

# CROP TALK



## OMAFRA Field Crop Specialists—Your Crop Info Source

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### Even More Soybean Problems? Soybean Seed is Small!

*by Horst Bohner, Soybean Specialist*

Dry! Hot! Aphids! These factors proved to be too much for last year's soybean crop. Along with harvesting half the yield seed quality and size were reduced tremendously. How will 2002 soybean growth and final yield be affected by planting small seed?

August environmental conditions are critical for soybean development. Seed size is determined by both genetics and the environment in which the seed develops. Severe stress on a soybean plant during flowering and seed fill can drastically reduce seed size and quality. Seed companies are reporting that soybean clean out is up to 50% this year. Soybean seed size this spring will be smaller than normal.

### Seed Germination

Seed from soybean plants that experienced stress during seed fill often have reduced germination. Research indicates a 5% drop in germination when plants are exposed to drought during seed fill. High air temperature during seed fill also substantially reduce germination. In one experiment seeds that developed at a day/night air temperature of 27/22°C had 84% germination, but those exposed to high air temperature stress (32/28°C) for 35 days had only 73% germination. The largest reductions in germination occur when high air temperatures and severe water stress occur at the same time. In one study the average germination dropped from 91% to 69% when plants were exposed to high air temperatures along with severe water stress!



Ontario Ministry of Agriculture, Food and Rural Affairs, Crop Technology Branch

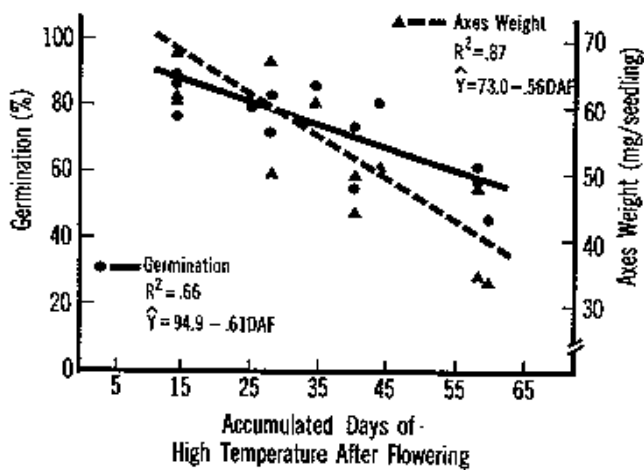
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## Seed Vigour

As seed quality declines, seed vigour drops off more rapidly than germination. Even if germination is relatively good, vigour may be considerably lower. Soybeans exposed to water stress during seed fill show a 12% drop in the seedling axis dry weight (a measure of vigour) compared to a 5% drop in germination. Figure 1 shows that with increased stress, vigour declines more rapidly than germination.

**Figure 1.** Germination and seedling vigour response to seed maturation under increased periods of high temperature. (Keigley and Mullen, 1986)



Not only was 2001 extremely dry, but it was unusually hot. Ridgetown reported 11 days above 30°C in June and July, and perhaps even more importantly, the first 9 days of August were all above 30°C. Soybeans can withstand heat stress when they have adequate moisture, but heat coupled with drought leads to significant declines in seed quality.

## Emergence

Depth of seeding, weather, genetics, vigour and seed size all interact during emergence. Seed size is the least important of these factors. Some studies indicate slightly reduced emergence of the smallest seeds within a seedlot. However the seeds tested in this research were extremely small and would be removed during seed cleaning. Studies show that across a broad range of seed sizes, effects on emergence are insignificant at normal seeding depths.

## Plant Height

Some differences in final plant size have been reported when small seed is planted. One reason may be the greater amount of stored energy in a larger seed (used by the growing seedling) allows the seedling a better start and results in a slightly larger plant later in the season. Table 1 gives the results of a comparison of 10% of the largest and 10% of the smallest seeds from a seedlot. The smallest seed produced slightly smaller soybean plants.

Table 1

Seed Size	Plant Height
Largest 10%	89.4 cm (35.2")
Smallest 10%	84.6 cm (33.3")

These differences are minor and would not have a significant impact on yield.

## Final Yield

The impact of seed size is minimal on final yield. Remember, large or small seed contains the same genetic material; therefore the genetic potential of the plant remains the same. When purchasing soybean seed, the quality of the seed is for more important than the actual size of the seed.

How much will last year's conditions affect this year's crop? Only germination and vigour are affected significantly. Get a germination and vigour test! Certified seed will state the germination on the bag, but you should ask for vigour test results. If you're planning on using bin run seed, get a certified lab to check both germination and vigour.

