

# CROP TALK



## OMAF Field Crop Specialists—Your Crop Info Source

### Table of Contents

1. Drying Costs Versus Yield Loss
2. Does Compost Need to be Turned?
3. Frost Seeding: December or March??
4. Potash - The Other Macro-Nutrient in Manure
5. Common Chickweed (*Stellaria media*)
6. Climate Change Money for Farmers - Are We any Closer?
7. Grain All Cozy by Christmas
8. Meeting Water Needs for Winter Grazing
9. Edible Beans - Plan Before Planting

### Brought to You by the Following OMAF Crop Specialists

*Mike Cowbrough*, Weed Management Program Lead  
*Hugh Martin*, Organic Crop Production Program Lead  
*Horst Bohner*, Soybean Specialist  
*Ian McDonald*, Applied Research Co-ordinator  
*Albert Tenuta*, Field Crop Pathologist  
*Michael Payne*, Biosolids Specialist  
*Keith Reid*, Soil Fertility Specialist  
*Jack Kyle*, Grazier Specialist  
*Brian Hall*, Alternative Production Systems Specialist  
*Peter Johnson*, Cereals Specialist  
*Scott Banks*, Emerging Crops Specialist  
*Gilles Quesnel*, Field Crops, IPM Program Lead  
*Christine Brown*, Nutrient Management Program Lead  
*Adam Hayes*, Soil Management Specialist - Field Crops  
*Greg Stewart*, Corn Industry Program Lead  
*Tracey Baute*, Entomology, Field Crops Program Lead

**Editor:** Joel Bagg, Forage Specialist

### Drying Costs Versus Yield Loss

by Greg Stewart, Corn Specialist, OMAF, Guelph and Peter Johnson, Cereals Specialist, OMAF, Stratford

Sixty cents per bushel drying! At \$2.60 per bushel corn, that leaves only \$2.00 per bushel after drying. These low corn prices and high drying costs are causing many growers to scratch their head in search of some profit. Some growers are considering leaving the crop in the field to dry. This causes many consultants to shudder! How much yield will be sacrificed by leaving the crop in the field to dry and can it be justified?

Using a corn price of \$2.80 per bushel and commercial elevator drying costs, we can calculate the maximum allowable yield loss associated with delaying harvest in

**Table 1.** Breakeven Final Corn Yields At Various Field Dried Moisture Levels

Harvest Moisture Today	Future Harvest Moisture	Future Breakeven Corn Yield if Yield Today is 160	Future Breakeven Corn Yield if Yield Today is 130
32	28	152	123
32	24	144	117
32	20	138	112
28	24	152	123
28	20	146	118
24	20	154	125



Ontario Ministry of Agriculture and Food, Crop Technology Branch

Agricultural Information Contact Centre: 1-877-424-1300  
 Publication Order Centre: 1-888-466-2372

Northern Ontario Regional Office: 1-800-461-6132  
 OMAF Web Site: [www.gov.on.ca/omaf/english/crops](http://www.gov.on.ca/omaf/english/crops)

order to achieve additional in-field drying. Breakeven final corn yields at various field dried moisture levels for two example fields are outlined in Table 1. This shows you can accept up to an average of 1.5 - 2.0 bushel per acre yield loss for every point that moisture is reduced!

Now, consider the situation where you decide to bite the bullet and wait well beyond this fall, until the corn is 15.5% moisture. The harvest losses that you can withstand are listed in Table 2.

**Table 2.** Breakeven Final Corn Yields At Field Dried Moisture Level of 15.5%

Harvest Moisture Today	Future Harvest Moisture	Future Breakeven Corn Yield if Yield Today is 160	Future Breakeven Corn Yield if Yield Today is 130
25	15.5	133	108

### Field Drying Considerations

- 1) Is my corn standing well and is stalk strength good? Stalk strength should be evaluated using push-tests, pinching the stalks or cutting stalks open.
- 2) Is my corn ear mould free?
- 3) Am I unwilling to sell the corn this fall, have no storage of my own, and would need to pay storage costs as well? This will increase the amount of loss you can tolerate.
- 4) Is the field free of surrounding woods which might make it susceptible to severe deer damage?
- 5) Have I considered how I will manage volunteer corn in next year's crop?

