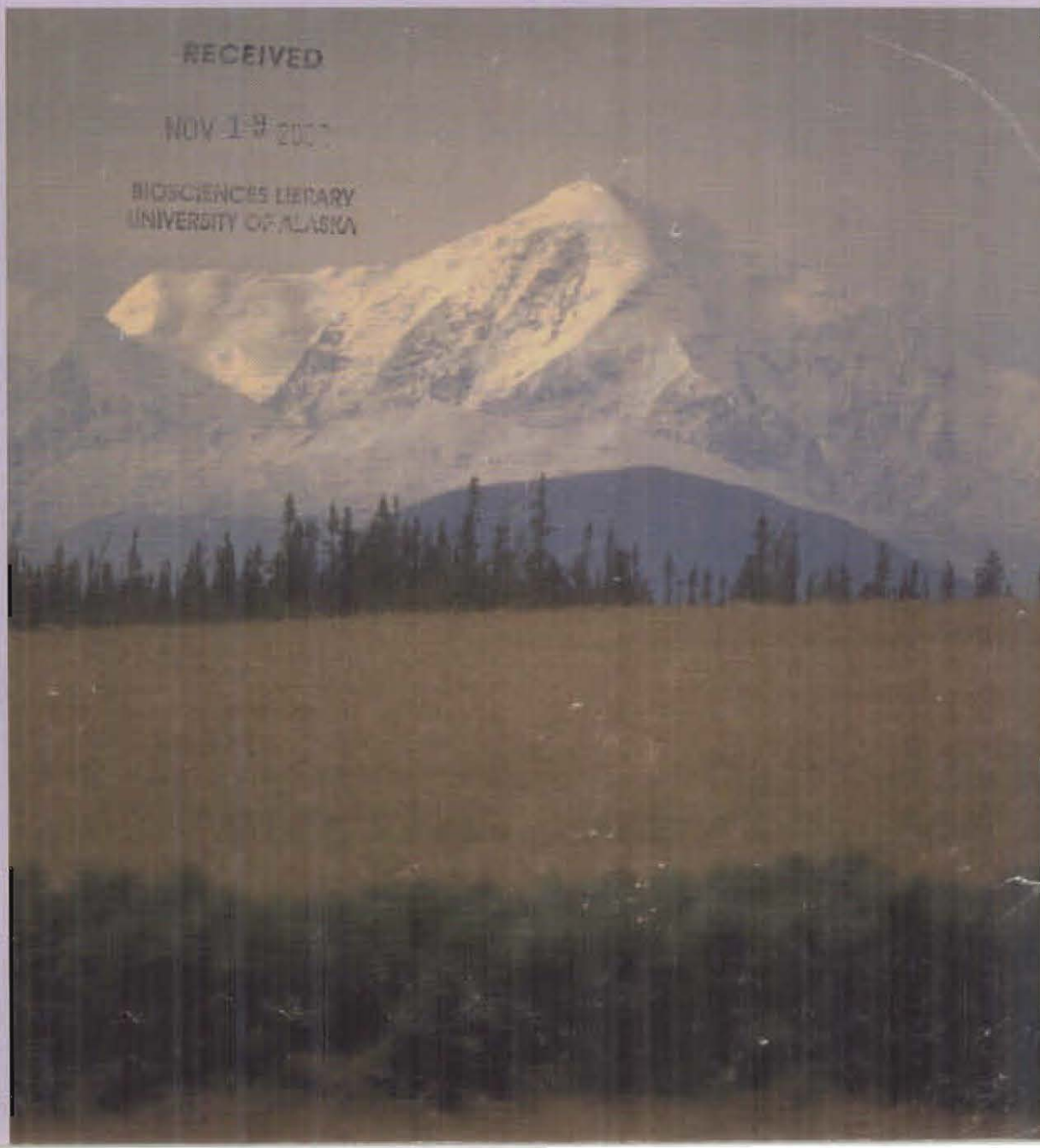
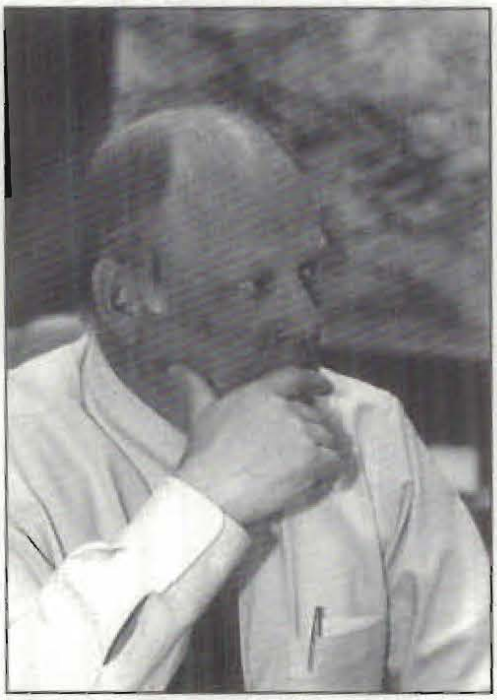
AgroBorealis

School of Agriculture and Land Resources Management
Agricultural and Forestry Experiment Station

Vol. 28, Number 1
Spring 1996

University of Alaska Fairbanks





Dr. Fredric Husby (AFES photo).

Dr. Fredric Husby is acting dean

Dr. Fredric Husby, professor of animal science, is the current acting dean of the School of Agriculture and Land Resources Management. He joined the SALRM faculty in 1975 as an assistant professor. He was promoted to associate in 1980, full professor in 1991 and was promoted to department head for Plant, Animal and Soil Sciences also in 1991. Dr. Husby replaces Dr. James V. Drew who retired in August 1995.

"Fred Husby is an excellent choice," said Drew. "In these difficult times, he knows the challenges the School is facing, as well as the many unmet needs of our students, and the people of Alaska. It's a balancing act with the available budget and what needs to be done. I know that Fred will be totally fair and dedicated to our land grant mission and obligation."

Husby and his wife, Vonna, have two grown children, Martin and Kim.

SALRM supports PBS Alaska One

Dr. Fredric Husby, acting dean for the School of Agriculture and Land Resources Management, presents Mel Birch, KUAC development associate, with SALRM's sponsorship. Thirty-eight faculty, staff and students raised $3,255 for KUAC's Alaska One public broadcasting station during the 1996 fund-raising campaign. The School's donation will sponsor Scientific American Frontiers *and* Newton's Apple *on KUAC-TV and* The Nature of Things *on KUAC-FM. Lab technician, darleen masiak, spearheaded the fund-raiser (Photo by J. Stephen Lay).*

Dr. Allen Mitchell named acting director

by: Peg Banks
Coordinator, Palmer Research Center

Dr. Allen Mitchell has been named acting director of the Alaska Agricultural and Forestry Experiment Station, replacing Dr. James Drew who retired in August 1995. Dr. Mitchell arrived at the University of Alaska in 1973 as a lab technician before pursuing his doctoral studies. He served in leadership positions at the University of Georgia and University of Arkansas before returning to Alaska in 1984. In 1987 he was promoted to associate dean for the School of Agriculture and Land Resources Management and associate director of AFES.

Mitchell's research interests are diverse and include citrus production in California, cotton and soybeans in the deep South, and potato and vegetable production in Alaska. He participated in one of the first revegetation studies on the North Slope in the early 1970s from which valuable data is still being gathered today.

He considers one of his most rewarding research projects to be an experiment in revegetating mine spoils in cooperation with AFES scientists William Mitchell and Jay McKendrick. "Alaska's soils differ so much from the mine lands in the Lower 48, so the scientific work was particularly interesting, besides being able to assist the industry."

Seeing the results of applied research is borne out in Mitchell's current work with potato and vegetable growers and forage and grain producers. Certain basic challenges, however, remain the same for producers no matter their location. "Although it is important for us to provide our students with expertise in Alaskan conditions, they must be scholastically prepared to work effectively wherever their careers may take them. They must have a broad understanding of universal principles of chemistry, physics, and biology to apply that knowledge to local problems," Mitchell said.

Dr. Mitchell serves on several policy-making bodies that include the executive committee of the Western Association of Agricultural Experiment Station Directors, the Regional Research Implementation Committee, the Technical Review Committee for the Sustainable Agriculture Research and Education, and Agriculture in Concert with the Environment programs. He enjoys a strong rapport with producers and clientele and has been a tireless legislative advocate for the University. In his role as acting director, Mitchell's commitment to the land grant mission continues.

Dr. Allen Mitchell (AFES photo)

"Not a day goes by without calls from producers, other private sector interests or individuals, with questions related to agriculture or other areas of resource development. Our responsibility is to serve the citizens of Alaska and provide, or help them find, the resources they need to pursue their goals. Right now our biggest challenge is simply to maintain the research capability needed to serve the people of Alaska. We cannot pursue this most important mission within the University without reasonable and appropriate funding. Experiment Stations throughout the country are engaged in this battle to maintain their identities and their role in carrying out the land grant mission."

Mitchell lives in the Palmer area and has two children, Brandt and Laura. Brandt earned a bachelor of science degree in forestry from the University of Arkansas, and works in the wood products industry in Texas. Laura graduated from the University of Alaska Anchorage with a bachelor of arts degree in journalism and public communications. She is a staff reporter with the *Frontiersman* while preparing to pursue an advanced degree.

AgroBorealis

EDITORIAL STAFF

Agroborealis is published by the Agricultural and Forestry Experiment Station, University of Alaska Fairbanks. A written request will include you on the mailing list. Please address all correspondence regarding the magazine to: **Publications, AFES; P.O. Box 757200 Fairbanks, Alaska, 99775–7200;** Internet: **fynrpub@aurora.alaska.edu** or World Wide Web at **http://www.leter.alaska.edu/salrm/salrm.html** At this welcome page you will find links to information about SALRM and AFES, about our undergraduate and graduate programs, and about our research.

This magazine was printed at a cost of $1.36 per copy by UAF Printing Services.

Agroborealis Contents

Vol. 28, No. 1,
ISSN: 0002-1822
Spring 1996

About the cover

A natural beauty

Delta Junction, Alaska is home to many of nature's natural attractions. On a clear day, it serves as the viewing ground of some magnificent mountains. On a hot summer day, it is the fertile grounds for crops such as barley, wheat and canola. It is also the stomping grounds of many species of wild game such as the bison pictured on the cover.

Dr. Sparrow discusses Delta's agricultural potential on page 6. Turn to page 7 for photos and information about Delta's bounty. Hans Geier talks about his experiences farming in Delta on page 29. *(AFES photos)*

Acting director looks forward in times of tight budgets, reduced funding, increased responsibilities

by: Dr. Allen Mitchell
Acting Director, Agricultural and Forestry Experiment Station

In September 1994, the United States Congress authorized the establishment of a new federal agency within the U. S. Department of Agriculture. This agency, the Cooperative State Research, Education, and Extension Services (CSREES) is really not new at all, but a combining of the missions and resources of the former Cooperative State Research Service (the Agricultural Experiment Stations) and the Cooperative Extension Service. The merger is part of the ongoing process to streamline the USDA into a more efficient and less costly department.

The new agency comes at a time when, at the federal level, research budgets are coming under greater scrutiny, when performance and results are being evaluated more consistently, and when the transfer of research information will be tested in terms of economic and social impact among our customers. It also comes at a time when the State of Alaska faces a $500 million budget gap and reallocation of tight university funding will reduces the AFES state funding by $600,000 over the next two years. This will mean fewer faculty and support staff and the elimination of some programs.

Among the programs being eliminated are dairy, beef and food science. Setting research priorities with our remaining resources will become more challenging. However, we will maintain strong programs in land management and environmental issues, plant and animal industries, forest and forest products industries, and rural and economic issues.

Alaska is a natural resource state. Land resources such as oil, minerals, timber, and food and fiber crops will continue to be developed. Experiment Station scientists are trained to assist in this development through research that will help sustain food and fiber production, remediate environmental contamination and damage when it occurs, foster rural economic health, and utilize and protect Alaska's forest resources.

Our goal will be to join with our federal and state partners and customers and provide quality research and outreach in our remaining program areas.

Yes Alaska, agriculture is viable in Delta Junction

by: Dr. Stephen D. Sparrow
Plant, animal, soil sciences department head

Agriculture in Alaska is a viable industry and contributes to a diversified economy. However, some uninformed individuals have the mistaken perception that economic development efforts such as the Delta Barley Project were total failures. That perception is not borne out by fact. I say it again, "Agriculture in Alaska is a viable industry!"

Scott Miller, president of the Delta Chapter Alaska Farm Bureau, and owner of Misty Mountain Farms, also expressed this view saying, "Past efforts to develop commercial agriculture have largely been perceived as failures which is quite to the contrary. While things didn't develop as originally envisioned, the land and potential are still here. The industry is older and wiser and we've adapted. There's a core group of farmers here who have survived and even thrived. We're proving that it's not only viable and profitable, but it shows wisdom to develop our ability to feed ourselves and the rest of the world."

Statistics show that the industry has witnessed steady growth in recent years. This is especially true for the Delta area where milk, potato, red meat, cereal grains, hay and grass seed production have become viable enterprises. Currently five of the state's dairies and a value-added milk processing plant are operating successfully in the Delta area. Potatoes produced in the area are sold statewide and some are exported to the Yukon Territory. Grass seed is exported to Canada, Japan, and other Pacific Rim countries. Wild game ranching and vegetable and canola production are emerging enterprises. This diversity within the agricultural community is a unique strength that allows it to respond to changes in markets and unpredictable weather. The emergence of agriculture as a viable industry is significant in a state attempting to diversify economically as other segments of the economy are dwindling.

"With our state's nonrenewable resources and the state's budget drying up," Miller said, "we need to readjust our focus on our renewable resources. Let's set our vision on the basics of food and fiber, both for ourselves and an ever-growing hungry world."

This has perhaps never been so important. In 1995 the Department of Defense placed Fort Greely (located near Delta Junction) on its base realignment list, which will negatively impact the economy of the Delta Junction area. Delta residents, and state and national organizations are aggressively searching for ways to mitigate or replace the economic loss. One way is to build strong private sector enterprises. Agriculture has a strong potential to succeed and become an economic mainstay.

Although Delta's agriculture is currently viable and growing, if it is to continue to grow and prosper, continuing research on crops, soils, and livestock is needed. The UAF Agricultural and Forestry Experiment Station currently operates a small research farm at mile 1408 Alaska Highway and research has focused on crop and soil management such as conservation tillage, soil fertility, and weed control. Prior to 1995, scientists with the USDA Agricultural Research Service were partners in the research efforts at the mile 1408 site. Unfortunately, because of cutbacks in USDA funding, ARS closed its operations in Alaska in February 1995. Timing of this closure was especially devastating as it coincided with a $500,000 reduction in university funding to the AFES research program.

