Bearded Wheat at Dominion Experimental Farms, mile 1016 Northwest Highway, (near Haines Junction), Yukon.

(National Film Board Canada, photo)

AGRICULTURE IN ALASKA

By G. W. Gasser

AGRICULTURE in Alaska dates from the gold rush days of '98. During the intervening fifty years enough evidence has been presented to convince the most doubting that a great variety of crops can be grown within the boundaries of the Territory.

The total land area of Alaska is approximately 586,000 square miles, more than twice the size of Texas. Because of the great range of latitude and longitude the climate of Alaska is widely divergent. For example the highest average annual precipitation of 248 inches occurred on Baranof Island in southeastern Alaska. The lowest, 4 inches, is recorded at Point Barrow the most northerly tip of Alaska. Temperature extremes are centred in the Yukon River area at Fort Yukon which is on the Arctic Circle. There the maximum has been 100°F. and a minimum of -71°F.

However, these extremes have no agricultural significance because the main farm areas are centred in the Tanana Valley, the Matanuska Valley and the Kenai Peninsula. The crops grown in these areas are substantial proof that climatically almost three-fourths of Alaska lies within the north temperate zone.

Today in Alaska there are about 15,000 acres actually producing farm crops, out of an estimated 7,098,000 acres adjudged arable. Truly, Alaska is a vast and sparsely populated country. Alaskans invite and encourage settlement, preferably by those qualified to pioneer. Agriculture as a business can prosper only if it develops rationally in step with increased population supported by various industries. The production of farm crops for export is definitely not practicable. Food to feed those living within the Territorial boundaries is a full-time job for every farmer now living there and for several thousand more.

Agricultural Research

Seven Experimental Stations, located at widely separated points in the Territory, were established and maintained by the U.S. Department of Agriculture. The earliest of these were started at the turn of the century during the gold rush days. Two of the seven are still in operation. The one, in the Tanana Valley was established in 1906. It is four miles northwest of Fairbanks and one mile west of the University of Alaska (P.O. College). The other Station, in the Matanuska Valley (P.O. Palmer), was opened in 1915. The five discontinued were located at Sitka, Rampart, Kodiak, Copper Center and Kenai.

During the operation of these stations trials were made of hardy grains and grasses, seed of which came from every northern country in the world. Similarly trial packages of vegetable seed, many kinds of fruit-

ing shrubs and trees were also shipped in and tested. Considerable hybridization of cereals, alfalfas, strawberries and potatoes was done. Outstanding results were secured with barley, wheat and strawberries. Hybrids of the latter, hardy throughout the Territory are widely grown today and the large, lucious fruit is a favorite in many Alaskan homes.

Much work was done with dairy and beef cattle. Some interesting crossbreeding of Holstein-Galloway was done, several of the hybrids showing excellent milking ability. Another and more interesting project was crossbreeding Galloway cattle with Tibetan Yak. The first generation showed good form and fair milkers, but the males were sterile as in the cattle-bison cross.

With this experience of 50 years of experimental work and aided by increased funds, a five-year plan has now been drawn up. Administrative headquarters have been moved from College, in the Tanana Valley, to Palmer, in the Matanuska Valley. The main projects to be undertaken are:

1. Soil research including classification and mapping and studies with fertilizers.
2. Milk production as affected by feed and increased light during winter months.
3. Dairy cattle breeding through artificial insemination.
4. Raising dairy calves to determine efficient rations and their cost.
5. Pasture and range improvement and management.
6. Testing and improvement of cereal and forage plants.
7. Processing and preservation of feed to determine the relative efficiency of field-cured hay, barn-cured hay and silage.
8. Studies of poultry to discover the effect of additional vitamins, mainly D, the influence of artificial light on egg production and, on the physical conditions of the laying hen.
9. Potato breeding.

This fine field of oats will be cut for hay. Copper River Valley.

10. Studies of diseases of economic plants will be made, particular attention being given to diseases of potatoes.
11. The growth and quality of vegetables as influenced by fertilizers.
12. Agricultural engineering; development of better potato storage and handling to reduce loss by bruising and subsequent rotting.
13. The utilization of local timber in comparison with other building material in conventional frame structures.

Permafrost

The effect of frozen subsoil on the season's crop growth has given rise to many surmises. Actual growing tests indicate that permafrost is neither stimulative nor dwarfing. In the interior of Alaska where rainfall is often deficient, it is a popular belief that, as the ground thaws, water is made available to the plants. Since the ground thaws rather slowly, water would thus be held within reach of the plant roots.