## Opportunities In Oats?!

by Scott Banks, Emerging Crop Specialist,  
Kemptville OMAFRA

Oat prices have been near record levels this winter! The future markets for September are above average. There is renewed interest by Quaker Oats in "quality" Ontario oats for milling in Peterborough. The key word is **quality!** The first question asked by growers is "what if my oats don't make the grade"? And what is the grade? Quaker Oats needs milling oats with good test weight (38 lbs. per "winchester" bushel), large

kernel size, high groat yield, high protein content and low oil content. In Ontario, varieties with milling quality are AC Goslin, AC Aylmer, Ida, Assinaboia, AC Francis and, new for 2003, AC Vermont. Groats must be a bright, natural colour and free from other grains, foreign material, grain insects & mites. Table 1 lists requirements, along with an example milling oat discount schedule. Another market opportunity for oats is the premium feed trade. The premium feed oat market also has quality requirements. Table 2 lists the specific requirements and an example feed oats discount schedule.

The feed oat price is determined by local supply & demand more than most other grain and oilseed crops. Note the large discounts associated with weathered oats! Harvest as soon as the crop is ready to avoid any potential weathering.

For pricing information, check out the Oat & Barley Council of Ontario's website at: <http://www.oatbarley.on.ca/home/> and look under Market Information for prices and elevations receiving oats

**Table 1 - Milling Oat Discount Schedule \***

Moisture	Discount	Test Weight	Discount
13.0%	0.00	40.0	0.00
13.5%	2.00	39.0	0.00
13.6%	3.00	38.0	0.00
13.7%	4.00	37.5	1.00
13.8%	5.00	37.0	2.00
13.9%	6.00	36.5	3.00
14.0%	7.00	36.0	4.00
above 14 %	reject	below 36.0	reject

Max 10.0 % small oats allowed (pass through 5/64 x 3/4 slot sieve)

Max 1.0 % barley allowed. Max 1.0 % wheat allowed

Max 1.0 % wild oats. Max 1.0 % canola allowed.

Max 0.2 % heat damage

Groats must be bright natural colour

Example only. Check with your elevator for specific discounts.

**Table 2 - Feed Oats Discount Schedule**

Moisture	Discount (\$/t)	Test Weight	Discount (\$/t)
13.0%	0.00	40.0	0.00
13.5%	0.00	39.0	0.00
14.0%	0.00	38.0	0.00
14.5%	1.00	37.0	2.00
15.0%	2.00	36.0	4.00
15.5%	4.00	35.0	6.00
16.0%	6.00		
above 16 %	reject		
	<b>Slightly Weathered</b>		<b>15.00/mt</b>
	<b>Weathered</b>		<b>25.00/mt</b>

Max 1.0% barley allowed. Max 1.0% wheat allowed  
 Max 1.0 % canola allowed. Max 0.2 % heat damage  
 Max 1.0 % wild oats

## Spring Canola Regaining Ground

*by Brian Hall, Alternative Cropping Systems Specialist*

Canola acres are set to rebound this year. After two years of decreased acreage in Ontario (25% less each year), there are good reasons to consider spring canola. With higher prices, and advancements in varieties and production practices, the excitement is back in canola!

Higher yielding hybrid canola, and herbicide tolerant canola are large improvements over older open pollinated types. Hybrid canola varieties are shorter than open pollinated canola, allowing direct combining, although the majority of canola is still swathed. Growers have adopted either no-till or minimum till seeding of canola.

The recommended nitrogen rate for canola is 130 kg/ha (115 lb/ha). Canola has the same phosphorus requirement as spring cereals. The provincial average yield for canola is 1726lbs/ac. Follow the market and know your production costs.

Consider the following points when seeding canola this spring:

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## Crop Rotation

Mustard can be the biggest weed problem, especially in non-herbicide tolerant canola. Minimize the risk of white mould by maintaining a 3 – 4 year rotation with non – host crops. Soybeans and edible beans are susceptible to white mould.

Plan your rotation to allow control options for volunteer canola in crops that follow. Volunteer Roundup Ready canola in Roundup Ready soybeans is controlled by Pursuit or Pinnacle. Volunteer canola is difficult to control once it bolts. Watch herbicides used in corn and soybeans: some leave soil residues that injure canola. Canola is particularly sensitive to triazine and ALS (Group 2) herbicides. Pursuit and Atrazine both have a 22 month planting restriction before canola. See OMAFRA publication 75, “*Guide to Weed Control*”, Herbicide Crop Rotation Restrictions (page 64).

The best stands of winter wheat often follow canola. Growers have reported success in underseeding canola with red clover, or other forage crops. Canola could smother the underseeding if it lays in the swath too long at harvest.

## Site Selection

Canola does best in cool climates (less than 2700 heat units). It can be planted on a variety of soils, but does not perform well on wet soils. Groundhogs are a major problem. Reduced tillage systems work well, provided seeding equipment can place the seed below the residue and in firm contact with the soil. No-till canola is successful when residue distribution, weed control, and fertilizer placement are optimized. The soil moisture conserved with no-till systems can be beneficial during a droughty growing season. Slugs can be a problem with heavy surface residues, particularly cereal residue.

