THINK GREEN! Newsletter

April 2004

Ontario Forage Council

New President

The Ontario Forage Council welcomes Dr. Doug Yungblut as its new President. Doug is Livestock Nutrition Manager at Pioneer HiBred Limited and has served as a Director with the Forage Council for many years. You will frequently see his articles in our THINK GREEN! newsletters. Other new appointments include John Beer as First Vice President and Bill Brown as Second Vice President.

Sincere thanks to our outgoing president, Barton MacLean, for his outstanding leadership to the Ontario Forage Council and forage industry.

Looking for technical information on:

- **Cutting schedules**
- **Alfalfa pests**
- **Scouting procedures**

Fertilization ??????

Check out our website at: www.ontarioforagecouncil.com

for quick easy, access to useful forage information.

Profitable Pastures Conference

Efficient pasture management was the focus at the recent Profitable Pastures meetings in where Dr. Ben Bartlett of Michigan State University, John Steele and Birgit Martin provided farmers several interesting session packed with both theory and practical application. Local area producers capped the day with Glen Wells in the Elmwood location and Carolyn Closs in Cobden. The conference attracted a mix of both beef and sheep producers.

Good fences make good neighbors and good pastures too! Dr Bartlett told us that the two most common problems of electric fences are poor end posts and an inadequate charge on the fence. The end posts of your paddocks are the foundation of the fence. Take the time to install them right, in fact 50% of the time installing the fence will be spent on them. The first meeting of an animal with an electric fence should be memorable. This will set the stage for a good lasting relationship. Three feet of ground for each joule of power on your fencer is required for adequate grounding. Invest in a digital voltmeter to help you monitor your fence.

Controlled grazing allows you to take responsibility for where and how your livestock graze. Good perimeter fences will keep your livestock at home. Good subdividing fences will help you to manage the livestock so that they graze the pasture in a more efficient manner. Grass growth is sunlight driven with 50% of the growth in the first 60 days and the next 50% of the growth in the next 120 days. We also have 180 days when grass doesn't grow and have traditionally relied on stored feeds but ideas such as stock piling pastures or using alternate feeds such as turnips or corn stalks can reduce the more expensive days of stored feed. Taking the livestock to the feed as in a pasture system reduces costs while maintaining performance.

The growth pattern of grasses means that more pasture acres must be introduced as the season progresses or livestock units removed in order to harvest the feed in a timely manner throughout the season. The quote "Grass only

(Continued on page 2)

Economic Benefits of Intensive Management Grazing

Managed grazing can be a profitable system of farming by:

- Lowering harvest costs by substituting livestock grazing for machine harvesting.
- Lowering overall feed costs by increasing feed quality and quantity per acre of pasture
- Lowering investment costs for infrastructure
- Improving herd health, thus lowering animal cull rate and health treatment costs
- Reducing labour costs
- Reducing need for expensive year-round manure storage

(Profitable Pastures Conference...Continued from page 1)

grows 3 leaves at a time" is a very visual illustration of the need for timely harvest. By the time the fourth leaf appears the first leaf is starting to die. Harvest or grazing needs to occur to maintain the production and quality of the pasture. Birgit Martin illustrated this with her pasture research, which documented the quality and quantity of pasture on offer by the height of the sward. Ideal quality occurs in the 10-25 cm height. Quality deteriorates lower in the stand and as the grass grows taller. Controlled or rotational grazing allows you to bring livestock into the stand during this ideal stage and then move them on before they overgraze weakening the stand. The first bite helps; the second bite hurts the plant. Pasture is a perennial crop, which relies on its root reserves to regrow.

Livestock graze for a set time period each day. Cows will graze for about 8 ½ hours each day and chew at 55-60 bites per minute. The influence that we can have on grazing is how large their bite size is. Grass that is 10-25 cm high is ideal for quality and to provide the most quantity into the mouth for each bite.

Subdividing pastures may increase animal performance by increasing the quality but it definitely will allow you to keep more animals on an acre of pasture over the season and makes it especially attractive this year.

Each of the speakers brought their own experience and understanding of pasture management for both cattle and sheep to the meeting. They sparked discussion and new ideas. Pasture is one of the few crops, which requires few inputs other than your management. It will pay you well for good management. Dr Bartlett described pasture as the "manageable meeting of livestock and forage to meet your goals." You have to clearly know and understand each of these aspects to achieve success.

