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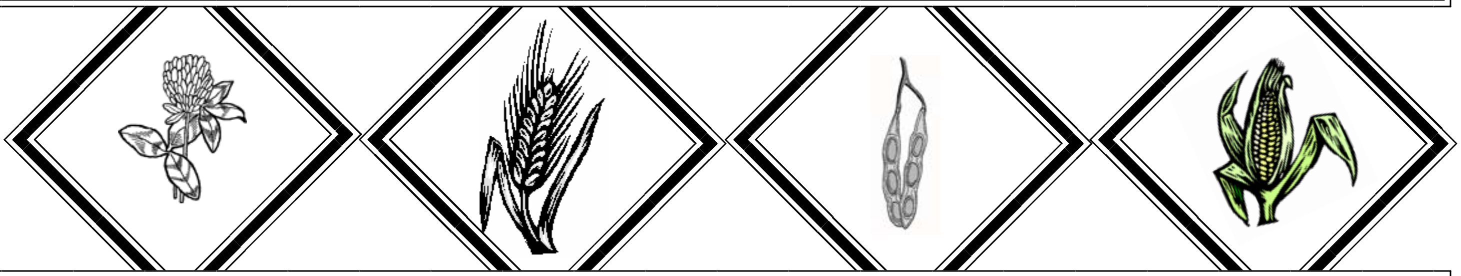
CROP TALK



OMAFRA Field Crop Specialists — Your Crop Info Source

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Which Fertilizer Attachments Should I Put on That New Planter?

by Keith Reid, Soil Fertility Specialist & Greg Stewart, Corn Specialist, OMAFRA

Many farmers are looking at updating their corn planters, in anticipation of more corn acres. The question that comes up is “what type of fertilizer system to install on the planter”, since it is usually more expensive to retro-fit. Before you can answer this question, you need to look at your entire fertilizer system. The fertilizer applied with the planter will need to be integrated into the bigger picture to provide maximum returns. Only after making this assessment can you decide whether liquid or dry systems will suit you better, and whether it should be seed placed, or in a 2x2 band.

How much fertilizer do I need?

There is a big difference between an intensive livestock farm, where soil tests have been built up to high levels by regular manure applications, and cash cropping on rented land where only the minimum amount of fertilizer has been applied. In the first case, the only goal of planter applied fertilizer may be a starter boost which can be achieved with a small amount of fertilizer or it could be the application of all the fertilizer for the crop in one pass. In the latter case, much more fertilizer will need to be applied at planting to meet the nutrient requirements of the crop.

How much fertilizer do I want to put through the planter?

There are choices between the amount of fertilizer that is broadcast preplant, applied at planting, and side-dressed. In general, the efficiency of phosphorus (P) use will be greatest if it is banded at planting time, while N and K are much less sensitive to placement. A system that uses a high-P starter on the planter, and broadcasts or side-dresses the rest of the fertilizer will give the greatest starter benefit while minimizing the amount of fertilizer that needs to be carried on the planter. On the other hand, where total fertilizer requirements are relatively low (such as where manure is applied), and where there are competing uses for time after planting, it may work better with the total fertilizer requirements applied with the planter.

What is my tillage system?

In no-till systems, there is a consistent yield advantage to applying a greater proportion of the total nitrogen at planting time (30-40 lb/ac). This does not appear to be the case in conventional tillage, so it is probably a response to reduced N mineralization in the cooler soils under no-till. If you are not broadcasting N pre-plant, and are planting no-till corn, your fertilizer system should be able to apply this N at planting.

Of course, the final choice of system on the planter will be a compromise between the optimum fertilizer use, and the weight, cost and complexity of the equipment added to the planter. Remember that the primary role of the planter is to consistently place the seed at the proper depth and spacing, and any fertilizer attachments that interfere with that are counterproductive.

