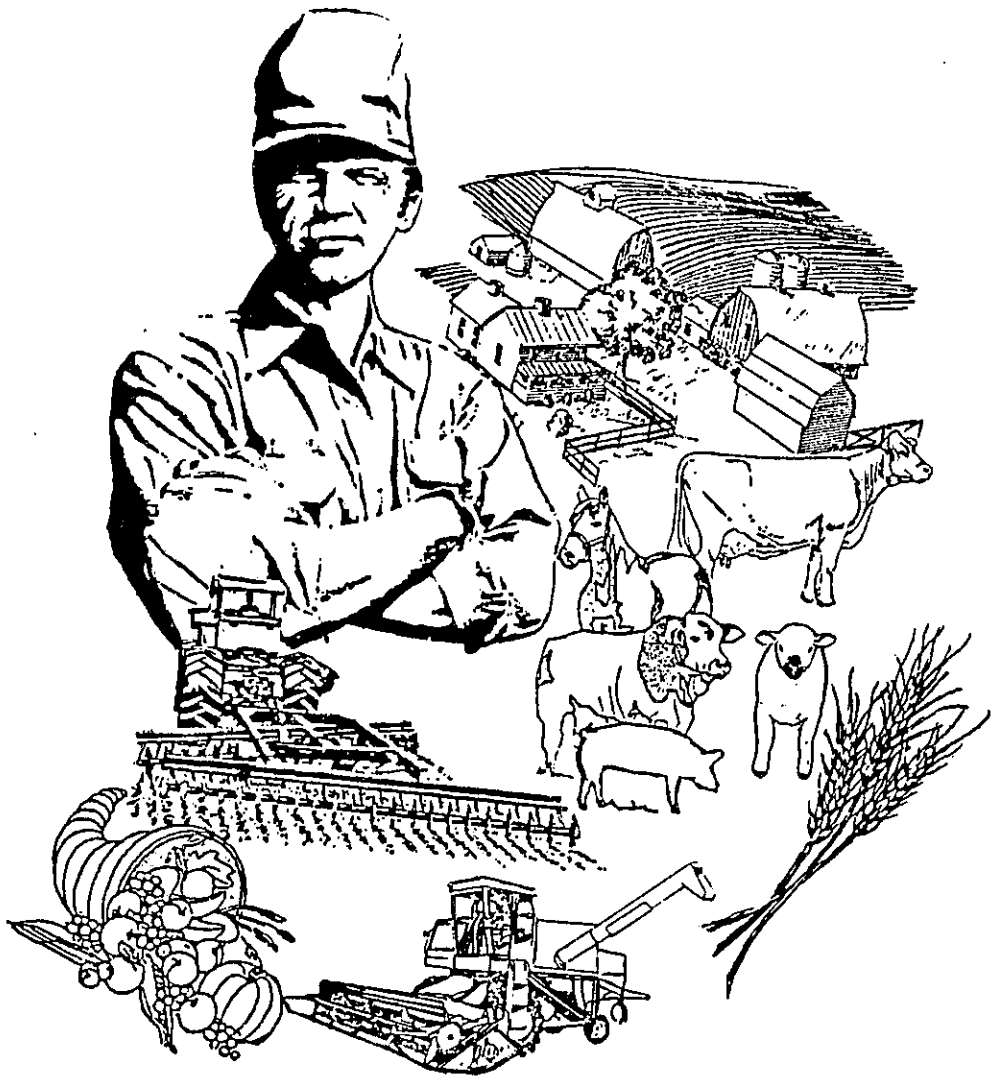
24th ANNUAL

NORTH EASTERN ONTARIO
AGRICULTURAL CONFERENCE

FEB. 26th & 27th, 1990



NEW LISKEARD COLLEGE OF AGRICULTURAL TECHNOLOGY

1990 CONFERENCE PROCEEDINGS

TABLE OF CONTENTS

WELCOME TO THE CONFERENCE

David Beattie, Director
New Liskeard College of Agricultural Technology

The New Liskeard College of Agricultural Technology and the North Eastern Ontario Soil and Crop Improvement Association are pleased to host the 24th Annual North Eastern Ontario Agricultural Conference and Trade Show.

The planning committee for the conference included representatives from farmer organizations and commodity groups as well as the North Eastern Ontario Soil and Crop Improvement Association and Ontario Ministry of Agriculture and Food personnel.

This year's program features a broad range of topics in field crops, horticultural crops and livestock production. An excellent slate of speakers including many producers will offer practical ideas and proven experience for the benefit of all farmers and industry personnel.

The Conference offers additional specialized topics for beef producers and those in the horse industry as new features this year.

The Trade Show will again feature a broad range of commercial displays with information and products of interest to producers. We appreciate the continued support and attendance of these suppliers at the Conference.

The NEOSCIA Championship Forage and Potato Show will be open for viewing all day on Tuesday.

The Banquet on Tuesday evening will close out the Conference on a high note with the Honourable David Ramsay, Minister of Agriculture and Food as our guest speaker.

Welcome to New Liskeard College and the 24th Northeastern Agricultural Conference. I am sure your participation will be well worthwhile.

MONDAY, FEBRUARY 26

1:00 p.m. CONFERENCE REGISTRATION OPENS

TRADE SHOW OPEN 1:00 - 5:00 p.m. AND 7:00 - 9:00 p.m.
Gymnasium

REFRESHMENTS AVAILABLE 1:00 - 5:00 p.m. AND 7:00 - 9:00 p.m.
Gymnasium

N.E.O.S.C.I.A. CHAMPIONSHIP FORAGE AND SEED SHOW, AND POTATO SHOW - PLACE YOUR EXHIBITS BY 5:00 P.M. - Room 550

CONCURRENT SESSIONS

CROP PRODUCTION - Lecture Theatre

2:00 - 2:40 p.m.
LUPINS IN THE NORTH
Ron Bailey, Rodanjen Farms, Thornloe
Maurice Beaudry, Cache Bay
Tom Murdock, Richards Landing
John Peters, Norhurst Farms, New Liskeard

2:40 - 3:10 p.m.
NATURAL AIR DRYING OF GRAINS AND DRYING ALFALFA SEED
Ben Hawkins, Head, Engineering Section, NLCAT
Mart Kirik, Extension Engineer

3:10 - 3:30 p.m.
SOYBEANS AND OTHER LARGE SEEDED LEGUMES IN THE NORTH
Tom Murdock, Richards Landing
Kevin Runnals, New Liskeard

3:30 - 4:00 p.m.
$200/HA PROFIT FROM BARLEY - IS IT REALLY POSSIBLE?
A.V. Skepasts, Head, Agronomy Section, NLCAT

HORTICULTURAL CROPS - Classroom C & D

2:00 - 2:40 p.m.
JUST WHAT IS ORGANIC PRODUCTION?
Hugh Martin, Organic Farming Specialist, OMAF

2:40 - 3:10 p.m.
MULCHES AND ROW COVERS IN VEGETABLE PRODUCTION
Laurier Guillemette, Agriculture Canada Research Station, Kapuskasing

3:10 - 3:30 p.m.
POTATOES IN THE NORTH
Lorne Hillcoat, Thornloe

3:30 - 4:00 p.m.
PICK-YOUR-OWN
Charlie Warner, Aidie Creek Gardens, Englehart

4:00 - 5:00 p.m. TRADE SHOW

7:00 p.m. ANNUAL MEETING OF N.E.O.S.C.I.A. - Classroom A

7:30 - 10:00 p.m. BEEF IMPROVEMENT WORKSHOP - Lecture Theatre
Sponsored by OMAF, Canada Beef Sires and the Timiskaming Beef Herd Improvement Club

7:30 - 10:00 p.m. THE EFFECTS OF THE EQUINE INDUSTRY ON AGRICULTURE - Classroom C & D
Dr. R. Wright, Equine Specialist, OMAF, Guelph

TUESDAY, FEBRUARY 27

8:30 a.m. TRADE SHOW OPEN 8:30 a.m. - 4:30 p.m. - Gymnasium

REFRESHMENTS AVAILABLE 8:30 a.m. - 4:30 p.m.- Gymnasium

N.E.O.S.C.I.A. CHAMPIONSHIP FORAGE AND SEED SHOW AND THE POTATO SHOW OPEN - 8:30 a.m. - 4:30 p.m. - Room 550

JOINT SESSION - CAN WE SURVIVE?
- Lecture Theatre -

10:00 - 11:00 a.m. SURVIVING IN THE '90'S- Richard Hiscocks, Pork & Crop Producer, Oxford County

11:00 - 12:00 p.m. FARMING AS A WAY OF LIFE - Gisele Ireland, Author

12:00 - 1:00 p.m. LUNCH - COLLEGE RESIDENCE CAFETERIA

CONCURRENT SESSIONS

CROP PRODUCTION - Lecture Theatre	ANIMAL PRODUCTION - Classroom C & D
1:30 - 2:10 p.m. PASTURE MANAGEMENT FOR ROTATIONAL GRAZING Dr. Stephan Weise, Research Associate, Crop Science Department University of Guelph	1:30 - 2:10 p.m. THE EFFECTS OF MULTIPLE COMPONENT PRICING ON NORTHEASTERN DAIRY PRODUCERS Wes Lane, Director, Planning Ontario Milk Marketing Board
2:10 - 2:50 p.m. FORAGE QUALITY AND ENSILABILITY Dr. Julien Proulx and Carole Lafrenière, Agriculture Canada	2:10 - 2:50 P.M. THE INTERNATIONAL TRADE SITUATION Sophie Dinnissen, Agricultural Economics and Business Section, RCAT

2:50 - 3:30 p.m. REFRESHMENTS AND TRADE SHOW

3:30 - 4:00 p.m. MOLE DRAINAGE OF CLAY SOILS Robert Chambers, Research Assistant, Engineering Section, ACAT	3:30 - 4:00 p.m. GRAZING STEERS AT NLCAT Dr. Paul Sharpe, Livestock Section, NLCAT
4:00 - 4:30 p.m. WHEAT PRODUCTION AND MARKETING IN THE NORTH Ken Peplinski, Englehart	4:00 - 4:30 p.m. BEEF RESEARCH RESULTS FROM NLCAT Paul Gumprich, Livestock Section, NLCAT

6:30 p.m. **BANQUET** (Riverside Place)

GUEST SPEAKER - The Honourable David Ramsay, Minister of Agriculture and Food

AWARDS PRESENTATIONS - N.E.O.S.C.I.A.

