

Agroborealis

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ag•ri•cul•ture (ag'ri-kul'cher) *n.* The science, art, and business of cultivating the soil, producing crops, and raising livestock useful to man (*sic*); farming.

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Note: In 2003, the School of Agriculture and Land Resources Management was renamed the School of Resource Management and Agricultural Sciences. Information about the school and the Agriculture and Forestry Experiment Station (AFES) can be found on the web at: <http://www.uaf.edu/snrns/>. AFES publications are found at <http://www.uaf.edu/snrns/afes/pubs/index.html>.

Editorial Staff

Acting Dean.....Frederic M. Husby
Acting Director.....G. Allen Mitchel
Publications SupervisorDonna Gindle
Editor.....Jan Hanscom

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Centennial Celebration Highlights

July 18: Alaska Agricultural Experiment Station Anniversary Bash, UAF Experimental Farm. Info: Jan Hanscom, 474-6923, or Pat Holloway, 474-5651.

Aug. 1: Ag Appreciation Day, Palmer, Alaska. Info: Allen Mitchell, 746-9450, or Gary Stewart, 745-3360.

Oct. 12–19: 3rd Circumpolar Agricultural Conference, Hotel Captain Cook, Anchorage, Alaska (Reception sponsored by Matanuska Maid). Info: Carol Lewis, 474-7670, or Stephen Sparrow, 474-7620.

Informational displays throughout the summer in various locations around the state.



The front cover depicts farming and gardening in Valdez, Alaska, around the turn of the century. This photo is courtesy of the Mary Whalen Collection, UAF Rasmuson Library Archives. Cover design by Jan Hanscom.

AFES's First 100 Years...

We normally use these pages to look to the future in terms of research efforts in agriculture, forestry and other areas of resources management that will assist in prudent development of Alaska's many resources. However, on this the 100th anniversary of the agricultural experiment station in Alaska, we thought it might be of interest to indulge ourselves with a little nostalgia and perhaps recharge our research batteries for the next century. But first, a little history of how we got where we are.



In 1862, President Abraham Lincoln signed into law the Morrill Act establishing land-grant colleges in the United States and its territories to provide education in the science and economics of agriculture. This was followed in 1887 by the Hatch Act which initiated the system of agricultural experiment stations to provide science-based research information for farmers and which eventually became part of the land-grant college in each state. While Alaska did not become a state until 1959, Territorial Governor John Strong accepted the federal land grant in 1917. This led to the establishment of the Alaska Agricultural College and School of Mines in Fairbanks in 1922. The college became the University of Alaska in 1935.

The agricultural experiment stations span ten decades from the Klondike gold rush to the trans-Alaska pipeline and beyond. Well in advance of the establishment of the college, the federal government initiated a system of agricultural experiment stations in Alaska in 1898 with the establishment of the first station at Sitka with a congressional appropriation of only \$5000. Sitka was chosen because it was the capitol of the territory and it was hoped that the fledgling station could take advantage of locating, at least temporarily, in a government building. The namesake of our present Georgeson Botanical Garden, Professor C.C. Georgeson, was the first agricultural researcher on the scene. Unfortunately for the new station, quarters in government buildings did not materialize, but Georgeson was able to rent a small house for his office and to establish variety trials with a number of agronomic and horticultural crops in gardens placed at his disposal by citizens of Sitka. The territorial government showed its cooperation in another way when the Governor, J.G. Brady, offered his silo for silage storage and his barn to house the station's oxen for the winter of 1898–1899.

With assistance from Isaac Jones, Professor Georgeson embarked on a number of investigations of agricultural potential over the next few years that included Kodiak Island, Kenai, and the Interior region of the Yukon, Copper, and Tanana river valleys. As a result of these inquiries, stations were established at Kodiak, Kenai, Rampart, Copper Center, Fairbanks, and eventually Matanuska.

Over these many years, agricultural research at the stations developed numerous northern-adapted varieties of grains, grasses, potatoes, and berries, as well as the adoption of other crop varieties from around the circumpolar north and elsewhere. The experiment stations helped Alaska feed its people from the boom days of the gold rush in the Interior through the construction of the Alaska railroad, survived the Great Depression barely intact, and served Alaska agriculture through the Second World War and the post-war period. We were also there to assist in the development of the oil pipeline and the Prudhoe Bay oil fields by supplying environmental and reclamation backup in plant ecology, wildlife habitat restoration, and bioremediation.

More recently, the Agricultural and Forestry Experiment Station has performed research in support of agricultural enterprises ranging from barley and animal production at Delta Junction, small farm and greenhouse operations near Fairbanks, potato, vegetable, and dairy production in the Mat-Su region, and reindeer herding on the Seward Peninsula. Also during these later years, the experiment station incorporated research in other land resource areas, including forest ecology, forest products industries, and rural and economic development. Change has been constant. Early oxen have given way to tractors, lanterns to electrical lights, and the farm almanac to on-farm internet access for everything from sources of seed to farm and forest production information from other universities and from the private sector.

Pictorials and selected highlights of the early years and of the accomplishments and setbacks that affected early agricultural research pioneers follow in this issue.

S. Alan Mitchell

100 Years of Agricultural Research in Alaska

The timeline on the next page highlights the development of the science of agriculture in Alaska. For more than 100 years Alaskans have been farming. They have produced enough food for their families and extra to trade with those who don't have the time or desire to till the soil. In a land that "Outsiders"

think of as a frozen wasteland, there is grown the largest cabbage, the best barley, the most disease free seed potatoes, the most brilliantly colored flowers, and animals for fur, meat and other by-products like antlers. The boom and



bust economy of Alaska has lead to a boom and bust cycle in agriculture as well, rather than the stable economic base other states have achieved from their agricultural business.

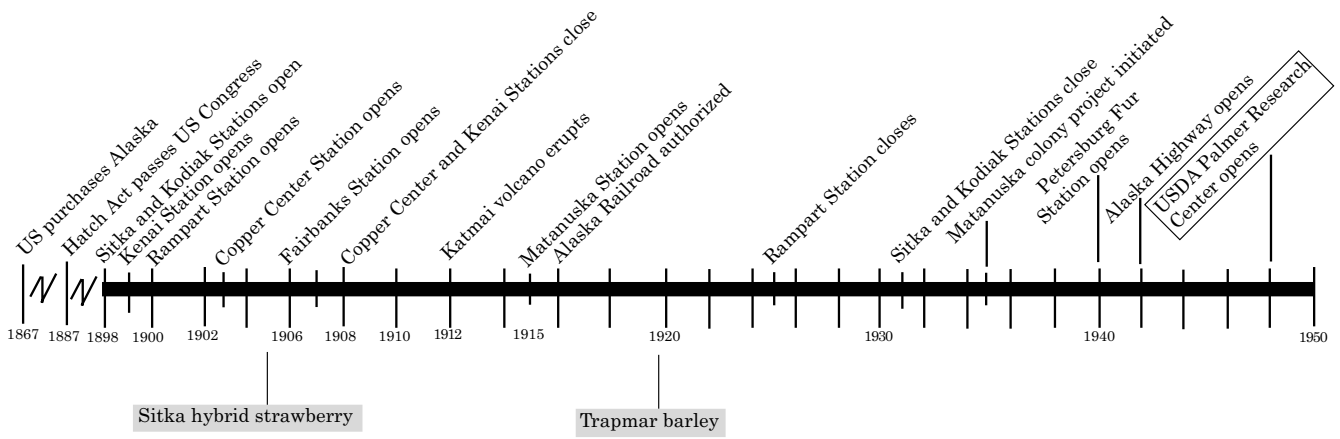
Since 1898, the science of agriculture has officially been studied in this state, and as a result we have new and better varieties

of potatoes, grasses, fruits, and vegetables, and have developed better plans for using our environment to maximize the productivity of agronomic businesses. The future of agriculture has never looked brighter, while the future of agricultural research is very much in question.

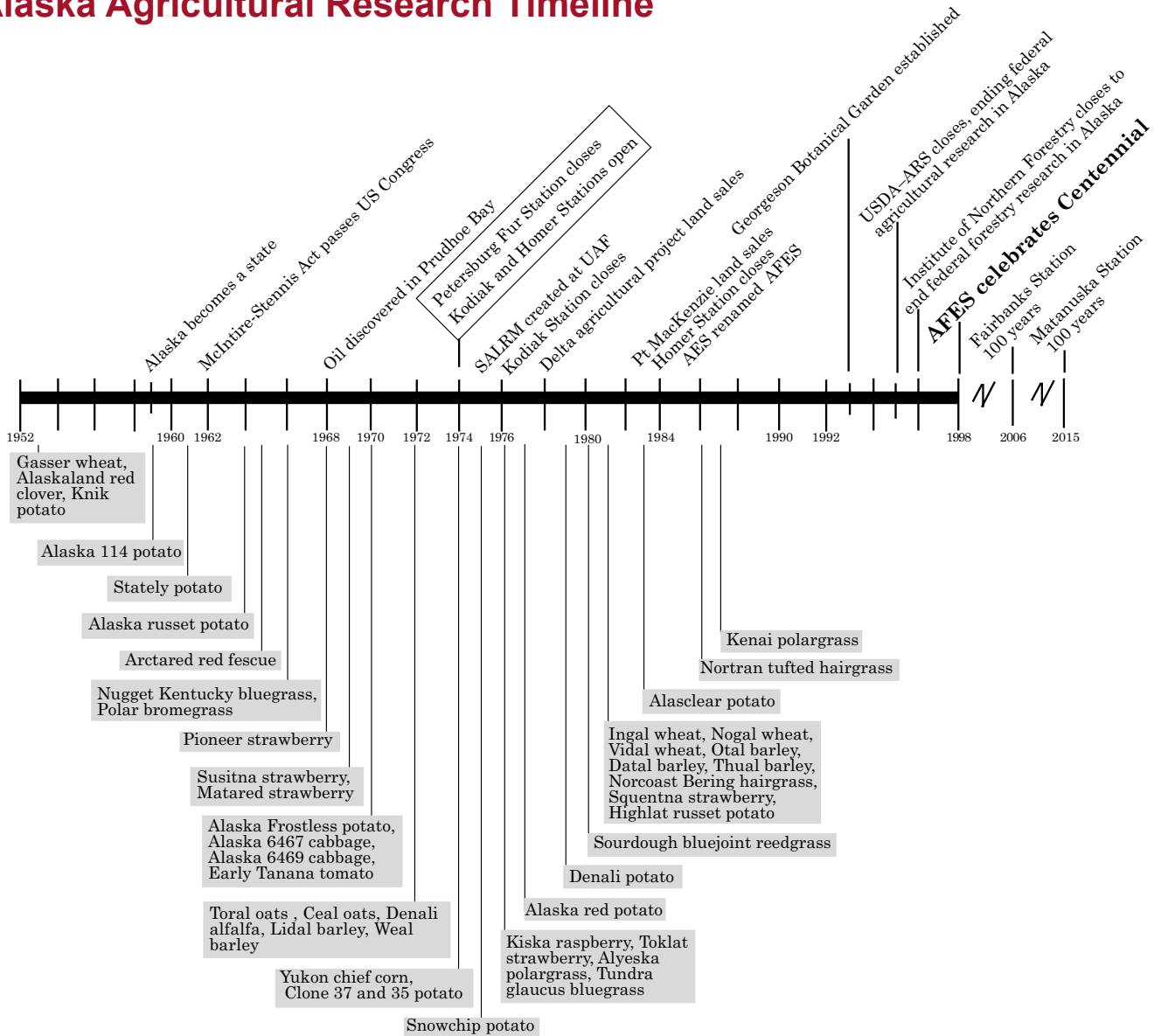
Centennial logo depicts agricultural experiment station's rich diversity

The Alaska Agricultural and Forestry Experiment Station centennial logo portrays the diversity and depth of agricultural experiment research for Alaskans. Forestry and resources management researchers study and help develop policies toward managing our state's vast forests; animal scientists have specialized in research affecting the health, care, and feeding of reindeer, swine, and cattle; plant and soil experts continue to discover and relay new information to gardeners, horticulturists, and land managers; and researchers working with geographical information systems ensure that Alaska remains on the cutting edge of technology that affects us in a variety of ways, including detecting wildfires, inventorying wildlife habitat and regenerating forests.





