

CROP TALK

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Ramping Up Production - New Life For Barley and Oats?

by Peter Johnson, Cereal Specialist, OMAFRA

Short on heat? Wet corn with big drying bills? Light test weight and grade discounts? In the areas of Ontario that can grow great spring cereals, 2009 has been a tough year for corn! Many growers had moved away from spring cereals in favour of more yield potential and theoretical profit in corn. After this harvest, it is time to reassess.

There are some excellent premium markets that have developed over the last few years in barley and oat production. Barley contracts are available over $200/tonne! Spring wheat can be an excellent crop. Yet, the acreage of these crops is shrinking. Despite the cool season in 2009, spring cereal yields were only fair. We need to reassess how we grow these crops and do a better job!

In winter wheat, we have had a project aimed at increasing yields termed the “SMART” Project (Strategic Management Adding Revenue Today). The results have been incredible, with a 23 bu/ac (25%) yield gain in 2009. This project combines the interaction of nitrogen, fungicides and growth regulators. In 2010, we hope to initiate a similar project in spring cereals. If you are interested, please contact me at 519-271-8180 or peter.johnson@ontario.ca.

Checklist For Spring Cereal Success

Meanwhile, with a challenging corn experience fresh on growers’ minds from 2009, crops like barley and oat are back on the options list. Here is the checklist for the best possible spring cereal crop:

- **Seed EARLY**! More importantly than any other factor, seeding date will determine your yield potential.
- Use **starter fertilizer**. Seed placed starter has huge benefits for cereals, especially if seeded early into cold soils.
- **Seed shallow**, but into moisture. With good soil moisture, target 1 inch (2.5 cm) planting depth.

- Excellent **genetics** (www.gocereals.ca) at the right **seeding rate** (Agronomy Guide, OMAFRA Publication 811).
- **EARLY weed control!** Initial research shows the critical weed control period in barley to be the 1-3 leaf stage. Virtually no one has sprayed that early in the past.
- **Rotation**. Spring cereals work best after a legume, not after corn.
- **Nitrogen** increases yield, but it also causes lodging. This is where we need more research.
- **Fungicides**. On oat there is only one option - spray at flag-leaf to control rust. In spring wheat there is only one option - spray at heading to control fusarium. In barley there likely is no option, but we haven't discovered the reason yet.
- **Harvest EARLY**! Nothing good happens to the crop after it reaches maturity (28% moisture). Get it out of the field!
- Take advantage of **market opportunities**! Lock in some of those good contracts.

If we start growing spring cereals like we mean to make money, maybe we won't have to rely on corn and soybeans as the big guns for profit!

Spring Wheat Yield Response to Fungicide

by Gilles Quesnel, Field Crop IPM Specialist, & Scott Banks, Emerging Crops Specialist, OMAFRA, Kemptville

Trials conducted in 2009 showed a 7 bu/ac (12%) yield response to foliar fungicides! These trials show the value that foliar fungicides can have on the spring wheat crop when applied using appropriate technology and proper timing. Quality data will be reported when available.

The trials were located at the Winchester Farm of the Kemptville Campus, University of Guelph. Three treatments were compared to untreated checks:

- Proline® at 170 mL/acre (high rate),
- Proline® at 128 mL/acre (low rate), and
- a tankmix of Proline® at 64 mL/acre plus + Folicur® at 59 mL/acre.

All treatments were applied at flowering (Day 4), using Turbo FloodJet nozzles, alternating forward and backward at 20 inch spacing, 12 inches above the wheat canopy. Treatments were replicated 4 times within each plot.

Yield Response

In Trial A, yield response to Proline® was 7.67 bu/acre for the high rate treatment and 6.33 bu/acre for the low rate treatment. Yield differences were significant between the treated and the untreated plots, but there was no significant yield difference between Proline® high rate and Proline® low rate treatments (Table 1), despite the small numerical yield gain.