Much of the success of the agricultural industry in Alaska and especially in the Delta area is a result of research by the AFES and ARS. An article beginning on page 7 highlights these results.

Station research at work in Delta Junction, Alaska

Researchers from the Agricultural and Forestry Experiment Station have helped ensure an active and expanding agricultural industry in Alaska through their research. For almost 100 years researchers have been working for Alaskans and the results can be seen in the day-to-day farming operations.

The mission of the Agricultural and Forestry Experiment Station includes teaching, research and public service. Our research is directed toward answering questions and providing information which will benefit Alaskans. AFES research results are disseminated to the general public through field–day demonstrations, individual consultation, and published bulletins and circulars.

When AFES releases a new crop variety or selection, breeders' seed or genetic plant materials (see sidebar, page 9), these are given to Alaska's Plant Materials Center (PMC). The PMC maintains breeders' seed of public varieties, and distributes foundation seed to growers.

Alaska Cooperative Extension (ACE) provides the communication link between AFES and the local producers. ACE summarizes and simplifies AFES research results and distributes the information through individual consultations, public forums and on–farm demonstrations. Printed materials can be obtained by calling the Experiment Station editor at 474-5042.

This article examines the impact of AFES research results on the agricultural industry in Delta Junction by highlighting individual farms and AFES research in action.

Research highlights

Misty Mountain Farms

Scott Miller and his family own Misty Mountain Farms where they annually raise about 150 head of beef for slaughter. They feed their cattle barley, oats and peas as forage and winter feed and use fishmeal as part of the protein supplement. No-till (conservation tillage) is Miller's best management production practice for barley.

AFES research at work: *Alaska barley varieties, no tillage practice, fishmeal in rations, oats and peas for feed.*

Knopp Dairy

Paul Knopp and his family currently milk 65 cows and have the capability to expand their operation to 80. This herd produces

Scott Miller explains his farm operation to the 1995 farm tour participants (photo by Donna Gindle).

John Dufendach, Frank Burris, Mike Crouch and their families operate this 2,800 acre Eagle Ridge Farm. Crouch, Dr. Joan Wadlow, UAF chancellor, Dufendach (with microphone) and Don Quarberg, ACE, are pictured above with tour participants (photo by Donna Gindle).

nearly 20,000 pounds of milk per cow per year—4,000 pounds higher than the national average. The Knopps feed their cows oats and peas in a silage mix, and use canola as a protein and energy supplement in a dry ration. Dr. Fredric Husby, AFES animal scientist, and Ken Krieg, livestock specialist with the Alaska Cooperative Extension will jointly work with the Knopps on future research that will focus on frozen embryo transplants to produce replacement heifers.

AFES research at work: *dairy nutrition, Alaska barley varieties, alternative crops: oats, peas and canola for feed.*

Northern Lights Dairy

The Lintelman family have been raising dairy cattle in Delta Junction since 1971 and began processing milk in 1979. Today Northern Lights Dairy produces both whole and 2% milk, and ice cream. They use oats, peas, and fababeans in the silage, and the dry ration is based on barley.

AFES research at work: *dairy nutrition, Alaska barley varieties, alternative crops: oats and peas for feed.*

Dennis Green & Sons

Dennis Green and his family has a diverse farming enterprise. They are pasturing reindeer for Donny Olson, a Nome herder—the deer will be sold to ranchers and others outside Alaska. Green farms 1,500 acres of grain and canola. The grains are bagged and sold whole or processed with canola and used as protein and energy in a pelleted feed. Demand far exceeds Green's supply of products. Green feeds the reindeer barley, oats, and canola seed in winter. Barley, oats, wheat, and canola are grown using conservation tillage soil management.

AFES research at work: *Alaska barley, oats and wheat varieties, alternative crops: oats, canola and peas, reindeer nutrition and stress.*

Eagle Ridge Farm

John Dufendach, Frank Burris, Mike Crouch and their families comprise a multi-family farming and recreation venture, the 2,800 acres Eagle Ridge Farm. Grain crops, grown on 328 acres, are used in baked products and flour that will soon be sold commercially. The team offers recreation

opportunities in an agricultural setting with sporting clays and game birds for dog training. Thual hulless barley and Ingal wheat are used in baking flours. The group plans to expand into organically produced grains.

AFES research at work: *Alaska barley and wheat varieties.*

Wrigley Farms

Bryce, Rex and other Wrigley family members operate the largest hog production facility in Alaska. They currently have 80 sows, with a capacity for 150. Local demand exceeds the supply for weaners and roasters. Barley, the base for the feed ration, is grown on the 1,700 acre farm; fishmeal is a protein supplement. Fertilizer is banded with the barley seed. Replacement gilts and boars are purchased from the experiment station when possible.

AFES research at work: *swine feeding with barley, canola seed, and fishmeal in rations, Alaska barley varieties, and fertilizer management.*

Schultz Farms, Inc.

The largest family operation in Alaska, Mike and Scott Schultz grow grain and grass seed on 5,000 acres. Barley is produced for feed and seed, grass is grown for hay and seed. Otal barley is the main grain crop. Tundra bluegrass seed is produced for revegetation. Nugget bluegrass seed is used for lawns and golf courses. Conservation tillage is practiced.

Marsha Melton and Dr. Irv Skelton enjoy Eagle Ridge's clay pigeon demonstration (photo by Donna Gindle).

AFES research at work: *Alaska barley and grass varieties, and conservation tillage.*

(See next two pages for additional photos and information).

AFES–developed varieties increase crops success

Gasser Wheat: *G. T. Gasser, R. L. Taylor, J. C. Brinsmade*
Weal Barley: *R. L. Taylor*
Lidal Barley: *R. L. Taylor*
Otal Barley: *R. L. Taylor*
Datal Barley: *R. L. Taylor*
Thual Barley: *R. L. Taylor*
Toral Oats: *R. L. Taylor*
Ceal Oats: *R. L. Taylor*
Ingal Wheat: *R. L. Taylor*
Nogal Wheat: *R. L. Taylor*
Vidal Wheat: *R. L. Taylor*
Tundra Glaucus Bluegrass: *W. W. Mitchell*
Alyeska Polar Grass: *W. W. Mitchell*
Nortran Tufted Hairgrass: *W. W. Mitchell*
Norcoast Bering Hairgrass: *W. W. Mitchell*
Kenai Polar Grass: *W. W. Mitchell*
Arctared Red Fescue: *H. J. Hodgson, A. C. Wilton, R. L. Taylor, L. J. Klebesadel*
Nugget Kentucky Bluegrass: *H. J. Hodgson, A. C. Wilton, R. L. Taylor, L. J. Klebesadel*
Alaskland Red Clover: *H. J. Hodgson, W. B. Wilder, J. E. Osguthorpe*
Sourdough Bluejoint Reedgrass: *W. W. Mitchell*
Polar Bromegrass: *A. C. Wilton, H. J. Hodgson, L. J. Klebesadel, R. L. Taylor*
Denali Alfalfa: *L. J. Klebesadel, R. L. Taylor*
Early Tanana Tomato: *A. Kallio*
Pioneer Strawberry: *A. Kallio*
Toklat Strawberry: *A. Kallio, D. H. Dinkel*
Sitka Hybrid Strawberry: *C. C. Georgeson*
Kiska Raspberry: *A. Kallio, D. H. Dinkel*
Yukon Chief Sweetcorn: *A. Kallio, D. H. Dinkel*
Denali Potatoes: *C. H. Dearborn*
Stately Potatoes: *C. H. Dearborn*
Snowchip Potatoes: *C. H. Dearborn*
Alaska Red Potatoes: *C. H. Dearborn*
Alaska Frostless Potatoes: *C. H. Dearborn*
Alaska Russet Potatoes: *C. H. Dearborn*
Highlat Russet Potatoes: *C. H. Dearborn*
Knik Potatoes: *C. H. Dearborn*
Alasclear Potatoes: *C. H. Dearborn*
Alaska 114 Potatoes: *M. F. Babb, C. H. Dearborn*
Alaska 6467 Cabbage: *A. Kallio*

Note: The USDA–Agricultural Research Service cooperated in developing many of these varieties.

Delta Farm Tour

1 Laurie Knopps, Knopps Dairy, explains the pasteurization process.
2 Lois Lintelman, Northern Lights Dairy, tells participants about the milk packing operation.
3 Don Quarberg, ACE, introduces the Wrigley family at Wrigley Farms—the largest hog production facility in Alaska.
4 Dennis Green farms 1,500 acres of grain and canola.

Photos by Donna Gindle

Experiment Station yields results

Weed Control

•Control of grasses in no-tillage •herbicide selections, time, and rate of application

Forage Production

•Legume and grass variety trials•cutting time for maximum yield and quality, winter survival •forage mixes for highest quality •field pea selections for seed and forage

Animal Nutrition

•Dairy rations for maximum milk production •beef cattle rations for maximum weight gains •swine ration for sows, feeders, and baby pigs •canola and fishmeal supplements for protein and energy •hulless vs. hulled barley in mixed feeds

Alternative Crops

•Varieties, fertilizer rates, cultural practices •canola •sunflowers •buckwheat •canarygrass •flax

Reindeer Ranching/Game Farming

•Stress reduction at handling •feed options, digestibility •routine management practices

Grain Varieties

•Otal barley: feed grain •Datal barley: feed grain •Weal barley: feed grain, forage •Thual barley: feed grain, human consumption •Toral oats: feed grain •Ingal wheat: feed grain, human consumption

Grass Varieties

•Nugget Kentucky bluegrass: turf, seed, revegetation, forage •Tundra glaucus bluegrass: seed, revegetation •Arctared red fescue: turf, seed, revegetation, forage •Polar bromegrass: forage, seed •Sourdough bluejoint reedgrass: revegetation, seed •Norcoast Bering hairgrass: revegetation, seed, forage •Norgold tufted hairgrass: revegetation seed, forage •Alyeska polargrass: revegetation, seed

Conservation Practices

•Minimum or no-tillage: soil and soil moisture conservation •crop residue management: wind erosion control

Crop Cultural Practices

•Maximum yield, early maturity •planting dates and seeding rates •fertilizer rates, time of application, position of placement

Scientists with the Agricultural and Forestry Experiment Station developed many of the popular grass varieties growing throughout the State. This lawn, located in Fairbanks' University West subdivision is Nugget Kentucky bluegrass (photo by Donna Gindle).

Agronomist discusses biological nitrogen fixation

by: Dr. Stephen D. Sparrow
Professor of agronomy

Nitrogen is an essential element for all life on earth. It is a major component of proteins and other necessary organic compounds in tissues. Nitrogen, in the form of dinitrogen gas, makes up 79 percent of the gases in the earth's atmosphere. Yet, nitrogen is one of the most limiting nutrients for most life on earth. This apparent paradox occurs because dinitrogen cannot be easily converted into forms of nitrogen which occur in living tissues and thus, most living organisms cannot use dinitrogen. Fortunately, there are a few types of bacteria that can convert dinitrogen into forms that are usable by other organisms. This process is called biological nitrogen fixation.

Several nitrogen fixing bacteria species live in the soil independently of plants and are called free-living nitrogen fixing bacteria. Other species of nitrogen fixing bacteria can infect the roots of certain plants and stimulate the plants to form root nodules. The bacteria live inside the root nodules and fix nitrogen which is made available to the plants. The plants benefit by obtaining nitrogen without competing with other plants for it. The bacteria benefit by having a safe environment with a ready source of food, which is supplied as sugars by the plant. Although it is the bacteria that fix nitrogen, the plants that are infected by nitrogen fixing bacteria are usually referred to as nitrogen fixing plants. The most well known nitrogen fixing plants are legumes and are infected by nitrogen fixing bacteria called *Rhizobium*. Legumes are important forage and food crops. Examples are alfalfa, clovers, vetches, peas, beans, peanuts, and soybeans. Other important non-legume fixing plants are infected by bacteria called *Frankia*. These plants are known as actinorrhizal nitrogen fixing plants. Examples include, alder, Russian olive, silverberry, and soapberry. Several legumes and actinorrhizal nitrogen fixing plants are native to Alaska.

The free-living nitrogen fixing bacteria in soil generally do not fix large amounts of nitrogen, with 5 to 10 pounds per acre per year being typical. Some nitrogen fixing plants can fix large amounts of nitrogen. For example, alfalfa has been reported to fix up to almost 300 pounds of nitrogen per acre in a growing season (LaRue and Patterson, 1981).

It is estimated that about 2/3 of the atmospheric nitrogen that is fixed in terrestrial environments each year comes from biological nitrogen fixation (Tilsdale et al., 1993). The rest comes mostly from the manufacture of synthetic nitrogen fertilizers. Also, small amounts come from natural, non-biological nitrogen fixing sources such as lightning.

The perception exists that because of Alaska's short growing season and low soil temperatures, plants here do not fix much nitrogen. The research, though, doesn't support that perception. Dr. Keith Van Cleve, AFES professor emeritus, reported that young alder stands on the Tanana River floodplain can add up to 150 pounds of nitrogen per acre per year over a 20–year period. We (Sparrow et al., 1995a and Van Cleve et al., 1971) found that some cultivated legumes in Alaska can fix over 100 pounds of nitrogen per acre (Table 1). Little research has been done on nitrogen fixation by Alaska native legumes. However, Dr. Vera Alexander and co–workers (Alexander et al., 1978), UAF Institute of Marine Science, found high levels of nitrogen fixing activity by some native alpine legumes.

A popular misconception is that nitrogen fixing plants transfer large amounts of nitrogen to neighboring, non-nitrogen fixing plants. Although some nitrogen leaks from roots, it is not enough to supply the nitrogen needs of other plants. Thus, most of the nitrogen in the nitrogen fixing plants becomes available only upon death and decomposition of their tissues. For woody, perennial plants, this comes mainly from leaves that fall each year in autumn; for herbaceous nitrogen fixing plants, the whole above ground plant becomes available for decomposi-

tion and release of nitrogen. For this reason, nitrogen fixing plants, usually legumes, are often grown as green manure crops. These crops are grown for their fixed nitrogen. They are usually plowed under after growth and allowed to decompose and release their nitrogen for use by succeeding crops. A problem in Alaska seems to be that decomposition does not occur fast enough to benefit the crop in the year following the legume (Sparrow et al., 1995b). We found that barley crops following legume crops recovered only 10 to 15 percent of the nitrogen fixed by the legumes. Another problem with green manure crops in Alaska is that the land must be tied up for an entire growing season by the green manure crop. At the current costs of nitrogen fertilizer, it is simply not feasible from a crops in Alaska strict economic standpoint, to justify green manure. In warmer climates with long growing seasons or warm winters, nitrogen fixing green manure crops can be grown during winter months or for part of a growing season, allowing the beneficiary crop to be grown in that same year.