Alaska Agricultural Research Timeline



Alaska's first agricultural experiment station— Sitka, 1898–1931

by Bob Gorman, Sitka District Resource Development Agent,
Alaska Cooperative Extension Service

In the summer of 1898 Dr. C.C. Georgeson stepped off a mail boat in Sitka to establish a series of agricultural experiment stations in Alaska that would determine if agriculture was possible in the great northland. Sitka, lying on the 57th latitude, was the official seat of the American government in Alaska from 1867 to 1900 and was the Russian territorial capitol from 1803 to 1867.

The Russians were not settlers, they were fur trappers. However, the czar decreed that all land patents require outposts to have gardens, so vegetable and fruit production first began in Sitka at the start of the 19th century. Sitka was called Shee Atika by the Tlingit Native Americans who settled this outer coastal island area thousands of years ago.

From the time Alaska was purchased from Russia in 1867, the topic of Alaska's agricultural potential was a hotly debated issue in Congress. In 1897 a three-person congressional team explored coastal and western Alaska to assess the agricultural potential. Two of the members, Dr. Sheldon Jackson (Superintendent of Indian Education with the Department of Interior) and Dr. Walter Evans with the Office of Agricultural



Sitka Station Building, 1902.

Experiment Stations of the Department of Agriculture reported their findings in detail and recommended establishing a series of experiment stations in Alaska. The third member, Benton Killin of Oregon, in a brief report advised against agricultural endeavors. Jackson and Evans' favorable comments were enough to convince Congress of the need to establish agricultural experiment stations in Alaska with headquarters in Sitka.

The reasons for locating the headquarters in Sitka were accessibility and climate. It was deemed necessary to locate this station at a point which could at the same time be in a reasonably easy communication with the rest of the Territory. Sitka was deemed

to be that point. At that time there was no indication of a speedy opening of the interior. The coast region contained practically the whole population and it seemed likely to remain the most important region for a long time to come.—C.C. Georgeson, Special Agent In Charge, Alaska Agricultural Experiment Station, Sitka, 1903.

As is often the case when the U.S. Congress is involved, there was more to the story regarding the origins and location of the Alaska Agricultural Experiment Station in Sitka. After the United States purchased Alaska from the Russians, the U.S. provided little governmental structure. Alaska was not designated a territory but was a department of Congress under the jurisdiction first of the army, then the U.S. Treasury Department, and lastly the navy before the first civil government was appointed in 1884.

The early American period of Alaska was so lawless that many Russians chose to return to the tyrannical czar rather than remain in Alaska. One U.S. revenue cutter and a small contingent of Marines oversaw the territory.

Missionaries came to work with the Native Americans shortly after the purchase of Alaska. One missionary of note was Dr. Sheldon Jackson, an ordained Presbyterian minister as well as Superintendent of Indian Education in Alaska. In a variety of letters to Congress in the 1890s, Jackson pointed out the desperate condition of the Native Americans. Fur trapping had depleted most fur-bearing animals, so little income was made from trapping. The intrusion of the Europeans in fishing and whaling had driven the whales far off shore and depleted fish stocks. Jackson's travels to western Alaska enabled him to cross the Bering Sea and encounter Natives there herding Siberian reindeer.



Formerly used by the experiment station horticulturists, this house was probably constructed between 1913-1919. In the foreground is an old cherry tree that still fruits, probably planted before 1920 (photo by Bob Gorman).

“So the question came up, why not have a bill introduced before Congress extending the provisions of these agricultural laws to Alaska under the control of the Secretary of Interior? Then he can establish the agricultural school and experiment stations by which, instead of experimenting on the raising of cattle, hogs and horses, as they would in Texas, Nebraska or Michigan, why not make the reindeer the principle stock of it,” stated Sheldon Jackson before the U.S. House Committee on Education, Friday, January 9, 1891 [in: Experiment Station in Southern Alaska—A Report to the 51st Congress 2nd Session, House of Representatives]. It should be pointed out that Dr. Jackson was operating a public school in Sitka for Native Americans at the time, which later became Sheldon Jackson College.

Congressional action finally came in 1897. However, Congress' decision to begin seriously exploring Alaska's agricultural potential was more likely related to the thousands of Klondike



The house on the left, like the horticulturists' house, was probably constructed after 1916. The two large rhododendrons are thought to be more than 75 years old. Middle: Sitka Station barn, 1902. Right: These trees were planted during the Sitka Station's active days. They include red osier dogwood and wood rose. Note the hillside in the background is the same one shown behind the barn in 1902 (all modern photos by Bob Gorman).

miners streaming into Alaska and less to the plight of the Alaska Natives.

Georgeson's mission in Sitka was twofold. First, he was to determine if Alaska's agriculture and horticulture could be developed, thus aiding the permanent development of mining, fisheries, and lumbering. If nothing else, Georgeson would determine if Alaska could support vegetable growth for miners and fishermen. As soon as 1901 he reported on the favorable results of the experiment stations, which were more truly demonstration farms.

That same report mentions experiments with growing potatoes in rainy Sitka. One particular experiment involved three different treatments, one using seaweed to fertilize potatoes. Georgeson reported, "Although the crop was but light and can scarcely be called a success, the experiment is nevertheless of interest, because it shows that seaweed, so abundant everywhere along the coast, is an excellent fertilizer for potatoes." The practice of using seaweed for garden fertilizer is still common in coastal Alaska.

The Sitka Station was the headquarters for propagating and testing garden products, berry plants, fruit bushes, ornamental shrubbery, and hardy bulbs. One of Georgeson's publications (*Bulb Growing in Alaska, Circular No. 2, Alaska Agricultural Experiment Station, Sitka. October, 1928*) describes demonstration results still valid today. He reported that propagation of hardy

bulbs began in 1923 and experiments confirmed commercial production is possible. There has been success in growing narcissus, tulips, English iris, gladiolus, royal lily, and hyacinths. He describes the coastal cultural practice of planting bulbs in raised beds 1–5 inches above the ground to improve water drainage.

The annual reports of the Alaska Agricultural Experiment Stations provide the bulk of the description of work done at the stations, the results and recommendations regarding agricultural and horticultural practices for Alaska. A few examples of the work at the Sitka Station include demonstration work in weed control and lawn grasses. The Annual Report of the Alaska Agricultural Experiment Stations for 1931–32 includes a report of weed eradication experimental work conducted on chickweed (*Alsine media*) and buttercup (*Ranunaculus repens*) which were the greatest problem in south coastal Alaska. Canada thistle (*Cirsium arvense*) was also noted as being scattered growth. The recommended treatment for Canada thistle was to dig the weeds weekly. One season of this treatment resulted in few plants surviving.

While most work at the Sitka Station involved vegetable and fruit production, some experiments, such as the hardy bulb, focused on ornamental horticulture and gardening. Another experiment tested the best varieties for lawns in Southeast Alaska. The recommendation was that red fescue (*Festuca rubra*) and redtop (*Agrostis*



Above, looking north from the former director's house, the area depicted in the photo was once a cultivated field. Now it is used by Alaska Cooperative Extension as demonstration plots. The large trees were not there in 1902, as can be seen in the photo at right. There was a blacksmith shop and cottage.

alba) were the best varieties for lawn grass and cover crops in south coastal Alaska. Kentucky bluegrass and creeping bentgrass were tested but grew poorly in poor soils. Fertilizing all of these species produced excellent grass stands. Liming made no difference in grass production but fertilizing with five tons per acre of "tankage" (6% nitrogen and 10% phosphorus) greatly stimulated grass growth.

Another function of the Sitka Station was propagating and distributing nursery stock to early Alaskans, as long as they provided the experiment station with a letter summarizing the growing season results. The 1928 Alaska Agricultural Experiment Station annual report recorded that nursery stock sent from the Sitka Station to 170 residents of Alaska included 1,452 strawberry plants, 404 raspberry plants, 173 gooseberry plants, 356 currant plants, 139 apple trees, 48 rhubarb plants, 630 ornamental shrubs, and 42 pounds of seed potatoes.

The final Alaska Agricultural Station annual report for 1931–32 summarized the work of the Sitka Station: "The Stations, and more especially the Sitka Station, by growing selected varieties under improved methods of culture, succeeded

in developing potatoes that are eminently suited to the Territory— These were propagated and distributed first from Sitka and later also at Matanuska." Small fruits tested and developed included: currants, raspberries, and gooseberries for south coastal areas as well as testing wineberries, Logan and other blackberries, huckleberries, blueberries, service berries, dewberries, buffalo berries, and cranberries. In the south coastal area, ornamental trees tested included maple, sycamore, poplar, larch, mountain ash, and elm. Shrubs tested and recommended for this region included single and double flowered varieties of the Japanese rose, honeysuckle, red flowering currant, weigela, and spireas.

The Alaska College of Agriculture and Mines in Fairbanks opened for instruction in 1922. On February 23, 1929, Congress extended the Hatch Act to Alaska, establishing Territorial-operated experiment stations, and the Smith Lever Act, providing for cooperative extension work in agriculture and home economics. Charles Bunnell, president of the college, was appointed the first director of extension. The federal agricultural experiment stations in Sitka



This bountiful Sitka garden was photographed in 1900.

and Kodiak were closed in 1931. The Matanuska and Fairbanks stations were administered by one director, still a federal employee, located at the Matanuska Station. Over the next 40 years, a gradual transition was made from federal control to University of Alaska Fairbanks control.

The Sitka Agricultural Experiment Station land was given to the U.S. Geological Survey for a geomagnetic and seismic station that is still in use. In 1994 the USGS entered into an agreement with the Alaska Cooperative Extension to allow use of approximately a quarter acre of land for demonstration plots. Most of the original 110 acres of the Sitka station has reverted to a second growth spruce-hemlock forest interspersed with muskeg. The house where Georgeson lived and worked, the station's horticulturist cottage, and a root cellar remain in use today. About 20 fruit trees, some berry shrubs, strawberries, and ornamental trees and shrubs are all living reminders of the role this site played in the development of agriculture and horticulture in Alaska.

Although we have developed a certain arrogance about our technological prowess, many of the agricultural and horticultural problems facing Alaskans today were examined 75 to 100 years ago. Contemporary researchers, extension agents, and producers would do well to review the records of the federal Alaska Agricultural Experiment Stations located in the University of Alaska Fairbanks Rasmuson Library, the Palmer Research Center, and the U.S. Federal Archives in Anchorage.



Sheep graze in a pasture at the Kalsin Bay site (1920) at left; above, log barn and cattle pens at the Kodiak downtown site (1907).

1898—1931

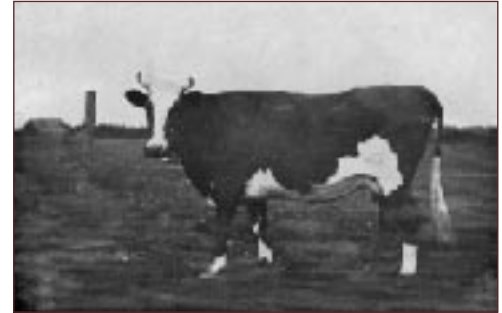
Kodiak experiments with station

The experiment station in Kodiak actually was reserved before Congress designated the lands for the Sitka Station. Over the years there have been stations located in four different sites on Kodiak and nearby islands. The main work of the Kodiak Station was to determine the practicality of raising cattle. A big blow to the Kodiak Station came in 1912 with the eruption of Katmai volcano, which covered the rangeland with up to 18 inches of ash.



Upper left, hay loader in 1914; lower left, a hay camp in 1916; above, a herd of cattle at the Kalsin Bay site, 1910.

Kenai Station: 1899–1908



At left, station buildings at Kenai, 1903; at right, a so-called native cow, Kenai Station, 1906.



Kenai found a niche in cattle breeding and commercial dairying at the turn of the 20th century. A farmer breaks newly cleared land at Kenai Station in 1903. In 1903, Kenai residents welcomed the completion of the barn at Kenai Station (below) and in 1906, the Common steers (right).



Experimental work began at the Kenai Station on the west side of the Kenai Peninsula. According to a written account from that era, "The beginning of a dairy herd was made at this station by the purchase of a cow and a calf June 3, 1902. The cow was bought from the Russian priest at this place and had originally come from Kodiak. Two more cows, daughters of the first cow purchased, were bought in 1903 and on May 13, 1906, the station received a shipment of 7 Galloways."

Kenai was found to be better suited to livestock breeding than general farming, and the work was therefore concentrated on cattle breeding with a view to commercial dairying. Some butter and cheese was manufactured on a small scale.



