

Introduction from the OFC President, Bill Brown

Time just seems to fly by. It has already been a year since I became President of the Ontario Forage Council. We just recently held our Annual Meeting at which time I was re-elected for a second year as President. I would like to take this opportunity to thank all the Committees and their chairmen for making this a very successful year. A big thank you to Ray Robertson, Mary Turkington, and Joan McKinlay for all of their work in managing the everyday activities of the Council. I would also like to welcome to the executive – 2nd Vice President Bob Dipple (Speare Seeds) and 1st Vice President John Adema (Ontario Cattlemen) Doug Yungblut (Past President) and I look forward to working with you on the executive.

I would like to take this opportunity to give you a brief summary of some of the things the Forage Council was involved with over the past year.

We welcomed several new members to the Forage Council namely – The Ontario Harness Horse Association, Kane, Gallagher, and CanGrow. We are happy to have them as members and look forward to working closely with them in the coming year.

Ray and I met with The Board of Director's of the Ontario Harness Horse Association and were very pleased with the excellent questions they had for us prior to becoming members. The Council has wanted to get the horse industry more involved as they are becoming significant users of forages in Ontario. With this in mind, several members of the Council met with OMAFRA Equine Specialist Dr. Bob Wright, and out of this meeting we formed a Committee to look at holding a Conference in the coming year aimed at the equine industry. We will be attending the Can AM Equine event in London with a display and speaker program. (March 16-19).

When you have exhausted all possibilities,
remember this—you haven't.

Thomas Edison

The Board of Directors summer tour this year took us to Dunlea Farms (Fritz Trautsmandorff's) at Jerseyville to view and discuss one of the leading hay producing operations in Ontario. This was extremely educational and informative.



The Research Committee called for and reviewed proposals for the Cord IV funding. Research dollars at the University of Guelph are being reorganized in a fashion that is making it difficult to continue the Forage Performance testing program. We continue to work with the Ontario Forage Crops Committee to ensure the testing continues.

We had very successful Forage Focus and Pasture Conferences this past year with probably the best attendance we have ever had. Profitable Pastures Conferences are set for March 7 in Drumbo, March 8 in Elmwood, and March 9 in Douro – if you use pastures you will want to attend one of these locations.

Again this year we have sent out several newsletters to keep you up to date on the latest forage knowledge and our many activities, one being the "Outdoor Farm Show" in Woodstock, where we had a display and a continuous play computer promoting forages. Many farmers stopped by our booth to ask questions about the industry.

Joel Bagg, Jack Kyle and Joan McKinlay attended the Expert Committee on Forage Crops in Winnipeg this year, representing the Ontario forage industry. It is good for the Council to keep up on what is happening with forages right across the Country.

In summary, we had a good year, with our main emphasis being hosting Conferences, putting out newsletters, administering the website to provide links and information to promote forages, and guiding research. While times ahead, especially in research, look trying, it is our objective to continue to show the value of forages to the Ontario Agricultural Community.

Bill Brown

President (Ontario Forage Council)

Making & Marketing Horse Hay

by Joel Baag, Forage Specialist, OMAFRA, Lindsay

The rural landscape in Ontario is changing, and we are seeing more and more horse farms. There are about 300,000 horses in Ontario, and the numbers are increasing. To put this in context, there are about 350,000 dairy cows and an equal number of dairy heifers. There are also approximately 400,000 beef cows, an equal number of beef calves, and about another 450,000 cattle on feed. The U.S. has over 9 million horses. Many of these are located in the Eastern States, within trucking distance from Ontario.

A horse will typically consume 2.0 to 2.5 % of its body weight per day in forage dry matter. There are also feeding losses when hay is trampled or wasted. Some of the forage is pasture, but mostly dry hay. This means there are approximately 750,000 tonnes of hay fed to Ontario horses every year.

A large proportion of horse farms do not produce their own hay and rely on purchased hay. Many horses are owned and managed for recreation, entertainment and sport. Horse owners often have other income. Unlike other livestock owners, what horse owners are willing to pay for hay that meets their criteria is not necessarily highly correlated with the commercial value of their horses. For hay producers, this is a huge potential market.

Listen To Your Customer

The first rule of marketing should be to “identify the product your customer wants to buy, and then produce that product”. This certainly applies to producing and selling horse hay, both domestically and for export. In order to be successful in the hay business, a new skill set is required that includes not only the hay production skills, but also a huge effort in marketing. Knowing your buyer and what she wants in terms of quality is a crucial component in carving out a niche in this market. Do your market research first, before you make the hay.