Table 1 - Yield Response Of Spring Wheat To Fungicide Application – Trials A

Treatments	Yield (Bu/acre)
Proline® high rate	67.75 a
Proline® low rate	66.41 a
Untreated check	60.08 b

Means in a column followed by the same letter are not significantly different. p=0.0004, CV 4.7

Trial B measured the yield response of Proline® low rate and a tankmix of Proline® and Folicur® to an untreated check. Yield response to the Proline® low rate treatment was 7.2 bu/acre, while response to the Proline® and Folicur® tankmix was 4.6 bu/acre. Yield differences were significant between the treated and the untreated plots, but there was no significant yield difference between Proline® low rate and the Proline® and Folicur® tankmix treatments (Table 2). The rates used of the Proline/Folicur tankmix are lower than what will be recommended with the new Proline /Folicur tankmix product available called Prosaro.

Table 2 – Yield Response Of Spring Wheat To Fungicide Application - Trial B

Treatments	Yield (Bu/acre)
Proline® low rate	65.9 a
Proline® + Folicur® Tankmix	63.3 a
Untreated check	58.7 b

Means in a column followed by the same letter are not significantly different. P=0.02, CV 4.21

Fungicide Treatment Costs

The fungicide plus application cost is approximately $30 per acre for the Proline® and Folicur® tankmix, $36 per acre for Proline® low rate and $45 per acre for Proline® high rate. With most 90 foot boom sprayers, trampling losses are about 2.5%. On a 65 bu/acre crop this represents a 1.6 bu/ac loss. At $5.50 per bushel for spring wheat, trampling adds $8.80 per acre to the treatment cost. Quality data is not available at this time, but may improve the economics of the foliar fungicide treatment. For more information on fungicide use consult the Field Crop Protection Guide, OMAFRA Publication 812.

Note that this is only one year's data. This study is to be repeated next season.

Acknowledgements

Cheryl Wightman, Kemptville Campus, University of Guelph.

Improving the Success of Red Clover Establishment In Winter Wheat?

by Ian McDonald, Applied Research Coordinator, OMAFRA and Dr Bill Deen, Crop Science, University of Guelph

Successfully establishing red clover in winter wheat can sometimes be challenging. Red clover in a corn-soybeans-wheat rotation can provide tremendous benefits. A good red clover stand can provide a nitrogen credit to the following year's corn crop of 70 lbs/ac. Red clover also provides erosion control and breaks compaction. The additional organic matter provides improved nutrient status, water holding capacity and many other benefits.

Current research by the University of Guelph, Brant County Soil & Crop Improvement Association and the Ontario Ministry of Agriculture, Food & Rural Affairs is trying to answer the question of how to establish red clover in winter wheat more consistently. This has been well researched in the past, but the solutions to the frequent poor results continue to elude us. Studies have looked at tillage, seeding time, seeding rate, type of red clover, seed treatments, drought and other factors.

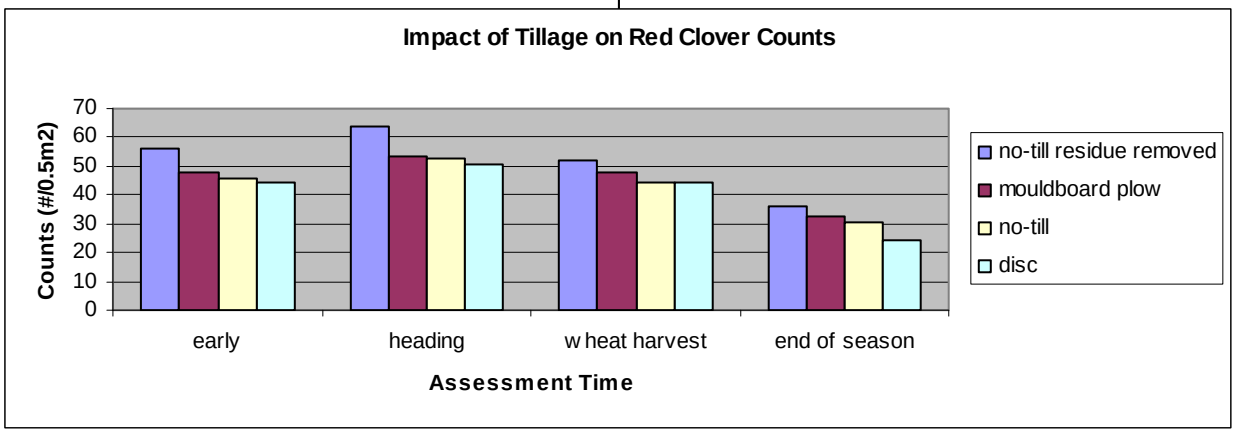
Tillage

The Cropping Systems group at the University of Guelph conducted a two year, 5 location study to compare tillage systems ahead of wheat planting. (Figure 1). Tillage treatments were:

- no-till with soybean residue removed ahead of wheat planting,
- mouldboard plow,
- no-till, and
- disc.

