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Yukon Agriculture 1985

STATE OF
THE INDUSTRY

YUKON AGRICULTURE 1985:

STATE OF THE INDUSTRY

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*Agriculture Development Series Report No. 3. Agriculture Canada,
Land Resources Research Center, Box 2703, Whitehorse, Yukon. Sept 1986.*

ACKNOWLEDGEMENTS

The authors wish to thank the contributors from the various agencies and private groups who provided information on their 1985 activities for this report.

In particular, the cooperation and efforts of Terry Hayward, Agriculture Canada, Economic Development Branch; Al Alcock, Yukon Livestock and Agricultural Association; Margaret Aimes, Yukon Department of Renewable Resources; and Lauren Crooks, Yukon Department of Community and Transportation Services, are most appreciated.

The report cover was designed by Thom Rodger; word processing of the report manuscript was undertaken by Nancy MacIntyre and Sigrun Tweed, all of the Yukon Department of Renewable Resources.

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I INTRODUCTION

During 1985 progress was made in developing an agricultural infrastructure within the Territory. This was brought about through the cooperative efforts of the Yukon Government and the Yukon Livestock and Agricultural Association. It was also the first year of a joint Federal-Territorial 3-year New Crop Development Project designed to provide information on growing conditions and variety performance. An Agricultural Planning Advisory Committee was formed as a vehicle to facilitate industry input to government policies regarding agriculture. An Agricultural Products Act was passed in the Yukon Legislature to allow regulation and set standards for agricultural commodities in the future. The year was also highlighted by increased involvement by agencies that offer extension services to individuals active in agricultural pursuits. The extremely complex process of providing land for agriculture has been an issue through the year, and the total number of dispositions of land was down from previous years.

This report is the second Yukon Agriculture Annual Report. The 1984 report was more than an annual summary; it discussed the agriculture industry and its development up to that point. Approximately 350 copies were distributed to the general public, political interests, and agencies involved in agricultural research and extension services to northern areas. It was well received as an informative document describing the situation and potential growth for Yukon agriculture. The 1985 report is intended to be an annual update; it attempts to keep the Government, industry and general public informed and to document the progress of the Yukon agriculture industry during this time of change. It covers the time period to the end of the fiscal year, March 1986.

The report is comprised of four major segments. Section II deals with the political background; section III gives an overview of the present state of affairs within the industry; section IV outlines the activities and achievements of a number of agricultural groups for 1985 and section V summarizes crop research, specifically the first year of the New Crop Development Program and results of the year's Forage Fertility Trials. Section VI is a concluding statement which looks ahead toward the near future. A list of references and publications prepared on Yukon Agriculture during the year is given at the end of the report.

II BACKGROUND

1985 was a year of political change in the territory. As a result of the May territorial election the ruling Progressive Conservatives were replaced with a minority NDP government. The direction and pace of agricultural development remained steady through the year. By and large, programs, initiatives and cooperative functions that were initially put in place by the Conservatives have continued under the new government into early 1986.

Prior to May 1985, there was much discussion of block land transfers from the federal government to the territorial government. These transfers were to include areas of particular importance to agriculture. While no blocks of land were transferred, land under 71 existing federal agriculture and/or grazing leases was turned over to the territory for administration under the agricultural development program. The federal lands office of Indian and Northern Affairs continued its policy of not issuing new agricultural leases and continued their call for a Yukon Agriculture Policy from the Government of Yukon.

In cooperation with the Yukon Livestock and Agricultural Association (YLAA), important progress was made by both federal and territorial agencies to provide the basic legislative and technical support that the industry does and will require. The passing in the Territorial Legislature in November of the Agricultural Products Act and the signing of an agreement with the Prairie Farm Rehabilitation Agency for technical services are two examples of these efforts. Government agencies have been prompt and positive about providing technical expertise to facilitate development.

The territorial agricultural land disposition program continued into its fourth year (see page 9). By the end of 1985 a cumulative total of almost 300 applications had been received for parcels scattered throughout the territory. The Yukon Department of Renewable Resources receives applications and is responsible for the technical review of applications for agricultural capability, land use conflicts and land management reviews but not disposition. Where the Territorial government has the authority, the Lands Branch of the Department of Community and Transportation Services issues an agreement for sale. Prior to 1985 many of these agricultural agreements for sale were issued where applications lay on Commissioner's Land. However, as the majority of the remaining active applications lie on federal land and require intergovernment transfers, there was a sharp decline in agreements for sale in 1985. Applications on federal land can not be processed until transfers are negotiated. It is unclear why more transfers did not take place. The virtual stalling of land claims negotiations meant little progress was made on issuing land tenures for a full spectrum of land uses, not only transfers for agricultural purposes.

Government policy development on agricultural issues lagged somewhat through much of the year and an enormous task lies ahead in this regard. One group in particular, the Agricultural Planning Advisory Committee (APAC), acts as a catalyst in this policy development (see page 16). APAC has a unique structure being jointly composed of both private (YLAA) and public (Department of Renewable Resources and Department of Economic Development) members. They are charged with the responsibility of advising the Minister responsible for agriculture, Hon. David Porter, on issues and policy matters relating to the industry. They met for the first time in May of 1985 and 3 times subsequent to that. The work of APAC has been a good example of a cooperative effort in helping to lay down the legislative and technical foundation for the development of agriculture.

The NDP government's throne speech in March of 1986 announced budgetary allotment for the formation of an Agriculture Branch of the Department of Renewable Resources. Before this, agriculture held an informal presence (previously referred to as an Agriculture Section) within the Department's Lands, Parks and Resources Branch. The establishment of an Agriculture Branch and the assignment of permanent staff is a major step for the industry. Mr. Dick Filteau was named the Acting Director of the new Branch effective April 20, 1986.

As was the case in 1984, land availability remains the major hurdle to allowing a full scale attempt at establishing agriculture as a significant industry within the Territory's economy.

III PRESENT STATE OF AGRICULTURE

1. Agriculture Production

All figures presented for agricultural production, land base area and production values are simply best estimates from our knowledge of Yukon farm activities and only change slightly from those presented in the 1984 report.

In 1985, there were 25 - 30 full-time and approximately 75 part-time farms in the Yukon, ranging in size up to 300 acres. Approximately 4500 acres of land have been improved. Total annual production was \$1.3 million. This is not calculated as farm sales, but as estimated farm production including home consumption. Farm sales in 1985 were estimated to be from \$300,000 - \$500,000 and included products such as hay, garden vegetables, greenhouse vegetables, eggs, meat products and bedding plants.

1985 marked the third year since the first territorial agricultural lands agreements for sale were signed. An increase in cleared land was evident but the process of converting forest land to producing agricultural land takes numerous years. No major change in the amount of agriculture produce was noted, however, it is expected that 1986 should show increased levels of production from Commissioner's land in the Whitehorse area.

The lack of well quantified agricultural statistics has been recognized as a serious shortcoming by both the private sector and the government. As 1986 is a census year, a census of agriculture will occur in the territory. More importantly, under the auspices of an Economic

Development Agreement project, the YLAA is hoping to undertake a detailed agriculture inventory to provide accurate data on the industry. This will allow comprehensive planning for future agriculture programs, marketing strategies, and economic forecasting as well as the establishment of a starting point from which to evaluate agriculture growth and direction in the future.