Bloat Control with Alfasure

Grazing pure stands of alfalfa or clover is considered high risk because of bloat. But high legume pastures produce more high quality feed per acre than grass pastures. This increased volume and quality results in improved livestock performance.

Alfasure is a new product on the market that controls the formation of frothy bloat. This allows for the grazing of pastures with a high legume content. Alfasure is a non-ionic surfactant that is delivered through drinking water.

It can be used with all types of ruminant livestock. The dosage for the prevention of frothy bloat is 6 - 20 ml per head per day depending on the water intake of the animal.

In trials conducted by Agriculture and Agri-Food Canada at the Lethbridge Alberta Research Station, Alfasure was 100 percent effective in controlling frothy bloat in livestock grazing alfalfa.

Alfasure gives the opportunity to graze a second cut alfalfa or clover hay field that would normally be considered too risky because of bloat.

This product is new on the market and there is an opportunity for some demonstration projects to show the effectiveness and ease of use. If you are interested in participating in a demonstration project please give me a call at 705-324-5855 or email jack.kyle@omaf.gov.on.ca

Cutting Management of Alfalfa

by Joel Bagg, Forage Specialist, OMAF

Cutting management of alfalfa is important to optimize yield, quality and persistence. Harvest schedules are dependent on the type of livestock being fed and the appropriate forage quality goals. Some dairy farmers place more emphasis on high-quality, frequently cut, good yielding stands that last for 3 years and are less concerned about alfalfa persistence. Others farmers will delay harvesting with the goal of higher yields and greater plant persistence, but lower feed quality.

Forage crops decline in feeding value as they mature. In a pure alfalfa stand, once alfalfa buds appear, feeding value will decline about 0.2% per day in crude protein and about 0.4% per day in digestibility. Short delays in cutting result in significantly lower forage quality.

Of course, finding a window of dry weather can complicate things even further. With a large acreage of forage, it is advisable to start cutting earlier to ensure the later cut material will still have adequate quality.

Forage Quality Goals

For a high-producing dairy herd, forage must be high in digestible energy and protein. The benchmark analysis for alfalfa for high-producing dairy cows is considered to be 20% crude protein (CP), 30% acid detergent fibre (ADF), and 40% neutral detergent fibre (NDF). This high quality requires an aggressive, early starting 3-cut system. Beef feedlots should also strive for earlier cut, higher quality alfalfa forage.

For beef cows, the most appropriate hay is higher in grass content, more mature and higher yielding, and is therefore lower in protein and digestibility. Many recreational horse owners prefer hay that is more mature and contains more grass. Because it is very important that horse hay not be "rained on" and be entirely free of mould, waiting for the right weather is the priority.

First-Cut Sets The Pace

The first-cut harvest date will dictate the total season harvest schedule. In Ontario, an early first cut is necessary for a 3-cut harvest schedule before the end of August.

As a general rule of thumb, for high quality, first-cut forage should be cut at mid-bud to late-bud stage. Refer to Table 1 – Developmental Stages Of Legumes. Cutting at the pre-bud (vegetative) or early-bud stage will result in reduced yields and may weaken the stand. Extremely low fibre levels may result in nutritional problems. Delay cutting fields that have been weakened by winter stress to allow plants to recover.

The Predictive Equations for Alfalfa Quality (PEAQ) method uses both stage of maturity (vegetative, bud, flower) and stem height to estimate the NDF of the alfalfa in a standing crop. A PEAQ stick has been developed, that incorporates the NDF estimates onto an easy-to-read measuring stick, which can be used in the field.

For beef cow hay, where yield and persistence are greater priorities than quality, cutting after one-tenth bloom (flower) is more appropriate.

With alfalfa-grass mixtures, grasses have the overall effect of increasing fiber levels and lowering protein. Grasses lose quality when heading occurs, so mature grasses can significantly lower quality. A compromise between yield and quality with grasses occurs at "early head emergence from the boot". Timothy and smooth bromegrass will mature much later than orchardgrass and reed canarygrass, but are less tolerant to frequent cutting schedules.

Second & Third-Cuts

Subsequent second and third cuttings of alfalfa may be in intervals of approximately 30 days (mid-bud) to 40 days (early flower) or more, depending on whether the goal is high quality or maximum persistence and yield.