Germination of red clover did not appear to be affected by the production system (no-till vs tillage vs previous crop residue removal). Non-uniform stands of red clover resulted from plant death, not a lack of emergence. The majority of stand loss appeared to occur between wheat flowering and harvest, regardless of the system. Better stands of red clover were seen with the residue removal and tillage treatments compared to the no-till alone. These treatments of residue reduction through removal or tillage may be reducing red clover predation by slugs or other insects. Tillage/residue removal may be altering drought sensitivity. Sensitivity to drought may be affected by improved root growth and establishment under residue removal systems.

Figure 1



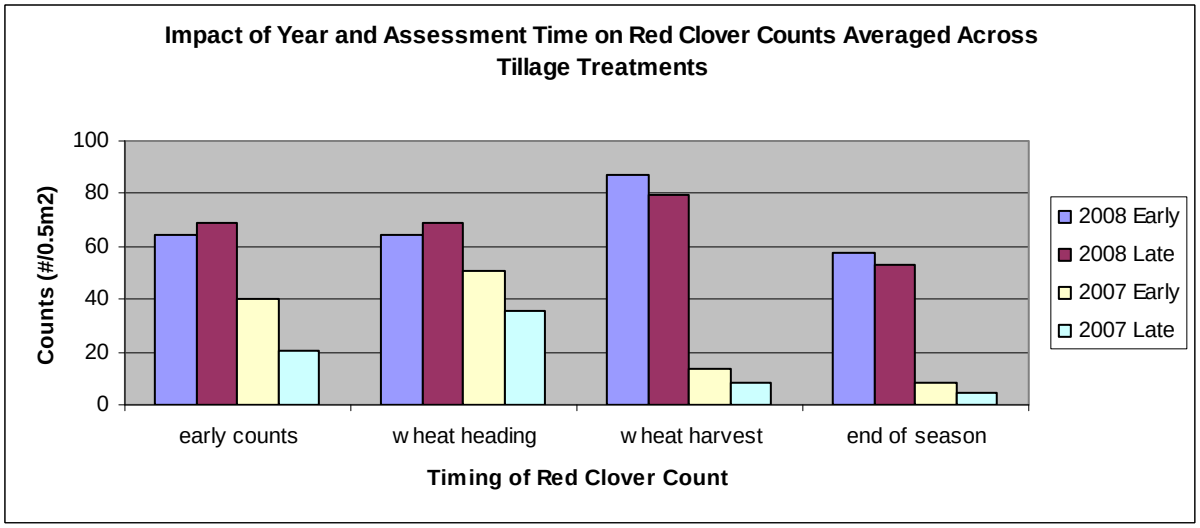
Time of Red Clover Seeding

Two red clover seeding methods were looked at:

- early broadcasting (frost seeding) - usually mid-March
- late broadcasting (when soil conditions allowed) – usually mid-April (Figure 2)