Redefine Quality

The criteria for “quality hay” are quite different for horses than they are for cattle. Forage quality for dairy producers means a high percentage of alfalfa, and early cutting to ensure high protein and digestible energy. Cattle are more tolerant to rain-damage or dustiness than

they are of advanced maturity from late cutting.

Freedom From Rain-Damage, Mould & Dust

By contrast, for horse owners, “quality hay” most importantly means dust-free and mould-free. Mouldy hay is the result of rain damage, baling at moistures that are too high, slow drying in the windrow during high humidity, or improper storage. Horses are very susceptible to mould spores and suffer irritation of the respiratory tract. This can result in temporary coughing, or the more permanent Chronic Obstructive Pulmonary Disease, also known as heaves. Horses develop a chronic cough and “wheezing” that is very serious and damaging. Mouldy hay can also cause colic, a digestive disorder that can be fatal to horses.

Match The Type Of Hay With The Horse

Matching the nutrient content of hay with the requirements of the horse is important. There are many different types and uses of horses with different levels of nutrient requirements. Relative to dairy cows, horses do not have high crude protein (CP) requirements. Some horse types, such as idle and lightly used mature horses, may have CP requirements of less than 10%. On the other hand, nursing broodmares, high performance horses (such as racehorses), and growing horses require higher digestible energy and protein diets, and therefore higher nutrient content hay. However, a large proportion of horses in the countryside, including the many idle or lightly used recreational horses, do not require high energy or even moderately high protein diets.

A lactating mare, or a high performance horse that is fed only low nutrient hay will lose weight and not be able to perform optimally. On the other hand, a mature horse used for the occasional trail ride is at risk of being too fat if fed high digestible energy hay. Hay that has no mould or dust is more important to maintaining the health of this horse. Therefore, the priority is having hay with no rain-damage or mould, rather than having early-cut hay of high nutrient content.

For these reasons “quality” for horse hay



most importantly means dust-free and mould-free. For a large proportion of the horse hay market, early cutting to increase protein and digestible energy is not as important, or even necessarily desirable. Grass or grass-alfalfa mixtures are often more suitable. The preferred mixture is typically alfalfa and timothy.

Because the priority is making hay with no rain-damage or mould, horse hay producers tend to be more patient, waiting for larger hay-making windows when a lower chance of precipitation is in the forecast. Later-cut, more mature forage is also often easier to dry to acceptable moistures for baling.

Green, Soft & Weed-Free

Colour does not provide any direct information on the nutritional content of hay, but a poor colour can be an indicator of problems during harvest and storage. A rich green colour indicates that the hay was not rained-on, dried quickly (indicating higher sugar content), and did not heat or mould during storage. Hay with a sweet smell is more palatable to horses. Similar to colour, poor odours can often indicate harvest and storage problems, particularly mould. Weeds and trash, such as old stubble, will reduce the value of horse hay. Weeds can be present in pasture and hay that are highly poisonous to horses.

Soft hay is more palatable to horses. Unlike cattle, horses use their mouth and lips to manipulate hay and pasture plants when eating. They easily sort their feed and eat leaves while leaving the coarse stems. The mouth, lips and tongue are very soft and sensitive, so they will avoid and waste coarse materials.

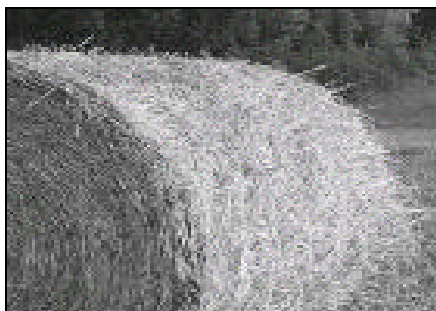
Making & Marketing Horse Hay (continued)

The Package – Bale Type & Size

While there are some opportunities to market large round and large square bales to horse owners, small square bales provide the greatest opportunity to meet the premium price horse hay market. This means manual labour or investment in automated small bale handling equipment. Small square bales are usually loaded on a truck and then handled many times, so they need to be firm, “square shouldered” and hold their shape. “Banana” bales and “almost-broken” bales are not acceptable.