Answering yes to these questions may put you in a position to consider leaving some of your crop out for additional drying. Remember, in farming there are no mistakes, just research plots! Contact the CropLine (1-888-449-0937) if you would like to set up a "research plot".

### Crop Insurance Implications

Be aware of the crop insurance implications of leaving corn to field dry. AGRICORP corn crop insurance contracts are based on harvest being completed when the crop is mature in a normal time frame, typically October and November. AGRICORP must be informed by December 15<sup>th</sup> of yield or status of the crop to avoid late reporting penalties.

Insurance coverage ends at the completion of a normal harvest period. In the event that the crop is immature and cannot be harvested due to an insured peril, AGRICORP will work with affected producers in order to assess damage and reasonably deal with the crop.

AGRICORP will not reimburse producers for yield losses on a mature crop not harvested and left in the field to dry. If you are considering leaving corn in the field you need to call the Customer Action Centre (1-888-247-4999) to have an adjuster contact you.

## Does Compost Need to be Turned?

*by Hugh Martin, Organic Crop Production Program Lead, OMAF*

There are many advantages of a good manure compost:

- reduced/eliminated pathogens
- reduced viable weed seeds
- reduced insect larvae (fly problems)
- reduced odour
- reduced volume and moisture content
- stabilized organic components and nutrients
- production of a soil amendment/fertilizer

To accomplish these advantages you need:

- the correct carbon to nitrogen ratio (25:1 to 35:1),
- to maintain proper moisture levels (40-60%), and
- the ability for air to travel through the composting materials.

If these conditions exist at the start, the advantages will be yours.

### Windrow Management

Turning the compost pile with a compost turner or a front-end loader can allow you more opportunities to "manage" the windrow or pile. Several turns in the first two weeks will get temperatures up to optimum. This will quickly reduce odours and the potential for flies, which is particularly beneficial if there are neighbours nearby. Turning will also reduce pathogens and effectively reduce your risk of potential problems if the site is tile drained or near water sources.

Windrows that are not turned can dry out at the surface and concentrate water near the middle. Uneven moisture content will reduce the

temperatures and the overall effectiveness of the composting. Turning will make the windrow more uniform. Turning can help to reduce moisture if it is too high, or allow an opportunity to add moisture if the windrow is too dry.

Composting requires oxygen. Turning will add lots of oxygen initially to the windrow, but an active windrow will use up this oxygen within 1-2 hours. The air spaces created by the turning must be complemented by sufficient porosity of the materials to allow air to continue to diffuse naturally into the windrow. Windrows must not be too large, as this air will generally only travel 1-2 metres through the compost material. Turning too frequently will breakdown the compost materials excessively and reduce the ability of air to diffuse through the compost.

### **Organic Standards**

USDA (NOP) standards require windrow compost to reach 131°-170°F (55-76°C) for 15 days and to be turned 5 times during this time. The Canadian organic standards are similar. The temperatures for in-vessel composting are more uniform and need to be held at 55°C for three consecutive days. The temperature known to kill most pathogens when they are exposed for three days is 55°C. In windrows only the core reaches these temperatures, so the compost needs to be turned 5 times to make sure that all materials are exposed to the high temperatures.

When using a front-end loader take care to clean fresh manure from the loader before turning the compost. When turning, try to turn the outside of the old windrow into the middle of the new windrow to make sure that all materials reach high temperatures to get good pathogen and weed seed kill.

### **Weed Seeds & Pathogens**

These high temperatures will also kill most weed seeds. If the windrow is not turned the pathogen and weed kill will be variable. Solid manure that is left to decompose aerobically without turning will breakdown and most pathogens will eventually die if the pile is left for more than one year. Unfortunately, on many sites this allows the potential for leaching and other adverse environmental and health risks. Under the Ontario Nutrient Management Act these nutrients cannot be left stored in the field more than 300 days (may be less depending on the various site conditions).

The challenge is to be able to make good compost without it costing a lot of money or time. Front-end loaders take more time and labour. Compost turners do a better job, but cost more initially. Costs can be reduced if several farmers can get together to share a compost turner.

For more information on manure composting refer to [www.gov.on.ca/OMAFRA/english/crops/organic/organic.html](http://www.gov.on.ca/OMAFRA/english/crops/organic/organic.html).