Seed placed vs. 2x2 band

	Seed placed fertilizer	2x2 band
Crop Response	Consistent response in increased seedling growth, less consistent yield response	Consistent yield response in low testing soils; responses rare in high testing soils.
Crop Safety	Moderate	High if maximum safe rates not exceeded
Maximum application rates (75 cm rows)	10 kg N + K_2O/ha Do not apply urea or diammonium phosphate with seed	73 kg N/ha or 120 kg N+K_2O/ha (reduce to 40 and 80 kg/ha if urea is the N source)

Liquid vs. Dry Fertilizer

	Liquid	Dry
Nutrient availability	Availability is equal for liquid and dry products	
Crop safety	Depends on placement and rate, rather than form	
Nutrient concentration	Tends to be lower	Tends to be higher
Precision of metering	High	Moderate – subject to uneven distribution within row
Cost per unit nutrient	N – slightly higher P – significantly higher	Lower
Flexibility of blends	Selection is generally limited to manufactured blends	Bulk blends can be customized to individual requirements
Compatibility with micronutrients	Most liquid starters require chelated micronutrients if blended, at significant cost	Most granular micronutrients can be easily blended with dry fertilizer
Labour requirements	Low, because can be easily pumped	Variable – old systems with bagged fertilizer had very high labour requirements. Bulk systems with augers to load planter boxes are less labour. Air carts with bulk delivery are comparable to liquid.

Organic Crop Production

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

Can you make money going organic? We know there is a growing demand for organic products. Prices for organic over the past 5 years have been consistently strong. Grain prices have been 2-3 times conventional grain prices.

Organic Grain Prices

Organic prices are set based on supply and demand. Prices have no connection to the Chicago Board of Trade prices that set the trends for most conventional crops. Therefore, the current upswing in corn prices has no impact, just as the low prices of the past few years had no impact.

Organic grain prices for next fall are strong. This is due to both the food grain markets and the strong livestock feed markets for the rapidly growing organic livestock sector. A weak spot this winter has been in food grade soybeans, which have come under increasing pressure from Chinese soybean imports and the hesitation by Canadian organic grain handlers to try to match their low prices. China has also been strong in the Japanese market, which has been a destination for many Ontario soybeans over the years.

Organic Crop Budgets

The 2007 OMAFRA Crop Budgets (www.omafra.gov.on.ca/english/busdev/facts/pub60.htm) include budgets for organic grain corn, soybeans, spelt, winter wheat, barley and oats. The organic production includes slightly more expense for mechanical weed control and hand weeding. The expenses for herbicides and fertilizers are omitted. Costs for manure/compost and cover crops are also included as appropriate, but the actual costs of these inputs will vary depending on the farm. Overall, the costs per acre are very similar for organic and non-organic crop production when using conventional tillage.

Organic Crop Returns

The following chart estimates some yields, prices and gross margins (using the budgets) for organic and non-organic production. Organic yields are assumed to be about 20-25% lower than conventional yields, but this varies and generally improves with organic experience. Prices and yields will vary for your farm situation. I recommend you look at the OMAFRA crop budgets to enter in your own input numbers. Land costs and the cost of transition to organic are not included in this comparison.

These numbers can look impressive for organic, but organic is not for everyone. Converting to organic tends to be a long term commitment and requires good records for the certification process. The transition to organic will take 2 to 3 years, where the field must be managed as organic and the transition crop is generally not able to get premiums. The best transition crops tend to be cereals and hay crops. Weeds are usually the biggest problem to manage in row crops, but good rotations help to manage weeds. You must use non-GMO crops. More information on organic is at www.omafra.gov.on.ca/english/crops/organic/organic.html.

Organic Crop Returns

Crop	Yield	Price	Estimated Gross Margin
Soybeans	30 bu/ac	$16/bu	$281/ac
Corn	98 bu/ac	$7.25/bu	$375/ac
Winter wheat	60 bu/ac	$8.25/bu	$251/ac
Spelt	1.1 tonne/ac	$400/tonne	$186/ac

Non-Organic Crop Returns

Crop	Yield	Price	Estimated Gross Margin
Soybeans	40 bu/ac	$8.00/bu	$131/ac
Corn	130 bu/ac	$4.00/bu	$146/ac
Winter wheat	75 bu/ac	$4.50/bu	$162/ac

Jimsonweed - An Emerging Problem In Field Crops?

by Mike Cowbrough, Weed Specialist, OMAFRA, Guelph

Traditionally, Jimsonweed has not been a concern in field crops as it has been either grown for ornamental or euphoric purposes. Consumption of the jimsonweed seed for euphoric purposes can have lethal consequences. At the very least, it causes severe illness requiring hospitalization. All parts of the plants are extremely toxic, especially the seeds.