## Planting

A firm, level seedbed is the most important factor for even stand establishment and high yields. Soils should be firm enough that heel marks are no deeper than the sole of a workboot. Packing both before and after drilling gives the best results in a dry year.

Seeding date has the greatest influence on yield.

Later plantings result in late flowering, when high temperatures and dry weather can sharply reduce yield. Canola is not as frost tolerant as a spring cereal crops. The ideal seeding depth is 1 – 2 cm (0.5 – 1 inch).

## Seeding Rates

Canola seed is small, and can disappear rapidly while seeding. New seed treatments for flea beetle control further challenge calibration compared to seeding seed plus granular insecticide product. Seeding rate is 45 kg/ha, delivering 5-6 seeds per foot of row. This can be a problem with some drills. To compensate, mix the seed with a low salt fertilizer, like MAP (11-52-0 but not mini-map) that has a similar density to canola seed. Occasionally MAP can build up on seed cups.

When seeding with seed only, the opening on each seed cup should be checked and adjusted. Some seed damage from grinding of the seed in the seed rollers can still result. Use a slow speed sprocket to avoid grinding seed, or seed through the grass seed box. A few growers are exploring the option of seeding in 14” rows, blocking off every other run, The effect of this practice on canopy closure, weed control and yields has not yet been evaluated.

## Red Clover Haylage?

*by Joel Bagg, Forage Specialist, OMAFRA, Lindsay*

Red clover can be a good alternative to alfalfa. Under ideal conditions alfalfa will out yield red clover. However, where alfalfa winterkill is a problem, red clover tolerates imperfect drainage and lower pH levels, and can be grown in fields that are too wet or acidic for alfalfa. Red clover feed quality is similar to alfalfa and can replace the alfalfa in livestock rations. Red clover is also grown for pasture and as a cover crop.

Red clover is a short-lived perennial and requires a short rotation. It establishes easily, has rapid spring growth, but lacks drought tolerance. Red clover is productive for the first two years, often thinning dramatically in the third year. Northern anthracnose, powdery mildew, and root and crown rot diseases are responsible for this short life span. Red clover has a weak taproot with many fibrous, side-branching roots.

## Varieties

The two types of red clover are double-cut or "medium" red clover, and single cut or "mammoth" red clover. Double-cut will flower in the seeding year, with vigorous regrowth after cutting and higher yields. Single-cut is slower growing and matures about two weeks later than double-cut. Single-cut does not flower in the seeding year, or after the first cut in succeeding years. Single-cut types are used as cover crops and plowdown.

Older red clover varieties tend to live just 2 years, behaving like a biennial. Newer, disease resistant varieties can be longer-lived and frequently have a productive third year. Where higher yields and improved persistence is required, avoid "single-cut" and "common double-cut" seed. Ontario double-cut red clover variety performance data is available at [www.plant.uoguelph.ca/performance\\_recommendations/ofcc/ofcc.htm](http://www.plant.uoguelph.ca/performance_recommendations/ofcc/ofcc.htm) and in Table 1.

## Establishment

Seed red clover early in the spring to ensure adequate moisture for establishment. Seed is less expensive than alfalfa. Red clover establishes easily and rapidly, and is very competitive with other species. Red clover can be seeded in pure stands, but most is seeded with grass mixtures. A combination with timothy will improve drying, and fill in the spaces left as the clover dies out. Red clover is a good companion crop for the establishment of reed canarygrass. As the red clover dies out, it is replaced by the slow-to-establish but very persistent reed canarygrass. Red clover is too competitive at establishment to be included in an alfalfa mixture.

Red clover establishment is similar to alfalfa. Red clover establishes well under a cereal companion crop due to its good shade tolerance. For optimum red clover establishment and early forage yield, companion crops should be harvested as silage at early heading. Direct seedings may require chemical weed control.

Red clover stands should be seeded at 10 lbs/acre, or 8 lbs/acre when seeded with 3-4 lbs of timothy. Red clover is one of the most successful forage species with no-till seeding. Red clover also establishes well when frost seeded into winter wheat.

Many Ontario soils have adequate natural levels of the *Rhizobium trifolii* necessary for nodulation. If there is any doubt, be sure to use an inoculant. Alfalfa inoculum will not work with red clover.

## Harvest Management

Harvest recommendations are similar to alfalfa. Quality does not decline with maturity as quickly as alfalfa. Red clover is harvested in a 2-cut system, with the first cut taken at 20% bloom or later, when yield is greatest. However, high producing dairy cow haylage should be harvested at the **late bud or early (20%) bloom** stage of maturity. Smothering can result if a great deal of fall growth is left over winter (because of red clover's large stems and leaves). A third cut taken after a killing frost is an option. Red clover haylage will require a longer wilting time than alfalfa to reach proper ensiling moisture.

