income and Expenses.*—An average dairy farmer's cash expenses amounted to \$9,053 in 1950 (table 6); his largest items of cash expense were feed, livestock purchases, and hired labor which accounted for 24, 12 and 11 percent, respectively, of the total. In this year, his total cash income was \$12,776, 83 percent of which came from milk sales. During 1950 the average dairy farmer increased his inventory valuation by some \$1,129. These items, plus an assumed value of \$650 for farm produce, meat and fish used in the home, gave him a total income of \$14,555.

The average dairy farmer's 1950 net income was \$5,502, with individual farmers reporting returns that varied from a loss of \$1,200 (excluding farm products used in the home) to a profit of more than \$11,000 (chart 3). The average net income on dairy farms was over \$1,000 greater than



on other types of farms. This marked a reversal of conditions in 1947 and 1949 when the dairymen's average income was considerably less. Higher milk prices, larger milking herds, and more efficient production and feeding practices were factors that helped increase the dairyman's profits in 1950.

### Potato Farming

In terms of numbers, potato farms are second only to dairy farms in Alaska. Potatoes are by far the most important cash crop in the Territory. Since 1947 from 60 to 75 percent of all commercial farmers have grown some potatoes for sale, and from 25 to 30 percent of all Matanuska Valley enterprises have been classified as potato farms.

Potato farming requires less investment in buildings and machinery and a smaller acreage of cropland than dairy farms. With the exception of the peak planting period in May and the harvest season in September, the grower is free from farm tasks most of the year. He utilizes this free time to increase cash income by working off the farm. Potato growers can use women and teen-age children to help with farm tasks in peak labor seasons. The main disadvantages of potato farming are: (1) income is usually in 1 to 4 lump sum payments not well distributed through the year, (2) considerable hired labor is needed during the harvest season when the labor supply is most critical, (3) there are no productive farm tasks for available family labor during most of the year, and (4) the grower is faced by severe weather hazards and market risks.

*Organization.*—Matanuska Valley potato growers had an average of 31 acres of available cropland in 1950 (table 1) as compared to 35 acres in 1949 and 55 acres in 1947; Tanana Valley growers had an average of 29 acres of cropland in 1950 of which 9 acres were idle and fallow (table 7). Most significant of the trends revealed by the 1947, 1949 and 1950 records



Potato growing requires a lot of seasonal labor. This Tanana Valley farmer was fortunate in being able to hire soldiers from nearby military posts. Working in their free time for \$1.25 to \$1.50 an hour (in 1950) they managed to save this valuable crop from unseasonably early frosts.



Chart 3.—Farm earnings: Net income and 1950 averages for 3 major types of farms in the Matanuska Valley, by farms reporting (excluding game, fish and farm products used in the home).

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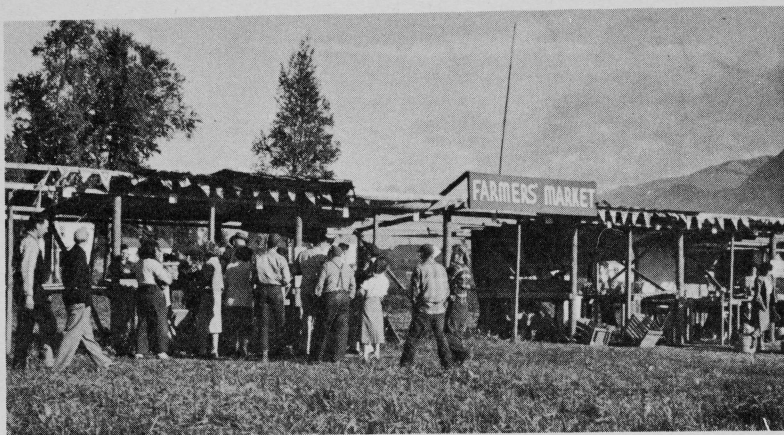
Table 13.—Potatoes: Labor distribution and tractor-hours required per acre by operation, Matanuska Valley, 1949 and 1950