When land in the permafrost region is cleared and cropped, the subsoil is completely saturated with water, because when the ground is covered by natural vegetation, thawing is limited to two feet or less. Under cultivation, the frost recedes from six feet to eight feet, especially on fields having a southern slope. The free water sinks as thawing proceeds; crop plants use some and there is also loss by evaporation. The sum total of these losses exceeds the average summer's precipitation of 7.0 inches. The inevitable result is that the subsoil on sloping land becomes depleted of water. Once this has happened crop plants depend exclusively on the water that sinks in from the surface.

Whether or not there is permafrost, the winter's freeze penetrates to a depth of from two to several feet. By the time the ground has thawed a foot or so, the surface two or three inches warms and cools according to the diurnel temperature changes. Spring planting and subsequent growth is affected very little, if any, by the mass of frozen subsoil.

Field of Hulless Barley in the Tanana Valley. There has not been a crop failure due to climate here for 45 years.

Southeastern Alaska

This is a heavily-timbered region with much precipitation and comparatively moderate temperatures both in summer and winter. Cereals do not as a rule ripen, but flourish like grasses and are capable of producing much feed as silage. There are many small gardens which taken together produce a great variety of vegetables of excellent quality. Commercial gardens could be developed in a few localities. Dairying has been profitably carried on for a number of years. Since there is a shortage of whole milk it would appear that this type of farming might be extended. The production of eggs and poultry is increasing, but at present does not meet the demand. Bush fruits, such as currants, gooseberries and raspberries thrive. Strawberries produce abundantly. Some small success has been reported with apples and cherries.

Aleutian Islands and Kodiak Island

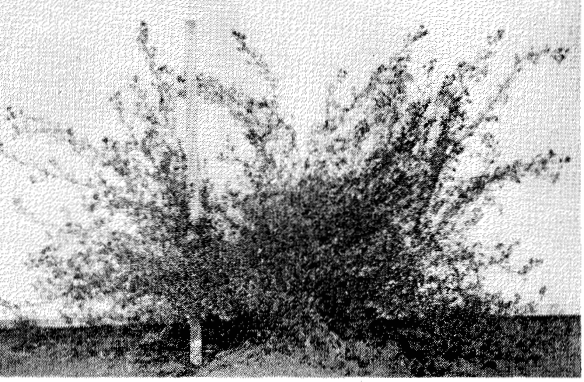
These are treeless except for the northeast part of Kodiak Island. The climate is mild, although high winds and fog are rather common. Grass is abundant and stock-raising is recognized as the principal farm enterprise. On several of the islands such as Umnak, Chirikoff, Sitkalidak, Unalaska and Kodiak herds of beef cattle and sheep have been kept for a number of years with reasonable success.

In spite of the mild climate only small areas are suitable for gardening due to the mountainous terrain, poor soil and much windy, overcast weather.

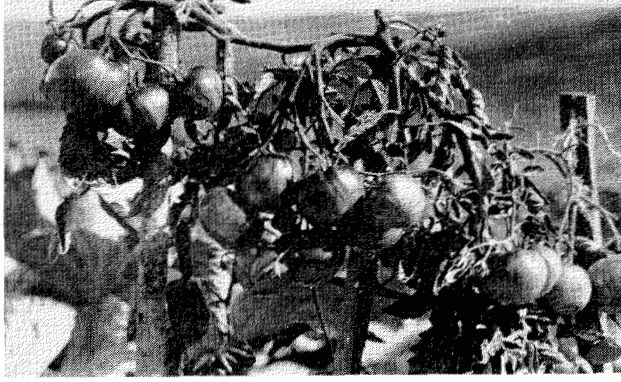
Kenai Peninsula

Many homesteaders have settled there. Conditions generally are very favorable to farming. Native grasses are abundant and cultivated grasses and cereals provide good hay and pasture. Summer temperatures are on the average too low to ripen grain satisfactorily, but the season is sufficiently long for most vegetables. The Peninsula contains many thousands of acres suitable for crop production, but the development of farming has been hindered by a lack of good transportation. The marketing of farm produce from the Homer district depends upon boat transportation to Kodiak, Seldovia and Anchorage. Such crops as potatoes, vegetables of all kinds, poultry and eggs, pork and beef are marketed. A road extending the length of the Peninsula on the west side, now under construction, will connect all the towns with Seward and Anchorage.