## **Frost Seeding: December or March??**

*by Peter Johnson, Cereals Specialist, OMAF, Stratford*

Amazing!! The hoopla one can create with a bit of media attention! Thanks to Dr. Duane Falk (University of Guelph) and Rob Templeman (Agronomist, Pioneer Hi-bred), we created the "**BLACK HOLE**" of wheat planting. The "black hole" of wheat planting refers to the planting time which gives winter wheat the least chance for winter survival. The worst situation for winter wheat survival is to have plants enter the winter at the 2 leaf stage. At this crop stage plants have used up seed reserves and not yet built up plant reserves to help the plants survive winter. In order to avoid plants entering winter at this stage wheat needs to be planted early enough that the crop has been able to store up reserves through photosynthesis or late enough that reserves are still present in the seed. Thus wheat planted after this "black hole" may actually outperform the earlier planted wheat that falls into this "black hole". There is no scientific side by side data to support this concept, but almost every farmer up and down the back roads has heard about it.

The hoopla had many interesting impacts. Some growers pushed soybean harvest harder and earlier than ever before, ending up with all of their wheat planted by October 10<sup>th</sup> or before (alright!!). Other growers stopped planting wheat once they thought they were getting into this "black hole" (DARN!). The absolute upside: everyone thought twice about planting date for this wheat crop. Yet another upside is that there are about ten plots out there this fall where we will compare the various planting dates, as long as mother nature gives us a couple more chances to get into the field.

Still, many growers did not plant as much wheat as they had hoped. In many fields, the beans just weren't quite ready. So what is the option now? **FROST SEEDING!** Consider spring cereals, especially spring wheat or oat, on the frost next spring. This has had some incredible success, and data to support this statement will be included in the next issue of *CROPTALK*. But the one **KEY** item that most growers miss to be ready for frost seeding next spring? - the fall burndown with glyphosate!

If you have any chance at all this fall, burndown fields that you even remotely are considering for frost seeding. Remember that, amazingly, glyphosate continues to have activity until temperatures have hit -4° C. Even fields that look clean now often have dandelion, chickweed, and other winter annuals that just hammer the heck out of the frost seeded crops next spring. If you can kill them this fall, you will have much better success next spring.

Meanwhile, if you're up for a challenge, try frost seeding some winter wheat this December.

## Potash - The Other Macro-Nutrient In Manure

*by Chris Brown, Nutrient Management Field Crops, OMAF, Woodstock*

Is it possible to get nutrient deficiencies when manure is routinely applied? In some areas, there has been a higher incidence of potash (K) deficiencies, even where manure is applied on a regular basis. There has also been a downward trend in the soil test potash levels in some areas of the province. How can this be?

Nutrient management rules and increased awareness have changed how manure is managed. Manure application rates are determined by considering nutrient analysis from the livestock type with the needs of the crop considering environmental risk.

### N & P Determine Manure Application Rates

Nitrogen and phosphorus are the two main nutrients considered in determining manure application rates. Over-application of nitrogen can lead to nitrate leaching and can lead to economic losses. Over-application of phosphorus can lead to increased phosphorus reaching watercourses and increasing

eutrophication. Potash is seldom mentioned, and never triggered in nutrient management planning for municipal bylaws or provincial regulations. As a result, potash removal by crops, over the entire crop rotation, may be higher than the total potash applied.

The ideal soil test range for potash is between 120 and 150 ppm (150 to 180 ppm for rotations that include legume forages). In this range there is no additional requirement for potash. Greater than 250 ppm K is considered excessive. Potash levels lower than 100 ppm will require additional applications of K to maximize yield potential.

There is a large range in potash levels in manure, due to the amount of potash in the animal feeds. On dairy farms, potash soil test levels are often very high when commercial K is applied to forages to help winter survival. This can cause problems in dry cow reproductive health. As a result, most dairy farms are more conscious of potash in their nutrient management planning.

In recent samples of liquid hog manure, potash ranged from 2.25 to 7% on a dry matter basis (average near 4.5%). Liquid manure, on a dry matter basis, is higher than solid manure for potash. This is due to the potash being associated with the liquid portion of the manure, while phosphorus is connected with the solids portion of the manure.