Weed Profile - Jimsonweed

Datura stramonium L.
Annual, reproducing only by seed.
Stems: Smooth, hairless, stout and erect.

Cotyledons: Long (2-4 cm) and oval (see Figure 1).

Figure 1.

Leaves: First true leaves are ovate and pointed (see Figure 2). Later leaves are alternate (1 per node) and sharply toothed or lobed (see Figure 3).

Figure 2.

Figure 3.

Flowers & Seed: White or light purple, very long and trumpet shaped. Seeds are small, black, flat and somewhat round (see Figure 4).

Figure 4.

Special Notes: All parts of the plant are poisonous and potentially lethal if seeds are consumed.

Control Options: See below

Herbicide Sensitivity Studies

Growth room studies were conducted in the spring of 2006 to gain a better understanding of Jimsonweed's sensitivity to common corn and soybean herbicides,. Keep in mind that weeds grown under growth room conditions are much more sensitive to herbicide applications than under field conditions. Therefore I would speculate that any herbicide that has intermediate activity on Jimsonweed would not be effective in the field.

Table 1. Jimsonweed sensitivity to numerous soybean herbicides when sprayed under growth cabinet conditions.

Soybean herbicide*	Weed sensitivity to herbicide**
Classic	Intermediate/Susceptible
FirstRate	Susceptible
Pursuit	Susceptible
Cleansweep	Susceptible
Reflex	Susceptible
Basagran Forté	Susceptible
glyphosate	Susceptible
pinnacle	Intermediate/Susceptible

*Herbicide were applied at the highest product rate listed in OMAFRA Publication 75, Guide to Weed Control.
** Jimsonweed was at the 4-6 leaf stage at application.

Summary

Numerous corn and soybean herbicides controlled Jimsonweed. For soybeans, Classic and Pinnacle may not be effective at controlling Jimsonweed under field conditions. Although Banvel and Distinct appeared to have less activity on Jimsonweed under growth room conditions, numerous extension articles in the United States list these two herbicides as being effective at controlling Jimsonweed.

Table 2. Jimsonweed sensitivity to numerous corn herbicides when sprayed under growth cabinet conditions.

Corn herbicide*	Weed sensitivity to herbicide**
atrazine	Susceptible
Pardner	Susceptible
Distinct	Intermediate/Susceptible
Callisto	Susceptible
Liberty	Susceptible
Marksman	Susceptible
glyphosate	Susceptible
Banvel II	Intermediate

* Herbicide were applied at the highest product rate listed in OMAFRA Publication 75, Guide to Weed Control.
** Jimsonweed was at the 4-6 leaf stage at application.

Comparing The Value of Various Manure Types

by Christine Brown, Nutrient Management Lead, OMAFRA, Woodstock

Manure is valuable, especially as fertilizer prices continue to increase. But how do various manure types compare when applied at a comparable rate? Table 1 uses average nutrient contents of various livestock types to compare manure N - $P_2 0_5$ - $K_2 0$ values. When applied at a rate that supplies about 130 lbs $P_2 0_5$ they reflect rates that would be typical for application ahead of a corn crop that would meet nutrient management BMP's.