Frequent harvests with short cutting intervals of less than 35 days puts stress on alfalfa that can reduce winter survival and first-cut yield the following year. Conversely, a long interval between cuttings will rebuild plant reserves and enhance winter survival.

Critical Fall Harvest Period

Harvesting before the "Critical Fall Harvest Period " allows the plants to regrow and build

(Continued on page 4)

Table 1 — Developmental Stages of Legumes

State of Maturity	Definition
Late vegetative	No visible buds. Stem at least 12" tall
Early bud	Visible flower buds on at least 1 stem
Mid bud	50% of stems have at least 1 bud
Late bud	75% of stems have at least 1 bud. No visible flowers
First bloom	Flowers on at least 1 stem
1/10 bloom	10% of stems have at least 1 flower
Mid bloom	50% of stems have at least 1 flower
Full bloom	75% of stems have at least 1 flower

(Continued from page 3)

sufficient root energy reserves for winter survival and persistence, as well as vigorous spring growth and good first cut yields. The Critical Fall Harvest Period is approximately 6 weeks long and varies with location. Refer to Figure 5-4 of Publication 811 "Agronomy Guide" for a map detailing the Critical Fall Harvest Period in your area.

The risk of alfalfa winterkill increases by harvesting during the Critical Fall Harvest Period, and should be weighed against the immediate need for forage. Yield sacrificed by not harvesting during this period is usually easily regained in first cut yield the following year. Cutting before this period can also enhance dandelion control since the alfalfa has time to canopy before dandelions make their autumn comeback.

Late Autumn Cutting

After a hard fall frost, alfalfa can be harvested without lowering root reserves, but there are risks. Leaving at least 6 inches of fall growth will aid in catching snow, which insulates the soil from cold temperatures. The stubble also helps alfalfa plants survive ice sheeting by protruding through the ice, allowing the movement of air for respiration. Unlike grasses, fall regrowth of alfalfa does not cause "smothering," but ice sheeting does.

More Information

For more information, refer to "Alfalfa Winter Kill Risk Factors" and "Predicting Alfalfa Quality Using PEAQ" on the OMAF Forage Website at www.gov.on.ca/OMAFRA/english/crops/field/forages.html, or from the Agricultural Information Contact Centre at 1-877-424-1300.

Pasture Fertilization *by Jack Kyle, Pasture , OMAF*

Good fertility will promote good forage growth. There are several fertility components for consideration in improving plant performance. Phosphorus and potassium are essential building blocks for plant growth. Nitrogen is the driver of plant growth. If nitrogen is limiting, growth will be reduced. For these nutrients to be readily available, the soil pH must be in the proper range.

The soil pH should be above 6.1 for most crops, but ideally 6.5 or higher. If the pH is low (acid soils), then it is important to apply agricultural lime. In low pH soils, nutrient availability is restricted and root growth can be diminished.

Plants that are lacking phosphorus or potassium will be weak, with poor root and top growth. A strong root system is essential for plants to take up moisture and nutrients throughout the growing season.

Phosphorus soil tests should be in the medium range (10-12 ppm as determined by the sodium bicarbonate test). If phosphorus levels are low, the addition of commercial fertilizer or manure is essential for strong plant growth. Phosphorus is especially important for seedling plants.

Potassium is the other building block that is essential. Soil characteristics will have considerable influence on potassium levels. Clay soils tend to be higher in potassium than sandy soils. Soil potassium should be 100-150 ppm using the ammonium acetate test (the Ontario standard). Potassium and phosphorus can be applied at anytime during the growing season.

Nitrogen is essential for good grass growth, once the phosphorus and potassium levels are adequate. Nitrogen can come from legume plants, commercial fertilizer or manure. If the legume content of the stand is greater than 50%, there should be adequate nitrogen for good grass growth provided by the legume rhizobia.

If commercial fertilizer is to be used there are several choices. Urea, ammonium nitrate and ammonium sulfate are the three most commonly used nitrogen sources. Nitrogen response is best achieved with 50 pounds of actual nitrogen per acre (110 lbs. of urea). If less nitrogen is applied, the grass will show a visual colour response but the yield response will not be significant. If more than 50 pounds is applied, there is a risk of leaching because the plants can not use the nitrogen as fast as it is available.