There is also a large range in the potash removed in crops. The rate is low in crops where just the grain portion is removed. However, when the whole crop is removed (silage, forages, cereal straw), then the potash removed increases significantly.

### Using Commercial K Sources

To ensure that soil test potash levels stay in the range where deficiencies are less likely, it is essential to include potash as a nutrient that is balanced in the nutrient management plan. If manure application rates are limiting potash replacement because of nitrogen or phosphorus content in manure, then it may be necessary to add commercial sources at some point in the rotation. Refer to Table 1 – "Approximate Application Rates to Meet Specific Nutrient Needs for Common Field Crops" for examples of application rates to meet specific nutrient needs. When utilizing manure, it is crucial to have:

- an analysis of the nutrients being applied,
- a record of actual rates applied to crops, and
- uniform application across the field.

When combined with regular soil testing, potash deficiencies should no longer be a concern.

**Table 1 - Approximate Application Rates to Meet Specific Nutrient Needs for Common Field Crops**

		Application Rate to Meet			
		N Recommendations	Crop Removal P <sub>2</sub> O <sub>5</sub>	Crop Removal K <sub>2</sub> O	Maximum NMP <sup>1</sup>
Livestock Type	Crop Applied To	gallons per acre			
<b>Liquid Hog</b> (ave 4% DM)	Corn	5,500	2,200	2,000	5,500
	Corn Silage	5,500	3,600	9,800	5,700
	Soybeans	(6,500)*	1,500	3,000	4,300
	Wheat	3,300	2,200	6,700	3,325
	Forage	(11,650)*	1,800	10,800	7,500
	Canola	3,700	1,300	1,500	3,000
<b>Liquid Dairy</b> (ave 8.5% DM)	Corn	8,100	3,200	1,400	7,300
	Corn Silage	8,100	5,300	7,000	9,400
	Soybeans	(9,200)*	2,100	2,200	6,200
	Wheat	4,900	3,200	4,750	4,900
	Forage	(11,700)*	2,600	7,600	10,800
	Canola	5,300	3,300	1,000	7,500
* brackets mean N is removed but not required		tons per acre			
<b>Solid Dairy</b>	Corn	35	8.5	3.5	19.5
	Corn Silage	35	14	17	25
	Soybeans	(33)*	5.5	5	17
	Wheat	18	8.5	11.5	18
	Forage	(49)*	7	18.5	29
	Canola	24	9	2.5	20
<b>Solid Poultry</b>	Corn	12	1.5	1.5	3
	Corn Silage	12	2	7	4
	Soybeans	(7.5)*	1	2	2.5
	Wheat	4	1.5	5	3.5
	Forage	(9)*	1	8	4.5
	Canola	8	2	2	3

<sup>1</sup> Maximum NMP rate does not take p-index n-index or liquid loading into account since they are situation specific

**Assumptions:**

- Rates are rounded to the nearest 100 gal/ac
- Manure application occurs in spring into standing crop or incorporation occurring within 24 hours
- 125 bu corn (6 dm ton silage) in SW Ontario (137 lb N requirement)
- 75 bu wheat with straw removed; spring cereals will have similar rates for K, lower for N and P
- 3.3 ton DM mixed legume-grass hay
- 40 bu soybean yield, 45 bu canola yield
- Average hog, dairy and poultry manure values from NMAN databank

## Common Chickweed (*Stellaria media*)

by Mike Cowbrough, Weed Management, OMAF, Guelph & Peter Sikkema, University of Guelph

### History

Common chickweed occurs in a wide range of habitats, ranging from lawns and field crops to the floor of deciduous forests. Common chickweed is one of the widest spread weed species in Ontario.

### Lifecycle

Common chickweed is an annual or winter annual, reproducing by seed and by horizontally spreading leafy stems that root at the nodes. Common chickweed will flower throughout the spring, summer and fall. One plant can produce between 10,000 to 20,000 seeds. Seeds will germinate at a depth of 1-2 cm.

### Identification

Perhaps the most distinguishing feature of common chickweed is the single lengthwise line of fine white hair on one side of the stem, but switching sides above and below each node (Figure 1). Stems are prostrate to semi-erect. The leaves are opposite (2 per node), oval with pointed tips and smooth or slightly hairy (Figure 2). The flower of common chickweed is small with 5 "two lobed" white petals, which give the appearance of 10 tiny petals. For more information, refer to page 73, OMAF Publication 505, "Ontario Weeds".