Table 1. Nutrient Value for Various Manures types applied at Typical Rates for Corn

Manure Type (average)	**Application Rate**	**Nutrients Applied** [1] lbs/ac N-P-K (~N from previous year).	**Value – 2007** (short & long term N-P-K) Before Application	After application[2]
Liquid Hog	5,000 gal/ac	115-120-90	$ 140	90
Liquid Dairy	7,500 gal/ac	130-120-190	$ 185	110
Solid Dairy	20 ton/ac	75-125-215	$ 170	110
Solid Beef	15 ton/ac	(33) 55-125-185	$ 150	105
Solid Layer	5 ton/ac	(15) 85-155-85	$ 135	120
Solid Broiler	3 ton/ac	(30) 60-140-105	$ 135	125
Anaerobic Biosolids	10,000 gal/ac	130-130-0	$ 135	135

- Assumes spring application incorporated within 1 day
- [1] nitrogen available in year of application
- [2] Application cost of $10/1000 gal or $3/ton (cost increases as distance from storage increases)
- $/lb value N-P-K = 0.50-0.40-0.30

Other Values

Manure also contains micro nutrients which vary with rations, but typically results in less commercial requirements of zinc, manganese and sulphur for livestock farms. Manure is also valuable for the organic material it provides to the soil. Putting an economic value on the organic matter is difficult since its impact is less obvious in the short term. Over the longer term, regular applications of manure, especially solid manure, result in better moisture holding capacity, better nutrient cycling and less vulnerability for crops to suffer from extremes such as excessive moisture and lack of moisture.

To determine the available nutrients and value of manure from various livestock types, check out the OMAFRA website at www.omafra.gov.on.ca/english/crops/soils/fertility.html.

Manure Application to Forages – An Economical Alternative

by Christine Brown, Nutrient Management Lead, OMAFRA, Woodstock

Manure application to forage crops can provide both a yield and quality benefit compared to commercial K or no application, according to an Oxford SCIA trial.

During the summer of 2006, manure was applied after 2nd or 3rd cut (at rates between 2,000 and 4,500 gallons/acre) after hay or haylage harvest on 8 replicated sites. Manure applied to alfalfa-grass crops showed a 12% yield increase and a slight quality benefit. When the quality parameters were compared in a spreadsheet that calculates "milk per ton" of forage , manure applied to forages gave an average 88 lbs more milk per ton (quality improvement) and 229 lbs more milk per acre per cut (yield + quality). This is shown in Table 2.

Advantages Of Applying Manure To Forage

The best option is still to spring apply manure to corn crops, because this option gives the highest economic return from the nitrogen. However, there could be several reasons a livestock producer may choose to apply manure to forage crops. Some of these reasons include:

- spread out workload to less busy times of the year
- reduce manure storage requirements
- prevent compaction damage to soils
- more opportunities and alternative crops to which to apply manure
- lower application rates – lower environmental risk

Manure applied to forage can meet these objectives while providing N-P-K that will save commercial fertilizer inputs.

Timely Application Is Important

The greatest challenge in applying manure to forage fields is timely application to prevent "traffic damage". Haylage fields are ideal since they are harvested more quickly than dry hay crops. . It is critical that manure be applied as soon after forage harvest as possible. When manure is applied to alfalfa regrowth, the plants impacted by wheel tracks must re-start growth. This regrowth will be from crown buds, as opposed to a combination of crown buds and apical bud regrowth from stems. Manure applied between 1½ to 2 weeks after the field was cut, risks a yield reduction of up to 50% in areas affected by wheel tracks.

Good quality forages are essential to animal nutrition, which makes timely harvest for all forage fields a priority to manure application. Therefore, when manure application for forages is considered, adequate labour and equipment are required to be able to combine timely forage harvest with timely manure application. Targeting manure application to last-cut fields, or having manure custom applied are alternative options. Manure applied to forage can meet these objectives while providing N-P-K that will save commercial fertilizer inputs.