Operation	Usual time of performance	Size of crew		Man-hours used per acre		Tractor-hours used per acre	
		Times over	Number	1949	1950	1949	1950
	Date	Number		Hours		Hours	
<b>Land preparation</b>							
Plowing -----	5-1—5-30	1	1	1.6	1.9	1.6	1.9
Disking -----	5-1—5-30	1	1	0.8	0.5	0.8	0.5
Harrowing -----	5-1—5-30	1-3	1	0.5	0.8	0.5	0.8
Other -----	5-1—5-30	1	1	0.3	---	0.3	---
Total -----				3.2	3.2	3.2	3.2
<b>Culture</b>							
Cutting & treating seed -----	5-1—5-30	1	1-4	7.7	7.9	---	---
Planting & fertilizing -----	5-10—5-30	1	1-3	4.0	5.5	2.0	2.7
Harrowing -----	5-20—6-15	1-2	1	0.4	1.0	0.4	1.0
Cultivating & hilling -----	5-20—7-20	1-7	1	4.1	5.1	4.1	5.1
Weeding & hoeing -----	6-10—8-10	1-2	1-4	3.6	8.6	---	---
Other -----	---	---	1-2	0.1	---	---	---
Total -----				19.9	28.1	6.5	8.8
<b>Harvest</b>							
Beating down vines -----	9-5—9-30	1	1	0.4	---	0.4	---
Digging -----	9-10—9-30	1	1-2	2.2	2.3	2.2	2.3
Picking up & sacking -----	9-10—9-30	1	2-12	34.1	33.3	---	---
Hauling -----	9-10—9-30	1-2	1-4	4.6	8.1	(a)	(a)
Total -----				41.3	43.7	2.6	2.3
Grading -----	10-1 —5-1	1-2	2-7	15.5 <sup>b</sup>	24.4 <sup>b</sup>	---	---
<b>TOTAL</b> -----				<b>79.9</b>	<b>99.4</b>	<b>12.3</b>	<b>14.3</b>

a An average of 2 truck-hours in 1949 and 3 truck-hours in 1950 were used for hauling.  
 b The 1949 data on grading was based on only 2 growers' estimates of grading time at the co-operative bins. The average time for 1950 is based on 12 cases and includes grading at the grower's storage as well as at the co-operative bins.

was a steady decline in average acreage planted to potatoes. The average Matanska Valley potato farmer grew 12 acres of potatoes in 1947, 10 in 1949 and 6 in 1950; average acreages in the Tanana Valley showed a similar decline during this period. Accompanying this trend has been an increase in the number of part-time potato farmers. Also noticeable was the decreasing acreage of small grains grown by Matanuska Valley potato farmers. As in dairy type enterprises, these trends point toward ever-increasing specialization.

Records in 1950 reflect little change in the livestock setup on potato farms in the Matanuska Valley. About half of the growers kept one or more milk cows to supply milk and butter for the farm home, and about the same number kept small flocks of poultry.



First farmer's market in Palmer made a modest start in late 1950. This is a typical Saturday market.

In the Matanuska Valley, the average potato grower's 1950 investment in farm equipment was \$2,837, and in service buildings \$5,023 (table 4). These were slightly greater than his 1949 valuations. His investment in farm equipment and buildings was lower than that of dairy and poultry farmers. The estimated value of service buildings on Tanana Valley potato farms was lower than on Matanuska Valley farms, many Matanuska Valley potato farmers own standard "colony" buildings which are therefore apparently in excess of needs.

*Potato Production.*—Detailed enterprise cost records were obtained from 23 Matanuska Valley potato growers in 1949 and 16 in 1950. This data included information concerning varieties, fertilizer applications, acreages, and yields.

With the exception of a few small fields, all potato acreage in the Matanuska Valley was planted to the Arctic Seedling variety in both 1949 and 1950. Planting rates varied from 500 to 1,000 pounds, averaging a little over 750 pounds per acre. Most farmers planted "home grown" seed. Commercial fertilizer applications were higher in 1950, averaging 630 pounds per acre as compared to 517 in 1949. In terms of available plant nutrients, acre applications included 45 pounds of total nitrogen, 131 pounds of available phosphoric acid and 90 pounds of water-soluble potash. Most growers buy concentrated carriers and mix their own fertilizers in preference to buying ready-mixed grades.