**Figure 1.** Single lengthwise line of white hair on the stem of common chickweed.



**Figure 2.** Common chickweed at the seedling stage.



### Post Harvest Control

Post harvest control of common chickweed is advantageous, particularly under heavy populations, because chickweed can be a host to a number of non-beneficial insects (i.e. wireworm). Common chickweed will also keep soil conditions cool and wet, which may delay spring planting. Fall applications of Amitrol and glyphosate provide good control the following spring. Refer to the product label for specific planting periods after applying Amitrol 240.

**Table 1.** Spring control of common chickweed using post harvest applications of glyphosate and Amitrol 240 in autumn\*.

Product (product rate/acre)	% Visual Control
amitrol (0.5 L/ac)	95
amitrol (1 L/ac)	99
glyphosate (0.5 L/ac)	96
glyphosate (1 L/ac)	99

\*One field trial only. Peter Sikkema (Ridgetown College)

### Control in Corn

A number of corn herbicides provide excellent control of common chickweed (Table 2). Atrazine provides the most cost-effective control.

**Table 2.** Common chickweed control in corn using various herbicides\*.

Product (application timing)	% Visual Control
atrazine (pre or post)	99
Banvel II (post only)	99
Callisto (post)	99
Converge (pre)	99
Distinct (post)	99
Marksman (pre or post)	99
Pardner + atrazine (post)	99
Peak Plus (post)	99
Shotgun (post)	99
Summit (post)	99

\*One field trial. Peter Sikkema (Ridgetown College)

### Control in Winter Wheat

Field experiments conducted by Peter Sikkema have shown that Refine Extra (thifensufuron-methyl/tribenuron-ethyl) is the only product that will give adequate control of common chickweed in winter wheat (Table 3).

**Table 3.** A summary of 4 experiments which evaluated the common chickweed control in winter wheat using various post-emergent herbicides\*.

Product	% Visual Control
Refine Extra	97
Estaprop or Turboprop or Dichlorprop-D	37
Target or Sword	35
MCPA Amine	34
Buctril M or Badge or Mextrol	15
2,4-D Amine	12

\*Peter Sikkema (Ridgetown College)

### Best Time for Control

Common chickweed will essentially germinate all year round, provided it is not being shaded by other plant species. It is generally susceptible to herbicides at any stage. Therefore applications should be made so as to either minimize impact on crop yield or to reduce weed seed production.

### References

Alex, J.F. 1992. Ontario Weeds - OMAF Publication 505. Page 73. Ontario Ministry of Agriculture and Food. Toronto, Ontario.

Sikkema, P.H. 2000-2003. Weed Control Trials Research Report. Ridgetown College, University of Guelph.

### Climate Change Money For Farmers - Are We Any Closer?

by Adam Hayes, Soil Management Specialist, OMAF, Ridgetown

It is a well-known fact that agriculture is 10% of the problem when it comes to Canadian greenhouse gas emissions contributing to climate change. For years many agricultural organizations have been saying that agriculture could be 20% of the solution. This concept could put money in farmer's pockets. It looks as if we are moving closer, but it will likely be 2008 before payments could be received at the farm level.

Russia appears to be moving toward signing on to the Kyoto Accord. Once they sign that will make the accord legally binding to all the countries that have signed, including Canada. The federal government is active on many fronts with respect to Kyoto. For years, Canada has participated in international meetings, including the Kyoto accord and subsequent meetings. They have lobbied hard to have agricultural and forestry sinks included and have argued on other fronts for Canadian agriculture. To date, the current government has not indicated what direction it will take on the climate change issue. It is likely that they will continue to support the initiative, especially if the accord becomes legally binding.

### Environmental Grants

How will reducing greenhouse gas emissions benefit your bottom line? There are two possibilities. The first would be through grants. Through the Environment pillar of the Agricultural Policy Framework, there could be grants in the near future for practices that would lead to greenhouse gas reductions.