2. Land Dispositions

Agricultural development is dependant on land being made available to individuals who wish to undertake agriculture projects. From 1982 to 1984, disposition of new agriculture land was confined to Commissioner's land, principally the area referred to as the Block Land Transfer (BLT) immediately surrounding the Whitehorse City limits. By the end of 1984, 31 dispositions of land totaling over 4500 acres had occurred. The Yukon Territorial Government is responsible, through the Department of Community and Transportation Services, to administer agreements for sale of agriculture land in the Territory. Previous to 1985 the only lands available for agriculture were on Commissioner's Land, that is, that land over which the Government of Yukon had jurisdiction. Many agriculture and/or grazing leases existed on federal land, but these were older leases pre-dating the 1975 federal moritorium on agriculture. Since that time, Indian and Northern Affairs Canada has not issued new agriculture leases anywhere in the Yukon.

As a step to moving the administration of agriculture to the Government of Yukon, in April of 1985, 71 federal agriculture and grazing leases were transferred to the Territorial Government. The Department of Renewable Resources is presently assessing the suitability of these leases for inclusion within their existing land application system so that these leases could go to title through the five year agricultural development program. The lease holders have the option of retaining an annual rental, or, if the land meets set criteria for arability (Class 5 or better) then most opt for an agreement-for-sale, under which a certain amount of clearing and seeding must take place.

Table 1 outlines the history of the agricultural land dispositions, and illustrates the huge difference in the number of applications received and the actual agreements for sale issued by the Yukon Department of Community and Transportation Services. Of the 284 total applications received to the end of 1985, 220 remain active, the remainder having been either withdrawn by the applicant or rejected because of land use conflict or agricultural capability class. The vast majority sit "on hold" while negotiations continue to make available federal land to the agricultural land disposition program. Agreements-for-sale within the BLT declined sharply in 1985 because most of the suitable land was consumed in 1983 and 1984. Most of the agreements-for-sale outside the BLT in 1985 have resulted from the 71 federal agriculture leases which were transferred in April to the Government of Yukon. As of the end of 1985, less than 15% of all applications received had gone to an agreement-for-sale.

The total area of land under active application to the end of 1985 stood at approximately 28,000 ha (74,200 acres). By the end of March 1986 an additional 2,000 ha had come under application to place the total area at just under 30,000 ha (79,000 acres).

TABLE 1

AGRICULTURE LAND REQUESTS AND
AGREEMENTS-FOR-SALE UNDER THE
PRESENT AGRICULTURAL LAND DISPOSITION PROGRAM

YEAR	APPLICATIONS RECEIVED	AGREEMENTS-FOR-SALE	
		WITHIN BLT	OUTSIDE BLT
1982	92	0	0
1983	70	20	0
1984	69	11	2
1985	53	2	4
TOTALS	284	33	6

The total area applied for certainly exceeds the long-term projected needs for Yukon agriculture of 27,000 ha (72,000 acres), however much of this land is likely to never come into production. Some applications may be refused or withdrawn, while of the arable land on any development parcel, only two-thirds needs to be cultivated. Certainly the short-term needs of agriculture have been satisfied at least in terms of land identified through application. Most applications are in the Whitehorse area; most of the land applied for is Class 5. In the future, development will have to concentrate more on Class 3 and 4 lands in order to provide balance to the types of products (grains and vegetables) generated by the industry. Almost all of the territory's high capability land requires transfer from the federal government before it can go to development.

IV AGRICULTURAL INITIATIVES AND ACTIVITIES

This chapter presents a brief summary of federal and territorial government agency activities as well as those of agricultural associations and societies. The discussions centre on activities during 1985 and the first three months of 1986.

1. Yukon Department of Renewable Resources - Agriculture Section

a) Extension Activities

The Agriculture Section of the Department of Renewable Resources functions as an information and education resource for the people of the Yukon to promote the commercial potential in the agriculture industry. Agricultural research from many sources is compiled and relayed to the public. Information and advice is passed on through phone calls, visits to the office, pamphlets, farm visits and seminars. The range of information topics the Agriculture Section has available covers almost all aspects of farming and agriculture: soils, livestock care, crops, building plans, chemicals, fertilizers, pesticides, greenhouse building, storage, and financial management advice. It also acts as a liaison between the Yukon agriculture industry and other agencies which offer extension services such as the Farm Credit Corporation, the Prairie Farm Rehabilitation Agency and the Regional Development Branch of Agriculture Canada. Ongoing research is also a concern; the Agriculture Section was involved in organizing the New Crop Development Project (see section V-2).

In 1985, all the farms requesting advice/information from the Agriculture Section were visited by either Dick Filteau, the Agricultural Advisor, or Art Hutchison, the Agricultural Development Officer. The section coordinated Farm Credit Corporation (FCC) visits to the Yukon and set up appointments for locals with FCC staff. Over 30 farm building plans were either provided or reviewed for a variety of structures (poultry, hogs, horses, vegetable storage, fences and gates). An additional 40 farm development plans were reviewed in conjunction with the agricultural land application process.

The Agriculture Section has also been compiling a reference library, which at this point consists of over \$1,000 worth of texts. It also includes video tapes of the 1985-86 weekend agriculture seminars held at Yukon College. This provides access to this information for the people in outlying communities that were unable to attend the seminars.

The Agriculture Section was involved in initiating, and then coordinating with the YLAA, the New Crop Development Project. Field days were held in conjunction with the project, in August and September. Dick Filteau visited all the crop trial sites around the Yukon to demonstrate and discuss the results of 1985 crop trials with the people in those areas.

b) *Seminars*

The Agriculture Section in conjunction with the Yukon Department of Education was responsible for organizing a series of weekend seminars held over the fall and winter at Yukon College.

In October, Scott Smith, pedologist with Agriculture Canada gave a general introduction to soil forming processes and the role of organic matter in soil fertility. He also presented some preliminary results of the 1985 crop trials. Joe Kuhn, ecologist with the Yukon Department of Renewable Resources, gave a talk on problems with the propagation of indigenous species.

In November, Lloyd Hausher from the Alberta Horticultural Research Centre in Brooks, Alberta, discussed various aspects of vegetable storage including storage facilities, washing, sorting, grading, packaging and marketing of vegetables.

The January seminar was given by Dale Cassidy who is from the Edmonton office of the Farm Credit Corporation. The seminar was on Farm Management, covering money management, decision making and priority setting.

Commercial egg production was discussed in March at a seminar given by Rod Chernos, a poultry specialist from Alberta Agriculture.

The series ended on a successful note in April, with a large turnout for the seminar on "Greenhouses and Backyard Gardening" given by local gardeners Herb Wahl, Clay Pugh, Debbie Peterson and Wayne Wilkinson.

2. The Yukon Livestock and Agricultural Association

In 1985, the Yukon Livestock and Agricultural Association (YLAA) was a major force in Yukon agriculture. As the industry representative, the association worked in cooperation with government interests to bring about many of the 1985 changes considered necessary to further the development of the agriculture industry.