Table 2. Yield/Quality Response from Manure Applied to Forages (average of 8 locations during 2006)

	Yield Data		Quality Data						lbs Milk from Forage			
Treatment	**Yield/cut (ton/ac)**	Difference	**C.P.**	**ADF**	**NDF**	**Lignin**	**K**	**TDN**	lb/ton	difference	lb/ acre	difference
(# samples)	wet tons	%	%	%	%	%	%	%		% (lbs)		% (lbs)
Without Manure (60)	6.41	---	21.8	36.0	47.0	7.5	2.8	60.1	**1442**	**---**	**1485**	**---**
With Manure (68)	6.97	8.0	22.1	35.1	45.9	7.0	3.1	61.0	**1530**	**5.6 (88)**	**1714**	**13.4 (229)**

[1]Using *MILK91* with all preset defaults except forage quality parameters (milk price $72.55/hL)
Milk91 is an Excel spreadsheet that uses the forage analysis (CP, ADF, NDF) to calculate an approximation of a balanced ration using NRC values

Does Precision Soybean Seeding Pay?

by Horst Bohner, Soybean Specialist, OMAFRA, Stratford

Traditional seed drills do a poor job of distributing seed evenly, resulting in seed clumping, that leaves large gaps within the row. This is shown in Photo #1. A planter that allows for precise seed metering results in more uniform stands. It also allows for better depth control.

There has been speculation that more accurate seed placement may allow for lower seeding rates compared to a drill and result in higher yields. In the case of glyphosate tolerant varieties, soybean seed has become the largest single input (approximately $50/acre). Lower seeding rates could significantly reduce this input cost.

Photo 1 - Emerging seedlings seeded with a no-till drill.

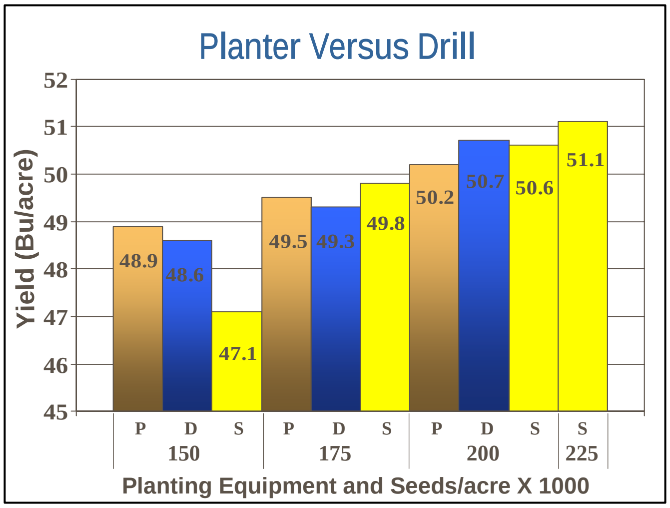
Drill Versus Planter - Seeding Rate Study

In 2005 and 2006 a study investigated the most profitable soybean seeding rate for 15 inch row spacing using a row planter. It also compared 15 inch rows seeded with a planter, to 15 inch rows seeded with a drill and 7.5 inch rows seeded with a drill.

Eight large scale replicated trials were conducted. Various 15 inch row planters were compared to a JD 1560 no-till drill with every other run plugged (15" row spacing) and all runs open (7.5" rows). All sites were no-till and different seeding rates were tested.

Results and Summary:

Graph 1 - Impact of Planter/Drill Seeding Rates on Yield



P = Planter (15" rows), D = Drill (15" rows), S = Solid Seeded Drill (7.5" rows) LSD 10% = 1.9

Planter Versus Drill Results

Although the planter units did a superior job in seed distribution, that did not translate into higher yields compared to the drill at the same seeding rate. The 15 inch drill produced equivalent yield to the three seeding rates as did the 15 inch planter averaged across all sites. At 1 out of the 8 sites there was a 3 bu/ac advantage to the planter. At all the other sites the increased accuracy of the planter compared to the drill had no significant impact on yield.

This is surprising, especially at the lowest seeding rate. Thirty days after seeding the planter rows looked superior because of better spacing. But the gaps resulting from using the drill did not reduce yields. This is likely because of the soybean plant's ability to compensate for gaps and may also be a reflection of the good growing conditions over the last two years. We intend to conduct these trials one more year before final conclusions are drawn.