One alternative to green manuring, at least for forage crops, is to grow nitrogen fixing plants in mixtures with non-nitrogen fixing crops. With this system, little or no nitrogen fertilizer is needed. This is because the nitrogen fixing crop produces its own nitrogen. Since the plant population for the non-nitrogen crop is less than that of such a crop grown in monoculture, there is probably less competition for the nitrogen in the soil. Also, the non-nitrogen fixing crop probably receives small amounts of nitrogen from the nitrogen fixing plants. This cropping scheme not only reduces the need for nitrogen fertilizer but also makes use of desirable characteristics of both the legume and the non-nitrogen fixing crop (usually a grass or small grain cut for hay or silage). Early research in the Matanuska Valley by Dr. Art Brundage (Brundage et al., 1979) and co–workers and more recent research at Delta Junction by Verlan Cochran (Cochran and Schlentner, 1995) of USDA indicated that a system in which a legume such as peas or fababean in mixtures with small grains such as forage barley or oats can be quite successful in producing good quality forage with minimal use of nitrogen fertilizer. Farmers have also reported success with such systems.

Table 1. Nitrogen fixation by legume crops at Fairbanks and Delta Junction, Alaska.

Legume crop	Delta Junction	Fairbanks
	lbs nitrogen fixed/acre/year*	
Altaswede red clover	48	72
Nitro alfalfa	30	53
Norgold sweetclover	63	86
Poneka pea	76	95
Frederick fababean	92	167
Indianhead lentil	52	52
Primorski white lupin	25	138

*Each value is an average of two years' data

We are currently planning research to determine which combinations of legumes and small grains are most suitable for Alaska. There is also interest in using nitrogen fixing plants, especially native plants, in revegetation of disturbed lands, such as mined-land in Alaska. Although some research has been done on this topic, there is a lack of information specific to Alaska.

References

Alexander, V., Billington, M., & Schell, D.M. (1978). Nitrogen fixation in arctic and subarctic tundra. IN: *Vegetation and Production Ecology of and Alaskan Arctic Tundra* (L.L. Tieszen, ed.). Springer-Verlag, New York.

Brundage, A.L., Taylor, R.L., & Burton, V.L. (1979). Relative yields and nutritive values of barley, oats, and peas harvested at four successive dates for forage. *Journal of Dairy Science* 62:740-745.

Cochran, V.L. & Schlentner, S.F. (1995). Intercropped oat and fababean in Alaska: Dry matter production, dinitrogen fixation, nitrogen transfer, and nitrogen fertilizer response. *Agronomy Journal* 87:420-424.

LaRue, T.A. & Patterson, T.G. (1981). How much nitrogen do legumes fix? *Advances in Agronomy* 34:15-38.

Sparrow, S.D., Cochran, V.L. & Sparrow, E.B. (1995a). Dinitrogen fixation by seven legume crops in Alaska. *Agronomy Journal* 87:34-41.

Sparrow, S.D., Cochran, V.L. & Sparrow, E.B. (1995b). Residual effects of harvested and green-manured legumes on a subsequent barley crop in a subarctic environment. *Canada Journal of Plant Science* 75:453-456.

Tilsdale, S.L., Nelson, W.L., Beaton, J.D., & Havlin, J.L. (1993). *Soil Fertility and Fertilizers*, fifth edition. MacMillan Publishing Co., New York.

Van Cleve, K., Viereck, L.A., & Schlentner R.L. (1971). Accumulation of nitrogen in alder (*Alnus*) ecosystems near Fairbanks, Alaska. *Arctic and Alpine Research* 3:101-114.

Who wants to weed anyway?

by: Grant Matheke, horticulturist, and Gayle Garrigues and Thekla Johnson, volunteers

During Summer 1995, we began studying the effectiveness of mulching with fresh grass clippings as a means to control weeds. Because our Monday night volunteers were getting mighty sick of weeding, they asked us why we couldn't use grass clipping mulch to control weeds. The volunteers said they did this in their own gardens. We really didn't have a good answer, so we decided to try it. Although we were a little concerned that grass mulch might insulate our normally cool soils and possibly affect plant growth, we decided to find out.

We planted four sets of mulched and control (no mulch) plots with Inca Yellow Marigolds spaced 10 inches apart (randomized complete block design for those who are into statistics). We measured soil temperature and moisture; plant growth and bloom time; and labor required for maintenance of control and mulched plots.

Although the data is still undergoing analysis, we do have some preliminary observations. Soil temperatures were

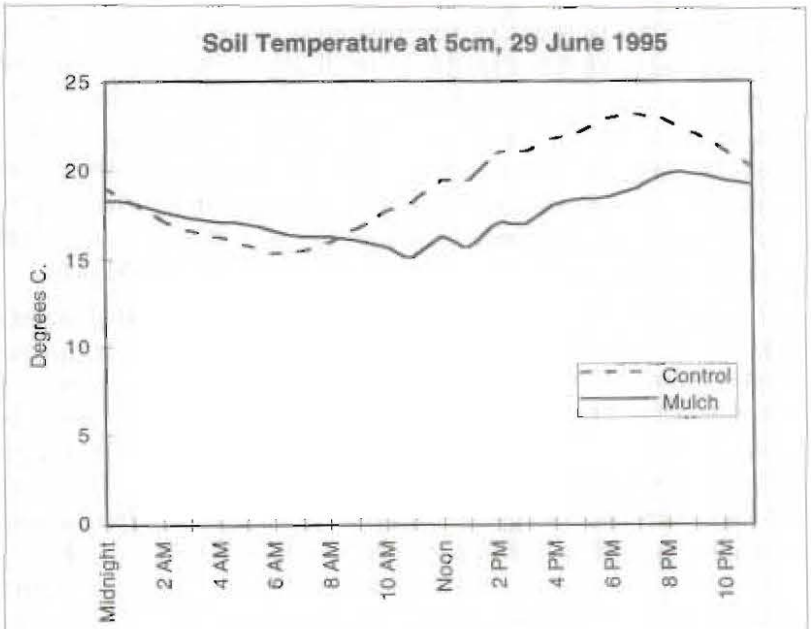


Figure 1. Early season soil temperatures on a clear, warm day.

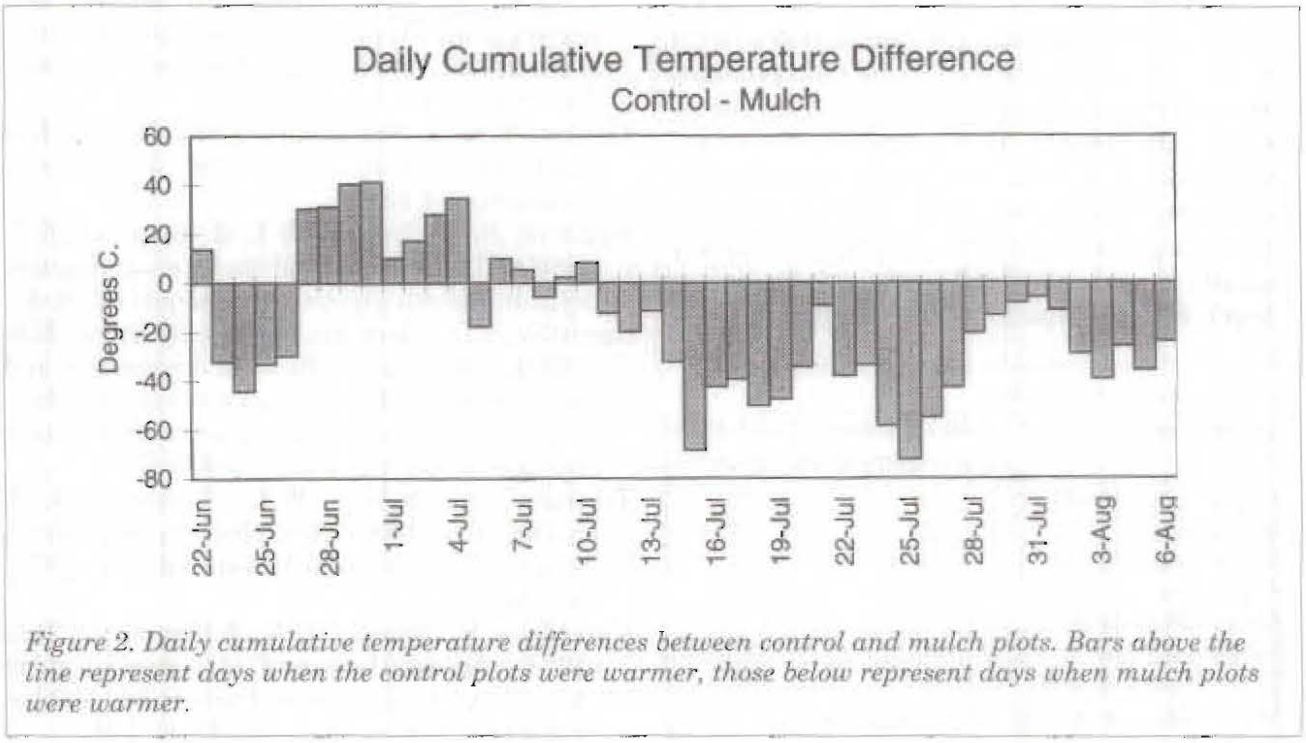


Figure 2. Daily cumulative temperature differences between control and mulch plots. Bars above the line represent days when the control plots were warmer, those below represent days when mulch plots were warmer.

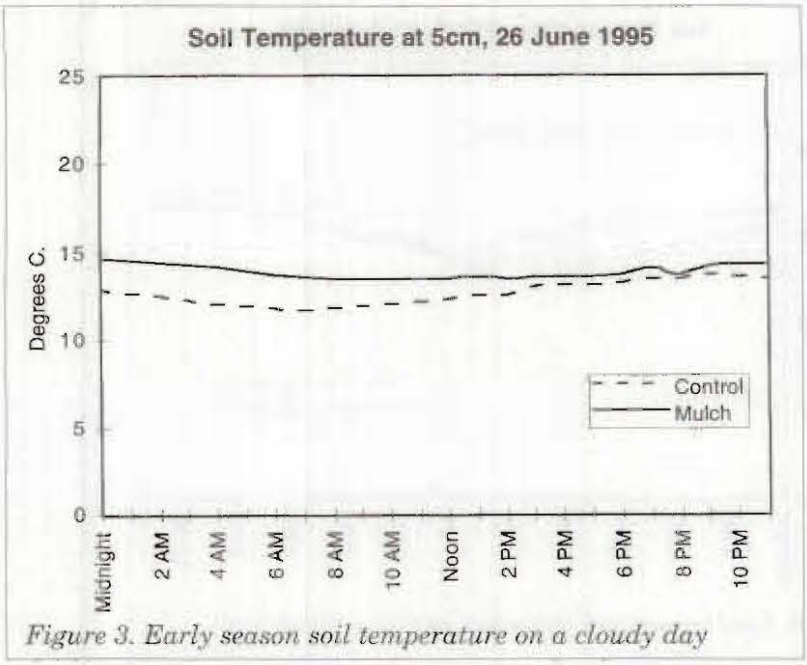


Figure 3. Early season soil temperature on a cloudy day

slightly lower in the mulched plots early in the season (Figs. 1 and 2). However, at night (Fig. 1) or on cool cloudy days (Fig. 3) soil temperatures were warmer in the mulched plots due to the insulating properties of the grass mulch.

Later in the season when the marigolds completely shaded the soil in both plots the soil was cooler in the control plots on both warm and cool cloudy days (Figs. 4 and 5). On warm sunny days the soil temperature in the unmulched control plots would rise above the mulched plots only late in the day.

In addition to controlling weeds, the grass mulch helped retain moisture. Soil moisture was slightly higher in the mulched plots throughout the season (Fig. 6). Maxima in soil moisture occurred after irrigation or significant rainfall.

In spite of the differences in soil temperature and moisture, there were no observable differences in growth rates or flowering times in the mulched and unmulched plots. Apparently these slight differences in soil temperature and moisture did not manifest themselves in any appreciable difference in growth rate or flowering time (Fig. 7).

The amount of labor required to apply mulch to the mulched plots was equal to the extra labor required to keep the unmulched plots weeded (53 minutes per 64 feet^2). Overall, it appears that there was no net gain or loss in terms of plant appearance or labor required by using the grass mulch. However, in fairness to mulching advocates we have to note that these plots were in an area that had previously been planted in annual rye grass and there were far fewer weed seeds and as a consequence far fewer weeds than in most of our plots. In addition, the vigorous growth of the Inca Yellow marigolds we used soon completely covered both plots and any developing weeds were completely shaded out.

Even though we did not realize any appreciable savings in labor in this small exploratory study, we were impressed by appearance of the mulched plots as well as the lack of weeds. As is usually the case, this study generated more new questions than it answered:

- What is the effect of mulching on soil temperatures in a year that is not as cool as

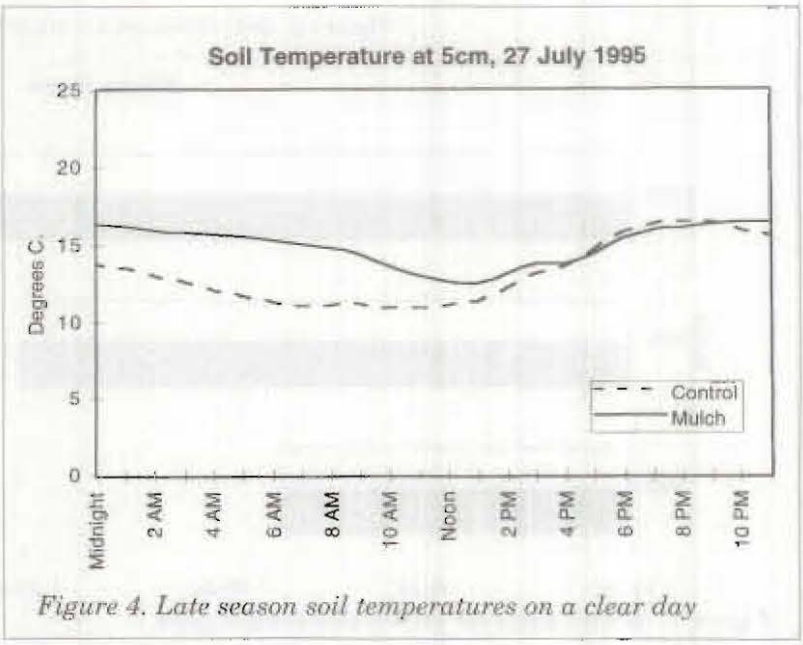


Figure 4. Late season soil temperatures on a clear day

the summer of 95?

- Since the early season is important for soil warming and plant growth, what is the effect of the timing of mulch application?
- Will mulching work better on row crops, where the labor required for application is reduced and shading from adjacent plants is less than in beds?
- What will be the effect of the additional moisture retained by the mulch on plants such as petunias that are more susceptible to disease than marigolds?