Rampart Agricultural Experiment Station, 1900–1925: looking at the past

by Frank J. Wooding,* associate professor of agronomy



'Finnish Black' oats was a particularly successful variety at Rampart, 1908.

During the period of its existence, the Rampart Station was the northernmost agricultural experiment station in the U.S. and possibly the world. It was located at 65° 30' N latitude, approximately 75 miles south of the Arctic Circle. The station was situated on the south side of the Yukon River, across the river from the gold-mining town of Rampart. During the peak mining years, also the peak years of the station, the population of Rampart reached 10,000 people.

Land for the Rampart Station was reserved in 1900, and a small clearing of about a half acre was made. Over the years additional land was cleared and buildings erected, and by 1920, approximately 90 acres were under cultivation. In 1906, a five-room cottage was constructed as living quarters for the station superintendent at that time, Frederick E. Rader. During the next eight years, building construction included two barns, two implement sheds, a combination workshop and grain-storage facility, a root cellar, a propagation house, and a greenhouse. No

additional buildings were added after 1914. During the summer of 1925, the station was closed because of the failure of Congress to make an appropriation sufficient for continuing its work.

The site of the station was in an area characterized by rolling land among low hills, sloping gradually toward the river. The virgin land was timbered with black spruce interspersed with poplar, birch, willow, and many species of small bushes. Georgeson describes the climate at Rampart as follows:

The region is characterized by an inland, subarctic climate. The winters are long and severe, the summers short and warm, and the rainfall light. The frost free period averages 97 days. The total annual precipitation is a little less than 10 inches and the rainfall during the growing season averages a little more than 5 inches. There is usually a dry spell during May and June which some years amounts to a drought. The snowfall is variable, usually from 2 to 4 feet, and sometimes as much as 5 feet.



A stump puller at work at the Rampart Station is shown in the photo on the left, 1908. A house and some experimental plots at the Rampart Station in 1907 (middle); and barley grown at Rampart in 1907 (right).

Goals and objectives at Rampart

From the beginning, research at the Rampart station emphasized grain growing. The following excerpt from the 1910 annual report clearly defines the importance of grain research:

The original plan for work at this station has been adhered to strictly, namely, the testing and breeding of varieties of grain, at the same time gradually extending the clearing and adding to the equipment until the station is fully prepared for this line of work. The growing of vegetables, the testing of potatoes, etc. are minor experiments.

Between 1910 and 1911, fertilizer experiments were carried out at the station which demonstrated that a lack of soil nitrogen was the most limiting factor, with regard to nutrient requirements, in crop production. Since the small numbers of livestock in the area could not furnish sufficient manure for fertilizing large acreages, and the cost of shipping commercial fertilizers was prohibitive, it was decided that a suitable legume for fixing nitrogen in the soils must be included in the crop rotation. In the 1911 annual report, objectives for the station are outlined as follows:

- 1. The testing of varieties of grain, with a view of finding something well adapted to the country.*
- 2. The crossbreeding of grain varieties which have desirable qualities in order to develop grain varieties of greater value than those now known.*

- 3. The introduction, culture, and propagation of hardy legumes.*
- 4. The growing of vegetables on a limited scale, especially potatoes.*

The objectives for the station as outlined in the 1915 annual report divided major emphasis equally between grain and legume research. Apparently, the problem of nitrogen deficiency increased with the length of time soils were under cultivation. The following passage best describes the purpose of the station at that time:

The Rampart station is devoted chiefly to the testing and breeding of grains and legumes. This work is being done so far north because it is believed that varieties originated and successfully produced in the latitudes of Rampart will succeed in all parts of the territory south of the Arctic Circle.

It is interesting to note that in the 1919 annual report a request was made for funds to clear additional land. The justification was as follows:

The larger area is now needed for increase plots for field tests of hybrid grains that are produced. This is also needed to summer fallow a larger percentage of cultivated ground each year and thus to aid in maintaining fertility.

In 1919, the Rampart station had gone to a cropping system based on summer fallowing. This type of system was destined not to become a popular agronomic practice in the United States for another 20 years.

Research accomplishments at Rampart

Legumes

Because of the necessity of finding a hardy legume for Alaska, a breeding program with alfalfa was initiated at Rampart. During the early years of the station a number of different kinds of legumes were seeded. Some such as white clover and sweet clover winter-killed the first winter after seeding. Others, such as alsike clover and red clover, gradually died out after 2 or 3 winters. Bird vetch and *Trifolium lupinaster* had good winter hardiness but were inferior as hay crops. By the process of elimination, alfalfa was selected for crossbreeding work because several types had demonstrated winter hardiness and desirable characteristics for use as a hay crop. *Medicago falcata*, a yellow-flowered alfalfa, had survived even the harshest winters without noticeable winter-kill. However, *M. falcata* did not produce high yields of hay; cuttings of 1.6 tons per acre are reported. On the other hand, 'Grimm', a purple-flowered variety of alfalfa (*Medicago sativa*) produced high yields of hay but lacked winter hardiness. Hybridization work involved crossbreeding *M. falcata* and Grimm. Although a number of hybrids were produced, none proved to be hardier than the parent, Grimm. The yellow-flowered type was the only alfalfa that proved absolutely hardy.

Grains

The success of the grain research program at the Rampart station can be described best by quotations from annual reports prepared by C.C. Georgeson, Special Agent in Charge of Alaska Agricultural Experiment Stations:

1906: Grain has matured every year since work was begun in 1900.

1908: Grain crops at Rampart were all that could be wished. Out of 67 varieties of grain grown in 1908 only 2 failed to mature. This station, which is less than a degree from the Arctic Circle, has been the most successful grain growing station. Grain growing is the most important work at this station.

1909: It is a great satisfaction to again



Fall plowing, Rampart, 1907.

report the work at the Rampart Station an unqualified success. Fifty-five varieties of cereals matured at this station the past summer.

1913: The success of Rampart Station has been almost phenomenal. There has never been a failure of more than a few late-maturing crops at this station, and even last year, with the severe freeze, all important crops matured.

During the early years of the station, grain research was confined primarily to the testing of varieties introduced from other areas and the selection of desirable heads in hopes of improving existing varieties. A total of 147 introduced varieties of barley, oats, wheat, and rye were evaluated during the life of the station. Work with crop rotations and soil fertility was done on a limited scale.

George Gasser arrived at the Rampart Station in 1907 and initiated a grain crossbreeding program aimed at the development of hybrids (See: "George T. Gasser: A Brief Biography," in this issue). At first, the hybridization program dealt entirely with barley, but later it was expanded to include wheat and oats. Of the three, barley hybridization was the most successful. Of course, more emphasis was devoted to barley because of its greater adaptability to northern environments. Although many hybrid barleys had desirable characteristics, none of the initial crosses were stable enough for release as new varieties.

Eventually, stability was obtained in one hybrid and it was released under the name of 'Trapmar', which is Rampart spelled in reverse. This variety proved to be highly successful and was grown in the Tanana Valley and other areas of Alaska for many years.

Oats was considered the second most important grain crop for interior Alaska. Although a number of varieties performed well, repeated reference is made in annual reports to a black-hulled introduction from Finland named 'Finnish Black'. This variety proved to be the earliest maturing oat grown at all the stations. Little mention is made in the literature of the oat hybridization program. Apparently, no oat hybrid was developed that showed improvement over existing varieties.

Several winter wheat varieties were tested at Rampart. 'Karkov', of Russian origin, was by far the hardiest variety, but averaged only about 25% winter survival over a number of years. Selected kernels from the small proportion of surviving plants were repeatedly seeded year after year in the hope of developing a hardy strain. However, no improvement was obtained in hardiness.

Prior to 1914, spring wheat was considered a marginal crop for the Rampart area. It failed to reach maturity about one out of every four years. The recommended varieties at that time were 'Romanow' and 'Ladoga', both of Russian origin. In 1913, samples of a number of spring wheats were obtained from the experiment station at Tulun, Province of Irkutsk, Siberia. Among them was the variety 'Khogot', afterwards erroneously but phonetically, spelled 'Chogot', and then referred to as Siberian No. 1. Siberian No. 1 was the earliest variety of spring wheat tested at all the Alaska stations, maturing in as few as 84 days at Rampart. After four consecutive successful years of growing Siberian No. 1. George Gasser stated in 1917: "Wheats have progressed so they are feasible." Yields, on a field scale, of 20 to 30 bushels per acre were frequently reported.

The spring wheat hybridization program

at Rampart, although it continued for almost ten years, was unable to produce a variety having characteristics superior to Siberian No. 1. The inability to transfer early maturity in the crosses is cited as the principle reason for the lack of success. In 1921, George Gasser was transferred to the Fairbanks Station, where he continued his work with wheat. Eventually (years after Gasser's retirement), a hybrid wheat superior to Siberian No. 1 was selected from materials originally worked on by Gasser. This wheat was released in 1953 and was named 'Gasser'.

Spring rye did not mature early enough to be grown at Rampart. Several varieties of winter rye were grown successfully for a number of years and all were hardy when the field was covered with an adequately insulating layer of snow. The Russian variety 'Hogot' was superior to all others tested.

Grasses

Perennial grasses were evaluated for winter hardiness and use as hay crops. Smooth brome grass proved to be the best grass grown at the Rampart Station. It was a good hay producer and survived the winters. Meadow foxtail was ranked as the second-best grass and was recommended as an early hay grass. Redtop, velvet grass, perennial ryegrass, and reed canary grass winter-killed the first winter after seeding. Kentucky bluegrass, meadow fescue, and timothy gradually died out after several winters. Tall meadow oatgrass and orchard grass survived the winters but were poor hay producers.

Potatoes

Potato research at Rampart included variety testing and development of cultural practices to improve yields. Variety testing was done on a limited scale, usually involving the evaluation of one or two new varieties each year. The years 1908 and 1909 were an exception, when a total of 35 varieties were grown. Cultural practices that were studied included: early

sprouting before planting, growing potatoes in cribs above ground level, and fertilizer application (both chemical and manure). Yields were noticeably increased by early sprouting and fertilization, but the use of cribs was not beneficial.

Yields ranging from 12 to 17 tons per acre were obtained when potatoes were planted on highly manured land.

Vegetables

Although vegetable research was not a major goal of the station, each year a number of types and varieties were tested in the station superintendent's garden. Their success or failure was included in annual reports. The following vegetables were successfully grown year after year: peas, radishes, green pod beans, table beets, lettuce, yellow wax beans, carrots, spinach, kohlrabi, rutabaga, mustard, cabbage, turnips, swiss chard, kale, broccoli, onions from sets, parsley, and rhubarb.

Some vegetables performed well in years when the growing season was favorable, but did poorly or failed other years. The following vegetables might be classified as marginal: parsnip, cucumber, celery, tomato, cauliflower, brussels sprouts, onions from seeds, eggplant.

Fruits

Various fruits were tested on a limited scale at Rampart, including apple, crab apple, red raspberries, red currants, and strawberries. Apple trees survived several winters but never produced fruit. A Siberian crab apple produced two fruits one year. Raspberries and currants were moderately successful, although yields were generally poor. Strawberries were by far the most successful of the fruit crops. Hardy strawberries, originating from the Sitka Station in southeast Alaska (no longer in operation), produced firmer and sweeter fruits when grown at Rampart.



Gold Coin potatoes, sprouted (left) and not sprouted (right), grown in 1910 at Rampart.

Epilogue

The Rampart Station was officially closed 55 years ago (when this article was first printed in 1979). During the span of its operation, it was one of the most successful experiment stations in Alaska. Since then, higher yielding, earlier maturing varieties of many crops have been developed for Alaska. Commercial nitrogen fertilizer (urea) is now produced in Alaska, and techniques are available for growing warm-season crops (including use of clear polyethylene mulch). In the case of winter wheat, there are a number of varieties which have greater winter hardiness than 'Kharkov', the best variety at that time.

Today, little remains of the Rampart Station. Small trees are growing where open fields once lay. Vetch, alfalfa, and strawberry plants now grow wild. During the 1940s the buildings were torn down and the lumber was used for construction of a school in the town of Rampart. Now, all that remain are their foundations. The population of Rampart has declined steadily until, now, there are only 34 permanent residents.