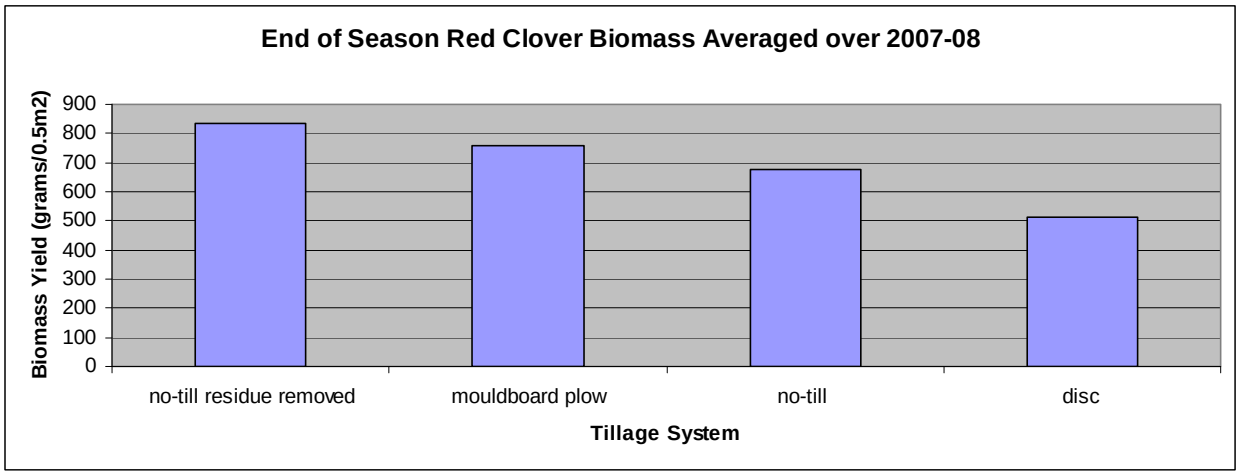
Year & Time of Assessment
Establishment differences were observed depending on the year looked at (2007 vs 2008), as well as the time of year that you did the red clover assessment (stand count) was completed. (Figure 2) In the dry year of 2007, stand counts reached a maximum prior to wheat flowering and consistently fell after heading. (Figure 2) In the wetter year of 2008, stand counts were much higher than in 2007 at wheat flowering and continued to increase up to the time of winter wheat harvest. Stand counts declined by the end of the season, possibly due to self-thinning.

Figure 2



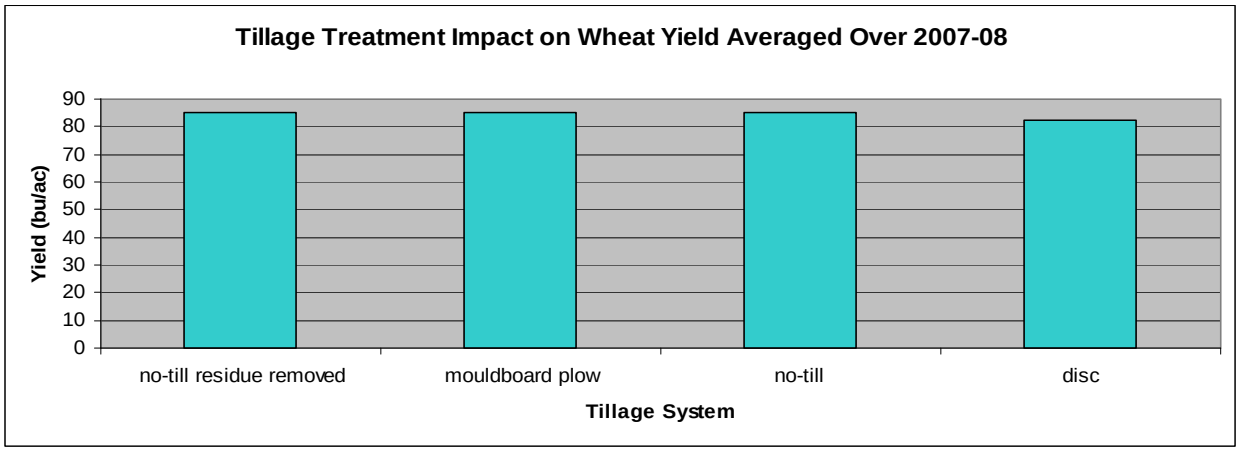
End of Season Biomass
Red clover biomass at season end was greater with the no-till treatment where soybean residue was removed, but not significantly different from the mouldboard plow or no-till treatment.

Figure 3



Tillage Before Wheat Planting
Wheat yield was not impacted by the tillage treatments applied before wheat planting. (Figure 4)

Figure 4



Bottom Line
These studies suggest that better red clover stands are possible when the previous soybean residue is removed by either tillage or physical removal, such as baling. Where soybean residue was removed, there were no differences observed in winter wheat yields. Red clover stand count in a dry year is considerably less then in a wet year. Earlier planting was more important in a dry year than in a wet year.

Additional red clover establishment in winter wheat trials were established in the fall of 2008 and 2009. The results of the red clover establishment trials that were seeded this spring will be reported in the next issue of Crop Talk.