The YLAA has approximately 150 members from its three chapters: Whitehorse, Klondike and Stewart Valley. Each chapter is involved in local activities. The Whitehorse chapter held a "Six Carrot Farmer's Market" three times in 1985, selling locally produced vegetables, flowers, baked goods and crafts (Figure 1). In August, the Klondike chapter was actively involved in the Horticulture Show in Dawson City as part of the Discovery Days celebration (Figure 2). The Stewart Valley chapter won first prize for a float they entered in the Canada Day celebrations held in Mayo.

The YLAA, along with Agriculture Canada and the Agriculture Section of the Yukon Government, recognized the importance of ongoing agronomic research for the Yukon. The Association administers the New Crop Development program.

The YLAA also appoints three of the six representatives to the Agricultural Planning Advisory Committee (APAC). The association was jointly responsible for the development of the Agricultural Products Act and the establishment of the two APAC subcommittees on livestock control and taxation.

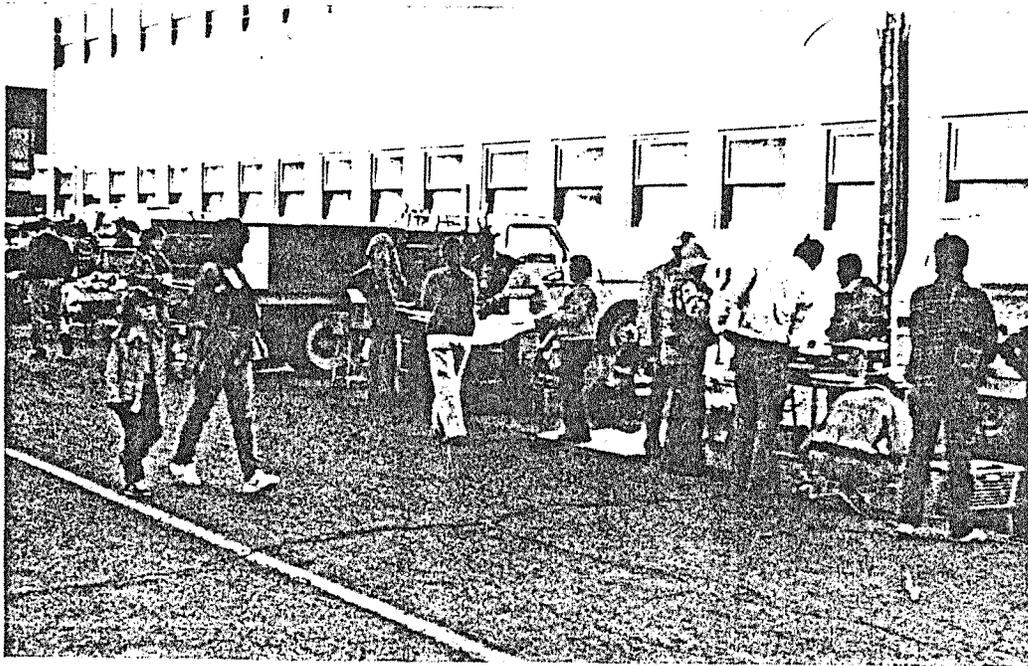


FIGURE 1 - Third Avenue, Whitehorse, location for the Six Carrot Farmer's Market in 1985. The first steps in local marketing of Yukon agricultural goods.



FIGURE 2 - Display of vegetables grown in the "Land of the Midnight Sun". Dawson City Horticultural Show, August 1985.

The YLAA has also been involved in providing educational opportunities to the farming community by organizing both spring and fall seminars. The spring seminar was held in Whitehorse and topics discussed included livestock health, construction of farm buildings, market gardening and vegetable storage. The fall seminar was held in Mayo where Dr. Don Dinkel of the University of Alaska spoke on techniques useful for extending the northern growing season. Attendance at both seminars, however, was lower than hoped for.

Throughout 1985, the Yukon Livestock and Agricultural Association continued to set the pace for the development of the agriculture industry in the Yukon.

3. The Agricultural Planning Advisory Committee (APAC)

a) General

The establishment of a "Consultative Committee on Agricultural Planning" was proposed by the former Minister of Renewable Resources, Hon. Howard Tracey, in a speech to the Whitehorse Chapter of the Yukon Livestock and Agricultural Association on December 19, 1984. The Association agreed to the initiative, and after some preliminary discussions on mandate, the Agricultural Planning Advisory Committee was established. The YLAA appointed its three chapter presidents to sit on the Committee, and the Minister of Renewable Resources designated the Director of Policy and Planning and the Agriculture Advisor from the Department of Renewable Resources, and the Director of Economic Policy Planning and Research from the Department of Economic Development, as the Yukon Government's representatives.

The first meeting of the Committee was held on March 16, followed by four subsequent meetings in May, June, September and November 1985. The mandate of the Committee is to make recommendations to the Minister on any agricultural matter it has considered.

The overall goal of APAC is to facilitate the growth of the agriculture industry. The other goals are to ensure the best use of both potential and existing farmland; to provide the opportunity for the committee to participate in policy making; and to review existing legislation and propose new legislation that will both assist industry and protect the consumer. In 1985, the APAC worked with the YLAA to develop the Agricultural Products Act. Two subcommittees, one on livestock control and a second on agricultural zoning and taxation were established. Their purpose is to develop and circulate discussion papers and to then receive public comment on these. These papers are expected to be released during 1986.

b) *The Agricultural Products Act*

The Agricultural Products Act was passed in October 1985, on the recommendation of APAC. The Act was passed in response to the need for guidelines in the marketing of locally produced agricultural goods. The Act is seen as the first step in establishing a framework for further, more detailed legislation that may be necessary in the future, and also a step in keeping industry involved in the process of developing the infrastructure for the Yukon agriculture industry.

Although the Agricultural Products Act does not deal with specific legislation for specific types of goods, it does provide protection for both consumers and conscientious producers. Inspection can now be done in cases where it seems necessary; contaminated goods may be seized and disposed of. The act also provides for compensation to producers whose goods spoil during seizure.

4. Agriculture Canada

a) Regional Development Branch

Agriculture Canada continued to support agriculture development in the Yukon during 1985 by maintaining a Regional Development staff position responsible for Northern Agriculture. In September 1985, this position was relocated from Ottawa to the Regional Development office of Agriculture Canada in Edmonton so as to better serve the agriculture sector of the Yukon.

Terry Hayward replaced George Forrester as the Agriculture Canada official charged with the responsibility of working with Yukon agriculture. Mr. Hayward sits on the Agricultural Planning Advisory Council as an advisor, and acts as the alternate member for Agriculture Canada on the Economic Development Agreement Renewable Resources Management Committee. He also works closely with the agriculture unit of the Department of Renewable Resources, acting as a source of information, advisor, and liaison between the territorial and federal bureaucracies on agricultural matters, programs, and initiatives.

During 1985, the Agriculture Canada Regional Development officer was instrumental in commencing discussions aimed at establishing a Canada Plan Service office in Whitehorse. This will be the eleventh such office established in Canada which provides building plans to farmers.