## Feed Quality

Red clover is most often stored as silage since it is difficult to cure as dry hay without going "dusty" or "moldy". Feed analysis of red clover is similar to alfalfa in crude protein, ADF, NDF and minerals, but there are some differences. Red clover contains enzymes (polyphenol oxidase) that inhibit protein breakdown in the silo. Fermentation does not break down red clover protein to the same extent as alfalfa, so red clover has more undegradable protein. Bypass protein of red clover haylage is 25 – 35%, while alfalfa is 15 – 25%. Red clover also has higher fibre digestibility (dNDF) than alfalfa.

In feeding trials comparing alfalfa and red clover at the USDA Forage Research Station in Wisconsin:

- dairy cows had reduced feed intake with red clover based diets, but had similar milk yield and produced less manure
- less crude protein was converted to NPN, which improved protein efficiency and reduced manure nitrogen

Heavy feeding of red clover haylage often results in black, loose manure, but this is not usually a concern. To enhance feed intake, blend red clover haylage with alfalfa haylage or corn silage.

Consider red clover where alfalfa production is limited, due to frequent winterkill, poor drainage or low pH. Consult your nutritionist to ensure that the unique qualities of red clover haylage are accounted for in ration balancing.

**Table 1 - 2002 Ontario Forage Crop Variety Performance**

Double-Cut Red Clover							
Cultivar	Yield (% of Prima) <sup>1</sup>				First Flower		Distributor
	South		North		Guelph	Kapuskasing	
	Year After Establishment		Year After Establishment				
1	2	1	2				
AC Endure	96	-	103	101	09/06	27/06	Parsons Seeds
Belle	99	108	103	118	08/06	30/06	Growmark Inc
Concorde	97	94	101	101	08/06	02/07	Quality Seeds Ltd
Laser	97	100	97	-	09/06	01/07	Wm Houde Ltee
NK 601	103	-	-	-	08/06	01/07	Syngenta Seeds Canada
Prima	100	100	100	100	08/06	02/07	Pride Seeds
Ram	97	94	98	103	08/06	02/07	Pickseed Canada Inc
Tempus	101	-	107	101	10/06	30/06	Pickseed Canada Inc
Walter	97	98	104	104	07/06	01/07	Mapleseed

<sup>1</sup> Average yield of Prima first year after establishment year - Southern Ontario trials 10.4 t/ha; Northern Ontario 8.0 t/ha; second year after establishment year – Southern Ontario 8.1 t/ha; Northern Ontario 5.7 t/ha.

A dash (-) indicates less than a minimum 3 public yield tests are available, thus a yield figure is not presented.

## Getting into Organic Farming?

by Hugh Martin, OMAFRA, Organic Crop Production, Program Lead

There are great opportunities in organic farming! Markets are growing 20-25% per year, with price premiums of 25-100%. But where do you start? Where do you get more information?

OMAFRA has a factsheet that gives some basic definitions and a list of associations and websites of general interest. Organic Farming in Ontario – OMAFRA order number 01-027 or it is on the internet at <http://www.gov.on.ca/OMAFRA/english/crops/facts/01-027.htm>

To learn more about organic farming growers need to build connections in the organic sector. For general information, the Ecological Farmers Association of Ontario and the Canadian Organic Growers are a good organization to join. Both organizations have regular newsletters included in their membership fees. The annual organic conference at Guelph is held on the last weekend of January and is an excellent place to network

and learn more about the organic industry in Canada.

All stores, processing and export markets will require the organic product they buy to be certified. Organic certification gives assurance to your customers that you are following the accepted standards of organic production. Processors also need to be certified.

The National Standard of Canada – Organic Agriculture (CAN/CGSB-32.310-99) is the official standard of Canada. This states the minimum standards for organic products in Canada. OCPP/Pro-Cert (Organic Crop Producers and Processors, Inc) has been accredited to this standard by the Standards Council of Canada.

OCPP (Organic Crop Producers and Processors, Inc.) and OCIA (Organic Crop Improvement Association, Ontario) are the two largest certification bodies operating in Ontario. OCPP is a Canadian based fee for service company and OCIA is a membership based organization with chapters across North America and the world.

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QAI (Quality Assurance International) is based in the USA and certifies mostly processing operations. ECOCERT is a certification body from Europe, and OFI (Organic Forum International) also certifies some product in Ontario.

The production standards for OCPP, OCIA and QAI are posted on their website and are a reference for more information on growing organic crops. These standards include a "permitted materials" list, indicating which crop inputs are allowed to be used on organic farms. Another website at [www.omri.org](http://www.omri.org), can also give some of this type of information.

Certified organic products require 36 months prior to harvest with only inputs that are permitted in organic production. Some certification bodies (CB) require inspection during Year 1 or Year 2 of the transition period. Fees vary between certification bodies (generally \$500-1000 per year). Most standards have very similar principles, but they are not identical. The accreditations that each local certification body has outside Canada will vary and your export markets have unique requirements. Be sure to ask what your market requires, and what your certification body offers.