What Will It Cost To Grow A Tonne Of Switchgrass?

by Scott Banks, Emerging Crop Specialist, OMAFRA

There has been a lot of talk about the combustion of crop residues and dedicated crops, such as switchgrass, for bio-energy. Currently, markets for switchgrass are very limited, but many growers and processors anticipate that this crop could become commercially viable in the future.

So what does it cost to grow a tonne of switchgrass? This is a good question. The economics of growing a new crop needs to be considered to evaluate cropping alternatives. OMAFRA has pulled information from various sources in Ontario, Quebec and the US to develop a crop budget for switchgrass. The switchgrass enterprise budget is available on the OMAFRA website at http://www.omafra.gov.on.ca/english/busdev/bear2000/Budgets/Crops/Forages/switchgrass_static.htm

Crop budgets are a simple format for estimating expenses. The example costs are only a guide to illustrate a method of preparing your projections. They are based on many assumptions, including land rental rates, seeding rates, fertilizer costs , etc. Due to regional differences, there may be considerable variation in results. Land costs and projected yield are significant factors in determining the cost-of-production.

In the example switchgrass budget, the Total Establishment Cost per acre is $389.61. Amortizing the establishment cost over 10 years, the Annual Cost including inputs, harvesting, etc., is $226.53 per acre or $73.07 per tonne based on an assumed yield of 3.1 tonnes per acre.

To project your breakeven price, enter your farm figures in the spaces provided. The resulting estimate can help assist you in choosing your future crop mix, set target prices and develop marketing strategies for your farm.

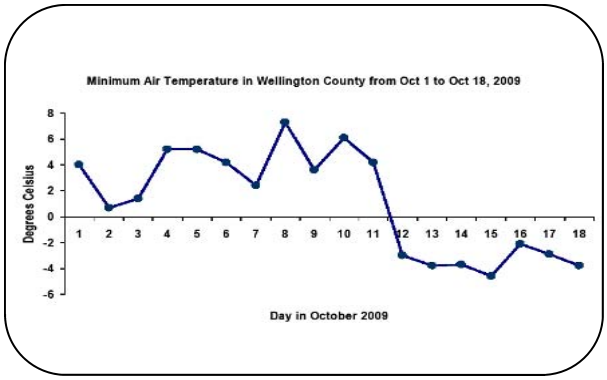
Excel versions of the crop budgeting worksheets can be found on the “Budgeting Tools” website at http://www.omafra.gov.on.ca/english/busdev/bear2000/Budgets/budgettools.htm.

Eastern Black Nightshade Can Handle A Good Frost

by Mike Cowbrough, Weed Management Lead, OMAFRA

The sight of nightshade's purplish/black berries in a "food grade" soybean crop is every producer's worst nightmare. They stain the seed and dramatically reduce the value of the crop. In theory, you would kill uncontrolled nightshade prior to harvest with either a herbicide (i.e. Reglone, glyphosate) or Mother Nature (i.e. a frost). The berries would drop to the ground, never go through the combine and the seed would be left unstained. Unfortunately this is a theory, and reality shows us otherwise.

Around the 12th of October, a significant frost was observed in Waterloo/Wellington area that resulted in a number of annual weed species "dying off" in soybeans. The one notable exception was nightshade. Even though the leaves were finally starting to wilt after 4-5 days of consecutive frosty mornings, the berries were still very much attached to the plant. Plant dessication with herbicides has proven equally ineffective, as many berries will still cling to the plant even after it has died off. The average plant in this field had 280 berries, with each berry averaging 60 seeds, for a total of 16,800 seeds per plant.



If you had Eastern Black Nightshade in a field of "food grade" soybeans it's either because:
1) You didn't know it was there in the first place, or
2) You knew it was there, but the herbicide was ineffective

Public trials conducted by the University of Guelph (Sikkema, Swanton and Tardif) have shown that the following herbicide programs provide greater than 80% control of Eastern Black Nightshade in soybean.

1) Pursuit (PRE or POST - 99% visual control)
2) Lorox L (PRE - 99% visual control at the highest labeled rate)
3) Dual II Magnum (PRE) followed by Reflex (POST - 98% visual control)
4) Dual II Magnum (PRE, highest labeled rate - 87% visual control)
5) Frontier (PRE, highest labeled rate - 80% visual control)

Valtera, a recently registered soil applied herbicide, is also effective at controlling nightshade.