Bale size is important to fit trucking requirements, as well as be a consistent and manageable size for handling. A 50 lb bale is about the heaviest that can be comfortably handled at riding stables. A 36 to 38 inch bale often fits the market, with about 9 to 11 flakes, or slices. Small square bales should be stored on their edge. Similar to the hoops of a barrel, the twine helps the bales maintain their shape and prevents flattening. This adds to a bale’s ability to “breathe” and dissipate moisture.

There is some demand from horse



owners for large round bales, based on their lower cost. Large bales are a convenient way to feed large groups of horses outside, but many horse farms do not have a loader tractor to handle them. Opportunities to market large bales to horse owners can be increased by providing delivery to the farm.

Large square bales have some potential in the horse market. Because they are more dense and need to be drier at baling, large square bales can be more challenging to make without mould and dust. They are easy to feed outside, but unlike large round bales, large square bales can be “flaked” and are therefore

also easier to feed to stalled horses inside.

Marketing Skills

Special marketing skills are necessary to be a successful horse hay producer. Marketing is not the same as producing a product and then selling it for whatever price can be had. Marketing involves identifying a product that consumers want to buy and then producing the product. Remember, the customer is always right. Know your markets. Talk to potential customers to identify market opportunities. Are you selling directly to the horse owner, or a hay dealer? What kind of hay do they want, and in what kind of package. Are you delivering? How will you ensure you get paid? Are you targeting local or export markets?

Gain market share by selling a quality product, rather than selling at a lower price. Research what the market is prepared to pay for a specific type and quality of hay. Work closely with a reputable hay dealer, or develop your own markets by networking, advertising and personal contact.

Hay is sold on the basis of reputation. For repeat business, be sure to meet the buyer’s expectations on the type and quality of hay. Buyers don’t like surprises. They want a consistent supply of hay that is of a desired quality. Taking care of existing customer loyalties is likely easier and cheaper than trying to find new customers. Marketing efforts may also add value to the product by providing services, such as delivery and education to the buyer. Be sure to have adequate liability insurance.

Sorting hay according to type and quality as it goes into storage is important. Hay producers targeting the horse market usually have alternate markets for hay that does not meet the quality criteria because of rain-damage or mould. This is often sold into the beef cow market for a much lower price.

Horse Hay As A “Cash Crop”

With low prices for corn and soybeans, many farmers are searching for opportunities to develop markets for alternate crops. There are opportunities to “add value” to hay crops by producing a specific hay product that the market wants to buy, and by providing customer

service. When producing and marketing quality hay, management efforts can have tremendous impacts on both yield and price.

Successful horse hay producers and marketers pay attention to small details – they add up and make a difference. It is necessary to be ready for timely harvest. Using newer hay harvest technology, such as new design conditioners, rotary rakes, windrow invertors, preservatives, and bale accumulators, can reduce drying time and labour. Hay crops have high removal rates of phosphorus and particularly potash, so fertility is important.

Cattlemen or dairy producers that view the horse hay market as a surplus market and do not produce the product specifically for horse hay are often disappointed and miss out on the potential premium prices necessary to make a profit.✂

PRECAUTIONS TO BE CONSIDERED IN PASTURING BRASSICAS

Pasture production guides suggest the possibility of digestive problems such as bloat, nitrate poisoning and or metabolic disorders in cattle that have grazed them for some time. *Brassicas* (the cabbage family) includes turnip, kale, rapeseed, cauliflower, brussels sprouts and many cabbages). It is generally recommended that they be offered slowly to livestock to permit adjustment. *Brassicas* contain a haemolytic factor that may cause grazing animals to suffer anemia. Cattle are more susceptible to this than sheep. This anemia develops after stock has been grazing for at least a week and may take 3 weeks according to a number of pasture references. In extreme cases, haemoglobin appears in the urine giving a red colour. This haemolytic factor in *brassicas* increases as the feeding date is delayed, and with plant maturity. Also *Brassicas* contain goitrogenic substances that affect the uptake of iodine by the thyroid gland and goiter develops. This is more of a concern with sheep creating light sensitization when the turnips are grazed in August and September, cut it can occur in cattle.

Is Your Power Fence Ready For Spring?

by David Picken, Kane Power Systems Consultant

Don't let the simple "checkup" of a fence system delay your jump on this year's grazing. Here are a few simple steps ensuring a positive "frustration-free" way in controlling stock on pasture right from the start.