The steps to becoming a certified organic producer are:

1. learn all you can about organic and your commodities
2. start the transition of your fields/farm
3. select the most appropriate certification body
4. apply for certification (in year 3 or earlier if required by CB)
5. certification body sends out an inspector (annually)
6. receive certification
7. market certified crop

Key international standards are found in the European Union, Japan, and USA. Some markets in those countries require additional certification such as IFOAM (International Federation of Organic Movements). Organic certification for export is complicated and continually changing; consult your certification body for current information regarding potential markets.

For markets within Ontario, stores usually accept any of the popular certification programs growers should always know their market requirements.

Organic markets look for a quality product and good supply.

## **Calcium - Wonder or Waste**

*by Keith Reid, Soil Fertility Specialist*

Calcium is an essential nutrient, required in small amounts for metabolism and cell nucleus formation. Much larger amounts are tied up in the cell walls, bound to pectin. This is not an essential role, but it does help the plant by stiffening the cell walls. The amount of calcium taken up by crops is relatively small, with most of it in the vegetative parts of the plant rather than the grain. For example, a corn crop yielding 150 bushels per acre will take up between 25 and 50 pounds of calcium per acre, but only one pound per acre is removed with the grain.

Calcium is carried to the roots with the soil water as it moves to the roots. In most soils, more calcium is carried to the roots than the plant needs, and the excess is filtered out of the water and accumulates around the roots. This is not evident in annual crops, but take a look at tree roots if you get a chance. A casing of lime is often found around the roots, where the excess calcium reacted with carbonates released by the roots, to form limestone.

When calcium deficiency occurs in plants, it is generally due to a lack of water rather than a lack of calcium in the soil. Calcium is only moved through the xylem, carried from the roots to the rest of the plant with the water stream, and stays where it is deposited. During periods of moisture stress, the fruits and newly opening leaves don't transpire as much as the rest of the plant, and so don't receive as much calcium. This can result in pockets of cells with weakened cell walls, which break down when the fruit begins to grow rapidly again. Blossom end rot in tomatoes or bitter pit in apples are examples. It is rarely, if ever, a problem with grain crops.

Calcium in the soil is present as a positively charged ion (cation), like potassium or ammonium. Unlike these cations, calcium has two positive charges instead of one. This means that it balances two negative charges on the soil particles, and can sometimes act to hold clay particles together. In western Canada, this is

evident where some soils have large amounts of sodium, and adding calcium will improve the soil structure. Most Ontario soils, however, have calcium as the dominant cation, so adding more makes no difference to the soil structure. Also, organic matter is a much more effective soil particle glue than any cation!

The calcium in soil solution or adsorbed on soil particles is only a small part of the total amount of calcium in the soil, particularly in alkaline (pH >7) soils. Limestone (calcium carbonate) can make up over 30% of the soil! This may have come from limestone ground up and left behind by the glaciers, or from calcium ions reacting with carbonic acid in the soil. Either way, it represents a huge reserve of calcium, as well as a buffer against changes in soil pH. The older soils in areas south and east of us don't have this luxury. That is why they recommend and need calcium, while we don't. So don't expect calcium recommendations from those areas to work here in Ontario.

### Quadratic Plateau Nitrogen Model St Clair District SCIA Project - Assessing Nitrogen Requirements in Corn Using the Quadratic Plateau Model

*by Adam Hayes, Soil Management Specialist*

The Quadratic Plateau model was investigated as a method to better predict nitrogen requirements for corn.

**Plot layout:** Field length strips of several nitrogen rates were established. The treatments consisted of 3 or 4 nitrogen rates below the growers normal rate of nitrogen and one rate above. Check strips (zero nitrogen strips) could have up to 30 lbs. N/ac applied in the starter. Data was analyzed using both the quadratic and quadratic plateau models.

**Results From 2000:** There were 6 cooperators for a total of 7 plots in 2000. (see Table 1). One plot was lost. Two plots did not level off in yield at high N rates, and the quadratic plateau analysis could not be used. Three other sites generated typical curves for both models, although the wet season increased the variability at one site. The plateau model gave a lower maximum economic rate of nitrogen (MERN) than the quadratic model. The last plot had poor yields with no response to nitrogen. This plot had 60 lbs. N/ac before planting, more perhaps than the MERN would require.