1903–1908: Copper Center ventures into agriculture

The Copper Center Station operated from 1903 through 1908 but it proved to be expensive to run. Supplies hauled over the mountains from Valdez had extremely high shipping costs and grain crops were not successful. The equipment was hauled to the new station in Fairbanks during the winter of 1908 where—according to those in authority—a more favorable climate existed for growing grain and expanding the population.



Vegetable gardens such as this one at Tonsina Bridge (top photo) gave surveyors reason to think a station in this area would be successful. Above left: Horses break for lunch in a cleared field during the surveying of the Copper River Valley to determine the best site for an experiment station. Above right: The first station building going up in 1903 at Copper Center Station.

1906: Fairbanks builds an agricultural station



In 1905, the citizens of the Fairbanks area petitioned the Secretary of Agriculture to establish an experiment station somewhere in the Tanana Valley. At that time, 82 homesteads were registered in the valley. In August of that year, Charles Christian Georgeson, director of Alaska Agricultural Experiment Stations, explored the Tanana Valley for possible station sites. With a considerable amount of persuasion from members of the Fairbanks Chamber of Commerce, Georgeson selected 1,393.97 acres that were located nearly midway between Chena and Fairbanks. The land was chosen because of its size and proximity to this transportation



The top photo shows a work team of horses at the Fairbanks Station in 1914. The barn was built around 1910. Potato field (above) with buildings in the background, 1910.



This tractor and threshing machine were new in 1917, but the barn was built in the 1930s.



The barn of the 1970s (above) looks much the same as the 1990s barn (left).



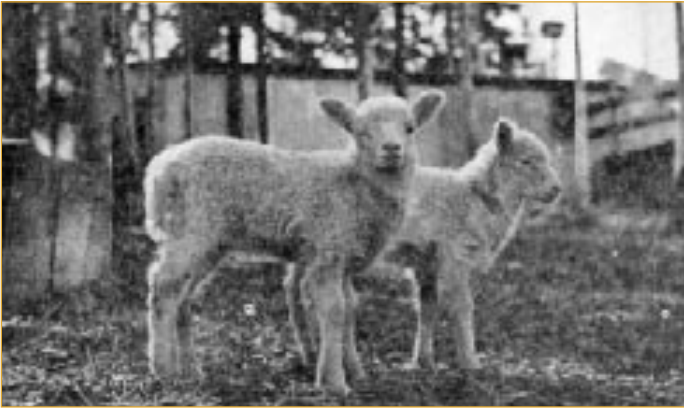
At left, propagation house built in 1910; at right, building site and character of timber at the new experiment station in Fairbanks, 1908. The color image below is an aerial photograph of the farm in the 1990s.

corridor as well as the availability of good soils for farming and its close proximity to the homesteaders.

There have been two barns at the Fairbanks Station. The first was a log barn completed by 1910. The present barn was built in the 1930s and is a landmark on the Fairbanks farm. There have been several additions through the years, but the basic structure is still in use today.

Today, Agricultural and Forestry Experiment Station personnel are actively engaged in research in wild lands management, environmental law, resource policy, vegetable crop diseases, crop variety development, watershed management, forest management, resource management, resource economics, mined lands revegetation, horticultural crop improvements, plant propagation, livestock feeds and nutrition, outdoor recreation management, environmental monitoring, greenhouse produced crops, soil fertility, agricultural economics, agricultural marketing, soil reclamation, silviculture, forage quality improvement, reindeer farming systems, soil microbiology, GIS technology, and forest nutrient cycling.





Above left, the lambs Pat and Mike, born April 18, 1934; above right, offspring of a full-blooded mountain sheep ram named Pete and a domestic Lincoln-Cotswold ewe.



The horticultural research and demonstration plots of the 1960s were restructured and officially became the Georgeson Botanical Garden in 1993. Lower left and above, the botanical garden now boasts integrated annual and perennial flower beds with garden architectural structures such as gazebos, planters,



Memorabilia with the centennial logo will be sold through the Georgeson Botanical Garden gift shop. For information on purchasing these and other Alaska made items from the gift shop, please visit the GBG at the Fairbanks Station farm or write the GBG gift shop, P.O. Box 757200, Fairbanks, Alaska 99775-7200.

Matanuska Station, 1915–present



Knik cabbage field at the Mitchell Ranch in 1913.



Above, the Matanuska Station in the 1950s, as photographed from the ground and from an airplane.



The new soils laboratory building built in the 1980 houses modern equipment to analyze soil, plant, and feed nutrient for farmers, gardeners, and researchers.

Palmer Research Center, 1948–present



The 'Kremlin' (above), as it is known by locals, was built in 1948 to house the federal experiment station (2004 photo by Connie Harris). Staff housing (above left) was available for federal employees. The glass houses at left were built for horticultural research.

The Matanuska-Susitna Valley was flooded with homesteaders at the same time that experiment station personnel were evaluating the area as a possible site for the newest station. Settlers quickly claimed all the available land and soon their biggest problem was finding a market for their products. These farming ventures were severely affected by World War I. Manpower was called away and development in Alaska stagnated. The Matanuska Station was included in the transfer of experiment station land to the Territory of Alaska and then to the new college in Fairbanks in 1932. Shortly after this, in 1935, the federal government relocated 202 families to the Matanuska Valley and agriculture in Alaska again became a priority for the federal government. The Palmer Research Center was built in 1948 to house a new USDA Federal Experiment Station. Later it also came under the administration of the Agricultural and Forestry Experiment Station, which now includes the Matanuska Farm Station, the Fairbanks Station, the Fairbanks Research Center, and the Palmer Research Center.



Dairy herd of E. Witwell, Anchorage, 1923.



A Mat-Su home and garden in 1916.

Charles Christian Georgeson— *a man with a vision*

by Janice T. Hanscom

One hundred years ago, Charles Christian Georgeson came to Alaska as the Special Agent in Charge of the United States Agricultural Experiment Stations. The Secretary of Agriculture instructed him to “act as if the country is your own and go ahead. Washington, D.C. is a long way from Alaska and all I want are results.”

Georgeson surveyed Alaska’s agricultural potential by establishing and administering seven experiment stations throughout the territory. In addition, he personally conducted plant breeding research. He became a vocal supporter of Alaska in its efforts to attain a stable agricultural economic base and increase its population. He truly is the father of Alaska agriculture.

Charles Christian Georgeson was born on the island of Langeland off the coast of Denmark on June 26, 1851. In 1873 he came to the United States to go to school, eventually earning his masters degree in 1882. He received his doctorate in 1916 from Michigan State College. His reputation as an outstanding plant breeder and agronomist was established before he finished his Ph.D. degree. Georgeson taught at Kansas State Agricultural College for seven years. In Kansas he met many of the men who would eventually come to Alaska to lead the various experiment stations.

Arriving in Sitka in 1898, the 47-year-old Georgeson plunged into his assignment. Since no one knew much about Alaska’s agricultural potential, Georgeson was limited only by his drive, enthusiasm, and budget.

Life in Sitka was very different for the Georgeson family. Viewing his appointment to Alaska as exile, he, his wife, and three



Charles Christian Georgeson (photo courtesy of UAF Rasmuson Library Archives).

children wished every day on the trip north to be recalled. The first winter the family lived in an unfinished house. “Yes, we were cold sometimes,” Georgeson said of his dwelling, “but our view was the finest in the world!” The family came to feel they were very lucky when compared with other experiment station personnel. Indeed, the first manager of the Rampart station, Professor Isaac Jones, lived in a woodchopper’s old cabin along the Yukon River. The roof leaked so badly that Jones erected his tent inside the cabin to keep dry. Jones spent the entire winter at temperatures as low as -70° F in his tent-cabin combination.

Georgeson opened the Sitka Station, his headquarters and Kodiak Station in 1898. In rapid succession, the Kenai Station was established in 1899, Rampart Station in 1900, Copper Center Station in 1903, Fairbanks Station in 1906, and finally the Matanuska Station in 1915. Both the Tanana Valley and the

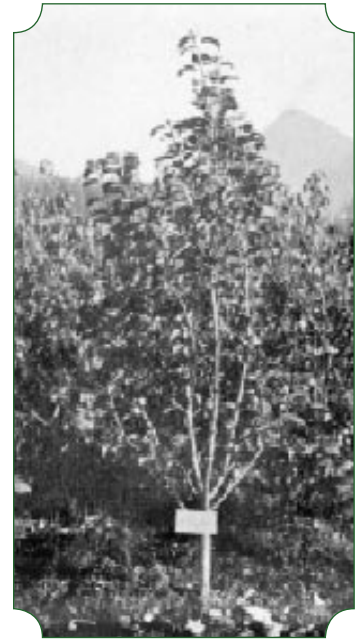
Matanuska Valley proved to be fertile grounds for crops.

Setbacks were part of the job, but none seemed to dampen Georgeson's enthusiasm for future Alaskan agricultural development. He was to provide results for the Secretary of Agriculture and he did. He studied everything from cows to grain to apples. Adequate land in Sitka was not immediately available for his use. It had to be cleared of woods, brush, and sometimes drained before planting could begin. The experiment station land was in the middle of a swamp, making cultivation impossible the first year, so Georgeson borrowed land to start his experiments.

In an interview Georgeson later explained, "My plots were scattered all over the village and having insecure fences, or no fences at all, the local boys, cows, pigs and tame rabbits rollicked joyously through them. Hens, which in Sitka fly like seagulls [sic], flocked to the feast I had unwittingly prepared for them, and when, by chance, they overlooked anything, the seeds came up to become the playthings of diabolical ravens, who, with almost human malice, pulled up the little plants merely to inspect their other ends."

He continued conducting experiments for many years in back and front yards throughout Sitka. Dr. Georgeson hybridized the native crab apple with several early maturing apples from the lower 48 states. A few apple trees scattered

Eight-year-old Whitney crab apple tree, 1911.



around the town today can be traced back to Georgeson's days.

His research efforts received popular approval. "You can imagine my joy when many branches set fruit. Everyone in the village was advised of the experiment and warned against disturbing those bushes. Then just about the time the fruit was ripe, the Indian women came along and gathered every one of my apples and made them into jelly!" he explained.

He developed the Sitka hybrid strawberry in response to some very skeptical Alaskan miners. "They all looked on me and my mission with pity and derision," commented Georgeson. That challenged him. He decided to give all Alaskans the opportunity to breakfast on strawberries and cream from their own back yard. In seven years he developed a hybrid strawberry "eight of which have been known to fill a quart container."

To complete the menu he searched for a cattle breed that could survive the winter, live off the land and produce good milk for cream. Georgeson imported Galloway cattle to Kodiak and later yaks to Fairbanks with this goal in mind. Galloway cattle were eventually replaced with Holsteins and the yak experiments were halted due to lack of funds. But not all his efforts ended in failure. The development of grain varieties that matured at the Rampart Station



Toklat strawberries were developed at the experiment station in Fairbanks (AFES photo).

guaranteed an economical local feed source for dairy herds in the Interior. Georgeson's dream of strawberries and cream came true before he retired.

Georgeson battled constantly for funding to carry out his work and provide for his employees. The 1898 budget for the Alaska district totaled \$5,000. By 1900, Georgeson had a budget of \$12,000 and was supporting three experiment stations. Members of the Committee on Agriculture felt \$12,000 was enough or perhaps even too much. Many people, both in Alaska and in the contiguous states, doubted the possibility of agriculture in Alaska. Georgeson went to Washington to address the committee only to be told "It's no use, your coming before this committee for a hearing. Your appropriation is twelve thousand dollars a year, and we're not going to allow you another cent." After Georgeson had extolled the wonders of the North, he did get an increase in funding.

Georgeson was a master at getting his money's worth from both his men and supplies. Rampart Station Superintendent George Gasser felt that Georgeson hired all Kansas State men because they knew "how to work hard long hours from dawn to dusk." Once an Indian cut off Gasser's finger. He went to the nearest doctor, an army physician, in Tanana for treatment. The bill was \$90. When Gasser presented Georgeson with the bill, Georgeson refused to pay. He claimed that experiment station personnel were federal employees. They received no other benefits so the army could pay this bill.

Georgeson became an advocate for

Alaska. He wrote 47 books, pamphlets, and circulars about the state and its agricultural potential. He published in popular magazines like *National Geographic*, in addition to Alaska Agricultural Experiment Station publications. "Alaska has been maligned, abused, and totally misunderstood," wrote Georgeson.