If you have used one of the above herbicide treatments and they did not provide adequate control, it may be possible that the population of Eastern Black Nightshade in your field is resistant. The University of Guelph can test to determine if it is herbicide resistant. Refer to www.plant.uoguelph.ca/resistant-weeds/services/.

Wet Weather Creates Hurdles For Manure Application

by Christine Brown, Nutrient Management Lead, OMAFRA, Woodstock

Protecting water from manure would be a lot easier if the weather would cooperate. After a spring and summer that have been cooler and wetter than normal, crops and field work are behind based on calendar dates, but manure storages are filling to capacity on or ahead of schedule.

Many soils are wet and field tiles are running. With long term forecasts calling for more rain, many manure storages will be at or close to capacity. A large acreage of corn remains in the field. Risk of field damage from soil compaction makes field work difficult, especially on heavier soils. Water contamination from field tiles and surface runoff risks must be considered when applying manure during a wet and/or wintry October, November or December.

For some farms, manure application will need to occur in "winter" conditions. "Winter", for the purposes of this article, is defined as frozen or snow covered soils, not the calendar date. For others, manure application will be the contingency plan to avoid an overflowing storage. In some fields, frozen soils may be required before tankers can manoeuvre them.

In wet conditions the ideal option is still to surface

apply manure onto crop residue followed by incorporation of the manure as soon as possible after application.

However, where this is not possible a common sense approach to minimize water or soil contamination is required. This includes identifying and managing high risk areas. Options for manure application during a wet harvest season or in "winter" conditions are as follows:

1. **Custom Application**
   Is this the year where custom application makes the most sense? It is important to consider place and method of application. Consider hiring a custom applicator if harvest and workload dictates that manure application cannot be done to meet environmental or farm needs. A custom applicator with site specific or GPS capabilities is able to map the location and rate of manure application so that commercial fertilizer supplementation becomes easier next spring.

2. **Records**
   Keep records of where manure has and hasn't been spread for crop nutrient and liability purposes.

3. **Avoid Injection Into Wet Soils**
   Injection of liquid manure isn't a good option in wet soils. Wet soils smear more easily, especially when combined with additional and concentrated liquids at each injection point. Surface application onto crop residue (ideally corn) followed by tillage at the earliest opportunity will result in the least amount of compaction damage in wet soils.

4. **Avoid Contaminating Surface Water**
   Spread on fields or parts of fields with the least slope. Start with fields where there is no access to surface water. Water flow patterns are obvious in most fields during a storm. Take note of these areas and avoid manure application to them as well as other areas where there is evidence of ponded water or eroded rills through the field.

5. **Consider Snowmelt Runoff**
   If manure is being applied to snow covered fields, consider the soil under the snow. Risk of contaminated runoff is highest where rainfall is combined with melting snow over frozen soils. Where will the runoff move? Snow covered fields with unfrozen soils, still have some capacity for infiltration. However, compaction could be an issue and there is still risk of contaminated runoff depending on conditions at snow melt. Target manure application considering snowmelt runoff patterns and avoid application in high risk areas.

6. **Separation Distances From Watercourses**
   Maintain separation distances from watercourses. Under good spreading conditions, the recommended separation distance from any watercourse normally ranges between 40 and 100 feet, depending on runoff risk. In winter application, the separation distance should be at least 100 feet. In the Nutrient Management regulations, the minimum setback increases to 330 feet with winter application where slope to the watercourse is greater than 3% for liquid manure, or 6% slope where solid manure is applied.

7. **Separation Distances From Surface Inlets**
   Surface inlets or hickenbottoms act as direct conduits to surface water. In a wet year, the risk of water contaminated with manure moving through surface inlets increases. As a result, separation distances from hickenbottoms or inlets should be the same as for watercourses.

8. **Keep Application Rates Low**
   A rate of 5,600 Imperial gallons per acre (6,800 US gal/ac) is the equivalent to ¼ inch (6 mm) evenly applied across spread width. Consider the soil conditions at the time of application. If a ¼ inch of rain fell in one minute, would it runoff or move?

9. **Monitor & Be Prepared to Implement The Contingency Plan**
   For all manure application options, monitoring is essential to ensure that contamination of water sources does not occur. If a spill or discharge to a watercourse does occur, it is required by law for the producer or operator of the application equipment to immediately contact the Spills Action Centre at 1-800-268-6060, followed by implementation of the farm's contingency plan.