Agriculture Canada continued to respond to individual farmers and farm groups with information and advice.

b) *Prairie Farm Rehabilitation Agency (PFRA)*

The Edmonton office of the PFRA, under the auspices of Harry Hill, gave verbal agreement to the Agriculture Section of the Yukon Government to provide the Yukon with engineering advisory services. In 1985, there were 22 requests for information on developing existing water sources for agricultural use and irrigation systems. The PFRA representatives visited the Yukon in September and October and were able to visit all 22 sites requesting their services. They plan to return in the spring to assist in initiating some of these projects.

c) *The Canada-Yukon Soil Survey Unit*

The Soil Survey Unit employs one soil scientist, Scott Smith, to work on a variety of soil-related projects, many of which are directly related to Yukon Agriculture. One casual position and a summer student were also on staff during parts of 1985.

Detailed soil mapping continued in the Whitehorse region. The second year of a four year project saw 10,000 ha of 1:20,000 soil mapping occur in the Annie Lake area south of Whitehorse (Figure 3). The final product will be a compilation of soil maps at a scale of 1:20,000 with derived maps of agricultural capability and residential suitability for the Carcross Valley, Takhini Valley and Yukon River Valley between Marsh Lake and Lake Laberge (excluding lands within the City of Whitehorse).

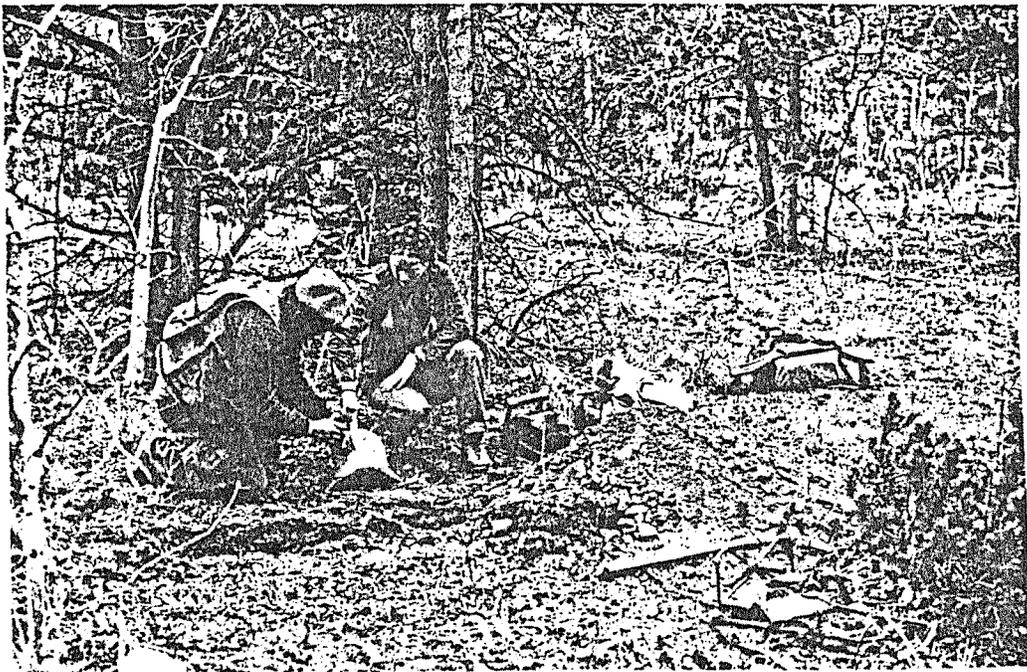


FIGURE 3 - One of the activities of the Whitehorse area soil survey is the assessment of soils for residential suitability. Here a sample is collected for engineering tests associated with on-site sewage disposal.

The soil survey unit coordinated soil fertility trials on forage plots in Carmacks, Dawson City, and Whitehorse. These trials were on existing stands of bromegrass under irrigated and non-irrigated conditions (see section on Crop Trials). Soil testing service for commercial operators was continued for the third year with 120 soil samples processed through the Alberta Soil and Feed Test Lab in Edmonton. Fertilizer recommendations were formulated for most of these.

d) *The Farm Credit Corporation*

The Farm Credit Corporation services have been available to the Yukon since 1961; however, because the pace of agriculture has been fairly slow only during the last 2 or 3 years has the services of the FCC been utilized here. The FCC operates as a lending institution as well as an extension service for farm financial planning. In 1984, the FCC received 7 applications and approved 5 loans for Yukon farmers totalling approximately \$210,000. None have gone through the FCC since then. In order to manage existing loans and as an extension service for financial planning the FCC representative, Dale Cassidy, visited the Yukon three times in 1985. In January of 1986 he presented a seminar at Yukon College on Farm Money Management.

5. Canada/Yukon Economic Development Agreement (EDA) - Renewable Resources Sub-Agreement

The EDA is a joint undertaking between the Government of Canada and the Yukon Territorial Government. It is intended to encourage the growth of the Yukon's renewable resource sector by providing assistance to businesses and individuals. The program was started in June, 1985 and can provide up to \$4.2 million over four years. It covers 5 major areas of economic opportunity, including agriculture.

The EDA offers assistance under two types of programs. One is designed for feasibility studies and resource inventories that could increase opportunities for commercial enterprises. The other is to promote innovative pilot and demonstration projects that have potential economic viability.

Since the agreement has gone into effect several agricultural projects have received support through the EDA. These include development of a hydroponic greenhouse food industry with the intent to grow lettuce year round in the Yukon; the feasibility of producing fresh herbs and spices in a greenhouse environment ; the feasibility of a sod farm in the Yukon; and the feasibility of an egg production facility. Table 2 lists the projects approved in 1985 and the amounts of funding allotted to each. Total project costs are considerably higher. The values reported here are for the EDA funding only. Project reviews will continue into 1986.

TABLE 2

PROJECTS APPROVED FOR EDA SUPPORT

<i>Project</i>	<i>Date of Approval</i>	<i>EDA Funding</i> \$
1) <i>Hydroponic greenhouse food production.</i>	<i>Sept./85</i>	<i>\$93,777</i>
2) <i>Feasibility study of greenhouse production of herbs and spices.</i>	<i>Oct./85</i>	<i>\$ 5,774</i>
3) <i>Feasibility study of local sod production.</i>	<i>Nov./85</i>	<i>\$83,500</i>
4) <i>Feasibility study of egg production unit.</i>	<i>Dec./85</i>	<i>\$76,952</i>

6. *Beekeepers Association*

The Beekeeper's Association was started in the Yukon in 1980 and has 13 active members in the Yukon. As well as ordering bees for the members, the association also tries to provide educational opportunities.

Dennis McKenna of Fairview College, Alberta gave a 3-day course in the spring. There is also a possibility that the Beekeeper's Association may be working in co-operation with Fairview College to do some research on a strain of bee developed there.

7. Horticulture and Landscaping Society

The Horticulture and Landscaping Society was started in April, 1985 with the objective of teaching its members about horticulture and landscaping. In 1985, it organized two garden tours and brought in 4 speakers to monthly meetings to speak on soils, transplanting, hydroponics and landscape design. The members of the society also sold plants at the Farmer's Market. There were 15 active members in 1985.

V 1985 CROP TRIALS

1. Background

In 1985, the Yukon New Crop Development Project was designed as a three-year project, funded by Agriculture Canada and the Yukon Department of Renewable Resources and sponsored by the YLAA. Previous to this, formal research in agricultural had been halted in 1970 with the closing of the Federal Experimental Farm at Haines Junction, until 1984 when Agriculture Canada and the Department of Renewable Resources started a small scale crop trial project. The need for a continuation of formal research was recognized, and this three-year program was initiated with 1985 being the first year.