SWEET LUPIN BEAN GROWING EXPERIENCE 1989 AT THE FARM OF MAURICE BEAUDRY, CACHE BAY, ONTARIO

Maurice V. Beaudry
1310 Levac Road
Cache Bay, Ontario
POH 1GO

Soil fertility level from 1988 soil test: Phosphorus 12 ppm; Potassium 119 ppm; Ph 7.6. The soil had grown a hay crop the previous year and was manured and plowed in the fall. Seed bed was prepared by using a custom hired C-TINE cultivator on May 1st and 2nd. May 2nd seeding using a 510 IH 6 X 24 seed drill. The beans were inoculated by pouring the dry powder on Beans in grain box and mixed by hand. The seedrill cups were open wide open and as we were planting barley in this same field the fertilizer rate was left the same at about 88 Pds/Acre of 0-46-0. Some seeds were shallow and a pass with finishing harrow was made.

On May 5th we sprayed this plot using Lorox at a rate of 1.7 litres/Acre in 20 gallons of water per acre. There were no signs of emerging weeds or beans. The beans emerged well about one week later and grew well. The first set of flowers were in late June and a second set in early July. By mid July quackgrass was coming faster than the beans in half of the strip. The control of Annual Broadleaf weeds was very good with only a handful of hempnettle and mustard plants escaping. They were pulled by hand. The pods were well formed and filled on the first set of flowers with about 5 beans per pod. The second set of flowers the pods were shorter with about 3 beans each.

Where the quackgrass overcame the beans there were many plants that fell over because of the weight of grass and the yield was considerably reduced in this part of the plot.

As the season progressed the leaves fell off and by the time for combining in early September only the stem and pods and quackgrass was left. The harvesting was by a custom operator and did not seem to be difficult to harvest and very few beans were cracked.

The yeild was 968 Pds of clean seeds.

With the first year's experience we feel that it is worth trying again, perfecting those points that limited yield especially quackgrass control. As for the future potential of the crop in Northern Ontario many questions must be answered. How do they fit in a dairy ration? How variable is the crop yield from year to year? What other possible markets can they be used for? Only time, research and experimenting can answer these questions.

COST OF GROWING LUPIN BEANS

Expenses/Acre	Seeds	220 lbs.	$ 72.00
	Inoculant	2 packs	4.60
	Lorox	1.7 litre/acre	34.00
	Custom Seed Cost		9.00
	Custom Seed Bed Preparation		12.00
	Custom Plowing		13.00
	Custom Herbicide Application		6.00
	Fertilizer		13.20
	Custom Combine		18.50
			182.30
	Interest for Lands and Tile Drain Cost		55.00
		TOTAL	$237.30

	For Seeds	For Protein Replacement
Income:	17.6 Bays at $18.00 = $316.50	75% of Soyabean meal 42% - 320/tonne = $ 240/tonne .109 X 968 = $ 105.00
Return over Expenses:	$ 79.50	-$132.30

SWEET WHITE LUPINES

John F. Peters
N O R H U R S T F A R M S
Holsteins
R.R. #2
New Liskeard, Ontario

One of the major costs of dairy farming is the cost of our protein supplements. This was the primary reason for trying to grow a crop of lupines. I spoke to another dairy farmer who had grown the crop the previous year. His biggest problem was the moisture content at harvest and the fact that he grew only five acres - not enough to dry properly in a drier. Using his experience as a guide we decided to plant 10 acres of this crop.

On May 11th, 1989, as soon as the ground dried after considerable rainfall we planted 9.4 acres of Sweet White Lupines at the rate of 175 pounds per acre. They were planted in 7 inch row spacing with a 5100 I-H seed drill with packer wheels. This gave us 5.5 plants per foot. The seed was dampened with water and the innoculant was mixed in the seed box. The feed cups were opened as wide a possible as the seed is quite large. They fed out quite uniformly. The fertilizer setting was set as low a possible and we drilled in about 50 pounds of 8-32-16 per acre at the time of seedings as a starter fertilizer. The field where the lupines were planted had a crop of Red Clover plowed down the previous summer after the first crop of hay was taken off.

It was then summer fallowed. This particular field is dark clay loam soil probably the best soil we farm. The germiniation of the lupines was very good - it looked similar to direct seeded alfalfa. The crop grew quickly and soon covered the ground with its canopy. However, quackgrass became evident and we sprayed the field with 7 litres of Poast Power Pak on June 07 with excellent results on grass control. There is no herbicide approved for post emergent use on lupines so we used no broadleaf herbicide. We had some mustard, lamb's quarter, stinkweed and Canada thistle.

Following seeding we had lots of rain - 125.5 mm in May according to rain gauge at our home location, which is three and a half miles from the field. We had 119.5 mm in June, 129.5 mm in July, 92.5 mm in August and 33 mm in September for a total for 500 mm or approximately 20 inches. With all this rainfall there was a lot of vegetative growth. The plants, at the time the pods were filling were from 30" - 45" tall. The weight of the pods began to pull the plants down and they lodged quite badly. This had no real effect on the harvesting as the pick-up reels on the combine picked up the crop well.

Only the first setting of flowers matured and ripened on the stem. The other two remained green. Our first frost was on September 14th and 15th with a heavy frost on September 26th.

There were more heavy frosts in October but none seemed to have much effect on the crop. The second and third set of pods remained green. The leaves were all gone by the middle of October and the stems turned brown. We combined one round on the field on October 11th. It was too green so we waited another week and direct combined the rest of the field on October 19th. It was still quite green but we wanted to harvest before it snowed. We had it custom dried with a starting moisture content of 53%. This created a lot of problems in the drier i.e.- it bridged up and would not flow, but was finally dried down to 17.4% moisture. The drying cost for 9 tonnes was $588.00. The analysis of the Sweet White Lupines was as follows:

	Dry Matter Basis	As Fed
Moisture	0%	17.4%
Protein	38.1%	31.47%
Calcium	0.25%	0.20%
Phosphorus	0.32%	0.26%
A.D.F. %	25.3%	20.9%

We took a bag of the beans into the local feed mill and they ground part and rolled part. We didn't like the results from either method so we put them through our hammer mill as fast as they would feed it. We were pleased with the results and began to feed them. We replaced the soybean meal at 47% protein, that we were feeding, and fed the same amount of Sweet White Lupines at 38.1% protein. Production from the cow herd remained the same for about 2 weeks and then began to increase. At the end of January we were averaging 58 pounds per day from 54 cows. The protein quality in our hay is much lower this year than last because of all the rain and poor haying weather. Production for the months of January is up 2000 litres over January of 1989, however, other factors also enter into this, i.e.- number of cows milking, number of fresh cows, number of calves fed milk, etc.

Some additional costs of growing Sweet White Lupines are:

Drying Cost - $65.00/acre
Seed Cost - $58.00/acre
Poast Spray - $25.00/acre

The yield of lupines was 2300 pounds per acre or 1.05 tonnes per acre. The value of lupines are said to be 80% of the value of Soybean Oil Meal which was about $400.00 per tonne at harvest time. Therefore the lupines were worth $320.00 per tonne or $336.00 per acre. On February 01, 1990, S.O.M was $302.00 per tonne or $241.60 per tonne for lupines.

If the growing season of 1990 is more normal in terms of rainfall and heat I think Sweet White Lupines could be grown here successfully. Early planting is also a necessity. I think our high moisture content was related to late planting, heavy rainfall and too much fertility in the soil.

SWEET WHITE LUPINES

Co-operator:	John Peters (Norhurst Farms)
Location:	S1/2, L-10, C-II, Harley
Soil Type:	New Liskeard Clay (Tiled) - very slightly acid to neutral.
Topography:	Slopes to the west
Cultivation:	'87-Red Clover, '88-Summer Fallow, '89-cultivate, harrow
Seeding Rate:	173#/Ac
Fertilization:	50#/Ac 8-32-16
Herbicide:	Poast (Sethoxydim) for quack control only
Planting Date:	May 11th, 1989
Emergence Date:	May 17th, 1989
Observations:	By Graham Gambles
June 01 -	2-leaf stage (2" 3" ht.)
June 13 -	4 inch avg. ht. (broad leaf weeds now evident)
July 04 -	15 inch avg. ht.; 50% 1st bloom; thistle problem evident
July 17 -	1st bloom 90% over, small seed pods observed
-	2nd set of buds are visible
August 08 -	36 inch avg. ht.
-	3rd bloom in progress
-	1st bloom set up to 10 pods per stalk (avg 8)
-	2nd bloom set poorly (avg. 2 pods/stalk, many have none)
-	major weeds are Canada Thistle, Mustard, Hemp Nettle.