Keep in mind, that a planter is superior when using very low seeding rates. This has been shown in other research studies. Under extremely low seeding rates (50 000 – 100 000 seeds/acre) the planter will provide significantly better yields compared to a seed drill.

Seeding Rate Results

This study has also demonstrated increased yields with increasing populations from 150,000 to 200,000 seeds/acre. When seeding rates were increased, yields increased.

It's worth noting that the benefit from increasing the seeding rate was different for the planter compared to the drill. Raising the seeding rate from 150,000 to 200,000 with a planter only increased yields by 1.3 bu/ac. Increasing the rate from 150,000 to 200,000 with a 15 inch drill increased yields by 2.1 bu/ac. Increasing the seeding rate from 150,000 to 200,000 in 7.5 inch rows increased yields by 3.5 bu/ac. This confirms that higher seeding rates are important for drills but not as crucial for planters.

Assuming a seed cost of $32 per unit, a seed size of 2,700 seeds/lb, and a selling price of $7.00 per bushel, the return for increasing the seeding rate from 150,000 to 200,000 seeds/acre is significantly different for the two pieces of equipment. Increasing the seeding rate for the 7.5inch drill increased profits by $12.65/acre. Increasing the seeding rate for the 15 inch drill increased profits by $2.85/acre. However, increasing the seeding rate with a 15 inch planter actually reduced profits by $2.75/acre.

Table 1: Gross Return Minus Seed Costs at Various Seeding Rates

	Increased Return of 200 000 over 150 000 seeds/acre
Solid Seeded (7.5")	$12.65
Drill (15")	$2.85
Planter (15")	$-2.75

Numbers based on $32.00/unit, 2700 seeds/lbs seed, $7.00/bushel selling price, and yield results from Graph #1. All inputs except for the cost of seed are assumed to be the same regardless of seeding rate and are not included in this comparison.

Conclusions

1. At normal seeding rates (175,000 – 200,000) there was no significant yield difference between the 15 inch planter compared to the drill seeded in either 7.5 inch or 15 inch rows.
2. Lower seeding rates yielded less than higher seeding rates in this study but reductions were relatively small.
3. The highest yield was at 200,000 seeds/acre for all three implements
4. The highest economic return for the drill was at 200,000 seeds/acre but was 150,000 seeds/acre for the planter.

Tillage and Rotation Impacts on Soil Quality

by Adam Hayes, Soil Management Specialist, OMAFRA, Ridgetown

What can we learn about soil quality from long term tillage and rotation plots? Long term tillage plots were established by Doug Young and Tony Vyn at Ridgetown Campus, University of Guelph in 1991 on a Brookston clay loam soil. The tillage treatments initially consisted of moldboard plow, chisel plow, ridge till and two no-till treatments. The ridge till treatment was later converted to no-till. The plots are in a corn-soybean crop rotation.

Four years later, long term rotation plots were established by the same researchers at Ridgetown Campus in 1995 on a Brookston clay soil. Five rotations were studied including continuous corn, continuous soybeans, soybeans-winter wheat, corn-soybeans and corn-soybeans-winter wheat underseeded to red clover in moldboard and no-till. Each corn and wheat plot had several nitrogen rates applied.

Funding was received from the Canadian Agricultural Producers Addressing Environmental Issues program to take samples and to cover some of the costs of the soil analysis.

Eathworm Middens

Counts of earthworm middens were taken in the fall of 2006 from the mouldboard plow, chisel plow and no-till treatments of the tillage plots. Middens are piles of residue and soil found on the top of large earthworm burrows. The results in Table 1 show that the no-till had almost 6 times as many large earthworms as the moldboard and 3 times as many as the chisel plow.

Table 1

Tillage Treatment	**Number of Earthworm Middens/sq m**
Moldboard plow	13
Chisel plow	26
No-till	74

Biological Activity

Bait lamina strips, were inserted into the same tillage treatments in November. Bait lamina strips were developed in Germany to give a measure of biological activity at depth but does not indicate what is eating the bait. The conditions at that time were cold and wet so there was less feeding than might have been expected. The no-till generally had more feeding than the moldboard or chisel treatments especially in the top 4 cm.