Forage trials also continued. These were first conducted in 1984 and were composed on various fertilizer treatments on both annual (greenfeed) and perennial (bromegrass) forage crops. In 1985, both the effects of fertilizer treatments and irrigation on yield were documented. Forage trials were tailored to local conditions and information needs. They are an ongoing project conducted cooperatively between the Agriculture Section of Department of Renewable Resources and Yukon Soil Survey Unit of Agriculture Canada.

2. New Crop Development Project (NCDP)

1985 marked the first year of a 3-year project to evaluate the performance of a range of cereals, field crops, forages and potatoes under Yukon conditions. A detailed document describing the results of the first year efforts has been prepared by the project manager, Mr. David Leaks, and is available from the agriculture office in the Department of Renewable Resources. A brief summary is presented in this report.

a) Site Locations and Climatic Data

Ten sites were selected to cover the wide range of climatic and agricultural capabilities that occur in the Yukon (Figure 4).

Unfortunately at 2 locations difficulties in obtaining complete results were encountered. In one case flooding occurred and in another site difficult access meant that plots were not properly maintained. However, full results of crop trials were obtained from the remaining 8 locations. Site conditions are summarized in Table 3.

The 1985 growing season had a surprising amount of variation. Dawson City, Pelly and Mayo areas were both cooler and wetter than normal. Whitehorse had average temperatures for the season, but higher than normal precipitation in June and dry conditions in July and August. Watson Lake temperatures were very close to average; precipitation was much lower than expected in June and July. Haines Junction data was incomplete, but appeared to have dry conditions for the season.

TABLE 3

SUMMARY OF SITE CONDITIONS FOR EIGHT LOCATIONS WHERE
CROP TRIAL INFORMATION WAS OBTAINED IN 1985

SITE NAME	AG CAPABILITY CLASS	LOCATION (approximate)			YEARS OF CULTIVATION	SOIL CONDITION		
		ELEV. (m)	LATITUDE	LONGITUDE		TEXTURE	pH	DRAINAGE
Sunnydale	4	431	64°05'	139°50'	3	SL ¹	6.5 - 7.0	well
Minto Bridge								
1. potatoes	3	585	63°75'	135°80'	10	L	7.0	mod. well
2. demonstration	5	590			1	gSL	4.5 - 5.0	rapidly
Pelly Farms	3	454	62°85'	137°30'	50	SiL	8.0 - 8.5	well
Firth Farms	5	646	60°90'	135°10'	1	SL-LS	8.0 - 8.5	well
Bjorkman	3	615	60°05'	128°95'	5	SL	7.0 - 7.5	well
Toole	5	646	60°12'	128°85'	5	L	5.5 - 6.0	mod. well
Tait	5	609	60°80'	137°65'	5	SiL	7.0 - 7.5	mod. well

¹/SL = sandy loam, L = loam, gSL = gravelly sandy loam, SiL = silt loam, LS = loamy sand.

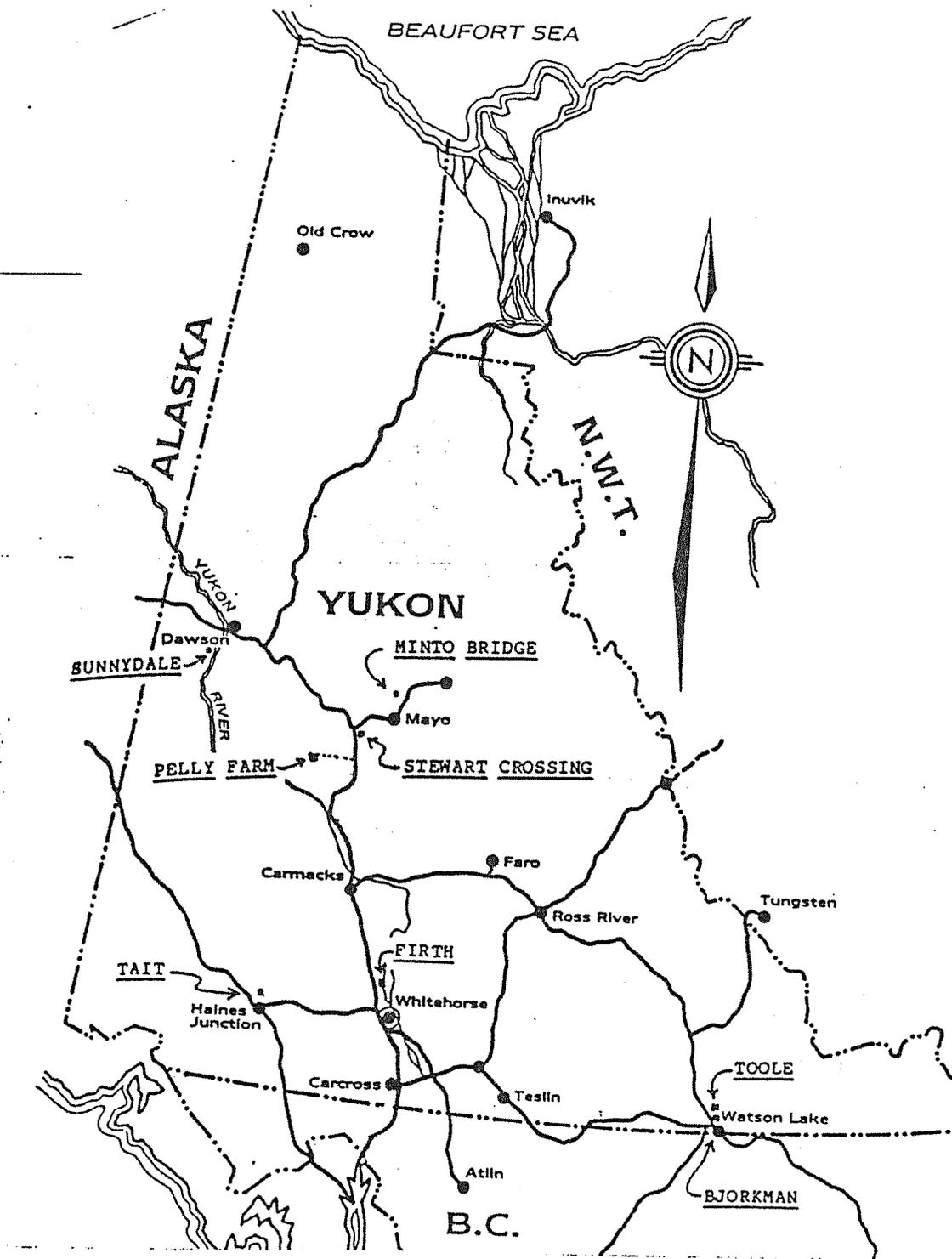


FIGURE 4 - Locations of crop trials in 1985 in the Yukon Territory.

b) Results

Varieties tested in the crop trials were chosen on the basis of 2 criteria:

i) likelihood of survival in the Yukon, and ii) potential economic contributions to the Yukon agriculture industry, either as forage/livestock or poultry feed or for human consumption. Another objective of this testing is to gain some insight into future selections of crop varieties for industry; one Yukon standard variety may not be adequate. Site specific suitability may be a more important factor for selecting varieties.