Georgeson was a vocal supporter of both homesteading and the immigration of Finlanders. He believed that since the Finns were used to the similar climates of Finland, they would adapt to Alaska and benefit the United States. Georgeson believed the biggest hindrance to settlement of the territory was the difficulty in obtaining land. It was very expensive to survey land and 80 acres was not enough to make a living in the Alaska climate. In a 1902 testimony before the Committee on Public Lands at the House of Representatives, Georgeson argued eloquently for an increase from 80-acre to 320-acre homesteads. "Alaska can furnish homesteads of 320 acres each to 200,000 families," said Georgeson. Eventually he won his point and Alaska homesteads were enlarged.

It is evident from his writings that Georgeson never doubted Alaska's potential for a great future in agriculture. Georgeson was convinced that Alaska could become a world leader in agriculture because of the land Alaska had to offer.

That potential still exists today. Great strides have been made in the development of new varieties that produce well in Alaska and the land is still there. It just waits for the correct economic climate. Then we will see Georgeson's vision for his adopted land come true.

Visit the Georgeson Botanical Garden website at: <http://www.uaf.edu/salrm/gbg/>

George T. Gasser—A Brief Biography

by Sig Restad*
Assistant Director,
Agricultural Experiment Station

George Gasser had been retired for five years when I first met him in 1958. At 79, he still attended regularly the weekly meetings of the Fairbanks Chamber of Commerce and held the position there of Chairman of the Agricultural Committee. His health was failing so he could not be very active, but “Doc,” as he was known to most, stayed on as chairman as a tribute to the more than 50 years in which he participated actively in the development of agriculture in Alaska.

George Gasser graduated with a Bachelor of Science degree from Kansas State Agricultural College in 1905 with a major in agronomy. On August 5 of that year he started his work in Alaska as assistant superintendent of the Rampart Agricultural Station under Frederick E. Rader. This was the farthest north of several stations started in Alaska after glowing reports of successful gardens in the territory reached U.S. Secretary of Agriculture Wilson in 1897.

These included a headquarters station which was started at Sitka in 1898, followed by stations at Kenai in 1899, Rampart in 1900, Copper Center in 1902, Fairbanks in 1906,



Putting up hay in Rampart, 1908.

Kodiak in 1907, and Matanuska in 1917. These early stations were carved out of the wilderness with a minimum of finances and equipment — as George found out at Rampart. He succeeded Frederick Rader as superintendent in 1908 and under his direction, eight acres were cleared with the aid of one team of horses. This doubled the station’s cropland, and experiment station reports praised Gasser for the clean, weed-free, well-managed plots he kept.

During his stay at Rampart, which lasted until 1920, George managed to keep up with variety testing, perform crossbreeding of small grains and legumes, raise garden seed for distribution throughout interior Alaska, work with small fruits, develop land clearing guidelines, amass a virtually complete plant collection of species indigenous to the area, increase the cropland to 90 acres, and manufacture his own power-driven threshing machine.

The population center of interior Alaska and the area of most activity developed around Fairbanks in the early 1900s and, in 1915, the U.S. Congress granted four sections of land for an Agricultural College and School of Mines.

George Gasser was a firm supporter of an Agricultural College for Alaska and

Vegetables ready for market, Unalaska (photo courtesy of the Boaz Collection, UAF Rasmuson Library Archives).



worked toward its inception with Dr. Charles Bunnell, who was to become the first president of the University. In 1917, the Alaska Territorial legislature created the Alaska College of Agriculture and School of Mines and appropriated \$60,000 for construction.

In 1920, George Gasser was transferred as assistant-in-charge to the Fairbanks Agricultural Experiment Station, where more agricultural activity existed. Fairbanks had its own flour mill capable of milling 25 barrels of flour per day and over 100 homesteads with agricultural problems that needed solving.

The first graduate of the new college in 1921 was John Sexton Schanely, who had transferred from Cornell in 1919 when courses first started. He homesteaded land next to the campus like many other students, and after graduation ran a seed business for some time. This property is just below the university, where a bank and the intersection of College Road and University Avenue are now located. Dr. Gasser bought Schanley's homestead and lived there until he died.

In 1925 and 1926, Doc did more graduate work at California and then became Professor of Agriculture at the college in 1927. He brought to the college twenty-one years of Alaska agricultural research experience gained at the Rampart and Fairbanks Stations, as well as the wide contacts he had developed in working with Alaskans. By this time he had developed Gasser wheat, a variety superior to any to be found for interior Alaska for the next half century. He was director of the college glee club, worked with many community activities, and could always be counted on for providing leadership in setting up the agricultural exhibit at the Tanana Valley Fair.

Doc found time for some activities outside of the experiment station and college also. He was in partnership with a commercial greenhouse in downtown Fairbanks on the property where the



Grain breeding plots at the Rampart Station, 1916.

Fairbanks Traveler's Inn now stands.

By 1936, George became dean of men on the Fairbanks campus and head of the college Department of Agriculture in 1937. In 1946 Doc Gasser was appointed the first commissioner of agriculture for the Territory of Alaska. Under his leadership, the territory established laws and regulations for improved marketing standards, animal health regulations and policies, aid to agricultural fairs, and the territorial government generally had a pro-development attitude.

He was one of the state personnel that accompanied a federal agricultural task force that toured Alaska in 1947 in order to review the possibility of Alaska's developing a more self-sufficient food base. One outcome of that task force was the establishment of the USDA Alaska Agricultural Experiment Station at Palmer.

George Gasser retired in 1953, but remained in Fairbanks. He remained as enthusiastic as his health would allow until his death in 1960. A crowded funeral service on a winter day at about 30° below in a little Fairbanks church demonstrated that the community had not forgotten an Alaska pioneer who spent a lifetime trying to improve Alaska's ability to care for herself.

*Reprinted from the January 1979 *Agroborealis*.
The author has since retired.

Last frontier's sweet nectar: *strawberries*

by Dr. Patricia Holloway,
Associate Professor of Horticulture



Hybrid strawberries grown in rows, Sitka, 1913.

Fresh strawberries! If we could only grow strawberries in Alaska, surely that would mean we could grow just about anything! Such was one of the challenges that greeted Charles Georgeson when he began the Sitka Agricultural Experiment Station in 1898, and it has captivated the attention of researchers ever since. Charles Georgeson was given the charge to try everything and anything he could find to learn what crops could be grown successfully in Alaska. He worked with grains, vegetables, shrubs, trees and fruits, but possibly his most successful and enduring accomplishment was with strawberries.

Strawberries are native to Alaska. The coastal beach strawberry (*Fragaria chiloensis*) grows in almost pure sand and gravel along the beaches, especially from Icy Strait to Prince William Sound. The fruit has been gathered by Indians for centuries. The same is true of the northern wild strawberry (*Fragaria virginiana*) which grows in patches throughout the Interior, particularly in dry, sandy soils. Only three years after Georgeson came to Alaska, he transplanted the first beach strawberries to the Sitka Experiment Station. In 1905, he also transplanted the northern wild strawberry to Sitka, but both attempts at domestication failed. The northern wild strawberries rotted in the wet Sitka ground, and the coastal strawberries grew such luxuriant foliage and runners in the fertile soils, that they produced no fruit.

As early as 1902, successful strawberry

production was reported by homesteaders in Southeast Alaska. Probably the most successful growers were in Haines. One gentleman in particular, Charles Anway, became well known for his giant strawberries, one fruit of which would fill a teacup! The Haines Strawberry Festival was an annual event for many years and celebrated Anway's accomplishments. These early successes were localized, and in much of the Territory, including the Sitka Experiment Station, "Lower 48" transplants did not survive. In 1905 Dr. Georgeson began an intensive breeding program that would eventually carpet the Territory with strawberry plants. He wanted to develop a strawberry that combined the hardiness of the wild strawberry with the fruit size and productivity of the cultivated berries from the "Lower 48" and find the perfect strawberry that would grow throughout the Territory.

He hybridized the wild beach strawberry from Yakutat with a "Lower 48" cultivar of unknown origin. This cultivated berry was named "Hollis" because it came from a garden in Hollis, Prince of Wales Island. Of the 2000 seedlings that resulted from the crosses, only ten percent bloomed and even fewer produced quality fruit. Selected plants were propagated and sent to all the branch Experiment Stations. In 1910, the first Sitka Hybrid strawberries arrived in Rampart on the Yukon River. Station Assistant in Charge, George Gasser, found that some of the plants would survive the intense winter cold of the Interior with only a covering of snow

for protection. He propagated the survivors and shared them with hundreds of homesteaders throughout Alaska.

The Sitka Hybrid strawberries were the pride and joy of the Sitka Experiment Station and homesteaders for many years. Seedling Number 468 was named in honor of President Warren G. Harding when he visited the Station in 1923. In the 1920s, Fairbanksan Strawberry Joe Nettleton gained quite a reputation for “his famous Sitka Hybrid strawberries” grown at his Ester Siding homestead located at the end of Gold Hill Road. Through the mid-1960s, Sitka Hybrid strawberries were touted as “the only variety recommended without reservation, as dependable through nearly all Alaska.”

Even today, they are sold commercially to homeowners and landscapers. Many old homestead sites throughout the state still have remnants of the Sitka Hybrid strawberries growing near long-forgotten foundations. One indication that strawberries are remnants of these original Sitka hybrids lies in their leaves. Many Sitka Hybrid plants have leaves with four or more leaflets rather than the three leaflets common to most cultivated varieties and to the northern wild strawberry. This trait comes from one of its parents, the coastal beach strawberry.

Sitka Hybrids included a diverse group of seedlings rather than a single cultivar. The plants that survive today in the Interior are not necessarily the same plants that survive in the Matanuska Valley or Anchorage or Homer area. One thing all Sitka Hybrids have in common is very soft fruit with white or pale pink flesh and pale pink skin. This characteristic made them suitable for home gardens, but not for commercial production. The Sitka Hybrid strawberries provided a foundation for breeding work conducted by Dr. Curtis Dearborn at the Palmer Agricultural Experiment Station from



John Scharles's strawberry ranch in Fairbanks, Alaska (photo from the Albert J. Johnson Collection, UAF Rasmuson Library Archives).

1951 through the late 1970s. The purpose of Dearborn's research was to develop a bright red strawberry for commercial markets. Three cultivars were released from this breeding program that have provided the first full red-colored strawberries that are consistently hardy in southcentral Alaska: 'Susitna', 'Squentna' and 'Matared'. These cultivars survive in the Interior, but they do not produce fruit.

Meanwhile—cultivated strawberries arrived in the Interior only five years after Fairbanks was founded. Fairbanks market gardener John Scharle imported thousands of plants from the “Lower 48” in 1907 and sold homegrown strawberries to delighted Fairbanksans the next summer. Although the imported plants did not grow well in subsequent seasons, Mr. Scharle hybridized the survivors with the northern wild strawberry to produce the first hardy cultivated plants in Fairbanks. These Scharle hybrids were grown by well-known homesteader Harry Badger, nicknamed the “Strawberry King,” and may have been used in the first breeding program at the Fairbanks Experiment Station begun by Dr. Arvo Kallio.

Kallio began hybridizing strawberries in 1958 and released his first cultivar in 1968. 'Pioneer',

also locally known as 'Alaska Pioneer', is still a popular cultivar sold for home garden use throughout the state and in Canada. Fruit size is small, but it is wonderfully aromatic, a characteristic that came from one of its parents, the northern wild strawberry. The other parent, 'Senga Sengana' was the top-selling commercial strawberry in Europe for many years. Following Kallio's departure, Dr. Donald Dinkel continued making selections from Kallio's original crosses for improved fruit size and hardiness. In 1977, Dinkel released 'Toklat', still the most important commercial perennial strawberry for Alaska.

Until the 1970s, all work done at the Agricultural Experiment Station involved June-bearing, perennial strawberries. When clear polyethylene mulches became commonplace in agriculture, a new system of strawberry production was developed in California. Everbearing strawberries, those that produce two crops per season, were being grown using a method of protected cultivation: clear polyethylene mulch for soil warming, and clear polyethylene row tunnels for additional heat and frost protection. Dinkel adapted this growing system for Alaska and provided an alternative to growing perennial strawberries. This system is very labor intensive and requires special mulch-laying equipment, but yields are very high. The most popular cultivar, 'Quinault' can produce up to

one pound of fruit per plant in a good season.