A cooperative organization is needed so that standard grades of produce can be placed on the market. This would require storage facilities and probably refrigeration of some kind. There is likely to be a market for all the farm products grown in the Homer district for some years to come.



Yellow-flowered alfalfa (Medicago falcata), hardiest alfalfa known, is used extensively in Alaska.



Bonny Best Tomatoes grown out of doors at Rampart, Yukon Valley—70 miles north of the Arctic Circle.

Anchorage

A large number of small farms have been developed near Anchorage during the past few years. Three hundred tons of potatoes, as well as large quantities of garden vegetables were produced during 1947. Several farmers were then feeding hogs on garbage from the army camps and the production of eggs and poultry was increasing. There is a good demand for the produce but eventually an organization for handling farm products, will be needed.

Matanuska Valley—Post Office Palmer

This well-advertised region is fully justifying the best that has been said of its crop production potentialities. Potatoes easily lead as a cash crop. Approximately 2,500 tons were grown in 1947. Yields of from 10 to 17 tons per acre, with the highest 20 tons, have been recorded. The quality is excellent. Wheat, barley, oats and winter rye are successful crops producing satisfactory yields of thoroughly ripened grain. Hay, crops of oats, alone and with peas or vetch, do well. An excellent quality of hay is made by cutting with a binder and shocking. If the crop is cut with a mower, curing on stakes is the usual practice. Silage, consisting of oats and peas has given very satisfactory results. The clovers and alfalfas grown in the United States are not found to be sufficiently hardy in the Valley. A biennial red clover and a yellow flowered alfalfa from Siberia do well. Extensive plantings have not been possible for lack of seed. Alsike and white clover with grasses make excellent pasture and are being used to some extent. Vegetables of many kinds grow astonishingly well and are superb in quality. Insect pests and diseases are troublesome at times, but with proper attention damage is kept down.

There is a network of well-graded roads, an excellent central school system, and churches. The marketing facilities are centred in a cooperative association which serves the settlers efficiently. The produce handled by the Matanuska Valley Farmer's Cooperative Marketing Association includes milk, vegetables, potatoes, pork, poultry products and beef. The

beef that is produced is a by-product of the dairy farms. Farm products are carefully graded at a central plant and are delivered to the markets in excellent condition. The Co-operative also purchases supplies needed by the farm people such as feeds, seeds, fertilizer, farm machinery and general merchandise.

There is at the present time at Anchorage and Fort Richardson a good market for produce from Matanuska Valley farms. The supply of dairy and poultry products, pork and beef, could be greatly expanded. The demand for potatoes and some garden crops is somewhat limited and it would be necessary to find additional markets if the acreage of these crops were to be greatly increased.

Tanana Valley

This is the most extensive agricultural area in Alaska, comprising approximately 7,000 square miles. The soil in the valley floor ranges from very fine sand, which is the most extensive, to fine sand. On the adjoining slopes the silt loam is considered to be as good as the Knox silt loam of the central United States. It is no surprise, therefore, that potatoes of high quality are regularly grown on the slope soils throughout the Tanana Valley region. The yields per acre are somewhat limited by the rainfall, which is approximately 7 inches for the growing season. Nevertheless, 18 tons per acre have been reported for a top yield. Excellent yields have been produced on the valley floor, but it is subject to midsummer frosts severe enough to injure potato tops but not grain nor hardy vegetables. On the slopes the interval between frosts severe enough to injure potato tops averages 105 days. For hardy plants such as pasture grasses the average number of growing days is 123. There has not been a crop failure due to climate causes in the 45 years of farming in the Valley. Grain yields per acre are:—wheat 20 bushels, oats 50 bushels and barley 30 bushels. In general, the range of possible crop production is similar to that of the Matanuska Valley, except that in the Tanana Valley the somewhat longer daylight and a few degrees more summer heat tend to hasten maturity of grains.

Arctic Circle

There are extensive areas at or north of the Arctic Circle at places such as Fort Yukon, Shugnak and Wiseman where potatoes, cabbage, cauliflower, carrots and other hardy vegetables are grown every year, and where grain hay and even ripe grain of early varieties of wheat, barley and oats can be raised.