We plan to continue this study on a slightly larger scale this summer. We hope to find answers to at least some of our questions. In addition, we will select sites that have a history of greater weed concentrations than the plots we used last year or add weed seeds to the plots. Stay tuned!

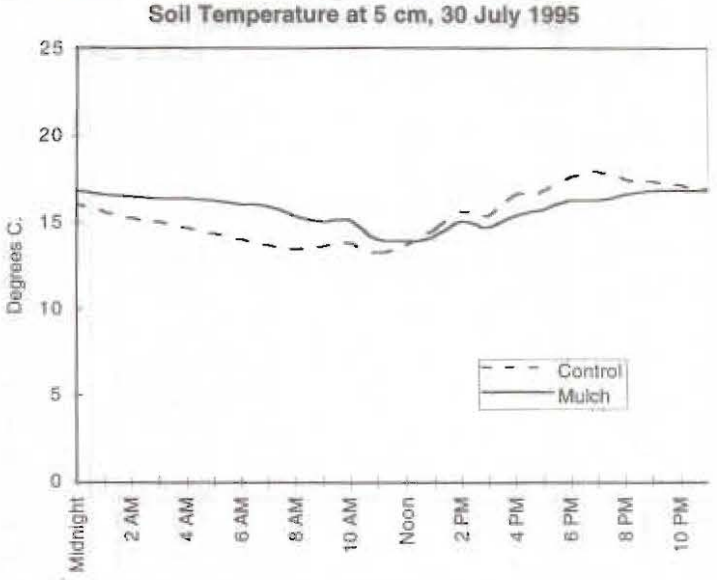


Figure 5. Late season soil temperatures on a cloudy day.

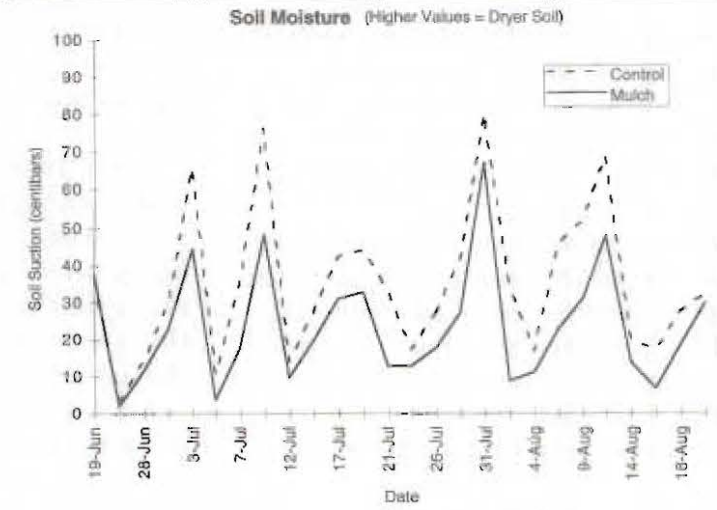


Figure 6. Soil moisture in mulch and control plots.

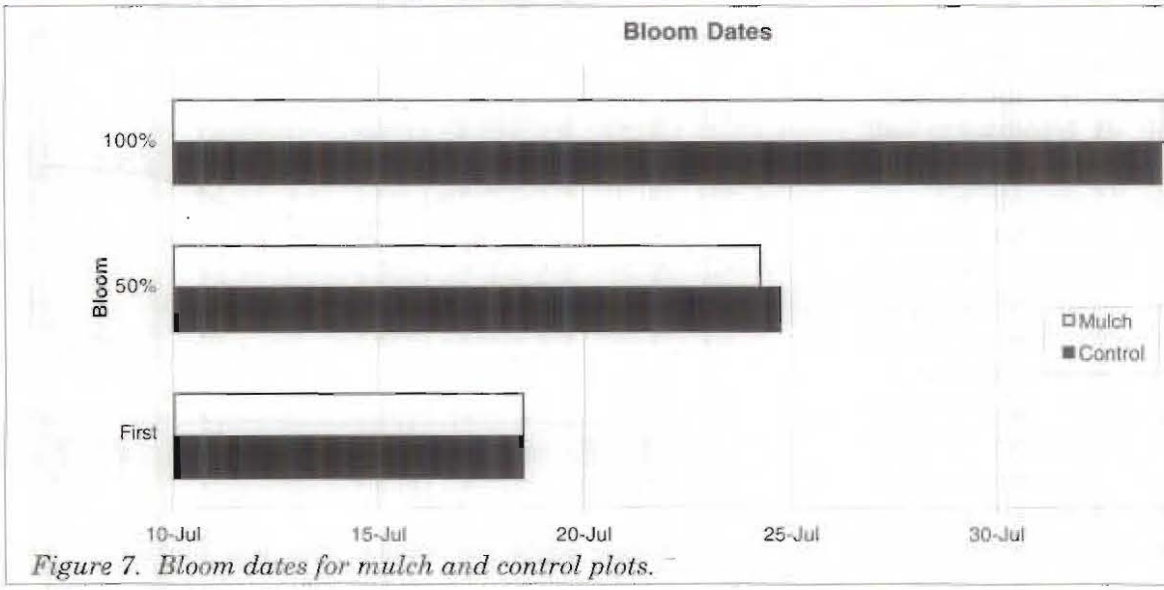


Figure 7. Bloom dates for mulch and control plots.

Agronomic crops for Interior Alaska

by:
Dr. Charles W. Knight
Associate professor of agronomy
and
Robert M. Van Veldhuizen
Agronomist

Six-row spring barley ready to harvest (file photo).

The average planting time for agronomic crops in Alaska is approximately the first three weeks of May. Harvest occurs between mid–August and late September depending on weather conditions. The frost-free growing season is between 83 and 100 days during which most crops must mature and ripen. Crops such as barley, wheat, oats, rye, triticale, buckwheat, canola, flax, sunflowers, safflower, meadowfoam, fababeans and field peas have all been tested in Alaska, often with limited success due to insufficient information on the climatic, nutrient or cultural requirements of the crop. The Agricultural and Forestry Experiment Station supports an agronomic breeding and variety evaluation program to learn about crop requirements and share that information with local producers. The crops listed below summarize present recommendations and releases as well as some of the more promising varieties that are the result of ongoing research and testing since the first agricultural experiment station opened in Sitka in 1898.

Barley

Barley is the most successful cereal crop in Alaska because it matures and ripens under cool temperatures and short growing seasons. It will ripen 80 to 100 days after planting. Barley can have either a winter or spring growth habit and have either 6–row or 2–row spike characteristics. Of these, spring barley with 6–row spikes matures the earliest (Figure 1). Winter barleys lack hardiness and succumb to winter kill, and 2–row spring varieties often mature 10 days later than 6–row varieties. Most 2–row barley varieties are classified as malting or pearling varieties while the 6–row varieties are generally used for animal feed. Research to date has shown that Alaska–produced

Figure 1. Barley

Variety	Spike Type	Harvest Season	Growth Habit	Source	Yield bushels/acre
Otal	6-row	early	spring	Alaska *	68-77
Datal	6-row	early	spring	Alaska*	76-78
Lidal	6-row	early	spring	Alaska*	76-78
Svendal	6-row	early	spring	Alamasu, Inc.**	45-63
Thual[1]	6-row, hulless	early	spring	Alaska*	40-77
Weal[2]	6-row, hooded	mid	spring	Alaska*	64-80

* Alaska Agricultural and Forestry Experiment Station and USDA
** Private corporation, Delta Junction, Alaska
[1]naked kernels–good for human consumption as well as feed grain
[2] awnless—good for forage as well as feed grain

Figure 2. Oats

Variety	Type	Harvest season	Source	Yield bushels/acre
Athabasca	yellow–hulled	very early	Alberta, Canada	87-105
Toral	yellow–hulled	early	Alaska*	122-134
Cascade	yellow–hulled	medium	Alberta, Canada	90–147
Nip	black–hulled	very early	Sweden	111-123

* Alaska Agricultural and Forestry Experiment Station & USDA

malting barleys are good in such characteristics as kernel weight and plumpness and wort color but they are poor in barley color and marginally high in soluble and total protein.

Oats

Oats are second in importance to barley as a cereal crop in Alaska. Although oats require seven to 10 more days to mature and ripen than barley, they can also be harvested green as a forage or hay crop. Oats are grown primarily for livestock feed. The straw is also in high demand for animal bedding since it does not have the rough awns (beards) of barley or wheat straw. Four of the best adapted varieties are shown in Figure 2.

Wheat

Three major types of wheat have been grown in Alaska: spring wheat, winter wheat and durum wheat. Winter wheat varieties frequently have poor winter survival and result in poor yields. Durum wheat varieties require a longer growing season and often fail to mature and ripen. Varieties of hard red spring wheat (bread wheat) have shown the best adaptation to the Alaska climate. Spring wheat requires an additional 10 to 15 days to mature and ripen than barley and is a marginal crop in years with early frosts. The best varieties grown in Alaska are presented in Figure 3.

Rye

Rye is a late maturing crop in Alaska and requires seven to 10 days more to mature and ripen than wheat. For this reason it is more marginal than wheat. There are two types, spring and winter rye. Winter rye is susceptible to snow mold damage and few seedlings survive the winter. However, one variety, 'Saskatoon', will have enough survivors to equal the yield of 'Gazelle' spring rye. Both of these varieties are susceptible to a disease called ergot. This is a very conspicuous, blue-black, hard fungal mass that develops in place of the kernel. The ergot sclerotia contains several chemical compounds, most of which are harmful to humans and animals. Average yield per acre for rye is 41 to 65 bushels.

Triticale

Triticale is a hybrid between wheat and rye which combines the hardiness of rye with the high bread-making quality of wheat. It also possesses the late-maturing qualities of both parents making it another marginal crop for Alaska. Like rye, it is susceptible to ergot. Average yield per acre is 30 to 80 bushels.

Canola

Canola is a high quality edible oilseed crop containing 43% oil and 57% meal for animal feed. There are two types of canola, Argentine and Polish. Argentine canola varieties have large seeds and are often late maturing. Polish canola varieties have smaller seeds and are early maturing. Unlike other members of the *Brassica* species, canola is not affected by the long daylength of Alaska summers, thus it flowers abundantly and produces seed. The main problem experienced in Alaska has been uneven ripening of the seeds resulting in a high percentage of green seeds at harvest.

Figure 3. Wheat

Variety	Type	Harvest season	Source	Yield bushels/acre
Ingal	hard red spring	early	Alaska*	44–61
Cutler	prairie spring	mid	Alberta, Canada	33–69
Chena	hard red spring	early	Siberia	46–73
Gasser	hard red spring	early	Alaska*	38–55

* Alaska Agricultural and Forestry Experiment Station & USDA

Alan Tonne, AFES, swaths Thual hulless barley. Small grain crops are often swathed prior to combining to expedite grain drying (AFES photo).

These green seeds add an undesirable green tint to the processed oil. The primary goal of current research is to reduce this percentage of green seeds. The most popular varieties for Alaska at this time are 'Reward' and 'Tobin', both early maturing Polish types developed in Canada. Yields average 25 to 35 bushels per acre. Argentine canolas like 'Legend' will yield slightly more but have a much higher percentage of green seed and a higher moisture content at harvest.

Other Crops

Buckwheat is used for flour even though it is not related to wheat. It is an indeterminate plant which means that it will flower and produce seed all season long. However, even the first seeds produced are late maturing. Timing of the harvest is critical because the plant will lodge (fall to the ground) severely if hit by frost, making it nearly impossible to mechanically harvest. In addition, the seed must be dehulled before the flour can be milled. Because of all these factors, buckwheat is a marginal crop for Alaska. Average yield is highly variable, ranging from eight to 100 bushels per acre.

Sunflowers are classified as confectionery or oilseed. Both types have been grown in Alaska with varying success. Tall sunflowers will mature and ripen in Alaska if they are started in a greenhouse and transplanted into the field. Newer dwarf sunflower (sunwheat) is earlier and will usually mature if seeded directly into the field. However, sunflowers heads turn downward and their edges curl up when mature, creating a bowl-like depression. The late fall rains common in Interior Alaska will collect in these depressions, keeping the heads moist to a point where they cannot be mechanically harvested. Attempts to leave the sunflowers in the field until after they freeze dry are negated by mold formation in the head and by the local bird populations which can consume more than 50 percent of the crop. Average yield in the Fairbanks area is 90 to 126 bushels per acre.

Flax is classified as fiber or oilseed. The fiber flax is usually taller and yields higher biomass than the oilseed varieties, however both types can be used for fiber or oil. Linen is produced from flax straw and linseed oil from the flax seed. Oilseed flax such as 'Norlin' requires a long growing season but can reach maturity in good years. It is often slow to emerge and has too much green matter at harvest. This makes it difficult to mechanically harvest and dry prior to storage or processing. Average yield is 10 to 15 bushels per acre. Fiber flax will produce a good tonnage in Alaska, however, the quality of the linen has not been tested.

Field pea is a cool season, early maturing crop that grows well as a forage crop, often interseeded with oats. When grown for dry seed production, the short, semi–leafless varieties are the best. Taller or heavier varieties will lodge, making it difficult to harvest mechanically. Like sunflowers, field peas can be totally decimated by migratory waterfowl in the fall. Average annual yield is 10 to 60 bushels per acre.

Canarygrass is a crop grown specifically for bird food. It requires similar soil, climatic and nutrient characteristics as the small grains and produces seed similar in size and shape to flax. 'Elias' is a typical variety that can be grown in Alaska. It will yield an average of 10 to 15 bushels per acre.

Technology improves Palmer's laboratory research capabilities

by: Carolyn Pennington–Chapin
M. S., Agriculture & Extension Education

There's something cosmic going on within the walls of the Agricultural and Forestry Experiment Station's Palmer Research Center Laboratory. The lab, part of the University of Alaska Fairbanks, is quietly tucked between Palmer and Wasilla and is the only one of its kind in Alaska. It houses four research technicians who specialize in soil, plant, and animal feed analysis. The lab is also the new home for a state of the art, technological wonder called Star Trek.

Wonder what Star Trek has to do with agriculture research in Alaska?

Star Trek is the nickname for the newly acquired Perkin-Elmer Optima 3000 XL Emission Spectrometer. The machine, which costs $110,000, replaces the antiquated and slowly dying atomic absorption spectrometer. Palmer lab technicians annually analyze over eight thousand samples for the AFES, state and local government agencies including NASA, Smithsonian, Alaska Department of Fish and Game, private industries and the public.

The number of samples can, and did, take its toll on the instruments. Dr. Rudy Candler, laboratory supervisor, said that the old machine constantly needed repairing, it required extra labor for additional sample preparation, it lost revenue due to down time, and it was inefficient in analyzing samples. On several occasions, he said, the 20–year–old spectrometer failed to analyze or consistently run samples.