August 25	-	1^0 pods full; 2^0 pods 1/2 full; 3^0 none.
	-	starting to lodge
September 05	-	Pods still green - some lighter shading in the localized spots
September 18	-	10% are changing colour
September 25	-	Killing frost
September 28	-	50% brown
October 19	-	Harvest - very wet seeds

This field has always produced the best crops for this co-operators. The field is believed to be high in organic matter.

John Peters Lupin Plot Team

NAME : O.M.A.F.
CONTACT: G.J.Gambles
PHONE : (705) 647-6701
COUNTY : Thunder Bay

ADDRESS: Box "G"
New Liskeard,Ontario
P0J 1P0

SAMPLE INFORMATION
Field # : 08
Sample #: 00009
Lab # : A9-1426
Lot # : 8

CROP/SOIL INFORMATION
Crop : Barley Seeded Down
Legume : -
Texture: Clay - Clay Loam

MANURE INFORMATION
Type: -
Rate: -
Unit: -

TEST RESULTS	VALUE	RATING
Soil pH	6.7	
Buffer pH	6.4	
Phosphorus	30	H
Potassium	271	E
Magnesium	850	
Manganese	14	

NUTRIENT REQUIREMENTS BASED ON TEST RESULTS

Nitrogen	15	kg/ha
Phosphate	0	kg/ha
Potash	0	kg/ha
Lime	0	tonnes/ha
Manganese	0	kg/ha

OMAF MESSAGES

Manganese deficiency can be prevented, and frequently corrected, by spraying the crop with 2 kg/ha manganese in 200 L of water. Manganese sulfate is the recommended source and should be used with a spreader-sticker. When deficiencies are severe, two or more spray applications may be necessary. Soil applications of manganese are inefficient and not recommended.

Your zinc soil test is very low but zinc deficiency is not expected on this crop. If zinc deficiency symptoms do appear a zinc spray may be applied to the crop.

E (excessive) ratings signify that applications of this nutrient in fertilizer or manure may lower crop yield or quality. Phosphate addition to soils with excessive phosphorus levels can induce zinc deficiency on soils low in zinc and can increase the risk of water pollution. Potash additions may induce magnesium deficiency on soils low in magnesium.

For cereals seeded down, low rates of nitrogen are recommended to allow good forage establishment. If grain production is your main objective, use the amount of nitrogen recommended for the grain crop not seeded down as shown in the cereals section of the OMAF

Drying Alfalfa Seed

by Ben Hawkins, P. Eng.

The harvesting of alfalfa or other small seed can be difficult during the fall season because of weather conditions. There are times when the seeds are combined at higher moisture contents than long term storage will permit.
Working in conjunction with a local farmer, an inexpensive dryer for small seed was developed and tested at the New Liskeard College of Agricultural Technology.

A gravity box grain wagon was converted to a seed dryer by installing a canola floor in the upper portion. The unloading door was removed and a one horsepower grain drying fan was installed in its place. These modifications cost approximately $300.00. (price of fan not included)

The alfalfa seed was evenly distributed over the floor area to aproximately 4 inches of depth and the wagon was placed in a heated machinery storage.

The time required to reduce the moisture content from 19 percent to 10 percent was 24 hours.

NATURAL AIR GRAIN DRYING

by Mart Kirik, P.Eng.
Agricultural Engineer

An eighteen foot (5.47m) diameter steel grain bin with fourteen foot (4.27m) sidewall height was fitted with a flat perforated steel floor above the original concrete floor. Between the two floors a seven horsepower (5.2kw) electric fan blows outdoor air.

In 1988 barley went into the bin at 18.2% moisture content and twenty days later the moisture of the grain was down to 14.6%. The process used 4040 kwh of electricity and using six cents per kilowatt hour the cost would be $242 for the 2500 bu. or 54 metric tonnes in the bin. That would be 10 cents per bushel or $4.49 per metric tonne.

In 1989 the barley went in at 22% moisture and twenty one days later the grain was 14.9% average moisture. Barley at 14.8% moisture is considered safe for storage.This time energy used was 3230 kwh and using the same cost for electricity the cost of drying was $194. The amount of grain in the bin was nearly the same at 2453 bushels or 55 metric tonnes. The cost of energy in 1989 to dry the grain was 8 cents per bushel or $3.53 per metric tonne.

It is called natural air grain drying only because no heater is used. This project estimates that about half of the necessary energy for drying comes as discarded heat from the elecric motor. There is no capital cost or maintenance cost of a heater.

Barley was successfully dried using a manufacturer's fan capacity of only 1.1 cubic feet (31L) of air per minute per bushel. The generally recommended air flow rate for this kind of drying is 2 cfm/bu, and in 1962 the recommendation had been 3 to 5 cfm/bu.

When air picks up water, a significant amount of measurable heat is converted to a difficult to measure heat of vaporization. This project has shown that where evaporation is occurring around kernals of grain there is a detectable temperature drop. The amount of temperature drop indicates how fast drying is going. The location and time of the temperature drop indicates where and when drying occurs. Lack of temperature drop tells us that drying is no longer happening.

To measure the temperature drop the devices must be accurate within one tenth of a Celsius degree and must take hourly readings within the grain. Thermistors change elecrical resistance with change in temperature and in this project they were installed on two foot (61cm) spacing on a vertical string in the grain bin.

The temperature drop which is significant is the one between adjacent temperature readings. This minimizes the thermal flywheel effect which the large grain mass definitely has.

A non-destructive method was developed for removing samples from the full grain bin. Before the bin is filled, several ABS plastic pipes of two inch (6cm) internal diameter and of different lengths, strapped to a wooden four by four inch (10cm) square pole, are installed down at an angle from the roof hatch.

To remove samples then from a full bin a one inch diameter brace drill bit was riveted, bound with copper wire, and soldered to the end of a long copper 3/4 inch (2cm) diameter pipe. A hole in the side of the pipe 18 inches (46cm) above this auger tip serves as entry point for the grain. This sampling probe is turned easily into the grain using vice grip pliers.

The project has discovered that drying occurs only when outdoor temperature is high or rising. The collected information indicates that the fan can be shut off whenever outdoor temperature is falling. This discovery might save half of the cost of drying by this natural air method because outdoor temperature is falling about half the time in our climate. The objective next fall is to verify that conclusion.

Natural air grain drying is practical in northern Ontario. Two temperature sensors spaced two feet appart vertically near the top of the grain can tell when drying is finished by lack of significant temperature drop. The fan motor contributes half of the energy necessary for drying.The fan can be shut off whenever outdoor temperature is decreasing. A method for conveniently extracting grain samples without damage to bin walls was developed. The new state of the art instrumentation is responsible for seeing what has never been seen before while grain is drying using natural air.

$200.00/ha PROFIT FROM BARLEY IS IT REALLY POSSIBLE?

BY A.V. SKEPASTS
Head, Agronomy Section
N.L.C.A.T.

Perhaps we should rephrase the question, can we obtain high yields from our barley crops while using currently available technology? Before we answer this, let us review the factors which are known to contribute to high yields.

Barley responds to well drained, fertile soils with a pH of 6.5 to 7.5. Soils that have adequate amounts of major soil nutrients as indicated by the soils test as well as having adequate amounts of nitrogen will certainly give high yields.

In northern Ontario we do not have to be concerned about the lack of many micro-nutrients. We do have a problem with manganese deficiencies in some years.

A proper soil test and tissue analysis of the barley plant will guard against nutrient deficiencies.

QUALITY SEED AND RECOMMENDED VARIETIES

Provincial field crop recommendations carry a list of recommended varieties; these varieties are thoroughly field tested over six test areas in the province.

As a first step, one must select a variety which yields best in a given test area. Most grain growing areas in northern Ontario are either in test area 5 or 6. One should study the list carefully. There are distinct varietal differences as to the yield potential, lodging resistance, disease susceptibility and the numbers of days required to reach maturity. Only varieties that can utilize the entire growing season and can ripen in our home area every year will be harvested without losses of grain.

Viable, large seed with a high germination percentage will give us the highest yields. Trials conducted at O.A.C. by Dr. Zavitz, in the late twenties, showed that large seed of the same variety yielded 114%, medium size seed being 100%, while the small seed yielded only 85%. Recently Dr. Leroy Spilde of North Dakota State University also concluded that large seed of wheat and barley generally out-performed medium and small seeded grain.

My suggestion is rather simple, one should use the best and largest seed available. If you are a seed grower the recommendation is super simple. Run the seed over the cleaner once more. Large seeds with increased food supply frequently germinate faster, emerge better from greater depth and produce more vigorous seedings than do smaller seeds. Increases from 11% to 14% in yield should not be frowned upon. One should make sure that the seed is treated before seeding.

SEED BED PREPARATION AND TIME OF SEEDING

Do not overwork the soil, and seed early. These are two management practices that will encourage higher yields.