Both replicated trials and demonstration (unreplicated) trials were held. Demonstrations were less elaborate; results are intended to guide future trials.

The results were affected by two main factors. Spring was late in 1985, postponing seeding by ten days to two weeks. Although this was considered abnormal, the possibility of wide variation in seasonal temperatures and precipitation further necessitates the selection of early maturing varieties. Variations from year to year in monthly temperature and precipitation in the Yukon are among the highest in Canada.

Two other problems affecting the results were inadequate planting quality and poorly maintained plots. A new belt-seeder was purchased to rectify the seeding problem; experience gained from the 1985 season should result in better management procedures to prevent the latter from recurring.

a) Cereal Trials

The replicated varieties were planted in a standard format of four rows measuring 5 m in length. Each of these four rows were replicated three times, with the inner two rows of each four row plot harvested at the end of the season. Tables 4 and 5 summarize grain and forage characteristics of top performing varieties at each of the five locations where replicated cereal trials were conducted. The following is a descriptive summary of performance for grains.

WHEAT -- Of the 6 varieties of wheat grown (Garnet, Park, Columbus, Saunders, Nepewa and Katewpa) Garnet ripened the earliest, Park next and Columbus latest. No wheat tested gained full maturity at any site. Garnet and Columbus tended to give the highest forage yields.

BARLEY -- 10 varieties of barley were grown (Tupper, Scout, Lidal, Datal, Diamond, Johnston, Otal, Gateway, Calibre, Ollie) with Lidal, Otal and Datal being the earliest to mature at each location. Scout reached full maturity at Sunnydale and Otal matured at Pelly Farm. No one variety gave consistently high forage yields.

OATS -- 5 varieties of oats were tested (Toral, Foothills, Grizzly, Cascade and Cavell). Toral matured completely at Pelly and Stewart Crossing. Foothills gave very high forage yields, despite being unable to mature.

The results of these trials conformed well with the results of the less formal 1984 crop trials. The Alaskan grain varieties (Toral Oats, Lidal, Otal and Datal barley) were the earliest to mature. Although these were not always the highest yielders, they gave above-average results of a superior quality. There was a marked difference in the performance of each variety from one site to another, not surprising considering plots were located under a range of climates and agricultural capability classes (class 3 to class 5).

TABLE 4
SUMMARY OF BUSHEL-WEIGHT AND PROTEIN CONTENT OF BEST MATURING CEREAL VARIETY AT 5 LOCATIONS IN THE YUKON

SITE	AG CAPABILITY CLASS	WHEAT			BARLEY			OATS		
		VARIETY	BUSHEL WT (KG)	PROTEIN (%)	VARIETY	BUSHEL WT (KG)	PROTEIN (%)	VARIETY	BUSHEL WT (KG)	PROTEIN (%)
Sunnydale	4	garnet	25.9	19.8	scout	24.8	17.5	--	--	--
Stewart Crossing	4	garnet	26.2	23.1	lidal	20.0	13.7	total	16.5	14.2
Pelly Farm	4	Park	24.5	17.8	otal	21.9	17.3	total	15.8	14.4
Minto Bridge	5	garnet	15.5	20.6	otal	16.6	16.3	total	11.5	11.8
Firth Farm	5	--	unproductive	--	Datal	13.9	11.6	total	8.2	12.4

TABLE 5
SUMMARY OF FORAGE YIELDS OF TOP PRODUCING CEREAL VARIETY AT 5 LOCATIONS IN THE YUKON
(All locations were harvested during first week of September)

SITE	AG CAPABILITY CLASS	WHEAT		BARLEY		OATS	
		VARIETY	YIELD (KG/HA)	VARIETY	YIELD (KG/HA)	VARIETY	YIELD (KG/HA)
Sunnydale	4	garnet	14,135	Gateway	16,426	--	--
Stewart Crossing	4	Columbus	14,000	Scout	17,214	Cascade	18,270
Pelly Farm	4	Columbus	11,236	Scout	13,214	Foothills	16,316
Minto Bridge	5	garnet	8,136	Tupper	13,214	Cascade	18,270
Firth Farm	5	Neepawa	5,146	Lidal	3,573	Foothills	7,393

b) Grass and Alfalfa Trials

The grass and Alfalfa trials were planted in the same standard format as the cereal trials using the variety Anik as the two outside guard rows. No harvesting was done in 1985 in order to determine the ability of these to overwinter. Nine grass varieties were tested and appeared well established and vigorous by the end of the season (Figure 5). Seven alfalfa varieties were tested and also appeared well established, with the exception of the Stewart Crossing site, where the plants were dry and yellow. Gaps appeared in the rows of the grasses and alfalfas; this was attributed to the problems with the original seeding.

c) The Demonstration Trials

Varieties of soybeans, lentils, fababeans, fieldpeas, safflower, mustard and canola were grown in demonstration (unreplicated) trials. The two features looked for were vigorous growth to indicate forage production (where applicable) and degree of maturity at harvest. Nodulation of legumes was also sought. The following summarizes the performance of the demonstration trials.

SOYBEANS -- None of the sites produced pods on the 2 varieties of soybeans tested. They exhibited poor germination rates and tiny plants. In one case plants did not even appear.

LENTILS -- 2 varieties of lentils were tested. At Sunnydale, pods formed, and may have matured with an earlier planting. Small immature pods were produced at most other sites.

FABABEANS -- 6 varieties of fababeans were tested, and produced pods and nodules at every site, although none matured to drying. Minto Bridge and Toole's Lake had the poorest quality; at Sunnydale, Pelly, Stewart Crossing and Firth's they grew profusely enough to have made excellent silage.

FIELD PEAS -- 8 varieties of field peas were tested and all did quite well as potential silage. Two varieties came to full maturity at Sunnydale. Nodules appeared on all varieties at all sites.

SAFFLOWER -- 1 type of safflower was tested. It failed to germinate at Minto Bridge; at Stewart, Pelly and Sunnydale, tiny immature pods were produced.

MUSTARDS -- 4 varieties of mustard were planted at Sunnydale, Minto Bridge and Stewart Crossing, and reached full maturity at each site.

CANOLA -- Only Tobin variety was grown and at only one location (Sunnydale). It grew profusely and matured to a good yield.