Fifty pounds of nitrogen will give about one thousand pounds of dry matter per acre in additional yield. If you feel that you need more nitrogen, then split applications over the season by applying nitrogen after grazing the paddock. Plant response to added nitrogen will occur in the 4-6 weeks following application. Apply additional nitrogen a few weeks before you want the additional growth. Early spring applications will just add to the bulge of May and June forage growth. In most cases, the nitrogen should be applied in early- to mid-June to encourage growth for late-June and July.

If there is a requirement for phosphorous and potassium fertilizer, it can be applied at the same time as the nitrogen to avoid a second trip over the field.

A hungry forage crop will result in hungry livestock. Feed the forage and the forage will feed your animals.

Pasture Walks – A Learning Experience

by Jack Kyle, Pasture Specialist, OMAF

Is your organization looking for an activity or meeting idea for the coming year? If you are involved in planning for your organization consider having a pasture topic on your agenda.

Pasture is the lowest cost feed source and in these times of stressed markets paying attention to your biggest expense item - feed- will show significant benefits.

Pastures are often neglected or ignored in the feeding program. Top managers are achieving pasture gains in the range of 500 to 600 lbs. of lamb per acre.

Many pastures are only at 20 - 25% of this production level. The majority of the pastures could have their productivity increased by 50% in one season and in a few years have it doubled or tripled.

Developing a "grass eye" is a key component to improving your pasture management ability. A "grass eye" is the ability to see what is happening in the pasture and what is about to happen from the perspective of the grass. It is this information and knowledge that will allow you to plan for and react to the best management options available.

At a pasture walk you work as a group sharing your observations and learning from the different perspectives that each person brings.

Some of the topics that might be considered for a pasture walk could include: species selection, when to start grazing, when to remove livestock, fencing systems, fertility, stocking rates and stocking density.

By sharing their individual observations and experiences the members of the group will take away ideas that will help them increase the productivity of their pastures.

Consider a pasture walk as one of the activities your organization holds this year.

If your organization needs some assistance in setting up and holding a pasture walk contact Jack Kyle at 705-324-5855 or email jack.kyle@omaf.gov.on.ca

Upcoming Pasture Walks

Throughout the 2004 growing season the Ontario Forage Council will be involved in pasture walks across Ontario.

Bus Tour — Pasture Demo and visit to Bruce Hydro Plant

The Ontario Forage Council the Grey County Soil & Crop Improvement Association will be co-hosting a bus tour in late July 2004.

The tour will include a pasture demonstration on Glen Well's operation in Bruce County and a visit to the Bruce Hydro Plant in Tiverton. Glen was a speaker at our 2004 Profitable Pastures Conference. Watch our website for details on possible bus tours in other areas as well.

If you are interested in a Pasture Walk or the Bus Tour:

- Watch our website for details at: www.ontarioforagecouncil.com
- Phone or email our office and we will let you know when the details are finalized.

Email: info@ontarioforagecouncil
Phone: 1-877-892-8663

Forgotten Hunger

by Jennifer MacDonald , C.C.A., Simcoe District Co-operative

Forages are one of the most responsive crops to fertilization. As we deal with a limited budget we tend to reduce or cut out fertilization of this crop altogether. The perennial nature of this crop does not forget this mistake.

A soil test is the best determination of what the soil needs to produce a good forage crop. If a soil test is not available a good strategy is to apply the nutrients the crop will remove based on the species in the stand.

Nitrogen fertilizer is not required for a pure alfalfa stand. Alfalfa is a legume that produces its own supply of nitrogen from the atmosphere. Application of significant amounts of nitrogen to heavy legume stand will encourage grass production reducing the legume content. Alfalfa will continue to produce enough nitrogen to supply itself and the grasses in the stand until the legume content reaches approximately 50 percent. At this time the fait of the field needs to be determined. Stands with less than 30 percent legume are not producing enough nitrogen to supply the grass species. Once the stand reaches this level nitrogen becomes its biggest hunger. Nitrogen is required for grasses to increase volume, quality, and protein levels. A minimum of 75 pounds per acre of nitrogen is required to achieve a response from a grassy hay or pasture.

Phosphorus is essential for establishment. Application once the crop is established essentially replaces nutrients that will be used for future production years. Only 10 to 15 percent of phosphorous is utilized in the year applied. This requirement pattern for phosphorous is true whether the forage stand is legume based, grass based or a combination of both. Crop removal rates for 4 Mt of hay require 52 pounds per acre actual phosphorus (approx. 100 pounds per acre product). This is one reason a field should have medium phosphorus levels (15-25 ppm) before seeding down. This will increase the chances of overall success and profitable yield. If soil levels are low (5-15 ppm) build up the soil before seeding and apply phosphorus at seeding time in furrow. An in furrow application of Monomonium Phosphate (MAP) is safe to an extent because it has very low toxicity levels.