During the past 10 years, strawberry research has continued at the Fairbanks Experiment Station. We have conducted cultivar trials of everbearing strawberries and research to improve the intensive protected cultivation system to assist commercial growers. We maintain demonstration plots of both perennial and annual strawberry growing systems in the Georgeson Botanical Garden in order to share cultivation techniques with the public. We maintain plants of all existing cultivars bred at the Experiment Station to share germplasm with growers and researchers throughout the Circumpolar North. In 1989, we experimented with the production of strawberry plants, rather than fruit, for possible export to lower latitudes. California growers actually came to Alaska to learn if Alaska-grown plants would become dormant early, thus allow Californians to plant their annual strawberry fields and get ripe fruit earlier than their competitors. We produced high-quality plants, but the plants did not fruit earlier in California.

After 100 years, strawberries still hold a fascination for Experiment Station researchers and Alaskans in general. No doubt, when the Experiment Station celebrates its 200th birthday, there will be plots of strawberries somewhere on the farm!

Alaska's reindeer industry: past, present and future



Drew H. Shain, Assistant Professor, Animal Science
Greg L. Finstad, Research Associate
Alex K. Prichard, Research Technician

The reindeer industry is an important part of Alaska's agricultural economic base. It is a regional industry, located mostly on the Seward Peninsula, but generates up to 19% of the livestock products sold in Alaska. This equates to a \$1.1 million contribution to the state and local economies.

Past

Since 1891, when the United States government first introduced reindeer to Alaska, this industry has endured significant change. Alaska Natives were encouraged to own and herd reindeer to provide economic stability to the Seward Peninsula area. During the early 1900s wild caribou on the peninsula were hunted for subsistence purposes. As these caribou populations declined the reindeer industry filled the void by providing meat for local residents. The intent of the reindeer industry was—and still is—to provide a viable economic industry for Native communities on the Seward Peninsula as well as the rest of the state.

Near the end of the gold mining boom, local markets decreased substantially and, with them, the financial rewards of reindeer herding. Extensive non-Native ownership of reindeer caused economic conflicts and range disputes with Natives resulting in a disjointed industry. During that time, non-Native owners were exporting large quantities of meat to markets in the continental United States. By 1932, an estimated 600,000 reindeer existed in Alaska. Then came the Depression, resulting in fewer export markets. The decline in gold mining and

decrease in fur prices caused lower incomes for miners and trappers and reduced reindeer meat sales in the territory. In addition, poor range conditions coupled with severe winters and an increase in predation also contributed to the decline in reindeer populations. With the economic incentive gone reindeer herding also declined.

In 1937 Congress passed the "Reindeer Act" which prohibited ownership of reindeer by non-Natives and the United States government purchased all non-Native herds. The Bureau of Indian Affairs, in cooperation with Alaska Natives, assumed responsibility for governing the reindeer industry. Since that time, the reindeer industry has been evolving. From 1937 to 1948 reindeer numbers in Alaska declined from an estimated 544,000 to 32,000 animals and has stabilized at approximately 30,000 animals.

The history of reindeer herding in Alaska has a storied and illustrious past. Those interested in this history are encouraged to read several books which provide in-depth information and complete accounts of the early years of Alaska's reindeer industry. These publications include: *Where did the reindeer come from? Alaska experience, the first fifty years* by Alice Postell, 1990, Amaknak Press, Portland, Oregon and *Eskimos, reindeer and land* by Richard Stern, Edward Arobio, Larry Naylor, and Wayne Thomas, 1980, Bulletin 59, Agricultural and Forestry Experiment Station, University of Alaska Fairbanks. For more information on reindeer herding in Alaska you

AFES researchers modified handling techniques and equipment. They are currently concerned with feeds and nutrition of reindeer.



can also visit our web page at <http://reindeer.salrm.uaf.edu> [02/04 address].

Present

Reindeer production is still predominately located on the Seward Peninsula. A few herds located on coastal islands and along the state's road system make up the remainder of Alaska's reindeer industry.

The reindeer industry plays an important economic role for the state and especially the local communities. Income is generated mainly from the sale of velvet antler and meat. Although some monies are generated on island and road system herds, the majority is directly associated with the reindeer industry on the Seward Peninsula. This revenue helps support local economies where limited economical growth potentials exist.

The industry provides meat for local consumption as well as meat for export from the region. Reindeer meat purchased from local herders costs approximately \$2.25 per pound. Compared with prices for hamburger (\$3.75 per pound), pork chops (\$5.95 per pound), or chicken (\$2.30 per pound), reindeer meat is an inexpensive source of meat. In addition, meat is sold directly to retail and wholesale outlets who provide expert processing and market the product for \$5 to \$15 per pound, depending on the cut. Selling meat to wholesale or retail outlets adds \$600,000 to Alaska's economy, with approximately \$300,000 of that remaining on the Seward Peninsula.

The main operating expenses associated with reindeer herding are the hire of helicopters for herding during the summer months and labor costs associated with herding and handling animals. Reindeer herding



The top photo by Steve Lay shows reindeer being herded into the coral using a helicopter. Visitors can learn about reindeer at various farms in the Fairbanks and Matanuska areas (photo by Jay Mckendrick); below, Greg Finstad uses a reindeer "crush," to control an animal during handling (photo by Steve Lay).





Reindeer in the corral (photo by Steve

provides jobs for local residents, who in turn help support their extended families. In addition, equipment, fuel, and supplies used in reindeer herding are purchased locally. In all cases, this money stays in local communities and supports the local economies.

Agricultural and Forestry Experiment Station researchers, through the Reindeer Research Program, are highly involved in working with the state's reindeer producers. Researchers have helped improve reindeer production by developing a management plan to use a vaccine against brucellosis and to use Ivermectin® (an anthelmintic) to help control parasite problems. Past university research has centered around improving animal health, improving reindeer products and aiding management decisions. Current projects examine ways to improve animal productivity.

Completed research projects provide information on and have developed methods for processing and improving the quality of reindeer antler, assessing the quality and safety of reindeer meat, transporting reindeer by airplane, raising orphaned reindeer fawns, and examining the basics of management and medical aspects of reindeer farming.

Researchers demonstrate the incorporation and adaptation of handling methods used in other countries for use in Alaska's reindeer industry. Fawn separators are used to remove fawns from

facilities that handle adults, thereby reducing injury to fawns. Mechanical restraint chutes called "crushes" allow better control of reindeer. Modifying corral designs improves the handling efficiency and safety of reindeer. These practices improve the herders' ability to handle the reindeer and reduce the potential for injury to both animals and their handlers.

Three years ago we began evaluating the use of native range by free-ranging reindeer. Our goal is to identify plant nutrient content and determine which plant species reindeer choose in their diet throughout the growing season. Understanding which plants reindeer choose as forage and how the nutrient content in these plants change over time will give herders the necessary information to manage their herds and maximize the use of native forages. We are gathering information necessary to evaluate the quality and potential productivity of a range for reindeer production.

We are conducting a long-term project that examines the nutrient requirements for free-ranging and captive reindeer. As we combine new information about reindeer requirements for minerals, protein and energy with current knowledge about what reindeer choose to eat, we will be able to make recommendations to improve animal growth and antler production. We are also examining the use of locally available feedstuffs in reindeer diets. In Alaska, the only commercially available reindeer feed is made from 66% imported ingredients. Identifying locally available feedstuffs to feed captive reindeer will reduce feed costs and provide an additional market for Alaska-grown feed.

AFES researchers have developed and implemented a record keeping system, currently under revision, that provides a tool for herders to use in making management decisions. The previous record keeping system was maintained and used primarily by the reindeer researchers.

However, we are redesigning the system to be user friendly, allowing herders better access to their data. This system identifies each animal individually using its numbered ear tag to identify its owner. Information includes sex, age, treatments (vaccinations, antibiotics, and anthelmintics), physical abnormalities, antler weight, body weight, reproductive status, and research samples taken. The records contain valuable information that will help improve management decisions and enhance the ability of researchers and producers to increase reindeer productivity. The system also allows producers access to an animal's production data at the time of handling to enhance "on the spot" decisions.

Examining the quality of meat produced from Seward Peninsula reindeer is a renewed area of interest. Reindeer meat contains more protein and less saturated fat when compared with domestic red meat sources. Therefore, the sale of reindeer meat to health conscious and speciality meat consumers is lucrative. However, for these markets to survive and remain profitable, reindeer meat must provide consistent quality and an acceptable eating experience whether in Alaska or elsewhere. Researchers are currently examining the effect of electrical stimulation on meat tenderness and consumer acceptance. Applying practices used in slaughtering domestic livestock to reindeer might improve product quality and consistency.

Alaskans are slowly developing an interest in intensively farmed reindeer operations in addition to the free-range operations of the Seward Peninsula and coastal island herds. These operations, located in Delta Junction, Nenana, Palmer and Homer, take advantage of the reduced transportation costs. However, many questions need to be answered before intensively farmed reindeer can become a significant part of the industry.



Free ranging reindeer use native forages (photo by Steve Lay). Shown below is Elsa of the RRP research herd and her calf. (AFES file photo).



Future

With many unknown variables, one fact is certain—researchers and producers must work jointly to continue the reindeer industry's progress and development. The following goals and questions are areas where continued research can move the reindeer industry forward.

The reindeer industry should strive for more value-added products and improved marketing techniques. For example, by increasing state inspections of reindeer meat intended for retail sale, the value of that product can increase threefold. Value-added packaging on the more desirable cuts of meat can also triple their value and increase producers' profits. Additionally, improved marketing, increased consumer awareness of the health benefits of reindeer meat, and improved meat quality and consistency will stimulate growth in the industry.

As more reindeer meat is produced, there will be more problems associated with disposing of waste products from slaughter plants. Instead of considering it waste, producers could develop useful by-products. Ideas might include: developing canine chew treats (hooves, jerky, bones), sale of hides, developing a high-protein, high-fat meat product for use as dog feed, and developing dog snacks for dog mushers to use on the trail. These products will reduce the amount of waste needing to be recycled before being returned to the environment, while providing an added benefit to reindeer producers.

Although there is limited information about the complexity of nutrient requirements for both antler and lean-tissue growth, research in this area will continue to be important to reindeer production. Understanding these requirements will benefit both intensive and extensive reindeer producers. Intensive producers use captive farming practices, while extensive producers use free-ranging farming techniques. Intensive producers can benefit by accurately formulating diets for captive reindeer; whereas, extensive producers may benefit by supplementing critical

nutrients to free-ranging reindeer when natural diets are deficient. In both cases, providing nutrients to meet the animals' requirements will increase productivity and profitability.

The economics associated with raising captive reindeer have not been determined yet. Many factors must be considered when establishing the economic feasibility of intensively farmed reindeer. These include costs associated with interest on loans, diets, grazing, marketing, fencing, and animal health. Developing markets for reindeer products and examining alternative sources of income from captive reindeer need evaluation as we determine if raising captive reindeer is economically feasible.

Range evaluation and plant nutrient content will continue to be an integral part of the AFES Reindeer Research Program. Determining changes in ecosystem variables, plant species composition and nutrient content will provide information necessary to evaluate the influence of grazing from both reindeer and/or migrating caribou on range productivity. This information may also help determine the impact of migratory caribou on reindeer productivity.

Continued use and collection of data from reindeer herds will increase our knowledge about proper management principles and practices. These data are vital to our understanding of biological processes in free-ranging reindeer. Long term evaluation of these data and continued producer support will improve our ability to assist in management decisions.

Alaska's reindeer industry has faced and survived many challenges during the past 100 years. Through research and development, the reindeer industry will grow and continue to be a viable economic force in Alaska.

Alaska's agriculture

Examining 100 years of growth, lean times

Carol E. Lewis, Professor of Resources Management
and Roger W. Pearson, Professor of Geography

Alaska marks the 100th anniversary of the agricultural experiment stations in 1998. As the Russians learned in the early 1800s, agriculture in Alaska is marginal geographically. It is remote from large sustaining commercial markets and distant from the biologically richer mid-latitude biomes. This has not stopped the industry from becoming a modest but sustainable component of Alaska's economy.

The physical conditions typical of northern regions have not changed throughout the near 200 year history of agriculture in Alaska. A baseline of federal support has continued since 1898 with the first land surveys and establishment of the experiment stations. Federal and state programs sustained agricultural endeavors. However, governmental policies fluctuated dramatically from highly optimistic to somber and negative. The fledgling and at times faltering industry has reacted to projections and promises that agriculture would become a major part of Alaska's economy and experienced several boom periods. Major expansion did not occur, but neither is agriculture a dead industry as some have claimed.