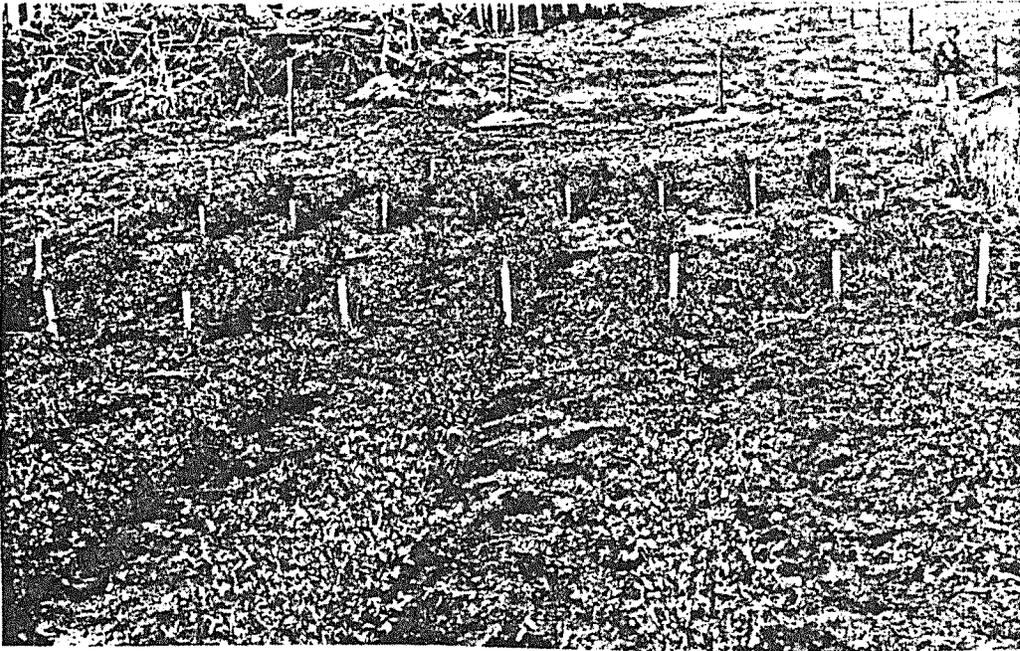


FIGURE 5 - Rows of alfalfa varieties tested at the Sunnydale site near Dawson City.

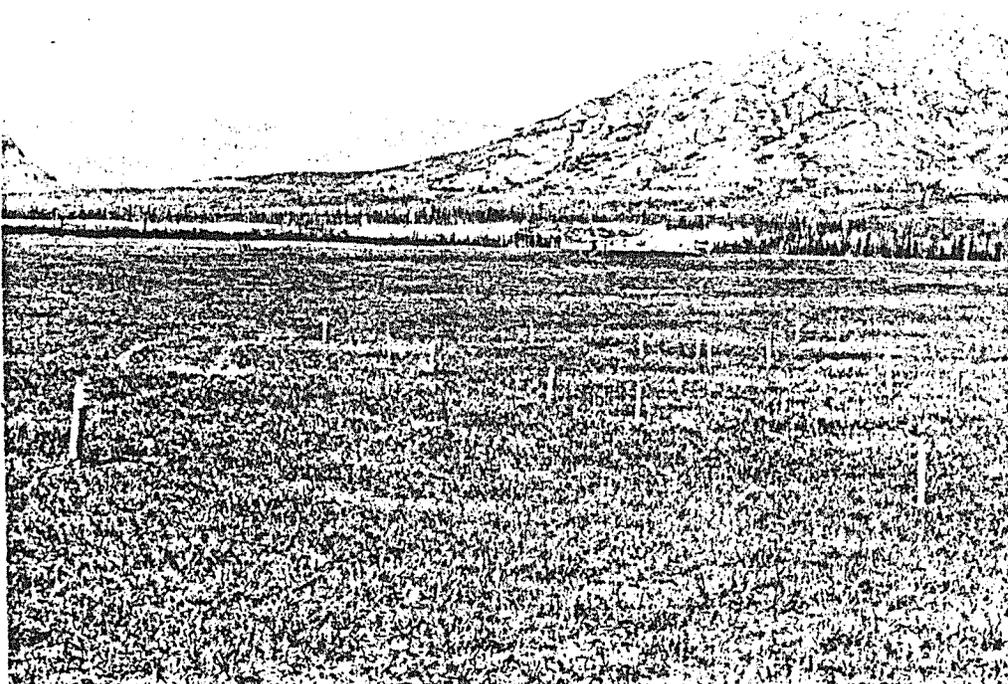


FIGURE 6 - Irrigated brome stand in the Takhini Valley west of Whitehorse. Stakes mark plots where different rates of fertilizer are applied. The standpipe to the left supports a terminal where underground sensors measure soil temperatures.

d) The Potato Trials

The potato trials were fully replicated at each site. They were also planted in 5 m rows with plants spaced 50 cm. apart. Rows were 1 meter apart with variety Pontiac planted as guard rows.

The results of the potato trials are tabulated in Table 6. The best yields were at Minto Bridge and Bjorkman's which were wet and frost free. The poorest results were from very dry and/or frost affected sites. Agriculture capability class was related to yield. Sites within agroclimatic class 5 areas were affected by frost through the growing season. Even light frosts greatly affected potato growth and illustrate the need for caution in selecting such areas for commercial potato production. Scab was a problem at Bjorkman's, Sunnydale and Minto Bridge.

Certain varieties produced heavy sets of small tubers, resulting in a high proportion of culls at certain sites. Irrigation also greatly affected potato yield. Low yields at Stewart Crossing can be attributed to drought.

TABLE 6
 YIELDS OF TOP PERFORMING POTATO VARIETY AT EACH LOCATION

SITE	AG CAPABILITY CLASS	VARIETY	YIELD (KG/HA)		
			MARKETABLE	CULLS	TOTAL
Minto Bridge	3	Gemseg	35,450	1,428	36,877
Bjorkman	3	Gemseg	25,893	3,735	29,628
Pelly Farm	4	Purple Survivor	20,765	1,281	22,046
Sunnydale	4	Purple Survivor	15,418	2,709	18,127
Stewart Crossing	4	Norland	6,811	1,062	7,873
Firth Farm	5	Norland	8,020	2,582	10,602
Tate	5	Purple Survivor	1,464	6,189	7,653
Toole	5	Gemseg	6,115	1,061	7,176

3. Forage Trials

The forage trials were held in two different agricultural capability classes at four different geographic locations. Each location had an individual plot plan tailored to meet specific needs. The trials were conducted to determine the overall relationship of plant growth to soil nutrients and specifically to ascertain:

- 1) forage yield without fertilizer*
- 2) the response of forages to various levels of fertilizer*
- 3) the increase in forage yield with irrigation*

a) Methods

The plots in the Takhini Valley and at Carmacks were sampled at two week intervals from early July through mid August. Those at Watson Lake and Dezedeash were sampled once during the cooperator's harvest. In all cases a 1 m² area, selected at random, was harvested, air dried, weighed and shipped for laboratory analysis of protein, moisture, fibre, Ca and P.

b) Results

Results are summarized in Table 7. The discussion of the results is organized according to sites. For purposes of extension, yields on Table 7 have been expressed in both metric (kg/ha) and imperial (lbs/acre and tons/acre) measures. Economic returns are expressed on a 50 lb bale basis.

1) *Takhini Valley*

This experimental site, situated on class 5 land, consisted of 18 5 x 6 m plots in an eight year old brome grass stand. Each fertilizer treatment was replicated three times and the data combined. The plots were irrigated regularly and sampled at two week intervals from the second of July through the fifteenth of September. Soils in this area tend to be low in both N and P but naturally contain sufficient K to support brome grass. The results show a significant response to the addition of both N and P and in all cases gave positive net returns at \$.18/kg (\$4.00/bale) (Table 7). The highest economic yield was with a fertilizer rate of 120-60-0 lbs/ac of N, P and K respectively. This gave the maximum production of 2.5 T/acre, an increase of 2.3 T over the control block. Total forage yield increased until late August after which growth declined and no additional biomass accumulated.