Livestock Production

Dairying:

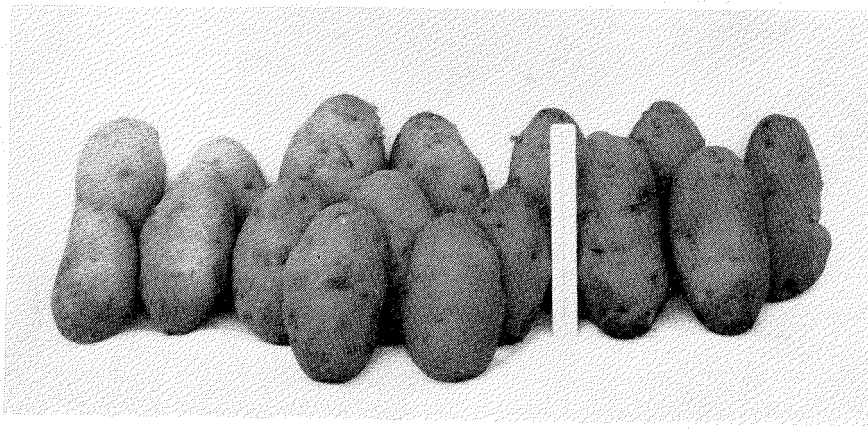
The total value of fluid milk produced in Alaska is much more than a million dollars. There are about 1,300 dairy cows, the most important

being Guernsey, followed by Holstein-Friesian, Ayrshire, Brown Swiss and Jersey. The Matanuska Valley has the largest number of dairy cows and of dairy herds. There are 33 farm dairies, all rated as Grade A. The milk is sold bottled and pasteurized at 40 cents per quart, the demand for whole milk has been so strong throughout the Territory that little if any butter or cheese is made. Under the new Agricultural Research Program several pure bred bulls of high producing milk strain have been shipped into the Matanuska Valley. An artificial insemination service is to be established this year.

Beef Cattle:

In order to discover to what extent the production of beef cattle on a commercial scale will be profitable in Interior Alaska, there will need to be tests of summer range and winter feeding. There are thousands of acres where native grass is abundant but range management and the economics of providing feed for winter, must be learned. Alaska is capable of producing large quantities of beef. Grass, the essential need, is plentiful. Careful estimates of 21 areas ranging in size from 25 square miles to 1000 square miles show a total of 6,993 square miles or 4,475,520 acres of grassland. These areas are capable of providing summer feed for 100,000 head of cattle. There is ample additional land on which the winter feed can be

This fine crop of potatoes was grown in the Tanana Valley. As much as 20 tons per acre have been grown in Alaska.



This Alaskan photograph shows a single hill of 16 potatoes weighing 13 pounds of Burpees Superior variety.

grown. Beef cattle are at present kept on two or three islands near Kodiak where they graze outside for the entire year. These herds have not been very profitable. The problem of marketing beef from the islands is most difficult. Before high-quality beef can be produced at a profit on the grassy islands of the Aleutian Chain, cold storage facilities will need to be constructed so that meat can be held until it is marketed. Anyone who considers beginning the production of beef cattle anywhere in Alaska, should first of all make a careful study of the whole question.

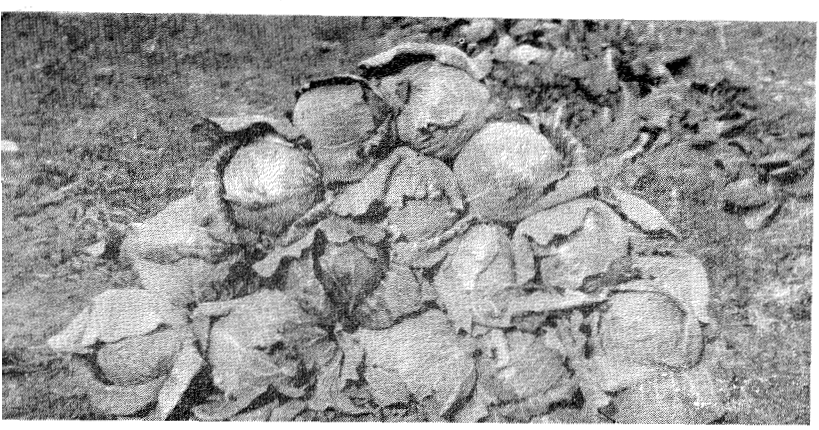
Sheep:

A few years ago about 1,200 head of sheep were grazed on the summer range in the Matanuska Valley, and wintered on farms where it was necessary to feed some hay and grain to them during the winter months. At the present time only a few head of sheep are to be found in this valley. The summer range is good and sheep return in the fall ready for the market. The expense of producing feed for wintering the sheep, has prevented the production of mutton and wool from being as profitable as dairying.