This is why Candler is extremely pleased with his new acquisition. "With an increase in demand for rapid and reliable sampling, we can't risk any more failings," he said. "The investment in the Optima 3000 XL is an investment in the future."

The Optima 3000 XL helps ensure that lab technicians quickly and accurately respond to their clientele, said Candler. It can easily analyze 72 out of 107 elements on the periodic chart, and extends many detection limits to parts per trillion in a sample.

"Star Trek can detect lower levels and more elements including low level selenium, cobalt, molybdenum, vanadium and halogens," said Candler. It can also provide data that will help monitor ground water contamination,

Dr. Rudy Candler, laboratory supervisor, discovers the capabilities of the Perkin-Elmer Optima 3000 XL Emission Spectrometer, "Star Trek" (courtesy photo).

inorganic chemical seepage, and buildup in the soil or city water chemical content, before these potential hazards violate Environmental Protection Agency standards, Candler said.

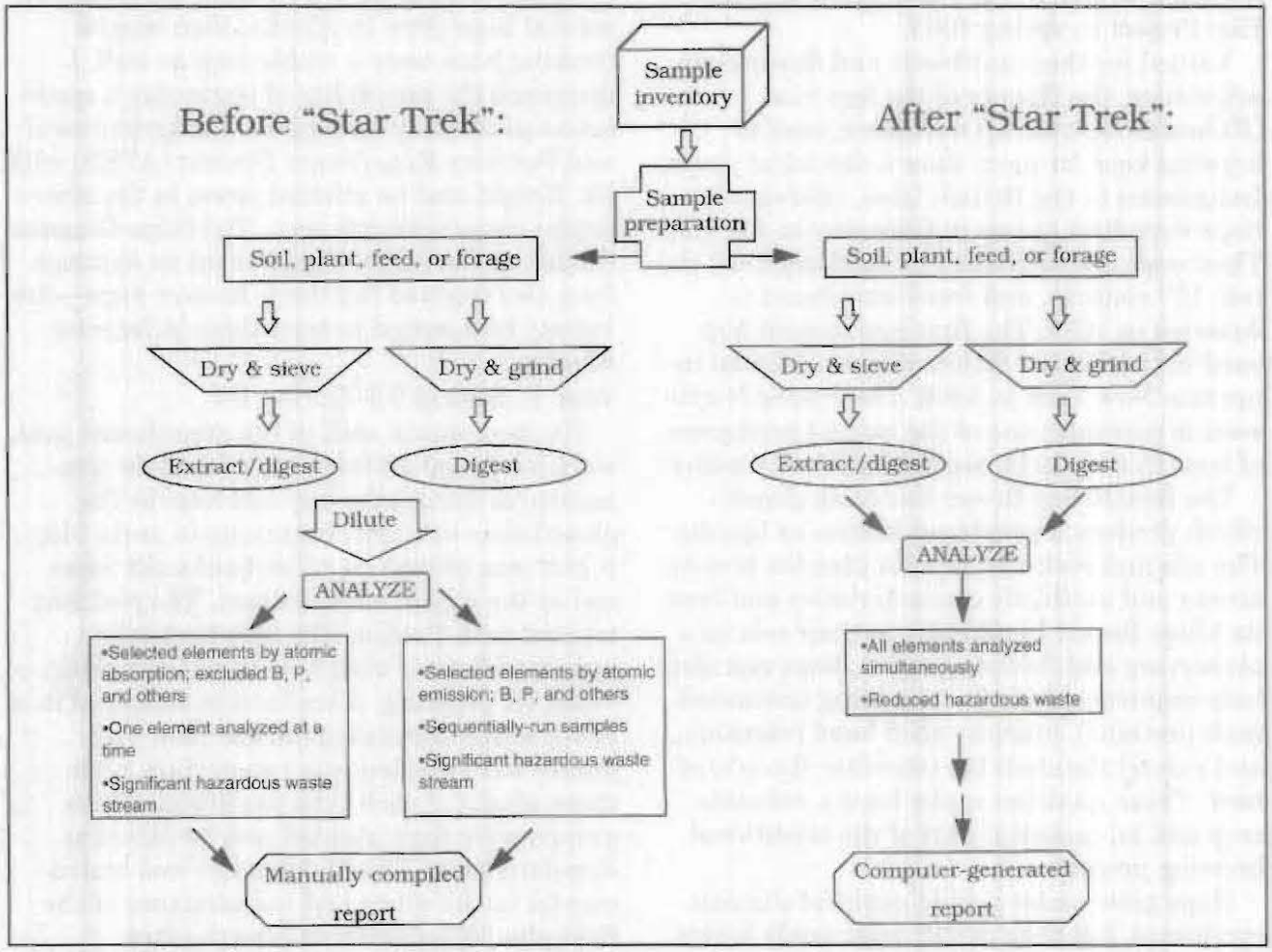
Star Trek performs a wide array of tasks that includes analyzing general water quality, agricultural feed/forage nutrient values, soil nutrient deficiencies, and specific elements associated with geochemical prospecting. The wide scope of possible analysis has attracted the interest of private companies such as British Petroleum, ARCO and Anchorage Water Utility. In the past, individuals have also submitted soil samples from home garden and farm fields for analysis. Candler said that once the machine is fully operational, the lab will begin processing the backlog of samples and then be ready to meet the demands from the public and private sectors.

Star Trek can efficiently analyze 60 elements simultaneously in less than one minute. In contrast, the old machine analyzed one element per minute. Because Star Trek is computer controlled, the lab techs can program it to turn on and warm up before they get to work in the morning. This will save valuable time because the techs will be able to immediately start loading and performing sample analysis.

Additionally, the new machine can provide a direct, computer–generated final report of the analysis data. This will decrease sample turn around time and increase the number and diversity of samples that technicians can handle. With the time saved and an expected increase in sample analysis demand, Candler believes Star Trek will be able to pay for itself in a relatively short time.

Technology in analytical chemistry rapidly changes, and the life span of most analytical instruments ranges from five to seven years, according to Candler.

"I am excited at this machine's potential. It is the 'Star Trek' concept of analysis and should be able to meet our sampling demands far beyond the year 2000."



Brewing up an Alaskan crop

Graduate student, researchers try growing hops

by: Steven R. Becker
M. S. candidate, SALRM

With the microbrew industry and homebrewing on the rise, Alaskans are again challenged by the logistical constraints of life in the far north. All the ingredients required to produce beer, except water, are currently imported from the Lower 48. This increases production costs for Alaskan brewers, and prevents Alaskan breweries from producing a certified Alaska-Grown product. It was this dilemma which, in part, prompted the Alaska Hop Project in spring 1993.

Valued for their antibiotic and flavor characteristics, the flowers of the hop vine (*Humulus lupulus* L.) have been used in brewing beer for more than a thousand years. Indigenous to the British Isles, cultivated hops were first grown in Germany in AD 768. They were not cultivated in England until the late 15th century, and were introduced to America in 1629. The first commercial hop yard in the United States was established in upstate New York in 1808. The Pacific Northwest is currently one of the largest producers of hops in the world, second only to Germany.

The female hop flower has resin glands which produce a substance known as lupulin. The oils and resins in lupulin give the hop its aroma and antibiotic characteristics and beer its bitter flavor. In addition to their role as a preserving and flavoring agent, hops can also help improve clarity (by removing unwanted malt proteins), promote good head retention, and extend the shelf life (stabilize flavors) of beer. These qualities make hops a valuable crop and an essential part of the traditional brewing process.

Hops grow under a wide range of climatic conditions, but they prefer deep sandy loams in regions with abundant early rainfall followed by dry, warm weather. The hop plant is a climbing vine, related to the nettle, which produces stems each year from a perennial rootstock and crown. They are dioecious plants (male and female flowers on separate plants), and the female flowers, or "cones," develop on the vine's lateral branches. Hop vines are propagated from runners, and, since only the female flowers are used in brewing, most producers only plant female vines.

The Alaska Hop Project

The Alaska Hop Project, an informal group of researchers examining the potential for commercially producing hops in Alaska, is comprised of Drs. Patricia Holloway and Charles Knight, Bob Van Veldhuizen and myself. Dr. Holloway had previously identified a variety of ornamental hop in old pictures of the Fairbanks area. We thought that if ornamental hops grew in Alaska, then maybe brewing hops were a viable crop as well. I discussed the possibility of beginning a qualitative pilot study on hops at the Agricultural and Forestry Experiment Station (AFES) with Dr. Knight and he allotted space in the alternative crops research area. The Hops Genome Project at Corvallis, Oregon sent us cuttings from two types of Northern Brewer hops—the variety best suited to conditions in Interior Alaska.

Year 1: Spring 93–Spring 94

The hop plants, still in the greenhouse pots, were hardened off (exposed to outdoor temperatures during the day and kept in the greenhouse at night) beginning in early May. A plot was chosen on a Fairbanks silt loam soil at the Experiment Station. The plot was treated with Treflan (the only herbicide approved for use with hops) and then cultivated for planting. A trellis was arranged in a north-south orientation on the plot. The plants were divided into two groups, with three plants of each type per group. These groups were then planted and fertilized at standard rates. Van Veldhuizen was instrumental in the setup and maintenance of the field plot. We monitored growth rates

throughout the summer and measured total above-ground biomass at the end of the season. There was no noticeable difference between hop types over the summer. No flowers were produced on any of the plants in the first summer, but according to experts, this is not unusual.

Our first treatment study was on winter survivability. We hypothesized that plants mulched with barley straw would have a higher rate of winter survival than non-mulched plants. We mulched six plants (three of each hop type) and left six without mulch. Much to our surprise, the non-mulched plants had a much higher survival rate. The mulched plants had 50 percent mortality, compared to 17 percent mortality rate in the non-mulched plants. Hop type did not appear to be a determining factor, as an equal number of each type had died. We could not determine the cause of mortality, but think that vole damage and snow mold might have been responsible.

In addition to increased mortality, the mulched plants emerged more than two weeks later than the non-mulched plants. We think this was caused by colder soil temperatures during the spring thaw. Although we didn't actually measure the temperature, the mulched areas still had ice crystals in the upper soil layers three days after the non-mulched plants had started to emerge. We originally concluded that it is probably best not to mulch hop plants.

Year 2: Spring 94—Spring 95

The second growing season started out well. We applied fertilizer after all the surviving plants had emerged. The spring rains came at the right time, and the hop vines grew early. Those plants which had been mulched continued to exhibit a two-week lag behind those which had not been mulched. The summer passed, but none of the plants showed signs of flowering. This was unusual, since our research showed us that hop vines generally reach full production in the second or third growing season.

We opted to forgo the winter survivability treatments because of the number of plants we lost. Instead, we decided to watch for the cause of mortality in the plants. The winter brought above-average snowfall and mild winter temperatures, and the voles were active and hungry. The remaining plants experienced a 50 percent mortality rate, and all plants showed signs of vole damage. The plants that did not survive had vole-damaged root crowns. The voles showed no preference for hop type, however. Of the four dead plants, two were from each hop type.

Spring 95—Present

The beginning of the third growing season started early, with emergence taking place in early May. The spring was dry because the spring rains held off until late June. In early June an herbicide—intended to control weeds in the area surrounding the plot—drifted into the plot, but all plants recovered. August was wet and cool, but the frost stayed away until late September. Once again, the vines grew well, but did not show signs of flowering. Since we were running out of plants, we decided to propagate more plants for a larger study. In October we dug up the plants, put them in large greenhouse pots, and stored them in the cold room of the greenhouse so that they may complete their winter dormancy.

Future efforts

The Alaska Hops Project continues to move forward. We will try to determine why the hop vines are not flowering. This spring we will begin a small photoperiod study in the greenhouse, to see if we can get the hops to flower by changing daylength. We will also take more root cuttings so we can try other tests on a larger field scale. We will examine row orientation, treatments to raise soil temperature, and methods to keep voles away from the root crown during the winter. Management and cultural techniques which will allow hops to flower would be a boon to both homebrewers and microbreweries in Alaska. Hop plants will survive the winter (even better if we can keep the voles away from them) and put on good vegetative growth. If the determining factors for hop flower development in the subarctic can be found, Alaskans will be that much closer to drinking a truly Alaskan brew.

NRM 310: Agricultural concepts

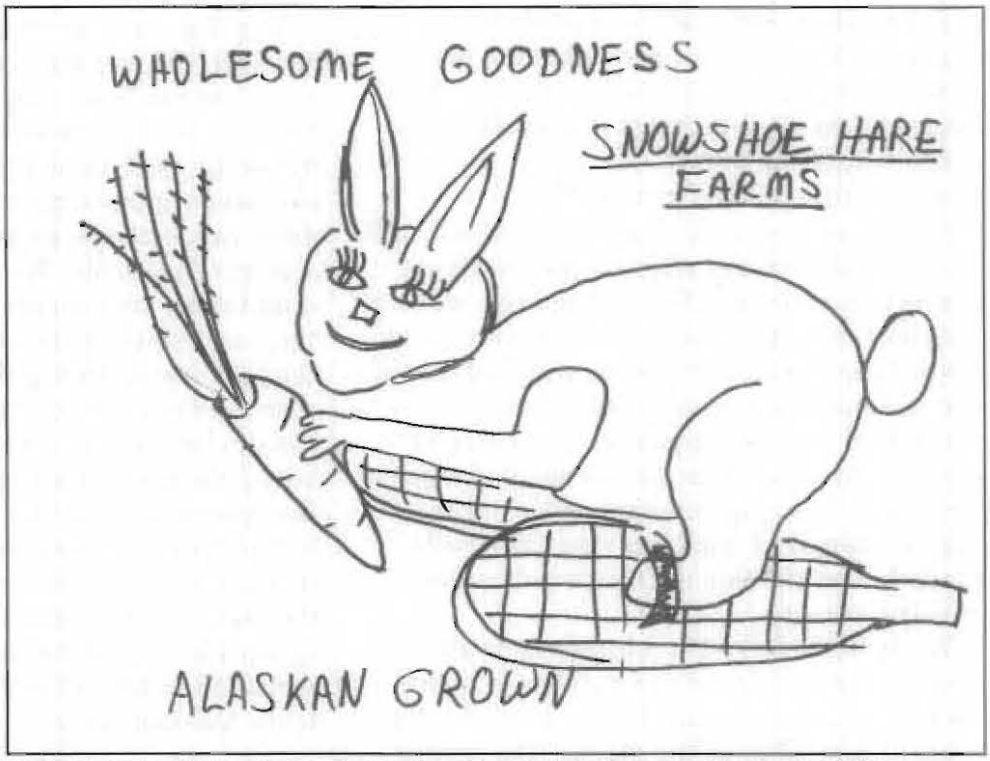
Students develop marketing strategies, design logos for Alaskan carrots

The NRM 310 course–Agricultural Concepts—is designed to teach students consumer marketing principles and help entrepreneurs in Alaska's agricultural industry. Students in the course develop marketing strategies, craft logos for Alaska products, and participate in sensory panels. While the summer/fall 1995 *Agroborealis* (volume 27, No. 2) highlighted the products and sensory panels, this article focuses on the student–developed marketing strategies and logos.