**Results From 2001:** There were 7 cooperators this year with a total of 8 plots. The 2001 growing season was hot and very dry. Rainfall was variable. Some plots received very little rain and a few received near adequate amounts. This resulted in normal yields in some fields and yields more than 50% below normal in others. High wind in the fall caused some lodging in most plots, but lodging was not significant. The dry growing season made it very difficult to draw significant conclusions from the data. Moisture was the limiting factor in most plots, not nitrogen. Yield responses are due to moisture differences within

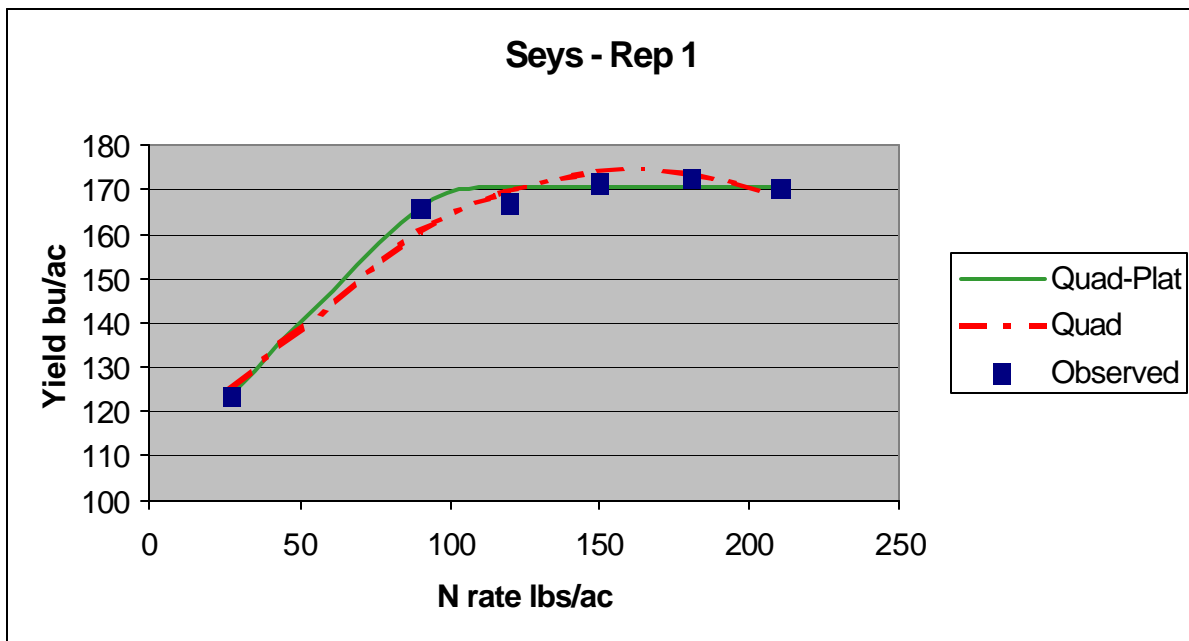
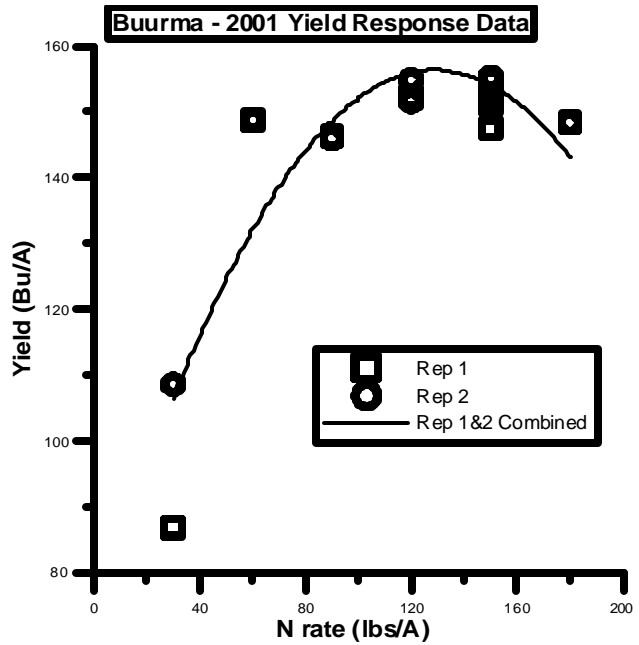
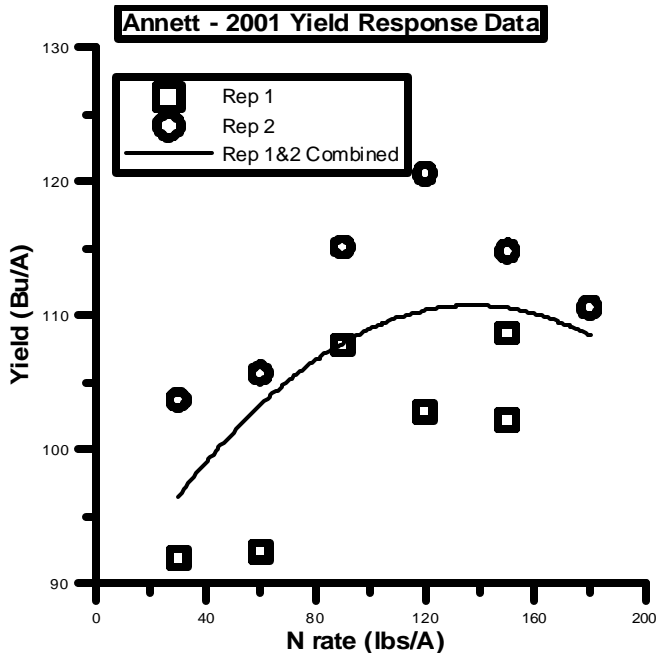
**Comparison of Nitrogen Recommendations - 2000**