Two or three large herds of sheep have been kept on some of the Aleutian Islands for a great many years where they have been raised without supplemental feed. The marketing of the wool and lambs has proved a serious problem and apparently these herds have not been very profitable. However, the wool is of prime quality and brings top prices in the United States. It is probable that some protection during storms along with concentrated feed and hay should be provided for emergency use during a few months of the winter. In most parts of the Kenai Peninsula, the Matanuska Valley and Interior Alaska, sheep could graze out of doors for from five to six months, but it would be necessary to feed them during the remainder of the year. Some shelter also would be an advantage. There are a few localities, such as at Healy and Lignite on the Alaska railroad, and perhaps in the upper part of the Tanana River where the snow blows off the hills, where sheep might graze during part of the winter.

Swine:

Most breeds of swine are prolific and comparatively free from disease in Alaska. The average litter from Hampshire sows at the Fair-



Cabbage make an excellent crop in Alaska. Here is a pyramid of Copenhagen Market, heads averaging 12 pounds. Heads have been grown weighing 40 pounds.

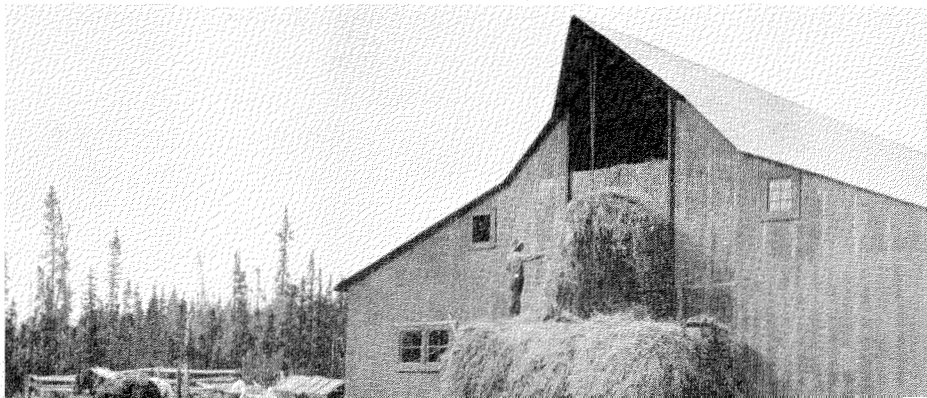
banks Experiment Station over a period of ten years has been between seven and eight pigs per sow. Pork can be produced on pasture for about four months and finished off on locally grown grains. There is a good demand for home grown pork and pork products and they can be sold at a profit. The swine industry could be extended to many small farms throughout Alaska and would probably prove to be most profitable.

Poultry:

There is a large demand at good prices for poultry and eggs in all parts of Alaska. At present prices for eggs a good profit can be made from keeping hens, even when it is necessary to import all of the feed from the United States at prices ranging from $160.00 to $200.00 per ton. The poultry industry could be expanded on many farms in the Tanana and Matanuska valleys where most of the feed can be grown locally at a reasonable cost. Well constructed poultry houses are essential for success.

Diversified Farming

There is good land still open for homesteading in many parts of Alaska, where many farm families could produce between 60% and 70% of the food they need. It would be necessary to keep a few dairy cows, a brood sow or two and a flock of a hundred laying hens. Practically all of the feed needed for the livestock could be produced cheaply apart from the labor required. Twenty-five to thirty-five different hardy vegetables can be successfully produced. Small fruits such as strawberries, raspberries, gooseberries and currants can be grown. Wild fruits including blueberries, low-bush cranberries, high-bush cranberries and huckleberries are abundant almost every year. Men and their families who have a love of the soil and who are willing to work and make their living from the soil, can do so without the investment of a great deal of capital. The average person taking up a homestead, however, should have sufficient funds to carry him over until such time as his farm can be put into production. This would probably require a minimum of between $3,000.00 and $5,000.00. The type of farming most likely to bring adequate return is one of diversified farm crops, together with livestock. The winters are long and the work needs to be planned to keep the farmer profitably employed throughout the year rather than for only the short summer season.



Grain hay being stored at Rampart—70 miles north of the Arctic Circle.