The seed bed for cereal grains such as barley does not have to be as fine as that for the forages. The seed-bed does not have to be deeper than 3" and the soil granules can then range from 1/8" - 1/4" in dia. with 1/2" dia. material mixed in. The seed bed should be firm since the soil must be in close contact with the seed to allow the water to enter into the seed to facilitate the germination process.

TIME OF SEEDING

How early should we sow? The answer is as early as possible. The minimum soil temperature for barley growth is 3 - 4°C, the optimum is around 23°C.

Not many producers check the soil temperature in the spring. It might be higher than what we think and the barley plants could have grown well under those conditions.

The minimum threshold temperature for germination is 34°F or 1.1°C. Since there is a warming trend every spring the barley would be well off to an early start.

One should seed early since the yield in the barley plant is predetermined before the hot weather sets in. Recent studies have shown that the number of spikelets per spike of barley are initiated after the fourth or fifth leaf is emerged, i.e., in the early jointing stage. Spikelets are the units of inflorescence in grasses, encased by two glumes and consisting of one or more florets. The greatest number of spikelets are initiated when temperatures are between 17 to 18°C while the least number is initiated when temperatures rise to 29°C.

One may say that this is the time when barley initiates potential sites for grain development. If seeding is delayed, this potential for more seeds is reduced.

We can picture that this is the time when barley plants "build storage bins" for the eventual grain. How well these "bins" will be filled is determined later in the season, around the heading time. If barley does not have sufficient "storage bins" (florets) in place, even the most ideal "bin" filling time will not result in high yields.

DEPTH OF SEEDING

Early seeding should be shallow, approximately 2" deep. There is plenty of moisture available for seed germination and early growth. As the seed starts to germinate, the radicle or first root appears and its growth downward is followed by the adventitious seminal roots. The radicle and adventitious roots make up the seminal (seed) root system. Soon after the seminal roots begin to develop the coleoptile (modified leaf) and first stem internode elongate toward the soil surface. The coleoptile is well adapted for penetrating through the soil. Elongation of colepotile and first internode ceases when the coleoptile breaks through the soil's surface into sunlight. The first internode of barley does not elongate indefinitely. This limits the recommended depth of seeding at about 2".

If you sow too deep, the coleoptile and the first internode are not long enough to reach the soil surface. The first vegetative leaf will emerge from colepotile and will try to grow upward. The vegetative leaves are poorly adapted to penetrate through the soil. In many instances seedlings will die before emergence and a very sparse crop stand will result. Also, by the time the first vegetative leaf is developed and starts to manufacture its own food through photosynthesis, only small amounts of endosperm remain, thus resulting in a rather weak plant that will produce very few tillers and will have a potentially low yield. Therefore, the depth of seeding is of a particular importance if high yields are wanted.

NARROW (3.5" - 4") VS REGULAR ROWS (7")

3% - 14% increases in yield have been reported from the use of narrow row seed drill in northern Ontario. When buying a new drill this should be kept in mind.

SOIL FERTILITY

The soil test program provides the opportunities for precise application of major nutrients such as phosphorous and potassium. The banding of part of plant nutrients is highly desirable particularly on soils that are low or medium in fertility.

There is no advantage in the split application of nitrogen fertilizer through the growing season. The numerous experiments in northern Ontario have proven this very well. The best time to apply nitrogen fertilizer is by broadcasting it prior to or at the time of seeding. The recommended rate at 70 kg of N per hectare will help to ensure high yields.

WEED CONTROL

To achieve high yields barley should be grown in a relatively weed free environment. The most damaging weeds are of course the perennials such as quack grass, Canada thistle and similar weeds. Clean, Roundup treated fields are the most advisable for barley production. There are many herbicides that are available for broadleaf weed control, and timely tillage operations will also help to eliminate many undesirable annual weeds.

The important consideration in weed control is the timely application of herbicides at three to five leaf stage of grain development and the use of correct herbicide rates.

DISEASE CONTROL

There are relatively few diseases which attack barley in northern Ontario. Usually minimal infection occurs relatively late during plant development. We have examined the usefulness of fungicides in barley production but have found no advantage to using them under our conditions.

PLANT GROWTH REGULATORS

Early seeding and balanced plant nutrients do not encourage the use of plant growth regulators. In extremely wet months of June and July the lush growth of barley may result in eventual lodging. If this happens, Cerone, a plant growth regulator, could be used to prevent lodging.

TIMELY HARVEST

Timely harvest is of the greatest importance. A properly adjusted combine will ensure high yields. One should check the manual and make the necessary adjustments in order to harvest the entire crop.

In order to answer the initial question let us examine the averages of regional barley tests grown over the last five years

at New Liskeard College of Agricultural Technology. These tests included all recommended cultivars along with the promising late plant breeder lines. The test had the well adapted and not so well adapted cultivars, (the best and the dogs).

Table I Average Yield (kg/ha)
Regional Barley Tests 1985 to 1989

YEAR:	1985	1986	1987	1988	1989	Average
YIELD:	4129	5086	6222	5993	7227	5731

Using the latest custom rates for Ontario let us calculate if there is any chance to make the $200.00 per hectare.

EXPENDITURES

	PER ACRE *
Plowing	$ 18.00
Discing	$ 10.00
Cultivating 2 X	$ 16.00
Seeding	$ 8.00
Seed Cost (Certified #1)	$ 17.00
Fertilizer ** 100 lbs of 6-24-24	$ 12.00
60 lbs. of N (Nitrate)	$ 19.00
Custom Spraying	$ 6.00
Herbicide (MPCA)	$ 6.00
Swathing	$ 9.00
Combine	$ 29.00
Moving Grain	$ 8.00
Land Cost and Insurance	$ 40.00
	$198.00
Interest on money spent on imputs only (April to September) (6 months @ 4% interest)	$ 11.00
	$209.00

* Rounded off to the closest dollar

** Soils with medium Phosphorus and Potasium test

CALCULATIONS:

Yield: 5 year average (from Table I)
5731 kg/ha or 5158 lbs/acre (107bu/a)
Lbs/acre X .454 = 2342 kg/acre or 2.3 tonnes/acre

Assuming price of barley @ $125.00/tonne
$125.00 X 2.3 = $287.50/acre

Return per acre minus expenditures:
$287.50 - $209.00 = $78.50/acre profit
$78.50 X 2.5 = $196.25/ha profit

Well, it was a good try, we are $ 3.75 short of the $200.00 mark.

Remember, in our estimates we were using the 5 year average yield from the entire test.

If, on the other hand, we would have selected the highest yielding variety in each year the results would be somewhat different.

Table II

Average Yield (kg/ha)

Best Adapted Cultiver 1985 - 1989

YEAR:	1985	1986	1987	1988	1989	Ave.
YIELD	4952	5657	6653	6773	8606	6528

CALCULATIONS:

Five Year Average Yield of best variety: (from table II)
6528 kg/ha = 5875 lbs/acre (122 bu/acre)
5875 lbs/acre X .454 = 2667 kg/acre or 2.7 tonnes/acre

Assuming price of barley @ $125.00/tonne
$ 125.00 X 2.7 = $337.5/acre

Return per acre minus expenditures:
$ 337.50 - $ 209.00 = $128.00/acre profit or
$128.50 X 2.5 = $321.25/ha profit

Since the barley prices vary considerably, the judicious management of the crops introduce certain stability in the production package. You may want to reexamine the production package and may want to make certain adjustment and improvements. The idea of profitable barley production should be the ultimate goal.

FORAGE QUALITY AND ENSILABILITY

Carole Lefreniere, B.Sc.. M.Sc., Julien Proulx D.V.M.
Agriculture Canada, Research Branch
Kapuskasing Experimental Farm

The main objective in the conservation of any crop is to preserve it at the optimum nutritional stage for use during the winter when the fresh crop is unavailable. Although ensiling is an age-old method of forage conservation, it is only recently (less than 20 years) that silage technology has been widely adopted in forage conservation program for forage on the farm.

Silage is produced by the fermentation of sugars in A crop of high moisture content. Lactic acid producing bacteria ferment plant water soluble carbohydrates (WSC). These consist mainly of glucose, fructose, sucrose and fructans. The lactic acid produced lowers the pH which inhibits butyric bacteria and other bacteria that cause spoiling of the crop.

Successful lactic acid fermentation requires three elements: an anaerobic environment, a population of lactic bacteria and adequate substrate for the lactic bacteria. Anaerobic conditions and sufficient population of lactic bacteria can be encountered during the ensiling process but the latter may be assisted by inoculation of selected strains of bacteria. The amount of substrate necessary for a satisfactory fermentation is influenced by two principal factors: buffering capacity and dry matter content of the crop. These two factors along with the substrate (i.e. WSC) determine the ensilability of the crop.

The buffering capacity is the ability of the plant to resist pH change; chemicals within the plant may neutralize lactic acid as it is produced. Legumes have higher buffering capacity than grasses meaning that more lactic acid has to be produced to lower the pH in legume silage than in grass silage.

Dry matter content affect the osmotic pressure exerted by the crop. The amount of substrate (WSC) present increases the osmotic pressure. The lactic acid bacterial activity ceases at the much greater final pH in wilted silages indicating that less fermentation had occurred than in wetter silages. Consequently, the wetter the silage, the higher the sugar content must be. The question is do we have enough sugar in our crop to sustain a good fermentation?