Fields with a large percentage of alfalfa are high consumers of potash. Alfalfa's response to this nutrient is increased disease resistance and persistence. An Alfalfa yield of 4 Mt per acre will remove approximately 180 pounds per acre of actual K_2O (300 lbs/ac of product).

One micro nutrient that needs to be managed in a forage crop is boron. The crop is very sensitive to this nutrient and should only be applied after appropriate testing shows signs of deficiency. Deficiencies are becoming more predominate for boron.

The next critical component of forage fertility is the timing of application. Timing your fertilizer application is again highly dependant on the species in your stand. A stand with a high legume content requires additional nutrients after first cut and every cut after until the critical harvest period. It is essential to have nutrients in place before the critical harvest period to increase winter survival. The sooner the application in the fall the more each plant will be able store before winter freeze up.

Grassy stands however, require nutrients in early spring and after each cut. A continual supply of nitrogen is required until the last cut. Keep in mind nitrogen encourages vegetative growth which is detrimental to a forage stand going into winter dormancy. In general, apply nutrients as soon as possible after harvest to reduce losses due to compaction and nutrient burn.

Determination of the best fertility program for your farm is highly dependant on your management strategy. The suggestions above give a general overview of best management practices. To determine specific fertilizer recommendations to improve the profitability of your forages contact your crop specialist.

Effect of Wheel Traffic on Forage Yields

by Steve Bowley, University of Guelph

Studies previously conducted at the University of Wisconsin have indicated that alfalfa yield is depressed due to traffic injury caused by a mechanical harvesting system. A comparison of a silage system (traffic one day after cutting) and a hay system (traffic five days after cutting) revealed that the hay traffic resulted in significant reductions in forage yield and that there were differences among varieties to this stress.

At the Elora site in 2003, a comparison of varieties and forage species was conducted to determine if there were species and variety differences in tolerance of traffic injury five days following cutting. This "hay traffic" stress was imposed on a series of OFCC trials following first harvest in 2003. For each test, five days after cutting, two replicates were driven on with a tractor (John Deere 6420) , two replicates were not. This stress was applied to alfalfa (6 tests involving 95 varieties), orchardgrass (7 varieties), timothy (10 varieties), reedcanary (4 varieties), tall fescue (7 varieties), and red clover (8 varieties).

On average, the reduction in yield in alfalfa and red clover was 11 and 13%, respectively. Surprisingly, the reduction in yields were significantly greater for the grasses, the yield reduction for tall fescue, orchardgrass, reed canary, and timothy averaged 15%, 16%, 27% and 32%, respectively. It was hypothesized that varieties with more rapid regrowth, higher yield potential might be those that are most susceptible to this traffic injury. However, there was no relationship between yield performance and the susceptibility to traffic injury.

This study showed that there is a significant loss in yield in areas that are driven upon five days following cutting, that grasses were more susceptible to the stress compared to alfalfa, and that there are varieties that have greater tolerance, and lower tolerance to this stress.

Table 1: Effect of traffic injury, applied five days after first cutting, on second harvest yield on forage species at Elora in 2003. Trial design was a split-block with two replicates, traffic was a John Deer 6420 driven to give one wheel pass completely over the treated area.

Species	Second harvest yield (kg/ha)				Percent difference		Number			Stand age (years)
	Control	Traffic	Differ-ence	sed	mean	variety range	Tests	Varieties	Observations	
Alfalfa	3555	3164	-391	70.3	-11.0	7.3 to -25.3	6	95	524	2,3,4
Orchardgrass	1368	1146	-222	44.1	-16.2	0.7 to -30.7	1	7	28	3
Timothy, early harvest	2499	1709	-790	119.6	-31.6	-20.7 to -44.6	1	10	40	3
Reed canary	2918	2138	-780	126.5	-26.7	-27.1 to -31.2	1	4	16	3
Tall fescue	3397	2881	-516	72.8	-15.2	-7.3 to -20.2	1	7	28	3
Red clover	3704	3233	-471	164.5	-12.7	-4.4 to -22.6	1	8	32	2

Managing the Effect of Wheel Traffic on Forage Yields

by Joel Bagg, Forage Specialist, OMAF

Hay fields have to be driven on to harvest a crop. Unlike haylage systems, where the forage is completely removed a day or 2 after cutting, dry hay harvest results in a great deal of wheel traffic that often occurs 5 days or more after cutting. Additional traffic activities include raking, baling and bale removal with a front-end loader tractor and wagons. Research began in 2000 in numerous U.S. States by Dr. Dan Undersander (University of Wisconsin) and others, to investigate the effects of wheel traffic on alfalfa yield.