Dr. Carol Lewis, resources management department head, described the process leading to a marketing research report which students use as a background to develop their marketing strategies and logos as closely resembling that used by industry. The first step is a sensory panel where students and other volunteers taste product samples. As a part of the sensory testing, participants may also be asked to describe their ideal, providing a baseline for comparison. The information defines a product profile and highlights distinctive product attributes. Next, participants complete a questionnaire answering questions about demographics, their shopping and eating habits, and, if appropriate, their views on organic products, "Alaska Grown" products, and Alaskan products in general. This information is used to help students identify relevant market segments for their advertising campaigns. Finally, researchers prepare a comprehensive marketing research report for students to use and for those who have supplied products for testing.

"From this report," Lewis said, "students learn to use scientific methods in marketing research and the informational and analytical processes required before a product reaches the grocers' shelves. Student teams then take the information and develop a marketing strategy and a product logo which they present to an evaluating panel that might be composed of instructors, producers, and professionals from the local art and advertising community."

Since 1990, students in NRM 310 have designed marketing campaigns for honey, carrots, barley pancake mix, Alaska salsa and tomatoes. The fall semester, 1995 class designed logos and marketing strategies for carrots using informa-



NRM 310 students, Debby Broneske, Nicole Poirrier and Stephanie Gibby-Saito developed this Snowshoe Hare Farms logo in their marketing efforts for Alaskan carrots.

An NRM 310 student team lead by Jeff Werner centered their 1992 advertising campaign on organic production and the significantly more intense sweetness of Alaskan carrots in comparison to imported carrots.

tion obtained in 1992. The students addressed such aspects as product planning, sales predictions, packaging, logo development, introductory promotional campaign, publicity, distribution, target market and specialty characteristics. The group judged to have the best overall marketing strategy was comprised of Debby Broneske, Nicole Poirrier and Stephanie Gibby-Saito. Their logo was "Snowshoe Hare Farms, wholesome goodness, Alaskan made."

Broneske, in her strategy paper, said, "We are sure our cute little rabbit symbol will attract young consumers. It is a cuddly little hare that children can identify with. The snowshoe hare is indigenous to Alaska. This association creates strong alliance to the "Alaska Grown" concept. Also, what better a brand symbol than the allegorical carrot eating Peter Rabbit."

"Deb, Stephanie and I are the owners of Snowshoe Hare Farms located in Alaska," wrote Poirrier. "Our firm believes in selling a quality and healthy product to families. The philosophy behind our four P's (product, price, promotion and place) is to introduce our name and associate it with a high degree of quality at a competitive price and earn a solid reputation. We feel strongly that once the taste and quality of our carrots are known our business will thrive.

"We will sell some carrots in two–pound clear bags and others will be sold in bundles with a label tied around them. Our packaging is made from recycled products and we encourage further recycling. We will print the logo on both the clear bags and the ribbons wrapped around the bundles. The bags will also have the nutritional information printed on the back," Poirrier planned.

"We particularly like the snowshoe hare," Broneske emphasized, "with snowshoes running around the bunch tie. This colorful bunch tie also serves the purpose of providing product identification to the grocery checker for correct product computer input into the register."

When describing her group's corporate philosophy, Broneske wrote, "We believe in Alaska Grown with its social and economical variables. We are in the business of growing just like our state. We know we can compete in the market. We have a product which will sell itself once tasted and compared to other carrots. We can provide enough variations of our product to be competitive, even with out-of-state products. Our pricing structure will offer middle and above–other brand prices. We have plans and research to introduce more exciting products in the future to boost our growth. We know we have a product which will meet our firm's needs (profit and growth) as well as provide a safe and healthy food source for our consumer. We have the ability to grow. We are sure that we are on the heels of the Alaskan potato and look forward to exporting our product to other states."

"In the beginning," said Gibby-Saito, "we expect to incur debts, but through promotion and sales, our label and logo should become known and our quality will speak for itself, bringing up sales. As we reach the saturation point of the carrot, we can begin sales with promotion through supermarket coupon books. At this point we can begin a new market for carrot juice, switching our emphasis to an unsought good."

Team teachers, Drs. Greenberg and Lewis said they look forward to testing a variety of Alaskan products in the classroom. "Our scope is not limited to vegetables and will include fisheries products in the near future. The NRM 310 class provides a vehicle to let others know about the diversity and high quality of Alaska's agricultural products."

Note: The 1992 course was taught in cooperation with former UAF instructor, Dr. Ruthann B. Swanson, now with the University of Georgia in Athens.

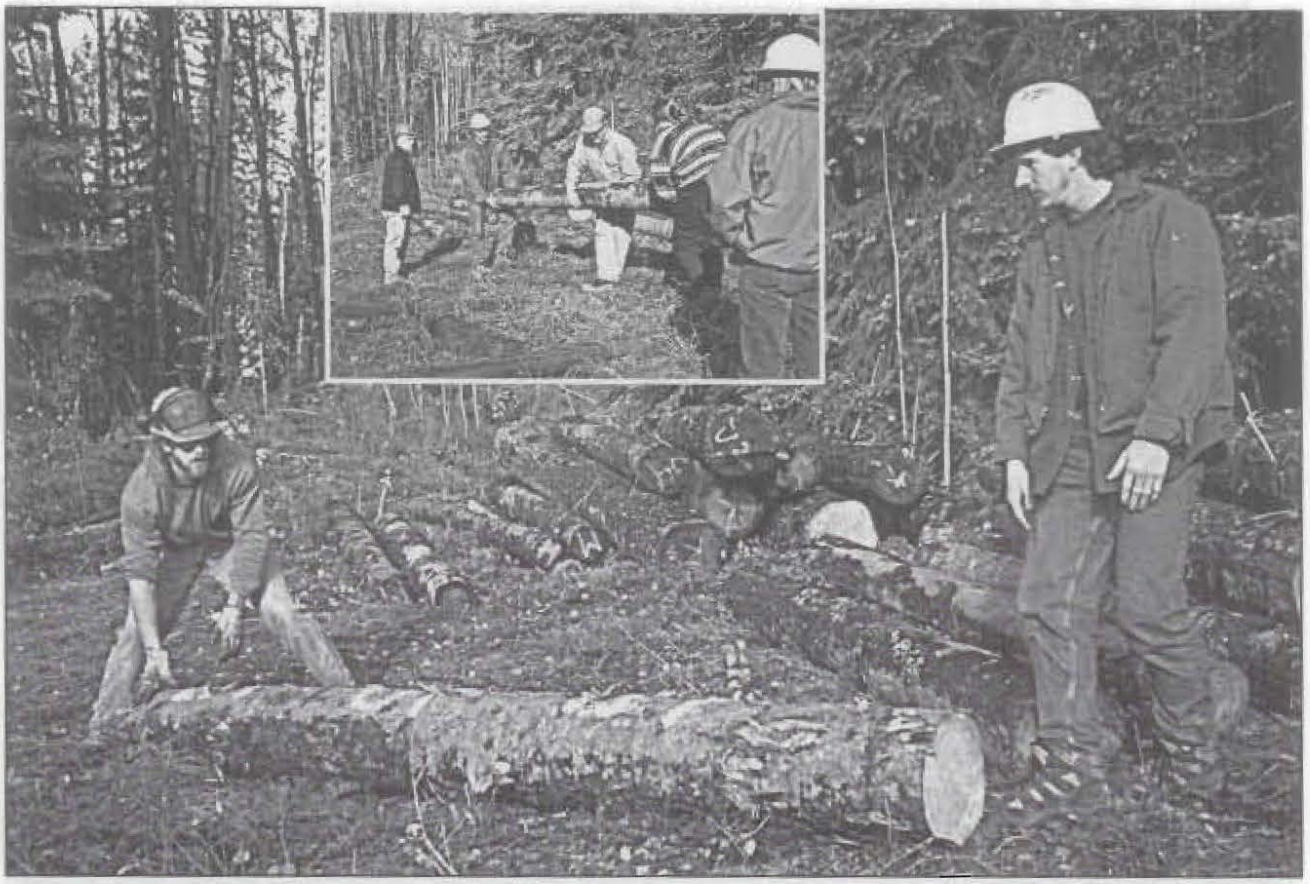
NRM 453

Students learn to harvest, use forest for products

NRM 453 introduces students to manual and mechanical timber harvesting methods, manufacturing and using forest products. The course explores the methods and equipment used in cutting, yarding, and transporting logs. Several manufacturing processes are discussed, including production of wood products such as plywood, pulp, veneer, paper, glue-laminated beams, strand board and furniture. Students learn wood identification techniques, and gain a better understanding of the role forest products play in the world, national, and local economies. Also, a section of the course covers wood products demand, its impact on the environment, and industry's role in the reforestation and revegetation of timber forests.

Angie Kruckenberg, owner and CEO of OK Lumber, explains the many applications for plywood to student Gary Pauley during a recent field trip. Tony Gasbarro, left, instructs NRM 453.

Tony Gasbarro, associate professor of forestry extension, assists students Gordon Amundson and Deb Broneske with log measurements during one of the field exercises. Research assistant Tom Malone and others look on as NRM students Samantha Lowen and Jamie Hollingsworth (bottom left) scale logs. Scaling calculates the actual number of board feet each log will yield. Pat McInroy, Erik "Moe" Johnson, and Tom Malone (bottom right) watch lumber come off the green chain during a tour of Northland Wood hosted by Alan Menecker.



Students Jamie Hollingsworth and Jerome Baxter select a white spruce log for cutting at the UAF sawmill. Jerome Baxter, Tom Malone and Samantha Lowen (inset) hoist one of the logs they'll scale and cut at the UAF mill. Bottom: Tom Malone, Pat McInroy, Tony Gasbarro and Samantha Lowen inspect the quality of finished lumber (in this case, Douglas fir) imported into Alaska.

—photos by Valerie Hendrickson—

Want to farm in Alaska? Advice from someone who's doing it

by: Hans Geier
M. A. in adult continuing education,
M. S. in natural resources management

Thinking of buying a farm in Alaska? Do the questions loom large and threaten to stifle your dream? Do you wish you could question a farmer to learn the ins and outs? Well, I used to have the same questions and wishes, but since I had no one to turn to, I jumped into that proverbial skillet with both feet. This article, though, is for those of you who are still in the dreaming and wondering stages. It is advice from my own experience as well as an extensive review of literature and records from the Agricultural and Forestry Experiment Station (AFES) at the University of Alaska Fairbanks. The information is not exhaustive, and although I'm farming in Delta Junction, a new farmer anywhere in Alaska will encounter many of the same challenges. I hope this information is positive, practical, and useful. I wish I had known it earlier.

A new farmer's first experience is undoubtedly the excitement of purchasing farmland. For me, this came when I bought a relatively small parcel (160 acres) in the Delta area from the State of Alaska. I am the third owner of the parcel that I purchased for what I considered to be a reasonable price. It was then I began to appreciate the magnitude of my undertaking.

Land clearing

The first truism I learned is that my land purchase is the smallest expense and improving the land for farming is probably the biggest expense. I discovered that hiring someone to clear the land can run from $125 to $200 per acre. This price doesn't include the endless stick picking that follows clearing and breaking. I'll be picking up sticks for years to come. The easiest way to avoid the work, but probably not the cost, is to buy a farm that has been cleared. Alaska agricultural literature—from the early 1900s to the present—is fraught with warnings about high clearing costs for land. Depending on your pocketbook and enthusiasm for labor, you may want to hire someone or invest in equipment and do it yourself. This brings me to my next point.

There is a very real trade-off between capital and labor in farm improvement. Clearing the land yourself, will enable you to save money and to experience working your land. To clear the land, I recommend using a crawler type tractor equipped with a bulldozer. This is where you learn the meaning of labor and capital trade-off. Generally, the more money you spend on a tractor, the less time will be needed to clear your land. This doesn't mean you must purchase a brand new tractor; even 50–year–old tractors are usually fairly reliable. They just won't have the bells, whistles and horsepower that make the newer ones more efficient.

I found it fairly easy to locate an older machine of at least 100 drawbar horsepower. This is sufficient to handle clearing, though it probably won't be as fast as the newer models. The trade-off, of course, is investing lots of your time versus lots of your money. I learned that old tractors are easier to fix than the newer ones, and they can often be purchased for less than $10,000. Used parts are generally available throughout the state and repairs are usually simpler and cheaper than those on newer machines. I purchased both a 1942 and a 1944 model, and plan to use one for work, and the other for spare parts. Crawler tractors are a long–term investment, and I've discovered they're much cheaper to buy than large wheel tractors of comparable drawbar horsepower in Alaska. With the limited availability of agricultural machinery in Alaska and the expense of importing it, converting these venerable old beasts is a cost effective way to acquire useful equipment.

To clear my land cheaply, I decided to burn it first. However, check with the Alaska Department of Environmental Conservation (DEC) because the agency may charge for air pollution rights in the future. You must also work closely with the Alaska Division of Forestry to get the necessary burn permits

Hans Geier clears land on his recently purchased farm in Delta Junction, Alaska (courtesy photo).

and ensure the fires don't spread. An effective burn plan can lower land clearing costs considerably. Also, ash from the vegetation after the burn will be more evenly distributed on the fields, thus requiring less fertilizer. Remember, clearing costs and labor can be minimized by working with the necessary agencies.

Where will you get all the money to clear your land? If you are like me, you'll need to keep your day job. I personally do all the work on my farm during holidays, vacations, and weekends. Thus, I finance my endeavor out of pocket, and do only as much as I can afford. I intend to plant barley in 1996, but do not plan on receiving any appreciable farm income for several years.

I'm living proof that farming is the most capital intensive industry in the U. S.— I keep plowing every penny of disposable income into my farm. The fact is while I am establishing my farm, it will continue to be a major time and financial investment. I justify it because I love farming. By the way, it helps if your spouse is also enthusiastic. Mine isn't, but she's a good sport, even if she would rather be shopping at Nordstrom's than looking at farm machinery.

Credit

The major lending agency for farmers in Alaska, the Agriculture Revolving Loan Fund (ARLF), has a variety of useful and affordable subsidized credit programs. The ARLF is a state entity subject to the actions of the legislature even though it operates like a bank. However, they cannot, by regulation, finance tracked vehicles or nonfarm use vehicles, which includes crawler tractors and multiple use trucks. The Alaska Rural Rehabilitation Corporation (ARRC) loans money for any farm business based upon a person's ability to repay. The ARRC demands higher down payments and application fees, but is willing to finance equipment that the ARLF cannot. For this reason, I have found them to be a useful credit source, at least for the developmental stage. There are other available sources—such as commercial private sector banks, USDA Farm Credit System, and the Commercial Fishing and Agriculture Bank. If you are interested in farming, I encourage you to explore all options and choose what fits your needs.