The level of WSC for direct cut silage (18% - 20% DM) should be of approximately 12% - 13% of dry matter to ensure a good

fermentation. Many factors have been shown to affect the level of WSC in plants: species, nitrogen fertilization, stage of maturity, growth cycle and environment principally temperature and hours of sunshine.

Under our conditions, grasses were found to have a higher concentration of WSC than legumes. Average WSC in our cultivated grasses ranged from 14% to nearly 17% of dry matter compared to alfalfa and red clover which contained 10% of the dry matter. The first growth cycle contained more WSC than the second growth cycle.

Nitrogen fertilization of grasses increased the yield but decreased WSC. Increasing nitrogen fertilization from 30 kg N/ha^{-1} to 150 kg N/ha^{-1} decreased WSC by 3% at the first cut and 4% at the second cut. Although the decreased is similar for both harvests, WSC concentration was higher for the first than the second cut. WSC for the lowest and highest level of nitrogen at first harvest ranged from 20% to 17% of dry matter compared to 14% to 10% of dry matter for the second harvest.

Temperature and light intensity had been known to influence WSC. By correlating temperature (calculated as growing degree days $5^{\circ}C$ basis) and hours of bright sunshine with WSC, bromegrass harvested daily during a twenty day period, we observe that increasing temperature decreased WSC but that increasing hours of bright sunshine increased WSC. The temperature accounted for a greater variation of WSC than hours of bright sunshine. This effect is rapid. Temperature one or two days before harvest could increase or decrease WSC in grasses.

Under our conditions, direct cut legumes don't contain enough sugar to sustain a good fermentation as the osmotic pressure is too low. Because of a lack of sugar and a high buffering capacity, wilting to 30% - 35% dry matter would be a wise decision. Grasses contain more sugars than legumes. Consequently grass could be ensiled at lower dry matter than legume.

A good management practice would be to harvest immediately after a cold period to take advantage of high WSC in grasses and apply N fertilizer at less than 90 kg/ha^{-1} $harvest^{-1}$.

MOLE DRAINAGE IN EASTERN ONTARIO

Mr. Robert Chambers
Research Assistant
Engineering Section
ACAT

This talk centres on mole drainage in Eastern Ontario but could as easily be applied to Northern Ontario as well. Many heavy clay soils have a drainage problem due to naturally low hydraulic conductivity. Conventional tile drainage fails to properly drain the soil unless the spacings are so close to make its installation uneconomical. One of the options looked at Alfred College was the use of mole drainage. Mole drainage has been used for many years in England and France with good success however it was unknown to what extent frost and wetting and drying would have on their performance in Eastern Ontario.

A site was selected not far from the college on a humic gleysol (Bearbrook series), mainly a montmorillonite type clay. The site was divided into 7 plots, 3 mole drained, 3 control (undrained), and one plot with conventional tile drainage spaced at 15 m (50'). In order to collect the mole drain flow a "French Drain" was used, that is a conventional tile drain back-filled with crushed stone. The mole drains were then installed perpendicular through the crushed stone at a 3 m (10') spacing.

To observe the deterioration in the mole drains over a period of many years 12 mm (1/2") diameter PVC plastic tubing was installed vertically in the installation crack at regular intervals. By using a fibre optic boroscope undisturbed observations could be made in the same location year after year without needing to dig up the mole drain.

The ground temperature was recorded above and below the mole drain with a Thermograph to find the number of frost cycles the drain experiences. It was found that frost and wetting and drying have little effect on mole drain longevity as mole drains have withstood 3 winters at the Alfred and are still in good shape, however good outlets must be maintained and the moles must be installed properly.

To check the efficiency of the mole drainage compared to tile drainage water level recorders were installed on each plot. What we observed was that during the summer the tile drainage worked as well as the mole drainage, however during the spring and fall after the shrinkage cracks had swollen shut due to the prolonged high ground moisture content, that the mole drainage system proved far superior to the tile drainage system in maintain a water table below 50 cm (20") below the ground surface.

A new machine that can set a grade on a mole drain has been tested at Alfred College from the Mastenbroeck company of England. Trails done at Alfred have shown the Machine to be effective in the installation of large field scale mole drainage systems with French Drains as collectors at 60 - 120 m (200' - 400') installed on a one-time bases with standard drainage equipment and mole drains perpendicular at 3 m (10') spacings installed every 3 to 5 years. The main advantage of mole drainage has proven to be the cost. With tile drainage at a 10 m (30') spacing (needed in some low k soils) costing approximately $1500/ha, ($600/acre) mole drainage can provide better drainage using a 3 m spacing for $600 - $1000/ha ($250 - $400/acre). This cost is mainly due to the French Drains which never need to be replaced. The drain also functions like a ditch, however there is not impedance to cultivation whatsoever. The cost of installing the moles is approximately $75/ha ($30/acre), if a good system of ditches already exists the farmer can use the ditch to replace the French Drain thereby reducing his costs even further. Another advantage is that if the farmer feels that if a certain spot in the field requires more drainage the moles can be spaced closer together for that location at a minimal cost increase.

In summary mole drainage works in heavy clay soils economically where often the tile drainage is not economically practical. The major capital costs associated with mole drainage, the French Drain network, lasts indefinitely whereas the mole installations are done every 3 to 5 years and costs are minimal, about the expense of a tillage operation.

Future research at Alfred will look at different soil mineralogy and expanders.

MULCHES, ROW COVERS AND TUNNELS IN VEGETABLE PRODUCTION

L. Guillemette
Agriculture Canada Research Station
Kapuskasing, Ontario

The advantages of using plastic mulches, mini tunnels and floating crop covers has been demonstrated many times in the past, however this new technology which cheats on nature requires the careful and timely execution of various tasks.

These techniques must not be used to compensate for poor crop management. Because of the increased cost of production, plasticulture must not only produce higher yields, it has to hasten maturity and produce a superior quality product. This new technology will only benefit those growers who can achieve better than average production under conventional methods.

Mulches

Material	Advantages	Disadvantages	Crops
- Polyethylene transparent, black or brown - 0.85 - 2.7 ml. thick	- Warms the soil - maintains uniform soil moisture - reduces weed growth - better soil structure - increase yields - earlier crop	- Clear plastic needs herbicides - fertilization more difficult - cost	- Warm season crops

Small Tunnels

Material	Advantages	Disadvantages	Crops
- Polyethylene, with holes, with slits, clear or semi-opaque	- Warms soil, air - reduce wind - protects young plants - earlier planting - earlier harvest - increase yields - can direct seed	- Labor to install (equipment) - overheating	- Warm season crops

Floating Covers

Material	Advantages	Disadvantages	Crops
- Polyethylene with tiny holes - polyester, fabric like (Reemay) - polypropylene, fabric like, (Agrinet, Kimberly Farm)	- Warmer soil and air - wind reduction - protects young plants from frost (-2°C,-5°C) - earlier planting - faster germination - faster growth - earlier crop - more uniform crop - insect protection - very light weight	- Need for good weed control - must be removed if excess heat - must be removed for polination	- Most vegetable including lettuce and brassicas

INSTALLATION

Plastic products can be installed manually or mechanically depending on the area to be covered. The soil has to be well prepared in order to obtain a large percentage of small aggregates to properly hold the plastic down. Wind can be the worst enemy of plasticulture and for this reason your site should be well protected. In light soils, a band of 8 to 9 inches has to be tucked under whereas in heavier soils a band of 6 inches is sufficient. A deep loose soil surface is required to do a good job of holding the plastic down. There is no danger of overworking the soils as there is almost no crusting under plastic, however the plastic has to be installed soon after working the soil to avoid too much moisture loss.

FERTILIZATION

Total rates of phosphorous, potassium and nitrogen remain the same as under conventional crop production, however the level of nitrogen used can be reduced in order to avoid delaying maturity since nitrogen uptake is more efficient under a plastic mulch. For ideal management a drip irrigation system is recommended for water and subsequent fertilizer application.

PRODUCTION

Three years of study at Kapuskasing using black plastic mulch has resulted in significant differences in yields of many vegetables.

Green and yellow wax bean yields were increased by more than 30% with the use of a mulch.

Sweet corn performance was also increased by over 30% with the use of a black plastic mulch.

Transplanted pickling cucumbers yielded 56% more and direct seeded cucumber had an increase of more than 160% under black plastic. Similar results were achieved with the transplanted and direct seeded slicing cucumbers.

Preliminary results from the 1989 season using transparent perforated plastic tunnels on such crops as cucumbers, peppers and tomatoes appear to be promising.

There are still many unanswered questions and details to be worked out, such as the best time to apply and remove tunnels or floating covers. Research on these and other questions is continuing however in the meantime, it seems that plasticulture may have a place in Northern Ontario vegetable production.

POTATOES IN THE NORTH

Lorne Hillcoat
Marketing Co-Ordinator
Valley Growers, Sudbury District
Cash Crop and Vegetable Producer
Temiskaming District

About a week prior to the submission date for printing of conference proceedings, I received a call from Simone Vaillancourt of NLCAT's Public Relations Dept., asking if she could provide assistance typing the presentation. I hadn't even decided what approach to take or topics I'd like to cover.

My first reaction was to call Becky Hughes or Candy Keith at the Spud Lab located at the College for some current information on the most popular varieties. Perhaps I should contact Sam Squire, OMAF's potato specialist, for a listing of Northern Ontario's pedigreed seed potato producers.