2) *Carmacks*

Irrigated and non-irrigated block were set up in this five year old brome stand. Six treatments each replicated three times were established and harvested on a regular two week schedule. Soil tests on this class 4 land indicated no requirement for K so varying levels of N and P were applied. Although control plots showed no yield difference between the irrigated and non-irrigated blocks overall yield increased with irrigation. Response to N and P was favourable up to 90 lbs of N and 45 lbs of P. Heavier concentrations of nutrients led to a lodging of the stand and decreased yields. The results indicated that under semi-arid conditions, it appears that irrigation is important not only in ensuring adequate available moisture for plant growth but also enabling plants to effectively utilize added nutrients.

TABLE 7
SUMMARY OF BROMEGRASS TRIALS

LOCATION	FORAGE	DATE HARVESTED	RATE FERTILIZED			YIELD		GROSS ³ RETURNS \$.18/KG	COST ² FERT. (\$)	NET ⁴ ADDED RETURNS \$.18/KG
			N-P ₂ O ₅ -K ₂ O ¹	LBS/AC	KG/HA					
Takhini Valley	Irrigated Brome	Aug 02	0 - 0 - 0	467	523	37.36	0	--		
			30 - 15 - 0	1245	1396	99.60	27.45	34.79		
			60 - 30 - 0	1686	1891	134.88	54.90	42.62		
			90 - 45 - 0	4149	4651	331.92	82.35	212.21		
			120 - 60 - 0	5134	5755	410.72	109.80	263.58		
			150 - 75 - 0	4564	5116	365.12	137.25	190.51		
Watson Lake	Nonirrigated Brome	July 22	0 - 0 - 0	2344	2627	187.52	0	--		
			110 - 65 - 30	3541	3969	283.28	116.75	--		
			110 - 65 - 10	2503	2805	200.24	105.95	--		
			50 - 35 - 0	3203	3591	256.24	51.05	17.67		
			80 - 50 - 15	4863	5451	389.04	83.90	117.62		
Carmacks	Irrigated Brome	July 31	0 - 0 - 0	519	582	41.52	0	--		
			30 - 15 - 0	934	1047	74.72	27.45	5.75		
			60 - 30 - 0	1037	1162	82.96	54.90	--		
			90 - 45 - 0	1971	2209	157.68	82.35	33.81		
			120 - 60 - 0	1193	1337	95.44	109.80	--		
			150 - 75 - 0	1815	2035	145.20	137.25	--		
Carmacks	Nonirrigated Brome	July 31	0 - 0 - 0	519	582	41.52	0	--		
			30 - 15 - 0	524	587	41.92	27.45	--		
			60 - 30 - 0	778	872	62.24	54.90	--		
			90 - 45 - 0	1297	1454	103.76	82.35	--		
			120 - 60 - 0	1297	1454	103.76	109.80	--		
			150 - 75 - 0	1034	1159	82.72	137.25	--		
Dezedeash	Nonirrigated Brome	July 24	0 - 0 - 0	2852	3197	226.16	0	--		
			0 - 0 - 60	2593	2906	207.44	21.60	--		
			0 - 0 - 120	2269	2544	181.52	43.20	--		
			60 - 30 - 0	5770	6468	461.60	54.90	178.54		
			60 - 30 - 60	3760	4215	300.80	76.50	--		
			60 - 30 - 120	3306	3706	264.48	98.10	--		
			120 - 60 - 0	4279	4796	342.32	109.80	4.36		
			120 - 60 - 60	6872	7704	549.76	131.40	190.20		
			120 - 60 - 120	4927	5523	394.16	153.00	13.00		

¹ N = nitrogen, P₂O₅ = phosphate, K₂O = potash, expressed in kg/ha of applied nutrient.

² Cost of fertilizer per lb -- N = .65, P = .53, K = .36

³ Gross returns calculated at \$.18/kg is approximately equal to \$.08/lb or \$.40/50 lb bale of grass hay.

⁴ Net added returns calculated as the gross return less the cost of fertilizer for any given fertilizer rate minus the gross return of the unfertilized hay.

3) Watson Lake

This trial design consisted of five treatments each replicated three times. These 3 x 5 m plots were harvested once on July 22, the date of the cooperators harvest. Fertilizer additions on this class 5 land were made on the advice of the soil test lab, P at half the rate of N and K at one third the rate of N. Maximum yields were produced with an intermediate application of all three nutrients. Although higher yields were obtained with increased fertilization they did not give positive economic returns. The addition of K with constant levels of N and P gave a net increase of 1/2 T/acre (1000 kg/ha).

4. Dezeddash

This non-irrigated site consisted of two blocks of plots situated in the cooperators brome stand. Each block contained nine 3x5 m plots which were harvested on July 24. Fertilizer was applied specifically to test the response to K and results were positive up to 60 lbs/acre. The maximum yield of 3/4 T (1500 kg/ha) was produced with a rate of 120-60-60. Soils on this class 5 land are deficient in all available nutrients but showed a favourable economic response to the addition of fertilizer. These trials will be discontinued until the infestation of horsetail (Equisetum sp) is brought under control. Herbicide trials are planned for next season.

c) Summary

In the Yukon, forages are the principle crop grown and are generally suited to the marginal agricultural lands of the territory. Yukon forages respond favourably to the application of fertilizer and water. The economics of this response and forage quality are currently under scrutiny. A publication summarizing the program is forthcoming and should be available early next year.

VI CONCLUSION

At a time when Canada's agriculture is suffering from a variety of ailments both internal and external, it is ironic that in the far Northwest, development of this same industry is proceeding at an unprecedented pace. The optimism of the small group of Yukoners who believe agriculture has a place in the north is in strong contrast to the disappointments and frustrations of many in the traditional farming areas of the country.

High freight costs associated with the Yukon's geographic isolation are what allows local agriculture to compete against imported southern goods. The aim of Yukon Agriculture is to reduce the dependancy on imported food supplies wherever these products can be produced locally. In so doing, a degree of diversity may be introduced into a small economy presently dependent on tourism, mining and government spending for its livelihood. Marketing may well hold the key to future success. Agricultural development in Alaska, fueled by the riches of oil production, now flounders, able to produce certain goods but unable to market them effectively. We hope that the Yukon can learn from Alaska's difficulties in this regard.

Farm financing and soil degradation are recognized in Canada as two major priorities requiring attention and support where necessary. The Yukon is an area of marginal agriculture, it will not be able to withstand

the ravages of either soil degradation or financial stress. 1986 should see the first of the new wave of agricultural products hit the market in the Yukon. The land, much of which is in the Whitehorse area (class 5), will have been brought into production under the Agricultural Development Program of the Government of Yukon and in some cases supported by funding provided under the Economic Development Agreement. The success or failure of these ventures may well dictate the direction, and certainly the speed, of future development of the agriculture industry.

REFERENCES AND INFORMATION SOURCES ABOUT YUKON AGRICULTURE

The following reports are available from the Agriculture Branch, Yukon Department of Renewable Resources, Box 2703, Whitehorse, Y.T. Y1A 2C6.

TITLE & AUTHORS	DATE PREPARED
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