Both Matanuska and Tanana Valley growers used from 90 to 100 hours of labor to produce, harvest, haul and grade an acre of potatoes (table 13), excluding time spent in marketing functions after their crop had reached their cooperative sheds. A similar value for the Pacific States of Washington, Oregon and California is 94 hours; for the United States as a whole, this labor requirement is considered to be 68 hours<sup>9</sup>. About

<sup>9</sup> Cooper, M. R., Holley, W. C., Hawthorne, H. W., and Washburn, R. S., Labor Requirements for Crops and Livestock, Bureau of Agricultural Economics, F. M. 40, May, 1943.

half of the labor required for potato production in Alaska was used during harvest. About one-fifth was used for grading. Slightly less than a third of the labor went to prepare the land, plant, cultivate and weed the crop.

Tractors were used from 12 to 15 hours per acre, and trucks from 2 to 3 hours. Most mechanized operations occurred before the crop was harvested. Some of the potato growers hauled their potatoes directly to

Table 14.—Potatoes: Seed, fertilizer, labor and power requirements and average total costs of producing an acre of potatoes, Matanuska Valley, 1950

Item	Quantity per acre	Unit cost	Average cost per acre
	<i>Pounds</i>	<i>Dollars</i>	<i>Dollars</i>
Variable costs			
Cash			
Fertilizer -----	630	0.053	33.48
Seed <sup>a</sup> -----	752	0.050	37.60
Seed dip <sup>b</sup> -----	1	2.25	2.25
Sacks	<i>Number</i>		
Harvest <sup>c</sup> -----	75	0.15	11.25
Market -----	115	0.25	28.75
Labor	<i>Hours</i>		
Picking up & sacking -----	33.3	1.50	49.95
Grading -----	24.4	1.50	34.88
Total -----			198.16
Non-cash			
Labor -----	41.7	1.50	62.55
Power			
Tractor -----	14.3	2.50	35.75
Truck -----	3.0	2.50	7.50
Total -----			105.80
Total cost -----			303.96
Overhead costs <sup>d</sup> -----			82.25
TOTAL -----			389.25

a Although most farmers use home grown potatoes for seed, it is entered as a cash item in lieu of the cash value involved.

b One pound per acre was assumed necessary.

c Field sacks last about 2 years.

d Breakdown of overhead costs includes \$34.50 per acre for equipment, \$40.75 for buildings, and \$10 per acre for land.

the cooperative storage bins as they were harvested. Others stored them on their farms and later hauled their crops to the cooperative sheds as storage bins became available, or for grading at the time of sale.

Because buildings and machinery are used for the entire farm business, it is difficult to determine just what part of their cost should be charged against a particular crop. In this study, the proportion of total product sales derived from potatoes was used as a guide. On the potato farms studied, potatoes were found to provide 73 percent of the total cash income from farm product sales; hence 73 percent of the total annual cost of equipment and service buildings was charged against the potato crop. This value was divided by the number of acres to obtain the cost per acre.

Following this method of computation, the equipment cost for growing potatoes was found to be \$34.50 per acre (table 14). This may be compared to \$13.35 per acre on irrigated farms in southern Idaho<sup>10</sup>. The difference can be attributed to higher prices for farm equipment, different production methods, and the small size of Alaskan enterprises where fields actually planted to potatoes averaged only 6 acres. Acre overhead costs for both machinery and buildings therefore cannot be other than relatively high. Building costs were calculated at \$40.75 per acre, while land charges were arbitrarily assessed at \$10 per acre. Total variable cost in producing an acre of potatoes amounted to about \$304. Cash variable costs comprised about two-thirds of this total. On a yield basis, variable costs averaged \$2.65 per hundred pounds of U. S. No. 1 tubers produced in 1950 as compared with \$2.40 in 1949. Overhead costs added slightly less than a dollar to that amount, bringing total production costs to \$3.39. Since the selling price averaged about \$4.50 a cwt the potato farmer's net return was \$1.11 per hundred or about \$128 per acre.

*Income and Expenses.*—Total average expenses of \$4,002 on Matanuska Valley potato farms in 1950 were higher than the \$3,153 in 1949. The largest items were machinery purchases and livestock and poultry purchases (table 6) which accounted for nearly 30 percent of the total expenses. Potato sales grossed 52 percent of the total cash income in 1950, as compared to 65 percent in 1949. On the other hand, non-farm income accounted for 28 percent of the total cash income in 1950 and only 20 percent in 1949. Tanana Valley growers received over \$1,000 more cash income from potato sales than Matanuska Valley growers, but they had less cash income from other sources.