The picture shows the crop rotation plot. The soybeans in the foreground are continuous soybeans and the taller soybeans in front of the corn are in the corn-soybean-winter wheat rotation. Both are in the moldboard plow tillage system. The soil structure of the three crop rotation plot is also significantly better than the continuous soybean plot.

Soil samples taken from selected treatments will be analyzed for organic carbon, nitrogen and phosphorus. Some other soil health measurements will be taken from the rotation plots this season. The yield data from all years of the tillage and rotation plots will be analyzed along with the soil data.

Thanks to Ivan O'Halloran, Ridgetown Campus, University of Guelph and Ron Beyaert, Agriculture and Agri-Food Canada for their assistance with this project.

Frost Seeding to Improve Forage Stands

by Gilles Quesnel, Field Crop IPM Program Lead, OMAFRA, Kemptville & Jack Kyle, Grazier Specialist, Lindsay

Frost seeding is used to improve productivity and forage quality of pastures and hay fields by broadcasting seed on frozen ground. Conventional tillage, minimum tillage and no-till usually have higher establishment success rate than frost seeding. However, frost seeding can be an economical way of rejuvenating an existing forage stand when tillage or no-tilling seeding are not viable options because of soil depth, variable soil drainage, stoniness, risk of soil erosion, cost or immediate forage needs.

Time of Seeding
For most of Ontario, the best time to frost seed is from mid-March or early April, once the snow is all or nearly all melted. Ideally, the ground freezes and thaws at least 2 to 3 times after the seed is broadcast. This freeze-thaw action helps to incorporate the seeds into the soil surface. Avoid frost seeding on top of snow where any run-off from rapid snow melt will wash the seed away.

Equipment
Frost seeding is often done using a spinner–spreader on an all terrain vehicle (ATV), a snowmobile or a tractor. In particularly rough or small areas, a hand-held broadcaster may be the preferred option.

Site Selection
For the seeds to germinate there needs to be good seed to soil contact. The best sites for frost seeding are thinning grass stands with some soil exposed. Seedling establishment can also be improved by overgrazing or clipping to 5 cm the previous fall to open the stand, weaken the existing plant growth and allow for better freezing and thawing action. Frost seeding is least successful in fields with thick sod.

Species Selection and Seeding Rates
Red clover is the easiest species to frost seed. The seed is dense, which improves seed-soil contact, it germinates at low temperatures and has high seedling vigour, allowing it to start growing early in the spring. Birdsfoot trefoil and white clover have been frost seeded with varying degrees of success. Birdsfoot trefoil is more difficult and slower to establish than red clover, but it is non-bloating. Once established, it will grow well under a wide range of growing conditions, and will persist longer than red clover.

Grasses are rarely frost seed successfully. However, research at the University of Wisconsin by Dr. Dan Undersander demonstrated greater establishment success with orchardgrass and Italian (annual) ryegrass than with timothy or reed canarygrass. Smooth bromegrass was intermediate for establishment, but is more winter hardy than orchardgrass and Italian ryegrass.

Because of auto-toxicity, which will prevent new alfalfa seedlings to grow in the presence of a mature alfalfa plant, alfalfa is not well suited to frost seeding.

Frost Seeding Rates
Use the higher seeding rates when significant bare ground is visible.

Species	Seeding Rate Kg/Ha (lbs/acre)
Red clover	3 – 6
White clover	2 – 3
Birdsfoot trefoil	3 – 6
Orchardgrass	3 – 4
Italian ryegrass	4 – 8

Fertilizing
While phosphorus fertilizer benefits new seedlings, in a frost seeding situation, fertilizing the field will provide the advantage to the existing plants. A better option is a late summer application of phosphorus and potash to promote growth and winter persistence of the newly established legumes. In the year of seeding, if an adequate stand (40% or more legume) is established, avoid the application of nitrogen fertilizer. Nitrogen fertilizer will increase the competition from grasses. In stands where there is a low level of legume, there will be a yield response from the grasses to additional nitrogen. If nitrogen must be applied to increase production, it should be limited to less than 50 kg/ha (actual) during the first season.