You may have to walk some fence lines, but before you set off, first test your Energizer. If you had put it into hibernation last fall and disconnected both the ground and fence terminal wires as well as unplugged it, chances are there'll be no problems. That is as long as it was working properly in the fall!

In any case, test the voltage across the ground and fence terminals. When you test voltage on the Energizer, make sure you have the wires from the fence and ground terminals disconnected as to isolate the testing to that of just the Energizer. Although there are different levels of voltages from one unit to another, expect at least 5000 volts (or 5. KV). This first step will give you a quick idea whether to continue on or have the unit repaired or replaced. If the voltage is much lower than 5 KV have it looked at by a trained service person if you feel it's worth fixing. If the voltage is 5KV or higher, then test it once again but this time with a 500 ohm resistance (load) across the terminals. This will allow you to see how well your Energizer will handle a load similar to livestock touching the fence and what voltage is available at this time when it really counts. The voltage you'll want to see now under this 500 ohm load will be at least 3.5 KV (3500 volts). 3500 volts is considered minimal for even cattle let alone harder to control livestock like sheep and predators and don't forget the nice vegetative grass and weeds that can swallow a fair bit of voltage too.

The larger and more powerful an Energizer the higher the voltage you will retain under load. ("No-load" voltage readings means very little once over 4KV

or 4000 volts). If you don't have a 500 ohm load resistance to test on the Energizer then see your fence dealer. It's the only sure way to know if your Energizer is working properly. There is usually no charge for this.

After having the Energizer tested with at least 4 KV, hook up to your fence and ground rods.

Let's say your voltage from the Energizer was 7.5 KV with no load before you hooked it to your fence. If you now hook it up to a properly built power fence with no shorts, you will have 7.5 KV all the way around your fence system. Any less voltage will be due to shorts or an inferior built fence. However, as long as you have high enough voltage available to travel through your livestock, you can still have control.

If you are like most people and have a few things going on within your fence and voltage is lower than you're content with, then you will have to locate the problems. The simplest most effective way to trace and find problems is to use a "Fence Compass". A "Fence Compass" is a hand held tester that tells you of a problem and points to where the problem is. This saves a lot of frustrating fault finding trips around the farm, often missing the real problem. OK, so you've found the problem with the Fence Compass and fixed it or you have a clean well built fence.

The last, but equally important step (usually never done, and very simple) is to test your ground system. No "rule of thumb" or the best of suggestions in how to ground a power fence will take the place of this next "test". The "ground test" will allow you to determine how effective your existing ground system is and how much better ground you may need in order to receive all the power you paid for.

Here's the test method:

Approximately 300 ft. or more down the fence line from the Energizer, short the live wires to the ground soil with conductive material such as steel fence post, etc. With a fence volt meter hooked up to the fence closer to the Energizer than the short itself, short the fence below 1000 volts (<1KV). With the fence left shorted out, take the volt meter to your first ground rod from the Energizer and measure the voltage between the ground rod and the soil. If the ground system is adequate, the reading on the volt meter will be 200 volts or lower. If the reading is over 200 volts, you will need more grounding to increase the performance of the existing Energizer. It is a good idea to conduct this test at least once a year. For best fence performance year round, conduct this test during a drier part of the year as the wetter soil will make a poor ground system seem better than it actually is. Any time you switch Energizers, another test will be required to ensure the best information for ground improvement decisions.

One last thought to realize – now that you have a properly working power fence, you need to inform the livestock. They sometimes won't take our word for it! Nothing like first hand experience. Before sending your livestock out to pastures behind a power fence, have them experienced. In a secure physical fence, (such as a barnyard) set up a power fence wire along the inside and power it. Usually only a couple of contacts by livestock will be enough to have them realize where this shock is coming from and form a lasting memory to stay clear. Whatever powered wire you use out in the pasture, use the same during the training. This training process done right will give you control of your grazing management. ✂

Disclaimer Statement

The information contained herein is provided as a public service with the understanding that Ontario Forage Council makes no warranties, either expressed or implied, concerning the accuracy, completeness, reliability, or suitability of the information.