This research showed that there can be significant yield losses as a result of wheel traffic damage, and that some alfalfa varieties are more susceptible than others. Driving over the plots reduced subsequent yields (second- and third-cuts) by an average of about 25 to 30% in the wheel tracks. Typical operations of cutting, raking, baling and hauling results in about 25 to 30% of the field being in at least one wheel track, but this could be as high as 60%.

Traffic damage yield reductions are largely a result of the breakage and damage to new shoot regrowth. Soil compaction may play a much smaller role. Regrowth typically begins 5 days after cutting. The longer the delay after cutting, the more regrowth and the more damage results. Weakened plants may also result in a carryover effect to the following year.

Dr. Steve Bowley, University of Guelph, investigated wheel traffic using some of the Ontario Forage Crops Committee variety plots at the Elora Research Station last year. His preliminary results showed a negative yield response to wheel traffic in grass species, as well as legumes.

Recommendations To Reduce Wheel Traffic Damage

There is still much to learn about the significance of wheel traffic damage in dry hay harvest and management practices that can help to minimise it. Here are a few recommendations:

- Harvest as soon as practical after cutting.
- Use smaller tractors where possible. For example, don't use the big loader tractor to rake.
- Avoid unnecessary trips across the field.
- Collect large bales and remove them from the field as soon as possible after baling.
- If manure is going to be applied, traffic damage is another reason it should be done as soon as possible after cutting.
- Use "traffic tolerant" varieties when they become identified by research.

Ontario Forage Council

Gold Level Members

Dairy Farmers of Ontario

Ontario Cattlemen's Association

Ontario Sheep Marketing Agency

Pickseed Canada Inc.

Pioneer Hi-Bred Limited

Corporate Members

BASF Seed

Corland Seeds

GROWMARK

Mapleseed

Ontario Soil & Crop Improvement Association

ProRich Seeds

Quality Seeds Limited

The Ontario Forage Council gratefully acknowledges funding received from the Ontario Ministry of Agriculture

Ontario

Agronomy Guide Available on Internet

The *Agronomy Guide For Field Crops*, OMAF Publication 811 is available on-line at www.gov.on.ca/OMAF/english/crops/pub811/p811toc. This includes an extensive Forage section.

The OMAF Forage & Pastures Website has also been updated at www.gov.on.ca/OMAF/english/crops/field/forages

Ontario Forage Council

c/o Grey County Agricultural Services
P.O. Box 463, 206 Toronto Street South, Unit 3
Markdale, ON, N0C 1H0
Website: www.ontarioforagecouncil.com
Email: info@ontarioforagecouncil.com
1-877-892-8663

Thanks to the Profitable Pastures 2004 Sponsors & Trade Show Participants

SPONSORS

- **The Ontario Cattlemens Association**
- **Ontario Sheep Marketing Agency**
- **The Canadian Cattlemens and Greenhouse Gas Mitigation Program**
- **Bar 5 Simmental Stock Farm**
- **The Royal Bank Agricultural Business Banking Centre**

EXHIBITORS

Agricorp
Alpharma Animal Health
Beef Improvement Ontario
Bishop Seeds Limited
Bluewater Feed Co. Ltd.
Brussels Agri-Services
C&M Seeds
Fytche Enterprises
Gallagher Power Fencing
Gencor
Germania Farmers Mutual Fire Insurance
Grey Bruce Health – BSE Response Team
Huron Bay Co-op
Mapleseed
Nancy Ackert & Associates
Nutritional Feed Additives Inc.
Ontario Ministry of Agriculture and Food
Ottawa Valley Seed Growers
Pickseed Canada Inc.
Prestige Contracting
Quality Seeds
Sprucedale Agromart
Thompson Feed