### Credit Trading

The second possibility is through offset trading or trading of credits to allow farmers or other sectors

to obtain credits for carbon stored in the soil or for emission reductions. A number of agriculture organizations continue to meet with Agriculture Canada to push for a system that could work for Canadian agriculture. These organizations feel that they have been able to positively influence the development of the offsets. The federal government will be releasing their latest vision of offset trading this fall for further consultation.

The way the system looks right now, projects could be started any time after 2002, but would not be eligible for tradable credits until 2008. This allows projects to start working on emission reductions now and prevents the projects from being considered business as usual by the beginning of the accounting period of 2008. It is hard to predict what the credits will be worth at this point. There are still a number of issues to be worked out. One of the key issues is whether participation in a grant program will prevent someone from claiming offset trading credits.

The federal government will be launching another round of the Pilot Emissions Reductions and Removals Learning program this fall. The program funds pilot projects to look at how trading might work in different sectors. This next round hopes to attract projects to pilot trades in agriculture.

### **Adaptation**

To date much of the focus has been on mitigation of greenhouse gases, and research in this area needs to continue. The other issue which Agriculture and Agri-Food Canada is beginning to look at more is adaptation. Even if the efforts to reduce greenhouse gases are successful, global warming will continue for quite some time. Strategies need to be developed to deal with the changing climate, such as shifts in insect populations, new diseases, and changes in production areas. You will hear more about this in the future.

At a provincial level an agreement was signed with the federal government, earlier this summer, to work more cooperatively on this issue. The provincial government continues to work with the federal government as they refine their Climate Change Action Plan. The Ontario Ministry of Agriculture and Food continues to provide input into provincial climate change policy and explores opportunities for agriculture.

## **Grain All Cozy By Christmas**

*by Helmut Spieser, Engineer, OMAF Ridgeway*

The corn should be almost completely harvested. The beans and cereals have been in the bin for some time. Just because you have the combine cleaned out and all the equipment under cover doesn't mean you are done for the season. There may be a few things that you have missed at the bins. If you harvested corn, particularly if you stored immature corn of lesser quality, you should be nervous. This dry immature corn has about 50% of the shelf life of dry mature corn. Immature corn does not keep as well as fully developed corn.

### **Core The Bins**

A good management strategy to eliminate surprises in stored grain, especially corn, is to core the bin. By removing two or three loads of grain from the bin and putting them back in the bin, you accomplish two things.

1. You remove that portion of the bin that contains the highest concentration of fines. Left undisturbed, these fines will restrict the flow of air through this central part of the bin. This could result in spoilage.
2. You establish the flow funnel through the grain. Come spring you know that the path to the unloading grate is clear.

Ideally these loads that you remove should be cleaned before they are put back in the bin. However, even if these loads are put right back in the bin without cleaning, the fines will be better distributed and won't offer as much resistance to air movement. Just moving a couple of loads of grain out and right back in again, breaks up the high concentration of fines that typically end up in the centre of the bin.

### **Clear The Vents**

Over time, material can be trapped on vent screens. If enough of the screen is covered, a reduction in airflow capability will result. The worst case could see vents completely blocked and the fan cause structural damage to the bin roof if the exhaust air has no place to go. Use a stiff brush to remove reddog and other materials from roof vents and eave openings. Having the fan on while cleaning the vents and eave openings will help blow this material outside the bin.

---

## Cool The Grain

Aeration is done at this time of year to cool the grain as winter approaches. Keeping the grain mass within 5C° of the average ambient temperature is crucial to prevent uncontrolled convective air movement within the grain mass. Convective air cells are moisture pumps. Convective air movement is caused by rising warm air. Warm air picks up moisture from the grain and when moist air contacts a cool surface it condenses and becomes water. Free water in a storage bin will lead to spoilage problems.

Run the aeration fan for sufficient time to completely cool the whole grain mass. Some fan run times to completely change the grain mass temperature for different aeration rates include; 1/5 CFM / bushel 75 hours, 1/4 CFM / bushel 60 hours, 1/2 CFM / bushel 30 hours, 3/4 CFM / bushel 20 hours and 1 CFM / bushel 15 hours.