10. **Alternate Manure Storage?**
    Consider alternative storage if available. Some neighbours may have sold their livestock, but still have manure storage space that could be "rented".

11. **Temporary Solid Storages**
    Where temporary field storages will be used for solid manure, make sure that the location is flat, and away from water sources and tiles locations. Location with respect to neighbours should also be considered due to potential odour complaints.

Sewage biosolids can not be applied during "winter". Details regarding temporary storage, and winter application is covered in more detail in OMAFRA Factsheets:

Temporary Field Storage of Solid Manure or Prescribed Materials (Factsheet #05-009) www.omafra.gov.on.ca/english/engineer/facts/05-009.htm and

Applying Manure and Other Agricultural Source Materials in Winter (Factsheet #04-069). www.omafra.gov.on.ca/english/engineer/facts/04-069.htm .

New Nutrient Management Rules – What Do They Mean for Crop Producers?

By *Christine Brown, Nutrient Management Lead, OMAFRA, Woodstock*

Sewage Biosolids and other non-agricultural sourced materials (NASM) have gained popularity during the past few years as a relatively inexpensive source of nutrients and organic matter. Crop producers using these materials will find that the application of non-agriculture sourced materials (NASM), such as municipal sewage biosolids, anaerobic digestate or vegetable waste, will become more similar to the application of manure nutrients on livestock farms.

You may have heard about some new Nutrient Management Regulations that were announced in mid-September regarding Non Agricultural Sourced Materials. These regulations focus on the land application requirements for materials such as municipal and paper mill biosolids, food processing waste, yard waste and other materials that were previously regulated by the Ministry of the Environment (MOE) under the Certificate of Approval (C of A). Consultants working with biosolids application will see significant changes due to the new NASM regulations. For producers the changes will mark a modification in how this nutrient source is managed in a cropping system.

There will be a transition period as the new regulations become implemented. January 1, 2011 is the date when all the changes are expected to be complete.

OMAFRA will be responsible for the administration of the regulation which includes approvals of nutrient management plans (NASM plans), as well as training requirements. Inspections to ensure the NASM is managed in accordance with requirements under the *Nutrient Management Act (NMA)* will be conducted by MOE. MOE will also continue to respond to complaints and/or notification of spills.

The regulatory changes were established to improve efficiencies and reduce the regulatory overlap that existed between the C of A system and the *NMA*. Gone will be the days of applying for a C of A in addition to including NASM in the nutrient management plan. The new approach will divide NASM into 3 specific categories, based on the source of the material. The quality and nutrient content of the material is used to determine application rates and setback distances from sensitive features such as water courses, residences and wells

Category 1: primarily unprocessed plant material such as cull fruit & vegetables and peels.
Category 2: processed plant materials such as bakery and brewery washwater and organic matter
Category 3; materials from animal or animal processing origin such as washwater from meat, egg and dairy processing, abattoirs washwater and municipal sewage biosolids

Category 1 has materials such fruit and vegetable peels with no chemical treatment that can be land applied at an application rate of less than 20 tonne/ha (9 ton/ac). These materials have relatively low levels of metals or pathogens and therefore do not require a plan or testing. Category 3, on the other hand, includes highly processed materials which require testing and a plan that establishes an application rate limit based on nutrients or metals and setback distances based on odours.

For Category 3 materials such as sewage biosolids, the metal and pathogen limits are unchanged. Metal concentrations above the limits result in the NASM not being eligible for land application. Application rates will also be based on the most limiting of nitrogen or phosphorus – similar to manure application.

Farms that receive NASM will not have to complete a whole-farm nutrient management plan. However, there will be the requirement for a nutrient management plan (called a NASM plan) for the field(s) to which the NASM will be applied. Nutrient management software (NMAN) will have all the regulation changes incorporated into its next update, (expected in the spring of 2010). Also unchanged is the requirement that fields receiving NASM have phosphorus fertility levels of less than 60 ppm. Biosolids pellets or other fertilizer products utilizing biosolids that are regulated by CFIA will not be affected by the new NASM regulations.

Much more detail on the new NASM regulations can be found at http://www.omafra.gov.on.ca/english/nm/