Agricultural production has continued to increase since its beginnings with the Russian traders. The industry experienced several booms following the turn of the 19th century. Today as the industry faces the turn of another century, Alaska's agriculture is modern though modest, supplying approximately ten percent of the state's food needs.

The industry has matured in its diversity. Much of Alaska's agriculture has nothing to do with the traditional production of food and fiber. Entrepreneurs derive income from agricultural

tourism, raising and stabling horses for pleasure and show, dog racing, revegetation, and seed production. In turn, these enterprises generate a demand for supplies and infrastructure to support their endeavors, supplementing the demand from traditional producers.

Alaska's agriculture has never been considered a basic industry in the territory or the state. Yet agriculture is important to Alaskans because it is a part of the rich settlement history of their state. For this reason, Alaska's agricultural industry is best understood in historical perspective.

By 1902, the head of Alaska's agricultural experiment stations had concluded that agricultural possibilities of a high order had been demonstrated.

Agriculture before oil

Agriculture in Alaska had its beginnings earlier than is recognized by most. Production of food was a primary concern in selecting sites for Russian trading posts in southern coastal areas. The Russians had limited success with roots and tubers. Soils were rocky and thin and the northern coastal marine climate was inhospitable to the production of most crops. Further, the Russians

preferred their native foods and imports from California.

The United States purchased Alaska in 1867 and federal interest in the agricultural potential of the territory was aroused. In 1892, the U.S. government brought reindeer to the Seward Peninsula in northwestern Alaska. The idea was to provide a more stable food source for the Eskimo people of the region. In 1897, a study group from the Office of Experiment Stations identified 15 million acres as having agricultural potential. Subsequently, seven experiment stations were established throughout the territory from 1898–1917; the first in Sitka followed by

Kenai, Rampart, Copper Center, Fairbanks, Kodiak, and Matanuska. By 1902, the head of Alaska's agricultural experiment stations had concluded that agricultural possibilities of a high order had been demonstrated.

The enthusiasm expressed by the government of the United States for agriculture in the new territory of Alaska was short lived. World War I and the Great Depression directed policy makers' attention elsewhere. During the depression years of the 1930s, support was reduced until, in 1932 the Sitka station closed, leaving only two experiment stations, the still existing stations in Fairbanks and Matanuska.

Although early surveyors had high expectations for agriculture in Alaska, most of the territory's 586,000 square miles were not classified as croppable land. Only 4 percent were designated as potentially suitable for crop production. When Alaska became a state and began to select lands given to it by the federal government, 5 million acres of potentially croppable land were considered. Only 500,000 acres were within existing transportation corridors, an important criteria for successful commercial production.

Alaska's economy, characterized by "booms and busts," was neither diverse nor stable. During early resource boom periods, food

production was a necessity. Transportation systems were poorly developed and it was difficult to move food stuffs into the expanding camps and cities. Agricultural expansion was inextricably tied to industrial booms (gold and oil) and federal injections (land programs and military expansion). The industry was also affected by the general economic development of the territory and state, its geographic extent and physical geography, and the sparseness and size of its population.

Each boom period brought people to Alaska who remained after the boom subsided. In 1900, there were 63,000 people in Alaska. By 1940, the number had increased to 72,000, and in the mid-1980s to roughly 550,000. The small population limited the instate markets for agricultural products. Additionally, there was little interest in farming. The majority of this population migrated to Alaska from urban centers and thus had no agricultural background. The lifestyle necessary for pioneering agricultural production on undeveloped lands was rustic and not easily acceptable to this population. People who had immigrated to Alaska clustered at the hubs of transportation systems, most constructed or improved to support boom economies. Approximately 75 percent of the population was concentrated in the so-called "railbelt" region making up roughly 20 percent of the total state area.

Agriculture did not provide the impetus for development of major transportation systems in Alaska as in other areas of North America. Thus transportation systems were not designed to move agricultural products. Also lacking was appropriate infrastructure for transferring products at multi-modal transportation hubs such as road/rail and rail/barge in the interior and on the coast of Alaska.

Agriculture developed most rapidly in two river valleys in Alaska, the Tanana and the Matanuska-Susitna. There was also some development on the Kenai and Aleutian peninsulas, on Kodiak Island, and in southeast Alaska. This was considered minor, however, in



Map showing agricultural land in production.



At left, a display of grains and vegetables grown in the Tanana Valley (photo from the Vide Bartlett Collection, UAF Rasmuson Library Archives). At right, Matanuska Maid display, 1970s (AFES photo).

comparison to development in the two river valleys.

Agriculture in the Tanana Valley was influenced by gold discoveries. In the early 1900s, the valley became the site for numerous gardens, market vegetable production, dairies, and hay and grain production. The Agricultural Experiment Station at Fairbanks was established in 1906. Land was withdrawn in 1917 for the Alaska Agricultural College and School of Mines, now the University of Alaska Fairbanks.

Commercial agriculture was a major component of the Tanana Valley's economy through the late 1930s when production began to decline. A reduction of federal support for Alaska agriculture during the U.S. Depression was undoubtedly a contributing factor. Improved transportation from southern Alaska ports into the Interior also contributed by making available imported produce at reasonable costs.

Agricultural activity began in the Matanuska-Susitna River valleys in 1914 with the construction of the Alaska Railroad. In the 1920s, the federal railroad operated a creamery near Palmer. Food was supplied to railroad crews and was transported by rail to the growing construction city, Anchorage.

The federal government moved 250 impoverished farm families from the midwestern United

States to the Matanuska Valley in central Alaska in 1935. The purpose of the project was to help these families supply themselves with food. Land was made available and access was provided with a rudimentary road system. Land had to be cleared of mixed hard and softwood forest stands before it could be farmed. The families engaged in various production farming activities such as dairy, hay, and vegetable production.

Despite the fact that development was not the objective of the Matanuska Colony, it sustained and became the catalyst for an expanding agricultural community. An agricultural experiment station had been established at Palmer in 1917. Palmer was also the headquarters for the first agricultural cooperative in Alaska. Matanuska Maid Cooperative was incorporated in 1939 and included a creamery. These two creameries, Matanuska Maid and the railroad creamery, were the roots that made the Matanuska Valley the center of dairying in Alaska.

Agriculture stagnated in Alaska during World War II. However, during and immediately following the war, Alaska became the home of three major military bases, one in Fairbanks, one in Anchorage, and one in Delta Junction. Anchorage was established as the headquarters for the military in Alaska. This increased

the population, provided civilian jobs, and established a large market for agricultural products.

The area surrounding Fairbanks did not recover substantially from its decline in the 1930s and continued stagnating during the 1940s. The city itself was growing and the population was becoming more urban. Agriculture in the Tanana Valley moved to the south and east and specialized in grains and red meat. In the 1950s, homesteaders began producing grain and livestock in the Delta Junction area. The federal government provided homestead lands and settlers had access to federal loan programs and information from federal agencies. They were left, however, to develop other components of an agricultural system on their own. After statehood in 1959, the state provided land through eight land sales. The largest, until 1978, was in Delta Junction in 1969 when 21,000 acres were sold.

The late 1960s marked a new era in Alaska's economic history, the discovery of oil. In 1968, a large oil discovery was made near Prudhoe Bay on Alaska's northern coast. This started the last of Alaska's major economic booms to date. Construction of the trans-Alaska pipeline brought people and high wages to Alaska. After oil began to flow in 1976, the state's income also increased.

With this prosperity, there was growing interest in agriculture. The state had, for the first time in its young history, adopted a positive policy toward agriculture, "Resolution 76," an effort to promote development. There was interest in expanding agriculture near Delta Junction with feed grain and red meat production and in Point MacKenzie near Palmer in expanding milk production.

Agriculture after oil

The state of Alaska decided to invest directly in the lagging agricultural industry in the late 1970s. The strategy involved combining public and private investments. State lands in large contiguous blocks were to be designated "agricultural projects," for producing specific products. Farms in economically viable sizes within the projects were to be sold to

interested individuals in the private sector. The land could not be subdivided, sale did not include subsurface rights, and only agricultural enterprises would be allowed. The state would provide funding through loans to farmers and additional capital through state investment in and/or loans to private firms for supporting infrastructure for transportation, processing, and marketing. Two agricultural projects were put in place by the state.

The first agricultural project emphasized producing feed grains to promote the production of livestock. Barley for feed grain had been grown since early settlement times. However, animal numbers were low because of a lack of slaughter facilities and small farm sizes. A contiguous block of appropriate state land was available adjacent to the Alaska Highway near Delta Junction which historically produced barley.

The initial land sale of 50,000 acres took place in 1978 when 22 farms were sold. These farms would provide sufficient grain for export and support of a red meat industry in the state. A second land sale in 1981 increased the acreage in the Delta Agricultural Project to 90,000 acres. Successful purchasers were granted low-interest state loans to develop their farms. A separate loan provided money to clear the land of its primarily black spruce cover.

The state granted the new cooperative in Delta Junction, the Alaska Farmers Cooperative, a loan to construct a fertilizer plant and 10,000 ton grain elevator near the project. The state also solicited investors in slaughter facilities in Palmer and Fairbanks, and a grain terminal in the Port of Seward at the southern terminus of the Alaska Railroad.

The period from 1978 through 1984 saw a sharp increase in the quantity and value of barley produced, primarily a result of increasing production from the Delta Project and rising feed grain prices in commodity markets. Red meat production, including pork, increased. One of the Delta farms was a hog production facility handling almost 300 sows. The Palmer slaughterhouse began operating under private ownership.

The slaughterhouse construction in Fairbanks experienced construction delays.



Cabbage and potatoes at Hope, Cook Inlet, August 16, 1903.

There were also problems getting entrepreneurs interested in the grain export terminal even though construction had started and materials were on hand. Export terminal construction was delayed until in early 1983 a newly elected governor vetoed a legislative appropriation for its completion. In 1984, feed grain prices in the commodity markets continued to drop as the U.S. farm crisis reached its climax. Imported grain competed with Alaska-produced grain. This, coupled with the delays and problems with the infrastructure, production problems encountered farming new lands, and in some cases inexperience of the owners of Delta Agricultural Project farms, caused a domino effect and bankruptcies were not uncommon as the Delta Project approached its tenth anniversary.

Barley production dropped sharply in the mid-1980s falling 68 percent between 1984 and 1986. To a lesser extent, red meat production also dropped. Alaska feed grain producers had no way to efficiently export grain. Surviving farmers began producing for the instate markets only. Slaughter capacity limited red meat production. The Fairbanks slaughter plant was never completed. Another meat plant outside Fairbanks that could handle only a few animals closed during this period. Because of bankruptcy, the state took over the slaughter plant operation in Palmer

and operated it under a management agreement with the Department of Corrections. Rumors abounded about the Delta Agricultural Project failure.

Harbingers of doom proved incorrect. The state adopted an aggressive program to resell lands it foreclosed in the Delta Project and also agricultural lands near the project. As a result, there were more farms. The new farmers had more experience and capital. Those who remained increased production and diversified, producing crops such as hay, oats, and canola, as well as barley. The number of cattle on farms also increased and the hog operation began operating at full capacity under new ownership. The Department of Corrections

maintained a management agreement with the state to operate the slaughter plant in Palmer. Two other plants, one in Delta and a custom processor near Fairbanks, began operating.

Grain consumption is still limited to instate livestock markets. However, if the quality of red meat is equal to that imported, there is room for growth in the marketplace.

The Matanuska Valley and Delta Junction are the state's centers for the dairy industry despite the fact that milk production in Alaska dropped continuously from 1964 through 1980 because of the decreasing number of dairy cattle in the Matanuska Valley. There were also creameries in the Tanana Valley. One operated in Fairbanks from 1911 to 1972. Milk production and processing in the vicinity of Delta Junction



Garden of Isaac Fisher, Anvik, 1904.

has been continuous since the late 1950s and a family operation now processes milk from five herds.

The Matanuska Maid creamery imported raw and recombined milk to make up the difference in dropping milk quantity from Matanuska Valley dairy herds. This was not cost-effective. Inefficiencies in the plant and low product flow resulted in bankruptcy for the creamery. The state of Alaska purchased the plant in the late 1970s and it is currently operated by an appointed executive board and a plant and marketing manager.