## Bag the Fans

Fans that are not covered allow free air movement through the grain in the bin. This uncontrolled air movement through the fan, caused by wind, can change the grain moisture content and the grain temperature. The condition of the grain that you put in the bin at harvest may be changed as air moves through the fan. Freewheeling of the fan and motor can also cause component wear. The centrifugal start switch wears when the fan and motor are turned by the wind. These covers can be made of canvas or some other type of tarp material held in place with a bungee strap, plywood, metal or puckerboard cut the same diameter as the fan opening and fastened to prevent wind entry. The fastening system has to be quick and simple. The most important part of this system is a way to remind the operator to remove the cover before the fan is turned on. This reminder should be located on the fan switch.

## Clean out the Boot

The boot is the bottom part of the elevator leg. The grain is fed into the boot and picked up by the cups on the belt and conveyed upwards. Grain that fills the bottom of the boot is never picked up by the cups and will spoil quickly when in contact with moisture. The amount of grain accumulated in this space will depend on the size of your leg and how tight or loose the belt is. If you have recently tightened your belt there will be more grain in the bottom of the leg boot. It will be easier to remove this material before it freezes solid.

---

## Meeting Water Needs For Winter Grazing

*by Jack Kyle, Grazier Specialist, OMAF, Lindsay*

Late season and winter grazing can reduce your feed costs. Stockpiled forage makes good late season pasture. An acre of corn stalks will feed a beef cow for one to two months. Fencing and water are often the two obstacles to realizing these low cost opportunities. A temporary electric fence can effectively contain livestock. With cold weather and freezing temperatures, adjustments must be made to the watering systems.

Fortunately, nature provides for some of the water adjustments. Water requirements are reduced with cold temperatures. Animals will also eat snow to meet some, if not all, of their water needs.

## Snow

Pregnant non-lactating females, such as beef dry cows, can readily adapt to this type of winter pasture. They have a much lower water requirement than lactating females. If the animals have access to clean fluffy snow, they will not require any additional water. Studies at the University of Alberta in the early 1990's showed that non-lactating pregnant females received adequate water from the snow, and produced as well as those animals that had access to water in a trough or water bowl.

When livestock are eating stockpiled forage, it is usually fairly high in moisture content and covered with snow. In the process of eating they are going to ingest a significant amount of snow. When these water sources are considered, along with the reduced requirement during the cold weather, the amount of extra water required is not as high as one would expect. The snow should be soft and fluffy so that the livestock can easily eat it. Hard, icy snow will scratch the animal's muzzle and discourage intake.

## Water Sources

It may be practical for livestock to walk a greater distance to water than would be acceptable in warm weather because their water requirements are low. In cold weather, dry cows will likely only drink once or twice per day. There won't be as much time spent walking to water as in the summer when consumption is much higher. The

herdsman can make effective use of a single water source and ration the stockpiled forage by starting the grazing close to the water and advancing the fence.

A solar or wind powered air bubbler system can be used to prevent a water trough or surface water source from freezing over. Using a water wagon to haul water is another possibility. The livestock water requirements are lower, so this option will be more practical than in the summer months.

Winter grazing will reduce the requirement for stored feed and reduce feed costs. Refer to “Turn Corn Stover to Low-cost Pasture” (Dec 2003 Crop Talk) and “Stockpiled Pasture” on the OMAF Forage Website [www.gov.on.ca/OMAFRA/english/crops/field/forages.html](http://www.gov.on.ca/OMAFRA/english/crops/field/forages.html). By investing a few dollars in temporary electric fence and using snow as a water source, you will be able to utilize forage that would otherwise be lost to your operation.

## **Edible Beans – Plan Before Planting**

*by Brian Hall, Edible Beans & Canola Specialist, OMAF, Stratford*

Excellent yields and strong prices in 2004 have increased interest in growing edible beans. Selecting the right field to grow edible beans is one of the most important considerations. Edible beans are a more delicate crop than soybeans, require more management, and are less tolerant of variable soil conditions. Factors such as soil type, drainage, stoniness, weed pressure, previous crop (s), soil structure, previous herbicides have a large impact on successful bean production.

### **Soil Compaction**

Soil compaction can be a major problem in edible bean production. Some growers have reported yield reductions as high as 50% caused by soil compaction. The affects of tillage, planting, harvesting and other field operations on soil compaction should be carefully considered. Compaction takes time to alleviate and cannot always be overcome through tillage. Some soils recover from compaction as a result of freezing and thawing, or wetting and drying cycles. Deep compaction below the top few centimeters of soil can last for more than 6 years.. Avoid growing edible beans in fields in which compaction is a concern.