Information

Everyone has an opinion on how to operate your farm (I am giving you mine). I have found some of the most credible advice comes from my neighbors. They have been farming longer than me and they have opinions on how to do practically anything. However, I keep in mind the old adage: You get what you pay for.

Another credible source of advice comes from the research scientists at the Agricultural and Forestry Experiment Station (AFES), University of Alaska Fairbanks. The station has agronomists, animal scientists, soil scientists, foresters, and even economists who will work with you. Unfortunately, the AFES's Delta Field Station will close if funding cannot be found in 1996, but the years of research in Delta and other areas in the state is still available to farmers from the University. Also, many researchers welcome the chance to work with individuals on their

farms, offering advice and useful, current research project results.

The Alaska Division of Agriculture provides help with land issues, offers information for dealing with other agencies and practical information on marketing, land clearing, and general farming questions. They are active advocates for the farming industry in general. While I have not used their services, the Alaska Cooperative Extension (ACE) has an office in Delta Junction which assists the farming community. They traditionally serve as a link between university researchers and the farming community. Many farmers in Delta have found ACE to be a valuable resource. There is also a whole alphabet soup of state and federal agencies that may be useful to check out. It will be necessary to interact with many of these agencies in the course of developing your farm, and also when you farm. When dealing with regulatory agencies, be persistent. Make sure you understand what you want to do and work to maintain clear communication with the agents.

Community involvement

While I don't live on my farm except when I am working on it, it's important for me to know all of my neighbors and to stay informed about the issues that are important to them. My farm is located in an undeveloped area, with no phone or electric services, and very long road access that has no upkeep. While some people may feel that living without these basic services is part of the attraction of remote living, others value personal safety, comfort and efficiency. Undoubtedly there are many opinions within the community and neighborhood on this subject. You should feel free to express your opinions and work for change.

I strongly suggest that all new farmers become involved in the farming community (for instance, I think the Alaska Farm Bureau is a worthwhile organization), join the local farmers cooperative, exercise their right to vote and participate in meetings. Many organizations are self–help groups for farmers and their businesses, and represent the farming community to politicians and agencies to resolve policy problems. Alaska farmers have a distinct disadvantage compared to those in other states in terms of political support, so it is important to be represented in these groups. The Deltana Community Corporation is another organization that actively assists farmers in the Delta area. They plan to bring value-added processing to Delta. These efforts will do much to alleviate the marketing problems of farmers in the Delta area.

Operational choices

There are many types of farms in Delta and other areas of Alaska. Following is a list of various types and a short assessment of the associated labor and expenses. I hope this will help you plan the type of operation you wish to undertake, based upon your experience, expertise, abilities, and financial situation.

- Barley and small grain operation is the least labor intensive, but requires a large complement of machinery, as well as a large amount of land. Work is concentrated for several weeks in the spring (planting) and fall (harvest), with some crop management in the summer and maintenance in the winter.
- Vegetable farming, while labor intensive, does not require much land and machinery and may be best for low capital operations. It begins with growing sets in a greenhouse in early spring, planting, weeding, harvesting, and marketing during the summer and into fall. Operators must have ready access to a market.
- Hay farming requires low labor, except for harvest, with medium to high land and machinery requirements.
- Livestock for meat and milk farms requires a year-around labor commitment. That means no vacations! Most often meat and milk farms also involve grain and forage operations for feed. Of course, animal husbandry and veterinary skills are necessary. Animal operations require comparatively large investments in herds, in addition to capital equipment specific to each type of farm.
- Most operations in Alaska are combinations of the above. If you can handle a multitude of tasks, I believe this may be the most efficient farm.

Marketing

Marketing is the biggest obstacle I see for my farm and that of other Alaska farmers. Farmers literally have no place to sell their

crop unless they find or develop it. For grain farmers, access to international grain markets is limited by the lack of a transportation system to competitively move grain outside, and instate markets are limited due to the lack of large milk, meat and poultry producers. Traditional potato markets are currently saturated, but premium, baker, and export markets show growth potential, according to Dr. Carol Lewis, AFES, and Don Nelson, Division of Ag. I've found there is a market for animal products in Alaska, and I encourage new producers to consider livestock operations. Vegetable markets are relatively unorganized, from what I've found. Plus, Delta producers have transportation and time restriction disadvantages compared to producers located near the population centers of Anchorage and Fairbanks. Many producers have found markets with the military, and most supermarkets are willing to accept quality Alaska grown products. Personal contact is imperative to market vegetables and should include farmers markets and restaurants. The Alaska Division of Agriculture, AFES and ACE offer assistance and information.

Machinery

I've discovered that farm machinery is either expensive or not available in Alaska. Planning and opportunism has figured heavily in my acquisition of a limited line of equipment. I also rely on my neighbors, trading labor for machine use. I've converted military surplus and construction equipment, but for most future purchases I would prefer more conventional agricultural implements. I read the Division of Ag's *Market Report* and the local newspaper's classified ads to find sale items. Hauling equipment from Canada or the Lower 48 is another option. The Dawson Creek, B.C. area is a good source (so I've heard). I read the *Capital Press* to stay informed about equipment prices in the Northwest, and the *Fastline* publication for Midwest prices. Transportation can make that $14,000 John Deere 4020 in Fairbanks a good deal compared to the $9,000 one in Minnesota when you factor in the cost associated with the 6,000 mile round trip to fetch it. I figure a minimum of $5,000 for transporting a semi-load of equipment from the Lower 48, or $10,000 for a railcar. Renting machinery or custom hire is an option, but the margin for error due to weather may make it preferable to own. Given the short harvest and planting seasons in Alaska, relying on custom operators often means waiting for them to finish their own work. This increases the odds that your work will be done too late, or not at all.

The purchase of machinery should be undertaken carefully. While I prefer new equipment, I know that good used equipment will probably be more economical. Before I buy a used machine, I make sure I have, or can get, tools to maintain and fix it.

Buildings

Farm buildings will undoubtedly be a major concern. Many people have simply hauled old ATCO units or other mobile homes onto their properties. This is a very cost effective way to acquire housing. In Alaska there is usually building material on the land; however, I've learned to be careful. Older chained–down spruce trees are likely to have rotted and are worthless for building purposes. Even recently chained–down spruce might be mixed with enough dirt to make working with them difficult and destructive to chainsaws and sawmills. Windbreaks, however, are a source of good wood, for building and for firewood. Blown–down spruce trees are likely to be dry, and are usually amenable to woodworking. Additional standing trees in windbreaks are also good sources for house logs or dimensional lumber. It's important to check with the appropriate agencies before cutting in your windbreaks. With planning, care, and hard work, serviceable buildings including log houses, root cellars, pole barns, and greenhouses may be built with a minimum of store bought materials, not to mention firewood and fencing materials.

Good luck in your farming ventures. I will gladly discuss any of the information I have given in this article with new farmers and can be reached at (907) 474–7727.

Note: Hans Geier grew up on a diversified farming operation in Minnesota and has more than 25 years of farming experience. He has managed field operations for a vertically integrated corn-soybean farm including supply, production and marketing.

Dr. Bonita J. Neiland, professor emeritus, reflects on professional accomplishments

Dr. Bonita Neiland at the Georgeson Botanical Garden in summer 1995 (photo by Valerie Hendrickson).

by: Valerie Hendrickson
Compositor

"I think it began with a rock collection when I was 10 years old," mused Dr. Bonita Neiland, sitting on a bench overlooking the Georgeson Botanical Garden one sunny day last July. "I'd gather all the different types of rocks I could find and bring them in the house. My mom would help me identify and categorize them. As time went on, I collected and cataloged everything I could find outside. I even kept a notebook on all the birds and plants I observed.

"When you're an only child growing up on a farm, the fields and the forests and the surrounding areas become your playground," she said. "Besides, I've always loved plants and cats. At one time I wanted to become a veterinarian."

Her childhood curiosity soon turned to scientific inquiry. It would prove to be the foundation for an accomplished and dynamic career. Her relentless drive and dedication was instrumental in the creation of UAF's School of Agriculture and Land Resources Management.

Neiland, vacationing in Fairbanks last summer, reflected on her role during the early days of her career, the School, and the events that initially brought her to Alaska.

Born in 1928, Neiland grew up on the family dairy-hay-grain farm near Eugene, Oregon. She earned her undergraduate degree in biology at the University of Oregon in 1949, and attended Oregon State University at Corvallis, finishing her graduate degree in plant ecology in 1951. She then received a diploma in rural science from the University of Wales as a Fulbright Fellow in 1952, and in 1954 completed her Ph.D. in botany/agronomy at the University of Wisconsin, Madison.

She returned to Oregon, married biologist Kenneth Neiland in 1955, and taught as assistant professor of botany at the University of Oregon. In 1959, her husband accepted a job with the Alaska Dept. of Fish & Game, and the couple headed to Juneau.

Dr. Neiland joined the faculty at the University in 1961 as Assistant Professor of Botany, teaching courses in plant ecology and plant physiology. While in southeast Alaska, Neiland conducted extensive studies on the ecology of forests and bogs in the coastal areas. Her research was highly acclaimed, and she is still considered a definitive authority on Alaska's

coastal ecosystems.

Dr. Patricia Holloway, a long-time friend and colleague of Neiland's, recalled Neiland preparing to go out into the field by herself.

"She always brought along three things: her research equipment, a shotgun, and her cats. The shotgun was there to protect the cats from bears."

In 1965, Ken accepted a job transfer, and the Neilands headed to Fairbanks.

"We homesteaded 150 acres on Chena Hot Springs Road," reminisced Neiland. "We called it Cassiar Farms.

"Coming from Oregon, I was looking for a land-grant college with an ag school," she said. "I was intrigued that, historically, agriculture in Alaska got it's start during the gold-rush days, when farmers planted feed for their mules and horses. However, by World War II, food and milk started coming in from the lower-48, and the focus on agriculture began to disappear."

She spoke of the challenges she faced as a woman in science trying to make her mark in what was traditionally a man's world.

"When I first got here, there was no SALRM. It was known as the College of Biological Sciences and Renewable Resources. Back then, women were just beginning to make inroads in a very male-dominated field. If it were not for Dr. Brina Kessel (then Dean of the College of Biological Sciences), I might not have been hired. She gave me my first job as a botanist."

By 1970, Neiland had become a full professor of botany and land resources management, and served as head of the Department of Land Resources and Agricultural Sciences. She developed a successful research program in plant ecology, and supervised numerous graduate studies in plant succession, vegetation analysis, and revegetation of Alaska forest and bog ecosystems.

Even back then, maintaining the curriculum and research programs would prove to be her greatest struggle.

"It was 1971. A former statewide administrator, who was way at the top, adamantly wanted to abolish the curriculum. Fortunately for us, it was Christmas break and he went on holiday leave. Dr. Kessel and I were able to push it through and get it approved while he was away. And although he wasn't too pleased about it, he later admitted that it was his mistake for going on vacation. There was nothing he could do at that point," she said with a victorious gleam in her eye.

In 1975, when the college of Biological Sciences and Renewable Resources dissolved and the School of Agriculture and Land Resources Management was formed, Dr. Neiland became Acting Assistant Dean for Instruction at the newly created school. In 1977 she became SALRM's first Director of Instruction and Public Service.

"The School's emphasis shifted with each university president. President Patty, for example, wanted the university's focus on liberal arts and social sciences instead of research and applied sciences. And the "wildlifers," as we used to call them, didn't want farming or timber harvesting of the land. It seemed no matter what we did, we encountered opposition."

Although the School's mission might have changed with each passing president, Neiland was determined to maintain her vision. It was her dream to develop a program that would give students a broad perspective of the field of natural resources management. According to Holloway, Neiland was relentless.

"First and foremost was her dedication to the students. That was always her number one priority. She held everyone to the highest standards, but she was fair and sensitive to everyone's needs. And she had uncompromising integrity. You always knew where you stood with her."

Carolyne Wallace worked with Neiland as her administrative assistant for sixteen years.

She recalled the many changes that occurred before the SALRM was established.

"We had a couple of acting deans after Dr. Kessel, including the dean of engineering! No matter where the administration tried to put us, Dr. Neiland never lost sight of her goal. When SALRM was finally a reality in 1975, I'm not sure she was ready for the fact that the really hard work had just begun. But she never faltered in her commitment to an integration of science, technology, economics, law and the humanities.

She is a most remarkable woman. She was an excellent boss and one I am proud to call a dear friend," added Wallace.

Their friendship has continued in the years since Neiland left Fairbanks.

"I remember when there was talk of building a Wal-Mart where our research plots are, at the intersection of Chena Ridge Road and the Parks Highway. Carolyne would send me clippings

from the Daily News-Miner to keep me posted," said Neiland.

When asked about the highlights of her career at UAF, Dr. Neiland reflected, "I thoroughly enjoyed teaching, the research, and building the School," she said. "Even though there were some long and bitter battles."

Looking back on the past achievements, Dr. Neiland refused to take all the credit.

"I don't like to toot my own horn," she emphasized. "I couldn't have done it without the help of many dedicated and talented people." But the victories did not come without disappointments.

"The Delta Barley Project failed largely due to politics. The spirit was there—there just wasn't any cooperation between the various entities."

After 26 years, Dr. Neiland retired from UAF in June 1987. The couple sold their homestead, packed up the cats and returned to Oregon. They make their home in the small town of Sisters. She admits to missing some, but not all, of the aspects of her former occupation.

"I miss the students and I miss teaching. One thing I don't miss is having all that pressure—the pressure of building tenure, of securing research grants or funding for the next project. And in light of program assessment...it's sad to see how deep the budget cuts have been and how badly it's affected morale. I think the students and the faculty are feeling very defeated right now."

While Dr. Neiland continues to be concerned about the future of SALRM, retirement has brought other rewards.

"The pace of my life has really slowed down. I'm finally learning to relax. For so many years I was focused on SALRM at the expense of everything else. Now I spend much of my time reading about things not related to my field, like archaeology and Greek and Roman literature. Lately, I've taken up a new interest—shooting rattlesnakes. There's so many of them down here. I'm becoming a pretty good shot."

Dr. Neiland also ran a successful campaign for director of the Soil and Water Conservation Board for Deschutes County. "We're having land-use wars down here," she said. "It's resorts versus farmland. Being on the Board keeps me in touch with the issues."

And the drawbacks of retirement?

"Well, growing older is a little frustrating—not being physically able to do the things I used to do. I considered putting in a big garden, but it's so dry down here, I would need to rig up some kind of irrigation system. Besides, I don't think my joints could take it anyway," she laughed.