The Point MacKenzie Project was planned to increase the number of dairy herds in southcentral Alaska and support the milk processing industry. Nineteen out of 31 farms were dedicated to dairy in a 25,000 acre contiguous block of state agricultural land at Point MacKenzie, 60 miles by road from the Matanuska Maid creamery in Anchorage. The sale took place in 1983. Those who purchased dairy farms were eligible for state loans for the land, capital improvements, and land clearing.

Beginning in 1984, the dairy industry experienced a rapid expansion. In 1987, at the peak of milk production since statehood, seven dairies were operating at Point MacKenzie and the Matanuska Maid creamery was operating at capacity based on an eight-hour operating day.

While state support resulted in a brief spurt of increased milk production, questionable land title resulted in new dairy farmers leaving the industry. Due to an error in land title, the lands sold in Point MacKenzie were actually a part of the state's Mental Health Trust and should not have been sold. Because farmers could not secure title to their land, they could not obtain loans for operating expenses, and numerous foreclosures occurred. Milk production declined until 1994 and reached a historic low point not seen since statehood. Again, rumors abounded of yet another failed state agricultural project.

Success does not always mean the fulfillment of the strategies thought appropriate by planners. Milk production in Alaska has increased slightly since 1994. Titles were



Harvesting potatoes at Tanana mission, 1910 (photo from the Ben Moyee Collection, UAF Rasmuson Library Archives).

cleared on the Mental Health Trust lands and these foreclosed parcels reverted to the state. The state is aggressively pursuing interested buyers for these lands. In 1997, there were three operating dairies at Point MacKenzie. Two owners were producing hay on their parcels and two other hay farmers produced their crop on a land lease. One of the dairies owned by the state was converted to a diversified prison farm.

There is interest in dairying in Alaska and at Point MacKenzie. The Matanuska Maid creamery operates in the black and aggressively markets a diversified line of products. Increase in the number of cattle and dairy farms in Delta is somewhat limited by the size of the local processor. It is possible to ship milk to the Anchorage creamery although not as cost effective as using the local processor. The turn of the century may again see a revitalized dairy industry in the state.

After oil was discovered and dollars began to flow into state coffers, aside from these projects, Alaska's agricultural industry continued to sustain itself without massive infusion of state capital, but with support from the state in essential services such as land sales, loans and loan assistance, inspection, and marketing. It did, however, benefit from the increased agricultural activity and interest generated by project agriculture.

An emerging segment of Alaska's agriculture

during this period was the greenhouse and nursery industry. Potatoes, hay, and vegetables have always been successful crops in most areas of Alaska. Although the climate and short growing season limit the variety of vegetables produced, carrots, lettuce, and cabbage are a major market crops. Russian traders had early success with potatoes and the crop came into its own commercially in the 1930s and 40s. There was a steady improvement in quality. Population increases in the early 1970s coupled with a decrease in supply from outside Alaska resulted in an increased demand for Alaska potatoes.

Research results and their adoption by producers continued to improve the quality of Alaska potatoes and increase the number of varieties grown. This led to increased demand from consumers and to rising prices.

After 1986, attractive prices lured new producers. Those who did not meet exacting consumer preferences ceased production. After a period of fluctuating quantity, production stabilized and increased. In 1996, the value of the potato crop approximated that of milk. Table potatoes and potato seed were among the few agricultural exports.

The Alaska market for fresh vegetables has always been limited by population. Historically, vegetables have only been processed for home consumption. Vegetables accounted for less than 5 percent of the cash value of agricultural crops prior to the oil years. This increased to almost 10 percent in the early 1970s.

The state Division of Agriculture put substantial effort into the “Alaska Grown” program in the 1980s. This marketing strategy and advertising campaign to promote high-quality Alaska agricultural products had continuing success. Improved quality of Alaska vegetables continued to result in increasing prices and “Alaska Grown” vegetables became available in supermarket chains, specialty stores, and farmers’ markets.

Hay has made an important contribution to Alaska’s agricultural industry. It has historically occupied the largest percentage of land devoted to agricultural crops. Brome and timothy are the

prevalent grasses produced. Since statehood, hay has remained near 25 percent of the cash value of all non-greenhouse and nursery products produced in Alaska.

The greenhouse and nursery sector is an often overlooked segment of the agricultural industry in Alaska. Crops include cut flowers, nursery stock, greenhouse production for retail florists, landscape firms, local garden centers, and floral/garden supply departments in national chains. There were rapid increases in production from 1981 to 1990 reflecting a rising economy. Of particular note were increases in cut flowers, potted flowers, and bedding plants. Since 1984, the greenhouse and nursery sector accounted for approximately half of the cash value of Alaska’s agricultural products.

Concluding remarks

During the first half of the 20th century, the stimulus for agricultural development in Alaska was the lack of adequate transportation facilities and the need to provide food for settlers. After World War II, the stimulus for agricultural development changed with infrastructure improvements. Federal homesteading and a state homesteading program made land available for farming.

With the onset of oil revenues, the state initiated agricultural projects in an attempt to stimulate agricultural development. Agricultural resources were seen as alternative to oil income. The dreams of planners did not come to fruition with the projects, but they did stimulate interest in agriculture and sparked a new era of modest expansion for the industry.

Alaska’s agricultural industry is maturing. Farmers and other entrepreneurs produce a wide variety of products. A historical perspective provides insight into the tenacity of Alaska’s farmers and the impediments they have had to overcome to make theirs a sustaining industry. State and federal support for research and other essential services have helped but have not replaced the tenacity of the farmer entrepreneur producing on the last agricultural frontier of the United States.

Alaska agricultural experiment stations transfer to college

by George Gasser, Director of the Experiment Stations, 1931–1953

(Reprinted from the first report of the College Agricultural Experiment Station, 1931.)

Historical

The land now occupied by the experiment station was set aside by Executive order under date of March 22, 1906, and comprised 1,393.97 acres. At that time and continuing until May 1, 1931, the station was under the immediate direction of the Division of Insular Stations, Office of Experiment Station of the Department of Agriculture. Ten acres of land were cleared during the summer of 1907 and the following spring some crop work was begun. Varied and extended experimental work has been carried on uninterruptedly since that time.

By act of Congress approved March 4, 1915, the land, reserved by Executive order in 1906, with certain additions to include four full sections, was further reserved as a site for an agricultural college and school of mines as set forth in Section 2:

Section numbered six, in township numbered one south of the Fairbanks base line and range numbered one west of the Fairbanks meridian; section numbered thirty-one, in township numbered one north of the Fairbanks base line and range numbered one west of the Fairbanks meridian; section numbered one, in township numbered one south of the Fairbanks base line and range numbered two west of the Fairbanks meridian; and section numbered thirty-six, in township numbered one north of the Fairbanks base line and range numbered two west of the Fairbanks meridian, be and the same are hereby granted to the Territory of Alaska, but

with the express condition that they shall be forever reserved and dedicated to use as a site for an agricultural college and school of mines; Provided, That nothing in this act shall be held to interfere with or destroy any legal claim of any person or corporation to any part of said lands under the homestead or other law for the disposal of the public land acquired prior to the approval of this act; Provided further, That so much of the land as is now used by the Government of the United States as an agricultural experiment station may continue to be used for such purposes until abandoned for that use by an order of the President of the United States or by Act of Congress.

To clarify the dual ownership subtended by the grant of 1915, an agreement was entered into between the Department of Agriculture and the College whereby the College was given an unrestricted title to the easterly two sections, The Executive order effecting this change was dated October 25, 1923.

An act of Congress approved February 23, 1929, definitely presaged College ownership of an experiment station (U.S.C. III, title 7, sec. 386 c) as follows:

An act to extend the benefits of the Hatch Act and the Smith-Lever Act to the Territory of Alaska.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following Acts, to wit, an Act entitled "An Act to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an Act approved July 2, 1862, and of the Acts supplementary thereto," approved March 2, 1887, as amended and supplemented, and known as the Hatch Act...be and the same are hereby, extended to the Territory of Alaska...

With the approval of the Secretary of Agriculture, agricultural experiment substations, to the number of not more than two, may be maintained under the provisions of the Hatch Act.

This act carries a grant of \$15,000.00 per annum to be expended in experimental and investigational research in subjects pertaining to agriculture.

Funds having now, nominally, been provided there remained the necessity of securing or establishing an experiment station. Two years later a further act of Congress covered this pressing need. This act was approved February 20, 1931, and

Provided, That the Secretary of Agriculture is authorized to turn over to the Agricultural College and School of Mines of Alaska the tract of land and buildings near Fairbanks,

Alaska, now occupied and used by the Department of Agriculture as an experiment station, together with such equipment at the station as is not needed at the other agricultural stations maintained in Alaska by the Department of Agriculture.

Therefore, on May 1, 1931, the westerly two sections of land together with the buildings and most of the machinery and other equipment, passed into the final ownership of the College. Thus, by sundry and substantial legislative acts there came to the College an experiment station already established in the records of research work.

News

Arvo Kallio 1917–1997



Dr. Arvo Kallio, 80, died Dec. 11, 1997 in Duluth, Minnesota. Born in Duluth, he grew up in Clover Valley, Minnesota. His parents were Frank and Anna Kallio. Arvo graduated from the University of Minnesota in 1942 with a B.S. degree in horticulture. He was a U.S. Army veteran in World War II, serving in the

Aleutian Islands. Kallio earned a master's (1947) and doctoral (1948) degrees from the University of Minnesota and pursued more graduate work at the University of Iowa.

He was employed from 1950 to 1968 by the U.S. Department of Agriculture doing horticultural research with the University of Alaska. He developed and released several improved, northern-adapted horticultural crop varieties for Alaska growers, including Alaska 6467 and Alaska 6468 cabbage, Alaska Pioneer strawberry, and, in cooperation with Dr. Don

Dinkel, Yukon Chief sweetcorn. Kallio greatly enjoyed his garden, moose hunting, and annual trips to Chitina to dipnet salmon.

In 1968 Kallio left Alaska to become director of Minnesota's Northeast Experiment Station. When that station closed in 1976, he did extension work and was a potato specialist in Minnesota, Wisconsin, and North Dakota until retiring in 1980.

He was a member of American Horticulture Society, Minnesota Horticulture Society, Duluth Hortus Club, Glen Avon Presbyterian Church, Gitchie Gumme Kiwanis and a number of other horticulture and botanical associations.

He is survived by his wife of 41 years, Mildred; daughters, Lisa (David) Mesedahl, Carrie Kallio, and Janet (Donald) Husby, all of Duluth; a brother, Pentti Kallio of Duluth; nephews, Laurence Kallio of Minnetonka, MN, and Daven Kallio of Indiana; and many cousins in Finland.

—Information provided by Les Klebesadel.

1997 Alaska woman in agriculture

The School of Agriculture and Land Resources Management and Alaska Agricultural and Forestry Experiment Station recently honored Mrs. Ileen K. Hollembaek of Delta Junction as the 1997 Outstanding Woman in Agriculture. The award presentation was part of the Annual

Alaska Agricultural Symposium held in November in Anchorage.

Mrs. Hollembaek has served Alaska's agriculture with distinction for more than 45 years. She and her late husband, Barney Hollembaek, have been a positive influence in Alaska farming operations, including Chianina and Angus beef cattle, buffalo, elk, and wild boar game animals, and certified seed production of barley, oat, wheat, and grasses. She and her family have successfully operated farms in the Matanuska-Susitna and Delta Junction areas.

Mrs. Hollembaek continues to serve her state and community through her participation in the Alaska Farm Bureau and the Pioneers of Alaska. The Agricultural and Forestry Experiment Station recognizes and honors Mrs. Ileen K. Hollembaek for her distinguished achievements in Alaskan agriculture, and extend best wishes to her for continued success.



Ileen Hollembaek at her home in Delta Junction, Alaska (photo by Charles Knight).

FLASHBACK

Children from the Klukwan Indian School (located on the north shore of the Chilkat River, 21 miles southwest of Skagway) display the school's bounty. A write-up, published in the 1911–1915 Alaska Agricultural Experiment Stations Annual Reports, said that the school garden yielded, “55 sacks of potatoes, 500 pounds turnips and rutabagas, besides lettuce, peas, parsnips, carrots, beets, rhubarb, cabbage, etc....Our success is due in great measure to a liberal use of the garden hose.”