Could it be that with only 2 short years involvement in the potato industry, I was a little hasty in agreeing to give this talk. Such people as Roland Serre of Field, the Edward's, both Chester and Doug from Thornloe and Englehart respectively, Mr. Hackett from Cochrane and of course, my boss, Roland Rainville, of Valley Growers in Blezard Valley, would have been much better choices to give this presentation. They have probably forgotten more about potatoes than I'll ever know.

There are also a number of entrepreneurs who have more recently become involved in the North's potato production. Some that come to mind are Murray Becker of Trout Creek, Morgan Carson from Thornloe, Hector Gendreau from Moonbeam, Jules Cantin of Hearst.....

By now you're asking yourself, is this guy ever going to stop name-dropping and get on with the topic title, "Potatoes in the North". There is a reason for my rambling.

In the preceding paragraphs, a number of both government resource people and farmers were mentioned. I'm sure the majority of <u>these people would be very helpful</u> in assisting either a newcomer or a present producer in the production aspects of potato production.

(NOTE: My apologies to the numerous Northerners involved in potatoes that weren't mentioned as the list if far from complete.)

The presentation today will cover:

A) some do's and don'ts of production and
B) reacting to consumer preferences and changing them into marketing opportunities.

Section A) Production Do's and Don'ts (As learned the hard way)

1) CHOOSING GOOD POTATO GROUND

- be very aware of pH levels - higher levels (6-6.5 and up) can cause extensive scab, a problem unheard of with field crops.
- potatoes hate wet feet and drown quite easily, therefore avoid fields with depressions unless tiled at a close spacing.
- conversely, with recent years of insufficient summer rainfall and drought conditions, remember that when the tubers are filling out the plant requires approximately 1 inch of water per week. If possible, locate adjacent to adequate water supply, irrigation, although costly, can easily double or triple yield.

2) MAINTAIN A STRICT HERBICIDE, INSECTICIDE, AND FUNGICIDE PROGRAM

- I thought with only 5 acres, weeds, beetles, and blights would not be a major problem - UNTRUE assumption.
- use fall application of Round-up and recommended rates of herbicide (Lorox) - high end of scale on organic soil, monitored with amount of expected rainfall, a good rain after application is beneficial.
- Colorado potato beetles can do significant damage in a short time - if using Furadan be careful - toxic (humans) and drift may eliminate desired insects such as bees.
- blights are also quite predominant in the North - learn early and late blight identification and use a reliable fungicide such as Dithane M45 for early and Ridomil for late. On larger acreage a rotating 7 day fungicide program is maintained, if a blight is detected, it usually is too late.

- tops do not readily die off quickly enough for adequate mechanical harvest. Using a top killer (Reglone) by September 1st is beneficial, remember, late blights may be transferred from stalks to tuber during harvest when stalks are too moist.

3) MAINTAIN GOOD HARVESTING PRACTICES

- don't harvest when soil temperature is too cold or during freezing temperatures. If frost occurs overnight, delay harvest later in the morning, cold potatoes bruise very easily.
- adjust boom heights on digger and bin-piler to minimize the drop height for the potatoes, bruising decreases storability and grade standards.
- use a tractor on harvester with narrow tires, as not to damage potatoes in unharvested rows.

Section B) Reacting to Consumer Trends and turning them into Marketing Opportunities.

Today's consumer has a much stronger product awareness than even a few years ago. The 90's potato shoppers will:

a) demand an ever increasing quality standard,
b) be more informed of varieties and their characteristics,
c) have organically-grown requirements,
d) be interested in freshness and convenience and
e) have more brand loyalty, especially when locally grown.

However, for these additional requirements the consumer will be willing to pay a premium price.

How then, does a producer turn these consumer demands into marketing opportunities?

For too many years, regardless of the commodity, most farmers have concentrated on the basic production of their product, with little regard for any niche market or value-added processes. The progressive producer will combine a number of aspects to make his product better known and requested by name.

Some marketing tips to remember include:

1. Always maintain a premium quality pack, people will remember a poor quality brand longer than an average one, superior quality is also remembered. Quality is expected by wholesalers and produce managers.

2. Design an eye catching label and brand name with a catchy ring, promote your logo through in-store signage, taste-test demo tables, free and purchased media coverage (Significant mileage can be gained by free coverage in the agricultural sector of your local paper, your local radio and TV stations, Image North, OMAF's Town and Country Ontario, etc).

3. Identify your product by variety name on the package (Yukon Gold - the buttery flesh variety, Norkota Russet - a great baker).

4. There is a place for organically grown produce, although it is a direct contradiction to item 2 (pesticide control program) in production do's and don'ts. Many factors enter the organic argument. These include: definition of organics, economies of scale, are shortfalls in production offset by premium price, is your target market sufficiently large, do you have a personal commitment to organics... Carefully evaluate these concerns prior to producing and marketing organic produce.

5. Embarking upon a value-added component to your product can result in a two-fold benefit. By processing your raw product you can generate a higher profit margin by offering the consumer more convenience, and at the same time, utilizing your seconds or culls which would have sold at a reduced price or not sold at all.

Guestimates as to the Future of Northern Ontario Potato Production.

Acreage in table stock should rise, due to more Ontario markets. This is partially caused by the two proposed plants (McCain and Irvings) for the Maritimes, and a more positive consumer awareness of Ontario-grown product.

Seed potato acreage is also rising due to the lower incidence of aphids and diseases in northern districts (Cochranes).

More co-operative or corporate identities will be initiated to service the wholesale trade with a consistent quality product and supply, and to also make promotional programs more effective.

A greater emphasis will be put on value added products.

PICK YOUR OWN

Charles Warner
Aidie Creek Gardens,
Englehart, Ontario

"Pick Your Own" is a term used to describe a rather novel and somewhat modern method of combining the harvesting and marketing of a crop. Many Horticultural crops are difficult, and costly to harvest. Having your customer harvest his own purchase shares the work and often reduces the cost.

Most horticultural crops lose quality and freshness very quickly after harvesting, so if your customer harvests his own purchase, he/she gets the product with the greatest degree of quality.

A number of basic ingredients are helpful when putting together a pick your own operation. A crops that is costly for a grower to harvest, but can be harvested with minimal skill by a customer is well suited. A crop that requires special skills or tools to harvest may be more difficult to organize into a pick your own. It is difficult for an untrained customer to determine when the corn is ripe, making this a less attractive crop to harvest this way.

In addition to having a suitable crop, it is essential to be able to attract enough people to your location to buy the product. Some crops will attract people from long distances. The alternate is a location near a concentration of people. In Northern Ontario the size and number of pick your own operations is significantly limited by the sparse population.

In its origin, pick your own (PYO) was used as a salvage operation to sell crops of poor quality or of low value, when all other avenues have been exhausted. Strawberries that became full of weeds, were too small, or were over-ripe were commonly handled this way. Then someone discovered that top quality strawberries would sell by PYO and fetch a top price.

Today, PYO operations are usually well organized, and properly planned out systems for marketing top quality produce. Fields need to be organized as to parking areas, exits and entrances/walkways, etc. The check out needs to be equipped with scales or some other system for measuring the product, a cash register or equivalent method for receiving cash, receipt or invoicing materials, possibly a communications system, and provide accommodations for the staff working there.

The field usually needs to be fenced, unless natural boundaries are in place, so that customers can be guided in and out past the cashier. The fields needs to be organized in such a way that you can easily guide people to an identifiable row or section for them to pick. It is necessary that the seller be able to keep track of where his customers have or have not picked. Usually extra roadways or paths are necessary for this.

Customer parking needs to be either adjacent to the field being harvested, or the grower may need to supply transportation to the picking area. It is usually preferable to avoid allowing customer's vehicles past the check out/in area. A fair amount of staff is still required to properly run a PYO operation.

Someone is required to sell the product, take cash, weigh product, and record the transaction. A second area is the field supervision. Most customers prefer some type of field organization or supervision. For larger operations it will be necessary to provide parking assistance as well. Staff needs to be communicative and well informed. Your customers need information on price, how to select or pick the product, where to go to pick and general organizational details.

Signs are usually an integral part of any PYO operation. Signs are needed to guide people to your property, indicate parking location, entrance and exits, price, rules, etc. Signs work cheaper than people and can remain on the job 24 hours per day. Your potential customer can't buy from you if he can't find you.

Pick your own, can if handled well, be a highly successful technique for marketing certain horticultural products. A good system, selling quality products, leaves both the seller and buyer feeling satisfied with the arrangement. A properly organized pick your own does, however, need considerable thought and organization to be successful.

SURVIVING IN THE NINETIES

Richard Hiscocks
Pork and Crop Producer
Oxford County

I welcome the opportunity to visit with you to-day on what we might do to survive in Agriculture during the 90's. By looking ahead we can start to develop a business plan that will place our business in a good position to be successful throughout this time period.

I would first like to set the stage for our discussion by looking at some trends that are taking place at the present time and probably will continue to take place during the 90's.