There have been many changes for Dr. Neiland and the University since she left Fairbanks in 1987 or 1988? Cassiar Farms is now Cassiar Heights Subdivision. Flower boxes have replaced research plots. And of the original six cats, only two remain.

"Yes, things are quite different now," she said. "But in retrospect, I have no regrets."

Bonita J. Neiland scholarship

After Dr. Neiland's retirement in 1987, colleagues and former students wished to reward her hard work and dedication by establishing a scholarship fund in her honor. With full support from the University of Alaska, Fairbanks, the Bonita J. Neiland Fund for Natural Resource Scholars was initiated in 1988.

Since that time, many friends, students, and colleagues have contributed to the success of the fund. The scholarship is awarded each year to a full-time undergraduate student demonstrating academic excellence in the Natural Resources Management degree program. In doing so, the work to which Dr. Neiland devoted a good portion of her career may continue.

Dr. Neiland will always be remembered for her tireless efforts in initiating, developing, and strengthening what is now the School of Agriculture and Land Resources Management. We are pleased to award this year's scholarship to Marc Colin Barnard. Congratulations!

Past recipients of the Neiland Award are:

1992-93	Stephanie Gibby
1993-94	Jennifer Sampson
1994-95	Rochelle Pigors

Dave Liebersbach, Class of '88, specializes in natural resources

by: Donna Gindle
Publications Supervisor

Some people go through life like an accident waiting to happen. But Dave Liebersbach goes through life waiting for an accident to happen.

Liebersbach graduated in 1988 with a bachelor of science degree in recreation management from the School of Agriculture and Land Resources Management. He is a natural resources specialist for the Bureau of Land Management and was previously assigned as the fire management officer for the Alaska Fire Service. He says his job consists of "all kinds of different work in the Arctic District and covers soil, air and water management including hazardous material and fire management, forestry and mining, and recreation."

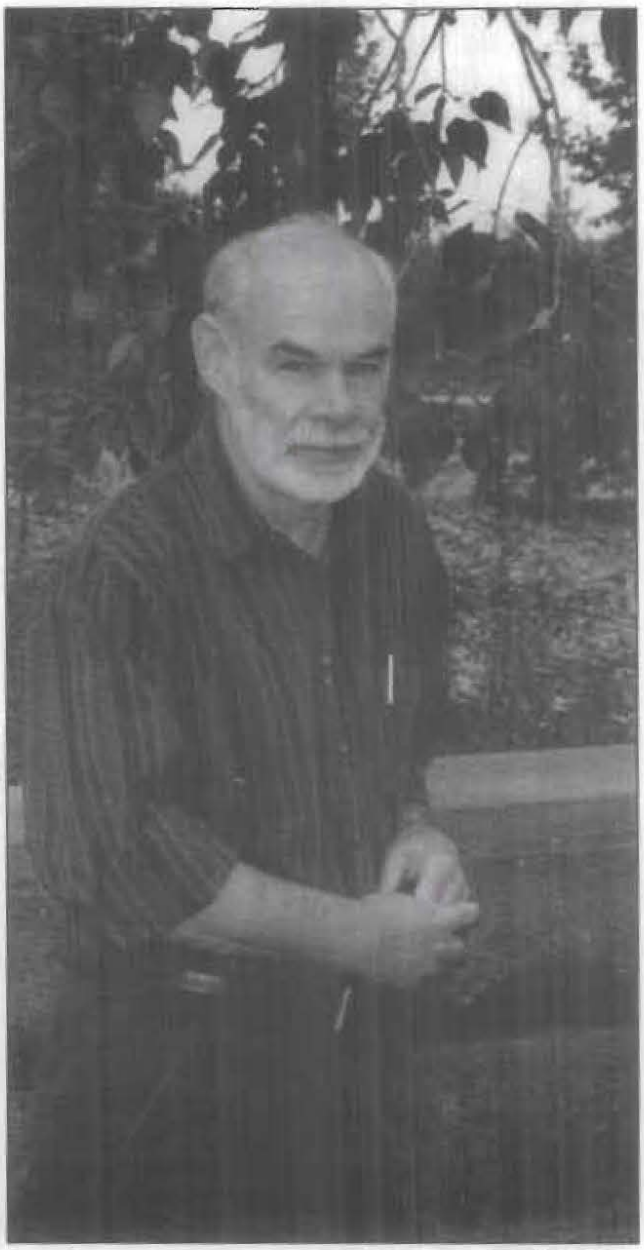
But it's not in that job where he waits for accidents to happen. This former smoke jumper now jumps on the opportunity to travel the nation fighting disasters.

Liebersbach is an incident commander for an Incident Management Team (IMT) which responds to major federal incidents throughout the United States. There are 18 national teams, one of which is located in Alaska. In addition to the commander, each team is comprised of chiefs for plans, logistics, finance, and operations (two positions), and air operations and safety directors.

Team members apply for vacancies as they come open and commit to at least three years. The competition is tough, said Liebersbach, but then so are the responsibilities.

"When we are activated, we are usually on that job an average of 12 to 14 days, and we work 14 to 18 hours a day. If the incident is major, team are switched out after a month. That's about the most a person can handle."

"Team members go into a situation and stabilize it," said Liebersbach. For example, if the incident is a fire we contain the fire so that it no longer poses a serious threat. Then we return the area to the organization that normally is responsible for it, who then mops



Dave Liebersbach is a 1988 graduate of SALRM. He works as a natural resources specialist for the Bureau of Land Management (photo by Donna Gindle).

and cleans it up."

Although the incidents are usually fires, Liebersbach said that the management teams have responded to such disasters as the 1995 bombing of a federal building in Oklahoma, the 1994 Koyukuk River flood, the 1989 Exxon Valdez oil spill, Hurricane Andrew and the Mexico City earthquake. As more and more agencies realize the value of the IMTs' tremendous training and skills, the teams are receiving more requests to help out.

"What makes this type of operation so valuable is our initial ability to organize and get things together. Our purpose is not to manage the incident for a long term but to get it stabilized and return it to the organization who resumes operations."

As the incident commander, Liebersbach serves as the first link with the organization. He says he quickly establishes what that agency expects of his team, determines the scope of his authority and defines "Where the buck stops.

"My team is made up of top of the line people. We know each other, we have been working together for a long time, and we work well together. This is advantageous because we don't need to spend a lot of time assessing the situation. We go about our respective duties and meet two or three times daily for updates."

Liebersbach's office, located off Airport Way in Fairbanks, is extremely organized. The exception is a mobility bag on the floor that seems out of place in the neat surroundings. It serves as a constant reminder that only a phone call separates Liebersbach from a disaster. His bag, which he keeps with him at all times when he is on national alert, contains a tent, sleeping gear, boots and enough living essentials for 30 days.

"We usually know when our chances are high to get called up," Liebersbach said, "because each team is on national call for one week every 18 weeks. Members of this number one team must be able to respond to a jet port within two hours of notification. The number two level has to be available to go within eight hours of call up and the number three level within 24 hours."

Liebersbach credits SALRM and his education for his career advancement. "My education has allowed me to advance higher in fire management. Fire management is more than just suppression. It has a lot to do with the ecology and the ecological impact on the environment."

Before pursuing his degree, Liebersbach worked for four years in the California Department of Forestry. Since coming to Alaska in 1970 he has worked numerous fire-suppression jobs in Bettles, Lake Minchumina, Kenai, McGrath, and Galena. He also taught fire management from 1986 through 1992 at SALRM's natural resources management department.

"Fire is interesting and exciting," Liebersbach explained. "But I decided I needed to broaden my horizons. That's when I became interested in natural resources management and went back to school."

And that might have been the smartest move he's made yet. He met fellow SALRM student, Lora Harbo, and they married. The two have one daughter, Tamiah, 6.

Liebersbach says he enjoys his current job, and sees it as a challenge to interact with miners, help them get their permits, while upholding federal restrictions.

"I see my challenge as one of integration, being able to serve both people who want to mine and those who want to preserve the environment. We have the resources; people should be able to use or develop those resources. But. And here's the but, they must not destroy the land in the process. Man has a long history of leaving a lot of ruin in his wake. We can't continue."

In his current position, Liebersbach is learning to deal with the pressures of how society views him.

"When I dealt with wild fires, I was always the good guy. People appreciated what I did. Now, I'm never the good guy. Nobody ever gets all they want. If what I do makes one person happy, you can be sure it made someone else less so. I basically just live by the knowledge that I have to remain neutral and execute the laws that Congress has passed."

Dave Liebersbach, Class of 88, one of SALRM's own.

Honoring Alaska's 1995 Women in Agriculture

Alaska Women in Agriculture award winners are (left to right) Jeannette Braiser, Joanne Marie Mosesian and Edna Anderson (courtesy photo).

Congratulations to Joanne Marie Mosesian, Edna Anderson and Jeanette Braiser, the 1995 recipients of the Women in Agriculture awards. The School of Agriculture and Land Resources Management, Agricultural and Forestry Experiment Station recognize the outstanding contributions of these women to advancing agriculture in their communities and throughout the state. Dr. Fredric Husby, SALRM dean, and Dr. Allen Mitchell, AFES director, made the presentations November 18 in conjunction with the Agricultural Symposium held in Anchorage.

Mrs. Joanne Marie Mosesian and her husband, Mike, own and manage Bell's Nurseries and China and have served Alaska's greenhouse industry with distinction for 23 years. Mosesian has actively participated in making Alaska grown tomatoes, poinsettias, and ornamentals synonymous with superior quality in the eyes of Alaskan consumers. She serves the Anchorage community with her fund raising for Clare House and other public service activities and actively and effectively supports state funding for agriculture.

Edna Anderson has staunchly supported agriculture in Alaska for more than 40 years. She started the first mainland rodeo in 1959 and provided all the livestock for the first Anchorage Rodeo in 1960. Anderson has been a charter Alaskan Rancher since 1958 and continues to successfully work on her family farm and 1,750 acres of leased land. She has served as the president of the Kenai Peninsula Farm Bureau, was a 1959 charter state member of the Alaska Cattleman's Association and former state president of the Alaska Farmer's and Stock Grower's Association, and a supporter of and cooperator with the University of Alaska agricultural program.

Jeanette Braiser, co-owner and co-operator of the Delta Produce Farm, in Delta Junction, Alaska, has been active in Alaska's agriculture for more than 22 years. Braiser currently farms—with her husband, Lyle—100 acres of barley, 200 acres of hay, and 150 acres of Delta Gem potatoes. They also raise 20 head of beef. She also serves her community as a Licensed Practical Nurse and volunteer Emergency Medical Technician; and is active in the Alaska Farmer's Co-op and Alaska Farm Bureau. She has also served as a 4-H leader, assistant leader and active Future Farmers of America parent, supporting her three sons and one daughter.

People, news & happenings

Best wishes, goodbye

Tony Gasbarro, extension forestry specialist and associate professor of extension for Alaska Cooperative Extension, retired in February after 23 years. He earned a bachelor of science degree from Colorado State University in 1962 and a master of science from UAF in 1979.

The SALRM recognized Gasbarro recently with an appointment to emeritus status. We wish him all the best in his pursuits with the Peace Corps.

A community recognition

Dr. Patricia Holloway, associate professor of horticulture, was one of two University of Alaska Fairbanks people recognized for outstanding contributions to the Fairbanks community last fall. The recognition was part of the UAF and the Greater Fairbanks Chamber of Commerce's College Town Day held Sept. 21, 1995 that recognized the partnership between the university and the community. Congratulations Dr. Holloway.

Conference News

The Agricultural and Forestry Experiment Station's faculty and graduate students attended the 1995 Circumpolar Agricultural Conference in Tromsø, Norway in September. Dr. Stephen Sparrow, Plant, Animal and Soil Sciences department head, said the conference offered a forum for the exchange of information and the interaction among people working in agriculture in the circumpolar north regions. During this conference, plans were finalized in the establishment of the Circumpolar Agricultural Association, a nongovernmental organization officially recognized by the United Nations.

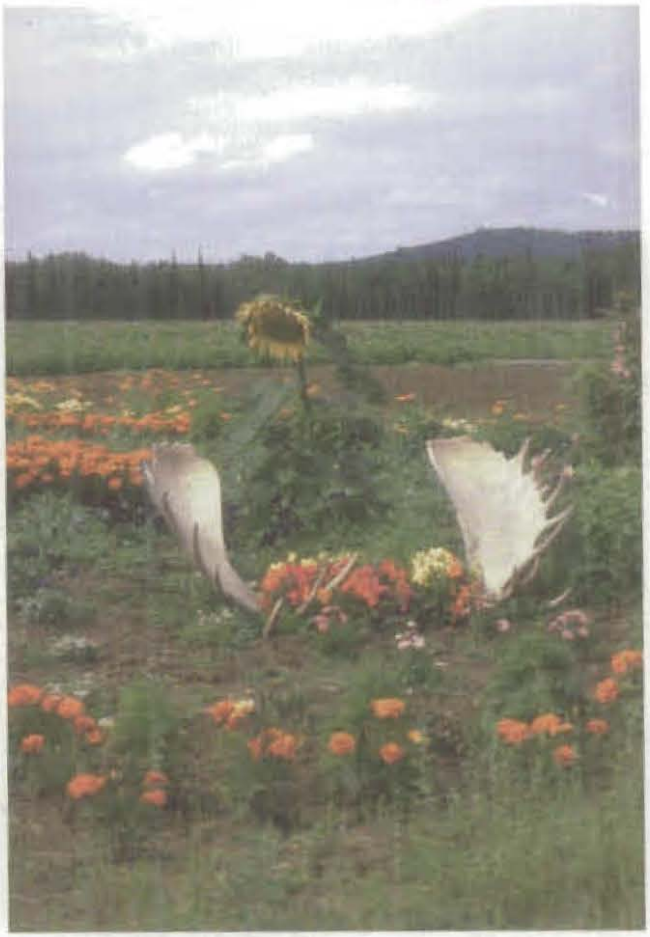
Plans are underway for the next conference to be held in Anchorage in October 1998. That conference will be part of the year–long celebration marking 100 years of agricultural research in Alaska. As the conference nears, more information will be made available.

Building a Bridge

The Sam Dinsmore Memorial Bridge will be the main entrance to the Georgeson Botanical Garden's children's pond and wetland garden. Volunteers donated all the materials and built the bridge. This beautiful arched bridge will go over the catch basin for water to be pumped up to recycle through the pond and wetland. The bridge will also be where children can develop math skills regarding water volume and velocity.

Jan Hanscom and Paulette Wille, left, square up the bridge. Steve Becker and Pat Holloway, right, put on decking.

Moose Design...



Paul Shoen, Shoen Farms in Fairbanks, has a true Alaskan landscape (photo by J. Stephen Lay)