### **Soil Structure**

Edible beans are one of the most responsive crops to good soil structure. Heavy soils that have poor drainage, crust, or are hard to till, increase the risk of uneven emergence and poor stands. Uneven emergence results in uneven ripening, delayed harvest and immature beans that increase the “pick” and lower grade and price at market time. The previous crop has a large influence on soil structure.

One good measure of soil structure is aggregate stability. A low index for water – stable aggregates means that soil aggregates will dissolve readily in water and form soil crusts. These soil crusts reduce seedling emergence, water and air penetration and lead to consolidated soils that restrict root growth. It is generally regarded that the field crops that promote aggregate stability are (in order of greatest to least): forage grasses > forage legumes > winter cereal (especially when plowdown red clover is also included) > spring cereals > corn > soybeans > edible beans. Is it any wonder some dairy and beef producers have some of the highest average edible bean yields? Of course, these producers also practice a long rotation of 4 years or more between bean crops.

### **Disease Control**

Crop rotation is the most effective biological control method for controlling a number of soil borne diseases. Two important diseases of edible beans, white mould and root rot, attack several crops and crop rotation must take this into consideration.

White mold survives from year to year in overwintering structures in the soil called sclerotia. 2004 was an ideal year for white mold that provided a huge inoculum source of sclerotia for next year. White mold can affect edible beans, soybeans, sunflowers, mustard and canola. Some broadleaf weeds can also act as alternate hosts for white mould. Maintaining a minimum 3 – 4 year rotation between these crops reduces the risk. Tillage is not effective in reducing the inoculum level, because the overwintering structures can survive a long time in the soil. Reduced tillage has been credited with reduced survival of sclerotia because it favors the bacteria that breakdown these structures.

Root rot is more challenging to control through rotation because it has a wide host (crop) range.

---

The organisms that cause root rots are often invasive, infecting plants that are under stress. Soil compaction, poor drainage, frequent cropping to beans, and other factors cause plant stress that favours root rot. Seed treatments can help to protect seedlings during emergence, but do not provide season long control. If you can provide an environment that gets beans off to a fast start, and keep them growing, root rot is often not much of an issue. Long rotations (4-5 years) reduce the severity of the disease. Plant beans only on well-drained soils or try to improve drainage.

### **Weed Control**

Options for controlling annual broadleaf and perennial weeds are more limited in edible beans, so they need to be controlled in the previous crop. Annual weeds, such as ragweed, can be a problem if beans follow winter wheat, and if there are weed escapes. Some perennial weeds like nightshade and pokeweed can cause staining of beans at harvest. Corn is often favoured as a previous crop because of the number of options for controlling problem weeds.

### **Insects**

Seedcorn maggot and wireworm can sometimes be a pest problem of edible beans. The risk of these pests will be greater following a forage crop or plowdown.

### **Tillage**

White and black beans have been the most easily adapted bean types to a no-till system. All edible beans respond to some tillage. This is often because of the less aggressive root system of edible beans. In a no-till system, within-row tillage is beneficial for white and black beans. For most other bean types, conventional tillage is most suitable.

### **Previous Crop**

When all these factors are taken into consideration, the previous crops that are often most suitable for edible beans are corn, followed by forages and cereals. A previous crop of corn, provides a good opportunity to control weeds, and an effective break in edible bean diseases. A cereal crop in which weed control was good would be preferred over a corn field, in which compaction might be an issue following a wet fall harvest. Forages provide the best soil structure, but soil insects and weed pressure could be an issue.

### **Manure**

Some mention should also be made of the success some producers have in growing edible beans on a field in a good rotation that also received manure the previous year. Edible beans tend to respond more to residual fertility than applied fertility. Research is beginning to identify the value of manure in promoting a healthy soil microorganism profile, and in some instances, suppression of some crop pathogens.

Good soil structure and a long rotation are cornerstones in successful edible bean production. It is very likely that seed production issues and the increased interest in white beans may limit seed availability for the most popular white bean varieties in 2005.