Committee Work

Variety Testing	Working with the Ontario Forage Crop Committee to insure that these tests continue.
Agricorp	Meet with representatives to develop forage insurance program. Representing farmers concerns about 2005 program.
Horse Industry	Working with members to help hay producers, agribusiness and the horse industry to better understand each others needs.
Voice for Forages	Represent forage concerns on committees

Extended Fall Grazing With Turnips—Two Experiences

Certain areas of the province experienced severe drought this past summer. What does one do when faced with a situation of a crop failure of triticale and pea mixture due to severe drought? Your stored feed inventory will not carry through until spring of 2006! A Woodville area farmer (and a full time teacher), salvaged as much of the drought crop and weed in round bales and on August 8th, no-tilled in 4 pounds per acre of purple top turnips in the 13 acres. Normally, one would consider this too late a date to expect a good crop of turnips for fall pasture.

The soil was a light loam and soil samples indicated the nutrient level in the soil were excellent. There was sufficient rain after planting to ensure good germination, and the crop never looked back! Approximately 60 days after planting, David's 65 cow/calf pairs were feeding off the turnips. David developed a unique system of feeding the turnips by forcing them to reach under an electric fence wire to feed. The wire was moved about a foot each time and it was moved 3-4 times a day. It only took less than five minutes to move the wire each time. This method resulted in "ZERO" wastage of the turnips! They ate tops, bulbs and roots. A couple of calves would sneak under the hot wire at a dead furrow, but they would retreat the same spot after having a feed. Feed analysis of the tops showed 28% protein and the bulbs were 17%. Based on six plot samples taken across the 13 acres, the average "Dry Matter Yield" was 7327 Ibs per acre! The testing was done by Jack Kyle, OMAFRA Forages Specialist and myself. ✂

By John Kinghorn



“David McKague using a hot wire to strip graze turnips”

An Alberta study with 150 large cow calf operations in 1998 found that you could save up to nearly \$1 per day per cow for every day you pastured beef cows compared to the cost of feeding stored hay. And that study did not cost the hauling and spreading of the manure produced.

Dunillan farm near Wakefield, operated by Myles & Cindy McMillan and their son Trevor, hosted a pasture day with a difference, a late season pasture walk on Saturday October 1st, 2005. Participants visited two fields of annual seeded crops, forage turnips and a forage corn for grazing being grown to prolong the pasture season and to demonstrate practices that effectively reduce Greenhouse Gas emissions.

In 2004 the McMillan's tried grazing silage corn to extend the grazing season for their cow herd. According to Myles in 2005 they decided to add a second annual crop, forage turnips to extend the grazing season into the late November. Their goal was to graze for 7 months a year.

Their 25 acre turnip crop was seeded at the rate of 2 lb/acre in early August 2005 after harvesting a crop of Tricale - and Red Clover for silage. At \$2.00/lb this is relatively inexpensive seed costs. With the excellent fertility conditions in this field that had served as a wintering out area for their beef herd for a numbers of year, the turnips took off with the rains that fell in late August and September. The McMillan's have found that they must remove the cattle during the wettest days in order to prevent too much mud since there is no longer a sod base to prevent the hoof action from working the pasture soil. They are also feeding some hay to buffer the effects of a full turnip diet. They have found that after the cattle have consumed the turnip tops they return and pull the turnip root out of the soil to munch it.

If the McMillan's get to graze their herd until December 1st, their feeding season will only be 150 days or about ¾'s of the typical cow-calf feeding season of 210 days in Quebec.

Hubert McClelland, agronomer

We made our last paddock shift on December 29th! We started on October 5th and strip grazed 50 feet increments along each side of the field which was divided lengthwise in two. The cattle (17 bred heifers @ 900lbs and 17 cow calf pairs @ 1100lbs and 400lbs were removed from the turnip field during major rain events, about 6 days in total. We made sure the cattle had access to late July harvest dry hay at all times, 1/2 bale per day for first 45 days and increased to 2 bales per day by the end of December. I figure we saved at least 175 4X4 Class round bales, because we're feeding 2.5 silage bales per day now. Trevor is rebaling our surplus dry round bale hay for the horse market and is getting well paid. We harvested 276 round bales of triticale and pea silage off the same field earlier in the summer. Who says forages and grazing doesn't pay? We will definitely do turnips again next year. Establishment costs were one pass with a 10 ft JD115 disk followed by a chain harrow and conventional seeding with an IH 510 disk drill. We put about 75lbs of stubble turnip seed on 23 acres, no additional fertility was required. In addition to stored feed savings and superior animal performance the turnip pasture allowed us to rest about 75 acres of grass pasture during the critical fall period. Hopefully this will bode well for us for this coming grazing season. An interesting footnote to our experience was that the cattle did not have access to water from mid October until mid November. The high moisture content of the turnips was all that was required, even for the lactating cows and calves.