1. Cheap Food Policy - This has been an ongoing problem for years and will not change in the forseable future. Present marketing systems will be under pressure. All marketing boards that discover price through negotiation or cost of production formula will be under continual pressures to lower price structure in order that food processors can compete with American imports. We have already had food processors close up shop with the excuse that they can't compete with U.S. processed food. Therefore a greater potential that a cap has been put on processed vegetable crops like peas, sweet corn, beans, etc.
   This basically means in order to maintain present profit situation, costs will have to come down. "Cost Price Squeeze"

2. Trend to larger and larger operations - This can be seen in all segments of Agriculture. (Abri-business as well as primary Agriculture)
   Managers have recognized the economics of scale - Age old method of solving the cost price squeeze. Increased units of production, thus decreasing per unit costs thus maintaining or increasing profit potential - (1000 Acres - corn, soy beans - 100 head dairy operations - 300 to 500 sows herds)
   Thus a greater move to part-time farmers and in order to keep their farm have to take off-farm jobs. The part-time farmer of the future will have fairly large holdings compared to to-day. Probably moving into less land ownership.

3. The general economy has enjoyed a lot of success the last 6 to 8 years. We must and we will have a correction in the general economy.

be increasing as much as it has.

What do we do in our business
- secretary
- monthly - profit and loss, balance sheet, enterprise analysis reports
- look forward to having these reports
- organization of data important - comparisons between last year and this year
- looking for trends that may be developing

P&L - analyze expenses P&L into productive and non-productive expenses

Balance Sheet
- Ratio's - Current Ratio - 2:1
- Equity - 50% +
- improve balance sheet
- restructure debt
- prioritize assets

Enterprise Analysis
- Cost Accounting
- Profit Centres and Cost Centres

Yearly Business Plan
- cash flow development
- look at plan several times throughout the year
- readjust cash flow for major changes
- put in changing crop prices on a regular basis

Lender Relationship
- information update
- no surprises
- cash flows

Along with good financial records, we must also maintain good production records.

1. field maps and history
2. dairy and swine production records

Business Structure of your business should be reviewed. Main reason to be in business is to create

Taxes
Debt retirement
Profits
Growth
Family living

When taxes are generated, we must legally try and decrease the amount of profits that leave through this expense.

We will probably have at least one rather severe set back during the 90's. This has to have some spill over effect into agriculture that will probably place a lid on our prices.

4. Government involvement in agriculture or lack of involvement will play a major role in the profitability of our business.
All you have to do is to look at the bottom line of you profit and loss statements over the past 5 or 6 years to realize the importance of government support programs to a lot of farmers.

What is the main thrust of North American governments to-day - To decrease or abolish government support programs. The U.S. Agriculture Secretary, Clayton Yetter, is pushing hard for world subsidy programs to be cut drastically in the next few years. Governments have found out how expensive these programs are.
Bearing this out is the latest announcement from Agriculture Canada, saying government support for farmers will decline 1.7 billion in 1990 from 3.7 billion in 1989. Farm incomes will drop 39%.
Over the past 5 years assistance - 21.7 billion - Farm profits due to sales - 20 billion.
These programs have failed to stem the tide of farmers leaving the business. They may have even hastened this movement to larger and fewer farms.

Governments want out of the massive support programs that they have been involved in. Governments are faced with the problem of trying to reduce the massive deficits they have built up.

The days of farming the governments are slowly coming to an end.

In light of these trends let us take a minute to explore some ideas that I think will become important management tools in your operation.

I COMPUTERIZE - Financial and Production Records - This is a MUST. The managers who survive the 90's will surely be much more familiar with accural P&L and balance sheet statements. Being able to analyze these reports and spot trends developing in your business will be very important. Timeliness is important.
As I mentioned earlier, we are going to be relying on the market place and less on government support programs - another push to more efficient operations.
Therefore we have to control our cost side of our business because as I mentioned before the income side will <u>not</u>

Legal Partnerships
Sole Proprietor -
Corporations

II RISK MANAGEMENT

We have spent some time on the cost side of the equation. Let us now look at the income side. Farmers in the past have been known basically as good production people and poor marketers, i.e.-2/3 crops sold in bottom 1/3 of the price range.
In Canada we have the marketing board concept that determines a price for a commodity by quotas, negotiation and central selling. Our products that are sold through these methods, marketing decisions have been removed for us.
However, there are traditional farm products such as corn, soy beans, spring grains, cold crops (cabbage, cauliflower, etc.), beef, hogs and sheep, just to name a few products that the farm manager has to market.
Marketing of these crops and livestock is a skill that has to be developed.

Two areas of marketing potential:

1) Market Niches and Value added products
   a) Retail outlets - small abattoirs - beef and pork
   b) Local stores, road side stands
   c) Speciality markets - organize
      - new crops

2) Majority of crops - corn, soya beans
   - regular channels or speciality markets - starch (food), distillers, industrial
   - livestock

Pulling the trigger is a tough job.

- knowing your costs and the market most important
- time spent is important here

Gaining a knowledge of various selling methods other than cash or spot market is important.

- forward pricing - basis, futures, options
  - minimum crop price

-knowledge - seminars, outlook seminars
- Marketing clubs
- Larry Martin, John Deputter
- Literature

-learn charting - manually
- computer - satellite
- modums - charting services

III JOINT VENTURING

a) Crop and Livestock Imputs
- buying clubs - fertilizers, pesticides, seed, premixes

b) Equipment - joint ownership
- lower capital in this area
- corn planter, UAN applicator, irrigation equipment, soybean planter
- fun!!

c) Business Expansion
- latest increase in building and land costs
- why - limit risk
- greater utilization of resources

Resources - financial - (equity financing not debit financing)
- people

d) Leasing of facilities and land
- low capital needed
- excellent way to start farming

IV NEW TECHNOLOGY

a) Computers
- financial
- production records
- ventilation control
- automatic feeding of dairy and swine
- tractor monitoring
- fertilizer applications

b) Equipment
- building and equipment design
- no till corn planters, etc.

c) Biotechnology
- pesticides
- crop preservatives
- crop growth regulators
- BST and PST (growth regulators livestock)

[Public perception of new technologies important]

V NEW CHALLENGES THAT WE MUST FACE

a) Environmental
- Pesticides - public growing concerns the environment (food safety, political)
- Animal wastes - pollution of streams, ground water - Nitrates

- Problem with large livestock population on small land bases
- No_3^- levels - fecal contamination

b) Animal Welfare Movement
- welfarist
- animal rights groups

c) Governments
- free trade impact
- lobby of OFA and CFA
- letter writing (bringing pressure to bear)
- (corn - environmentally sound industrial uses alcohol, de-icer)

d) Right to farm legislation

VI PEOPLE

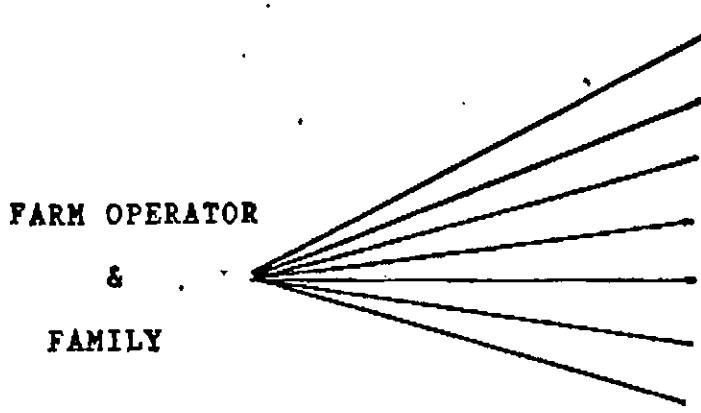
The most important asset we have.

You and your spouse plus the people you work with determine the profit potential of your business.

Surround yourself with food team of players.

MANAGEMENT TEAM

People = Success



Ideas
Needed
Responsibilities
"Say thanks"
Joint ownership
Profit sharing

" OUT OF ADVERSITY COMES SUCCESS "

The Effects of Multiple Component Pricing on Northeastern Dairy Producers

Wes Lane, Director, Planning
The Ontario Milk Marketing Board

Multiple component pricing (MCP) of milk in Ontario is targeted to be implemented on August 1, 1991. Prior to this move, the OMMB is planning to convert MSQ from its present form in litres of milk to kilograms of butterfat. It is expected that this conversion of quota will take place on August 1, 1990. In addition to re-issuing MSQ in kilograms of butterfat, the Board also intends to implement a system to make producers accountable for changes in the butterfat levels of their fluid milk shipments. The manner in which quota is issued is seen as a integral part of MCP. Thus the move to MCP will involve a two staged approach: firstly, issuing MSQ in kilograms; and secondly, implementation of the MCP system.

MCP is seen as a means of putting the dairy industry in a position to respond more readily to the changes that are taking place in the dairy marketplace. In recent years the trend toward low fat milk and dairy products has increased substantially. All indications are that these trends will continue into the 90's as consumers continue to be concerned about fat intake.

The OMMB is planning to utilize a three component approach, i.e. butterfat, protein and other solids (lactose and mineral) in MCP, with the greatest weight being on butterfat and protein. This will be in concert with management information from milk recording and AI programs.

Also under the current approach, the initial development of component prices will be done on a pool (regional) basis utilizing the average composition of the milk supply within a pool. This move should serve to recognize the differences in composition particularly between the Southern and Northern Pools.

Prices for the components based on trial runs shows producers would receive approximately $5.30/kg. for butterfat, just under $4.00/kg. for protein and approximately $1.65/kg. for other solids. In addition to these component prices, class premiums are applied to reflect milk being utilized within different price classes.