Cooperator	Normal N Rate kg/ha (lbs/ac.)	Pre Sidedress N Test (kg/ha)	Quadratic MERN (kg/ha)	Q. Plateau MERN (kg/ha)
Jack	170 (150)	68	---	---
Buurma	170 (150)	107	87	36
McEachren	170 (150)	103	82	---
Guilbeault	170 (150)	90	---	---
Annett-Home	170 (150)	80	87	---
Annett-Augrim	170 (150)	30	113	97
Seys	170 (150)	58	134	---
Elgie	130 (117)	0	---	---

**Note:** --- = the yield data could not be analyzed using the Quadratic statistical models.

fields rather than a nitrogen response. Scatter in the data make it difficult to predict the MERN. Variability in the yield responses made it difficult to calculate the quadratic curves, and in most cases impossible to calculate the quadratic plateau. In some of the replications the quadratic curve

actually curved up instead of leveling off. The MERN could be determined using the quadratic model in five plots. Only two plots could be analyzed using the Quadratic plateau model. The MERN for these two plots was higher using the quadratic model than using the quadratic plateau.



**Summary:** The number of plots and participation across the region was excellent. The plots were done well, and most had 2 replications. Unfortunately the weather during the two years of the project was extreme on both ends of the scale. 2000 was very wet and 2001 hot and dry. The valid data sets prove that there are opportunities to reduce the rate of nitrogen in some fields. In 2000 the Seys plot showed a reduction of nitrogen from 180 kg/ha to 110 kg/ha. In 2001 the Annett-Augrim plot indicated a nitrogen reduction from 170 kgN/ha to 100 kgN/ha, and the Buurma plot from 170 kgN/ha to 90 or even 40 kgN/ha (see table above or graphs below). The quadratic plateau may be a good approach to determine the most appropriate rate of nitrogen for a whole field. It does not address variability of nitrogen within a field. This data will be compiled with other nitrogen research in Ontario to further fine tune nitrogen recommendations. With better weather more would have been learned from this project. The region is interested in continuing this project for 2 more years. Returning to some of the same fields from the first 2 years will help to test the MERN's predicted.

## Winter Manure Application?

*by Chris Brown –OMAFRA Nutrient Management Specialist*

This debate is "hot enough to melt the snow"! Why is winter manure application such a big deal?

The current best management practice for manure application states "Manure should not be applied to frozen, and/or snow-covered soils except in contingency situations". This is one of the reasons behind the recommendation for 240-day storage of manure. Storage large enough to hold manure produced during the winter months, plus a little extra.

With winter application of manure (or biosolids), are we managing nutrients, or are we managing waste? Do commercial fertilizer spreaders apply nutrients in winter on snow?

The risk from winter spreading is surface runoff. When manure is applied to frozen soils, or even worse, frozen soils with a lot of snow-cover, the nutrients and the pathogens stay on the surface. Nutrients can not infiltrate the frozen soil. When

the "winter thaw" occurs, (often accompanied with rain), melted snow and manure, flows over the surface to a waterway and eventually a stream or river. The result is contaminated water!!

Even on fields, where manure nutrients would not reach a stream, there is a potential risk. A high concentration of nutrients in ponded or depressional areas of field could move nutrients below the root zone and potentially to ground water sources.

The other frequently asked question – "What's the problem with spreading solid manure, it won't go anywhere?" Solid manure contains nutrients and pathogens and will mix with water; therefore the risk of surface water impacts still exists.

Do opportunities exist to apply manure in winter? During the 2000/2001 winter, with many months of a deep white landscape, there were no opportunities to winter apply manure. However, in warmer winters, there may be opportunities for manure application.

If manure can be applied and immediately incorporated, or can be injected then the risk of surface runoff is significantly reduced. My definition of incorporation would mean mixing the manure with soil to at least a 4-inch depth. Be sure to leave the soil surface rough and till across any slope to reduce erosion. Keeping back from watercourses (at least 50 feet for loam soil with some slope) is essential to further reduce risk the risk of surface water contamination. In many areas, application in winter months will not be a practical option because soils are just too wet.

The debate will continue, and regulations, when introduced, could ban winter application altogether. However, a common sense approach that considers and minimizes risk, without a ban, appears to be the best solution to the issue of winter application of manure or biosolids.