In 1950, Matanuska Valley potato growers enjoyed an average net income of \$4,152. This average was about \$1,500 lower than that reported in the 1949 study. Excluding the value of home-used farm products (including meat and fish), incomes on individual farms varied from a loss of over \$600 to a profit of more than \$7,700 (chart 4). Because average yields, percentage of culls and prices were about the same in both years, the low net income in 1950 is attributed in part to smaller crop acreages in 1950 than in 1949. As shown in table 6, Tanana Valley growers earned lower net incomes than the Matanuska Valley growers primarily as a result of less non-cash income in the form of inventory increases.

## Poultry Farming

Although from 45 to 60 percent of all farmers in the Matanuska Valley were found to keep poultry in 1950 there were only 9 that obtained more than half of their total cash returns from egg and poultry sales. Poultry farms were therefore fewer in number than other types for which separate analysis were made. A greater proportion of these were found to be part-time units than in 1949. Egg-laying flocks on poultry farms were exceptionally small, the largest unit having 650 hens (based on an

<sup>10</sup> Bevin, Roland C. Production Requirements for Major Enterprises on Southern Idaho Irrigated Farms, Idaho Agricultural Experiment Station Mimeo Leaflet No. 116, June, 1951 p. 5.



A homesteader's cabin southwest of Wasilla. This family lived in the tent on the right during their first winter. During the second winter they lived in the small cabin of horizontal log construction which now forms the back room of their present home. Land clearing is their ever-present worry.

average of the beginning and ending inventories) and the smallest only 150 birds; egg-laying flocks averaged 329 hens and pullets per farm according to December inventories. Annual production of 21 flocks averaged 145 eggs per hen.

For almost a decade, the egg-feed price ratio has been more favorable in Alaska than in the State of Washington. Since feed represents about half the cost of maintaining an egg-laying flock, this favorable ratio implies a profitable position for Alaska poultry producers. To some extent, this advantage is offset by other high costs of maintaining an egg-laying flock in the Territory. Poultry producers enjoy an advantageous distribution of labor needs throughout the year, as well as an even and consistent flow of income. Developing larger flocks, more self-sufficiency in grain production, more efficient over-all operations, and expanding markets are ways that a limited number of poultry farmers may increase their profits.

*Organization.*—The average cropland acreage on poultry farms was about the same during the three years included in these studies (table 1). A significant trend in poultry farming is the increasing attempt toward self-sufficiency in producing feed. Over  $\frac{3}{4}$  of the poultrymen grew some grain in 1950 as compared to less than two-fifths in 1949 and slightly over  $\frac{1}{2}$  in 1947. The low proportion that produced grain in 1949 was handicapped by weather conditions which forced some farmers to harvest their wheat, oats, or barley as hay when these grains failed to mature. Only 3 of the 9 poultry farmers kept milk cows to supply milk and butter for home use.

Poultry farmers had a higher investment in farm equipment than other farmers. Average service building valuation on poultry farms, while less than that on dairy farms, was greater than average for potato and miscellaneous types. The average value per farm was \$4,312 for equipment and \$5,433 for buildings.

*Income and Expenses.*—In 1950 average total cash expenses of \$6,774 were almost \$2,000 greater than for the 8 poultry farms studied in 1949. Factors contributing to the higher cash expense in 1950 were greater cash feed purchases and increasing investments in equipment, livestock and poultry. The largest expense item was for feed, which accounted for about half of the total cash expenses in both 1949 and 1950 (table 6).

Total cash income was also higher in 1950, being \$9,240 as compared to \$8,830 for the previous year. There was no significant difference in the average flock size on poultry farms studied in the two years. Neither was there a noticeable difference in cash receipts from egg sales, which accounted for 49 percent of total cash income in 1949 and 46 percent in 1950. Potato sales were a larger source of income in the former year, accounting for 23 percent of the total cash income and only 13 percent in 1950. Non-farm income was 18 percent of total cash income in the former and 21 percent in the latter study. Even though his cash income was higher in 1950, the average poultry farmer's net income was considerably lower, being \$3,931 as compared to \$5,356 in 1949.