A preliminary analysis of a single month utilizing the 3 component approach for Northeastern Ontario showed a much more even distribution than had been previously experienced. In the month of November 1989, 48.5 per cent of the producers would have gained under MCP while 51.5 would have lost. Within this breakdown, 75 per cent of the producers were within plus or minus 50 cents per hectolitre of their current return. 13.2 per cent of producers would have gained by more than 50 cents per hectolitre, while 11.3 per cent would have lost by more than this amount. Caution should be used in assessing these results because they are based on one month only. Because there is seasonal variation in composition, the month to month variation can be fairly widespread, particularly when three components are used in the pricing system.

In summary, the new method of issuing producer quota and the MCP system will place less emphasis on butterfat and begin to recognize the other components in the milk supply. It is viewed as a system which is more market oriented given the shift toward lower fat products. In the short term butterfat will continue to be important as it still carries a fair weight in the pricing system. In the longer term, it is anticipated that protein will likely emerge as the most valuable component in milk.

THE INTERNATIONAL TRADE SITUATION

Sophie Dinnissen
Agricultural Economic and Business
Section, RCAT

BACKGROUND TO CANADA-US TRADE AGREEMENT AND CURRENT ROUND OF GATT NEGOTIATIONS

- impetus behind each

- issues involved

CURRENT NEGOTIATING POSITIONS HELD BY USA, EEC, AND THE CAIRNS GROUP

- What's at stake for each group in terms of agriculture?

- How do the dairy and beef sectors fit in? What are the issues to resolve?

- How far apart from the dairy and beef farmer lobby groups' viewpoint is the Canadian government's viewpoint?

GRAZING STEERS AT NLCAT

P.H. Sharpe, P.S. Gumprich and A.V. Skepasts
New Liskeard College of Agricultural Technology

Eighty acres of gently-sloping clay land were sown in 1986 to either:
a) a **GRASS** mixture: brome, timothy, orchardgrass, meadow brome, meadow foxtail and Kentucky blue or
b) a **LEGUME-GRASS** mixture: alfalfa, birdsfoot trefoil and white clover (50%) plus the grasses mentioned previously (50%).

Individual paddocks were 4.8 acres (1.9 hectares). Grass and legume-grass pastures were evenly distributed among 16 paddocks. Water was supplied to each paddock through a plastic line to an 80 gallon trough.

In 1988, eighty Hereford and Hereford cross steers were purchased in June at an average weight of 706 lbs (range 585 to 825 lbs). Steers were kept in a drylot and fed hay and water for one month, then were placed on pasture July 13 and weighed on July 14 and 15. The weight range when grazing started was 730 to 759 lbs. Steers were placed on pasture in 8 groups of 10.

All steer groups received a supplement, consisting mainly of UCO AA mineral mix and wheat middlings. This supplement was fed at a rate of 0.5 kg (1.1 lb) per steer per day in galvanized steel troughs. Half of the steer groups received lasalocid (trade name Bovatec) at a rate of 200 mg/hd/day in their supplement.

Following a period of adjustment to the pasture and supplement of about one month, growth rates of steers were determined for the 97 day (14 week) period: July 15 to October 27.

Starting weights of the four treatment types were within 9 lbs of each other and averaged 746lbs. Data for weight gains are given in Table 1. The overall average daily gain was 1.6 lbs/head/day. The lasalocid-treated, legume-grass-pastured type had a significantly higher average daily gain than each of the other treatment types. There was a significant inter-action between supplement type and pasture type (P=0.01).

TABLE 1. Weight gains over a 97 day period by steers on pasture

	No. of steers	Total gain (lbs) (mean + S.E.)	Av. daily gain (lbs/hd/day)
Lasalocid grass	20	125 ± 4 a	1.3 a
Lasalocid Leg-grass	17	205 ± 5 b	2.1 b
Control Grass	20	148 ± 3 a	1.5 a
Control Leg-grass	20	160 ± 3 a	1.6 a

b > a (P < 0.01).

The mean gain for all lasalocid-treated steers was 162 lbs and for control steers, 154 lbs. This difference was not statistically significant.

The mean gain for all steers on grass pastures was 136 lbs, which was significantly less ($P < 0.01$) than the 181 lbs for steers on legume-grass pastures.

Previous studies in the U.S.A. have resulted in a significant effect of lasalocid on weight gains in cattle on pasture. The relatively short length of the test period and the late start of the trial may have inhibited any positive effect of lasalocid, especially on the straight grass pasture.

In 1989, 100 Hereford and Hereford crossbred steers were put on pasture June 1 and allowed 3 weeks to adjust to their new environment. Steer weight gains were measured over a 104 day period (June 22 to October 4). Mean starting weight for all steers was 694 lbs, with group means varying from 675 to 715 lbs. Grazing management was similar to that in 1988.

Three different comparisons were made in 1989: (1) Grass vs Legume-grass pasture; (2) Lasalocid-treatment (200mg/hd/day) vs Control; and (3) Low stocking rate (10 steers/9.6 acres) vs High stocking rate (15 steers per 9.6 acres).

Each group of steers had two paddocks of 4.8 acres each to graze alternately. Steers were put into paddocks in which the forage was about 8 to 12 inches tall and were removed when forage height was about 2 to 4 inches. Paddocks were clipped and grass pastures were fertilized with 25 lbs nitrogen/acre within 2 days of steers leaving.

There were no significant effects of pasture type or lasalocid treatment on steer weight gains. However, individual weight gains for the low stocking rate (266.2 $\pm$ 7.7 lbs) were significantly higher than for the high stocking rate (231.1 $\pm$ 5.8 lbs; $P < 0.05$). Average daily gains for the low and high stocking rates were 2.6 and 2.2 lbs/head/day, respectively.

The total weight of beef gained by 60 steers on the high stocking rate paddocks was 13,900 lbs, compared to only 10,652 lbs by 40 steers on the low stocking rate paddocks. Total gain per acre was 362 lbs for the high stocking rate and 277 lbs/acre for the low stocking rate.

In 1988 there was a tendency for legume-grass pastures to produce higher steer gains than grass pastures but in 1989 this trend was reversed, possibly because in 1989, grass pastures had supplemental nitrogen fertilizer applied each time steers were removed.

It is not surprising that gains of beef per acre were higher with more steers per acre, since steers were not allowed to overgraze paddocks. A determination of ideal stocking rate would require a comparison of several stocking rates, in order to observe a peak in productivity and a decline with both higher and lower stocking rates.

BEEF RESEARCH RESULTS

By Paul Gumprich
Animal Science N.L.C.A.T.

In 1989 the beef herd at the New Liskeard College of Agricultural Technology consisted of 86 mature beef cows of mixed breeding. The cows were bred in 1988 by artificial insemination to two Red Angus bulls and a Blonde d'Aquitaine bull was rented as a clean up bull. Cows started calving in mid February and calved until late July. All calves born at the college were weighed at birth, injected with vitamins A and D and vitamin E and Selenium. Some calves are polled, all others were dehorned in the fall using a hot dehorning iron. Creep feed (made of barley, soybean meal, minerals and Decox plus) was supplied free choice to calves on pasture. Weaning of the steer calves took place in September approximately 3 weeks prior to the date when they would be sold. Heifer calves were weaned after the steer calves were sold in early October. Weaning weights were adjusted to 205 days.

Two trials were carried out with the beef cow herd at the New Liskeard College of Agricultural Technology in 1989. A growth implant trial (Synovex C) was conducted on the calves to determine whether growth implants improve rate of gain (to weaning) and if they are economical. This was done on both heifer calves and steer calves. The second trial was to determine whether early castration (at birth) would increase or decrease average weaning weights of steer calves compared to later castration (2 to 3 weeks prior to weaning). Castration was done surgically with a scalpel.

Heifer calves were either not implanted, implanted once early (approximately 45 days after birth), implanted once late (approximately 21 days prior to weaning), or implanted twice (early and late). The average adjusted weaning weights were 600 pounds, 618 pounds, 625 pounds and 615 pounds for the four groups respectively. There was no significant difference in using implants on the heifers' weaning weights. When these heifers were followed through to a year of age the difference in implanting versus non-implanting the heifers was significant to the 90% level. The heifers implanted twice showed an increase of 95 pounds (10% heavier) over heifers not implanted, or implanted only once.

Steer calves implanted showed no significant difference between the implanted group and the non implanted group. Implanting of the steers took place approximately 45 days after birth and 21 days prior to weaning. There was also no difference in weaning weight or average daily gain from birth to weaning between the early and late castration groups. Early castration, however, did ease operator stress as it was easier and less time consuming to castrate the calves at birth.

There were many variables that could not be accounted for. One of these variables was the difference in the sires. It was found that the heavier calves at birth had significantly heavier weaning weights and significantly greater average daily gains to weaning. Also, the great range in birth dates was a great factor in the calves' weaning weights as the later calves went to pasture at an earlier age. The size of the groups also limited the accuracy of the trials.

These trials will be repeated in 1990 with some slight modifications. All cows were bred to Charolais bulls. Fifty nine cows were bred (and conceived) to a Charolais A.I. bull and the remaining cows were bred to two cleanup Charolais bulls on pasture. All cows will calve between the middle of February and the middle of April. The herd has also been increased to 122 cows with the addition of 12 first calf heifers from the Thunder Bay Correctional Centre and 10 first calf heifers from the Monteith Correctional Institute. This will increase the group sizes. Implanting will be with Ralgro at birth and early castration will be done using an elastrator at birth. Dehorning will be done at birth with caustic paste.