Best Regards Myles ✂

Ontario Pasture Award Winner



February 21, 2006 – Toronto - Bob & Mary McKessock of McKessock Farms at R.R. 5 Chatsworth in Grey County are the winners of the 2006 Pasture Award. The award, sponsored by PICKSEED Canada, the Ontario Forage Council and the Ontario Cattlemen's Association (OCA) was presented today at OCA's Annual Meeting. For their environmental and pasture improvements and management, the McKessocks receive \$750 and a bag of forage seed.

The McKessock herd consists of 40 cows and their offspring. The original herd was Simmental and Simmental/Red Angus with a Charlois terminal cross breeding program. The cows are calved on pasture in April and early May, and Bob says that both animals and humans appreciate the healthy and stress-free environment of "calving naturally on pasture". The calves are weaned in late September and sold at the popular "presort-sale" at the Keady Livestock Market.

The pastures mainly consist of alfalfa, orchard grass, white and red clover with some trefoil. Frost seeding has been done on a regular basis to maintain a productive pasture base and make every effort to maximize the pounds of beef per acre. Bob also wants to minimize the number of times he has to plow up a pasture field and reseed. Rotational grazing increases the productivity longevity of the stands.

Livestock was fenced away from the swamp and wetland areas in the early 90's and gravity flow water systems were installed. Bob states that not only has it improved herd health, but it has also made livestock handling much easier. Three gravity flow watering systems are strategically located to provide a constant and easily accessible water supply for the livestock. Free choice mineral is always available which Bob believes has proven to be a major benefit to the health and performance of the cows and their offspring.

The winners say that a real strength in their pasture system is the excellent source of water on the farm, which is always in close proximity to all the pasture paddocks. Bob's peers are always quick to identify that his management and record keeping skills help to make for a winning combination.

Paul Wight, Ontario Sales Manager with PICKSEED Canada, said the McKessock's are ideal candidates for the 2006 award, because of the innovation they have shown in their farming operation and their willingness to share ideas for the benefit to agriculture and the industry in general.

Ray Robertson, Manager of the Ontario Forage Council, said that as producers try to cope with the financial crisis, they will look to practical management practices like these to maximize their net returns.

Excerpts from "The Disappearing Act: Efficiently Feeding Round Bales"

By Tom Hamilton - Beef Cattle Production Systems Program Lead/OMAFRA;

Barry Potter - Regional Livestock Specialist/OMAFRA

Do you know how much your cows are **eating**? Feed represents the largest single cost (60 percent of total) in a cow-calf enterprise. The old adage, "a penny saved is a penny earned" never resonated more strongly.

Science tells us that a 1300 lb. dry pregnant cow in good condition needs to eat about 27 lbs. of hay per day to maintain herself and grow her calf. But when farmers project the feed inventory they need for the winter, they may actually estimate their cows feeding needs at 35-40 lbs. of hay per day. Where does the missing feed go? Farmers are really tracking hay **disappearance**, rather than hay consumed by cows. Disappearance includes parts of bales spoiled during storage, dropped on the way to the feeder, and wasted or refused during the feeding process.

Whether feeding daily or weekly, using round bale feeders reduced waste. When offering a week's worth of feed at a time, they cut waste by 80 percent relative to no feeder, in the range of 5-6 percent of the total feed supplied. Daily feeding using ring type feeders also had low wastage, in the 5 percent range. If feeding daily, there must be enough feeders to allow each cow to eat at the same time. Feeding twice a week or once a week requires less time and labour, but you need enough round bale feeders to hold the required total amount of feed.

A study at Michigan State University compared feed wastage among different types of round bale feeders. Ring and ring/cone type feeders were the most efficient, resulting in an average of only 4.5 percent waste, while trailer type feeders had 11.4 percent wastage. Cradle type feeders were least efficient, with 14.6 percent of hay wasted. These results indicate that feeder choice is important. Hay production or purchasing costs are constant whether the forage ends up inside a cow or as compost. Wastage among systems for feed can range from 5 percent to 40 percent. Over a 200-day feeding period, this can change the feed inventory required from 5670 lbs. to 7560 lbs., or 2.8 tons to 3.8 tons. This would be a difference of \$40 to \$90 per cow per season, depending on your hay cost. Even moving from a moderately efficient system (15 percent waste) to a very efficient system (5 percent waste) would save 600 lbs. of hay per animal, or \$12 to \$27 per head.