## Improved 2002 Guide to Weed Control

*by Gilles Quesnel, Field Crop IPM Specialist, OMAFRA, Kemptville*

New to the Guide to Weed Control for this year is four tables identifying herbicides in corn and

soybeans that can be tank mixed. Under the corn section, table 13 - **Corn Soil Applied Herbicide Tank-Mixes** and table 14 - **Corn Postemergence Herbicide Tank-Mixes** list the registered herbicide tank mixes which can be applied to the corn crop. In the soybean section, table 18 - **Soybean Soil Applied Herbicide Tank Mixes** and table 19 - **Soybean Postemergence Herbicide Tank-Mixes** list the registered herbicide tank mixes which can be applied to the soybean crop.

Table 16, **Soybean Postemergence Herbicide Leaf Stages** is a new table that provides a handy reference guide of soybean and weed growth stages for the various postemergence herbicide applications. Table 16 also lists herbicide rate ranges where applicable.

Other new field crop herbicides and label changes for the 2002 season include:

- **FIRSTRATE** (*cloransulan-methyl* – group 2) is a soybean broadleaf weed herbicide that can be applied preemergence or postemergence, prior to the flowering stage of soybeans. FIRSTRATE is particularly effective against ragweed and velvetleaf, but weak on lamb's-quarters, annual nightshade and pigweed. The rotation interval with canola is 26 months.
- **BOUNDARY** is a co-pack of DUAL MAGNUM AND SENCOR 500F (*s-metolachlor* – group 15 and *metribuzin* – group 5). It can be applied preplant, preplant incorporated or preemergence in soybeans to control annual grasses and broadleaf weeds. The preplant incorporated application provides yellow nutsedge control. Do not apply to coarse textured soils with less than 2% organic matter or to metribuzin sensitive soybean varieties.
- **BROADSTRIKE DUAL MAGNUM** is a premix of *flumetsulam* (group 2) and *s-metolachlor* (group 15) applied preplant, preplant incorporated or preemergence in soybeans to control annual grasses (weak on proso millet), and broadleaf weeds. Preplant applications provide up to 80% control of horsetail. The preplant incorporated application provides yellow nutsedge control. Do not apply to areas where the soil pH is greater than 7.8 or where the organic matter levels are less than 2% or greater than 5%. The rotation interval with canola is 26 months.
- **SUMMIT** is a premix of *primisulfuron-methyl* –

group 2 and *dicamba* – group 4 applied postemergence in field corn (2 to 7 leaf stages of corn) to control broadleaf weeds and quackgrass. Do not apply to corn treated with an organophosphate insecticide. The rotation interval with canola is 22 months.

- **ACCENT 1-PASS**, is a new co-pack of ACCENT (*nicosulfuron* – group 2) and PEAKPLUS (*prosulfuron* – group 2 + *dicamba* group 4) for postemergence application in field corn. ACCENT 1-PASS can be applied from the 1<sup>st</sup> to the 8<sup>th</sup> leaf stage of corn to controls annual grasses (weak on yellow foxtail and crabgrass), quackgrass and broadleaf weeds. The rotation interval with alfalfa is 22 months.
- **LIBERTYPRIME** is a co-pack of PRIMEXTRA II MAGNUM (*s-metolachlor*, and *atrazine* - groups 15, 5) and LIBERTY 200 SN (*glufosinate ammonium* – group 10) that is applied postemergence on field corn developed to be tolerant to LIBERTY 200 SN. LIBERTYPRIME can be applied from the 2<sup>nd</sup> to the 6<sup>th</sup> leaf stage of corn to control annual grasses, broadleaf weeds and provide suppression of some perennial weeds.
- **KORIL** is a new formulation (235 g/l active) of *bromoxynil* - group 6, containing the same active ingredient as PARDNER, which is 280 g/l active.
- **MEXTROL** is a new formulation (400 g/l active) of *bromoxynil* + *MCPA* - groups 6, 4, containing the same active ingredient as BUCTRIL M, which is 560 g/l active.
- **EVICT SOLUPAK** is a 75 DF (dry flowable) formulation of *metribuzin* – group 5.
- **VENTURE L** is an emulsifiable concentrate (125 g/l active) formulation of *fluazifop-p-butyl* – group, which replaces VENTURE 25G AND FUSILADE II.
- **TOUCHDOWN 600** is a solution of *glyphosate TMS* – group 9, which contains 413 g/l active. This formulation is mainly for the bulk market. TOUCHDOWN 480, which contains 330 g/l active of *glyphosate TMS* is also available.
- **REGLONE DESSICANT** is a liquid formulation (240 g/l active) of *diquat* – group 22. This is a name change from Reglone 240.
- **VANQUISH** is a 480 g/l active formulation of *dicamba* previously sold as DYCLEER.