Large Baler Research And Storage Ideas

by Ronald T Schuler Extension Agricultural Engineer

Because the intermediate square bales (30" x 30" x 5') are denser than small square and large round bales, the recommended storage moisture is two to three percent less than small rectangular bales. Recommended bale moisture levels for storage with minimal losses may be difficult to attain in humid Wisconsin weather conditions. Harvesting large square bales above 17 percent moisture will require a preservative for good bale storage or plastic wrap may be used to maintain forage quality.

Preservative Research Results(Wisconsin)

In 1997 and 1998, Shinners studied preservatives and ventilation holes for intermediate square bales at moistures from 14 to 28 percent. The preservatives were propionic acid and a bacterial inoculant. Ventilation holes of three and five inches in diameter were two treatments evaluated for reducing dry matter loss and maintaining forage quality. Four different trials or cuttings were evaluated. Following are his findings:

- bales treated with propionic acid maintain higher moisture during storage
- propionic acid produced less heating at the higher moisture content
- ventilation holes in the bales did not produce less heating
- none of the methods reduced dry matter loss
- dry matter loss was less than 4% when baling at moistures below 16%.

Bale Wrapping Research Results (Wisconsin)

At the Lancaster Agricultural Research Station, plastic wrapping of intermediate bales was evaluated for bales at 21 to 40% moisture during 1997. Undersander and others studied the effect of time between baling and wrapping and the number of plastic layers. Following are their results:

- bales (800-1200 lbs) need to have 2 to 3% less moisture at baling than small squares
- bales should be wrapped within 24 hours after baling
- plastic wrapping bales at 21 to 38% moisture adequately preserved them
- four layers of 1.5 mil plastic(50% overlap, twice over) was adequate

Limited research results are available on bale tubes and line wrapping. The key to their success will be their ability to seal the bales and prevent any air from getting inside the plastic.

Preservative recommendations

Some preservatives that have been used are anhydrous ammonia, inoculants and buffered propionic acid. Although anhydrous ammonia costs less, handling and

safety problems make propionic acid a better preservative. The recommended application rates for large square bales are listed in Table 1, where the propionic acid concentration is 75 to 80 percent. If the acid concentration is less, more chemical will need to be added.

Table 1. Recommended application rates of propionic acid.

<u>Moisture Content</u>	<u>Rate(%)</u>	<u>Rate(lbs/ton)</u>	<u>Cost(\$US/ton)</u>
17-19	0.4	8	\$7.60
20-22	0.6	12	\$11.40
23-24	0.8	16	\$15.20

If the solution contains other acids such as acetic or citric acid, it will be less effective than a solution containing only propionic acid. Acetic acid is considered to be about one third as effective as propionic acid. Therefore you would need three times more acetic acid to have the same effect as the recommended rate of propionic acid. For bacterial inoculents, the manufacturer's recommendations should be followed.

The key to selecting the correct application rate will be determining the forage moisture content. An accurate method must be used and good representative samples must be obtained. There can be a large variation in forage moisture in the windrow

Ontario Forage Council Activities Up-Coming Events

March 7, 8, and 9, 2006	Profitable Pastures Workshops
March 16-19, 2006	CanAm Equine Show, London (Display and speaking program)

Research currently funded by OFC through CORD 1V funds

- 1.Management Stress Tolerance of Forage Varieties
2. Identifying and Correcting Uneven Red Clover Stands Underseeded in Wheat
- 3.Persistence and Maximum Yield Research in Alfalfa
- 4.Effects of Forage Species and Breed on Altering Fatty Acid and Iron Content in Meat
- 5.Evaluation of forage varieties for tolerance to management stress

Our Thanks to Gencor

The Ontario Forage Council would like to recognize Gencor who have supported them over the last number of years with provision of the board room for Directors and Annual meetings We thank them sincerely for their continued support of the Ontario Forage Council.

***Thanks to the
Forage Focus 2005
Sponsors & Trade Show
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The Ontario Forage Council thanks the
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for its support