Harvest Management
Once the new seedlings are established, regular grazing or harvest will reduce competition from existing grasses and allow light penetration into the canopy. In the year of establishment, avoid overgrazing by keeping at least 5 to 8 cm (2 to 3 inches) of top growth.

Where Will You Be Five Years From Now?

by Ian McDonald, Applied Research Coordinator, OMAFRA, Guelph

In the last year and half we have seen commodity grain prices jump to a level where many can actually see profit. This has been fueled by the tremendous growth of the biofuels industry in the U.S., bolstered by the Bush administrations ambition to reduce reliance on foreign energy. A rapid expansion of ethanol, and biodiesel processing infrastructure has occurred. The U.S. is looking to add 10 million acres to the 2007 US corn crop. Historical users of grains, including livestock farmers and the food industry, are facing substantially increased competition for feedstocks.

Great Opportunities, But No One Knows The Future
At the recent Corn-Soybean-Wheat conference in London, Cal Whewell from FC Stone, Ohio. talked about the “staying power” of these higher commodity prices. With higher prices there are lots of opportunities to do “good business”. But he also had a cautionary tone regarding the impact of ethanol growth on crop prices. There are currently great opportunities, but no one knows the future. Grain based ethanol is a great thing, but it is only one component of a rapidly expanding bioenergy sector. It is also politically motivated, and with that comes risks. Whewell’s take home message was - take the present market opportunities to pay off debt, conservatively update your infrastructure, and sock some away for a rainy day.

Whewell spoke about the fact that there are other technologies out there which may yield more efficiently than grain ethanol. If energy prices stay high, further developments will occur in efficiency of energy yield per acre and in energy efficiencies of end use technologies, such as transportation fuels, home heating, and electrical production. These could impact the demand side of the equation. Whewell discussed the phenomenal developments in the “shrinking footprint” of electronic devices (ie cell phones and ipods) compared to the stagnate progress in fuel consumption efficiency of internal combustion engines. He used an example of a 1907 Model T Ford compared to his new 2007 Pontiac Vibe, which both get the same gas mileage. He was astonished that we have made so little progress over the last 100 years in this area. New technologies could significantly impact long term grain prices if they cause a significant increase in energy utilization efficiency.

Capitalize On New Technologies
As new technologies come along, is Ontario agriculture prepared to capitalize on them? Agriculture will be an integral part of the new bioeconomy, from where the feedstocks for food, fiber, fuel, chemicals, and materials are going to come from. Society will look to agriculture and forestry as the source of clean energy and an opportunity to reduce greenhouse gas and

environmental impact. Agriculture may function very differently within this emerging bioeconomy.

In order to capitalize on this potential, agriculture may be looking at different crops, including biomass crops such as switchgrass, reed canarygrass, and fast growing woody species. We may also be looking at technologies that are not biological, such as wind and solar farms. One technology that is getting a great deal of attention in Europe is the anaerobic digestion (AD) of manure, energy crops and organic wastes, for electrical generation. These AD units are located on the farms with the byproducts being a nutrient rich digestate that “closes the loop” and supplies the next feedstock crop with fertility.

Growing The Margins Energy Conference

With the current momentum and inherent instability of public interest, we need to take advantage of the present situation and explore the best opportunities for Ontario agriculture. That is difficult in this environment of high commodity prices, because it is so easy to just do what we have been doing. But, how long will we have this combination of high commodity prices and public/government interest to capitalize on? OMAFRA with its partners are hosting the “**Growing the Margins Energy Conference”** on April 11-13th, at the London Convention Centre. It will bring together governments, producers, technology industries, financial institutions, the insurance industry, Ontario Power Authority, Alternative Energy Proponents, and others. The goal is to understand the opportunities in Ontario associated with the bioeconomy sector. Be part of the discussions about the opportunities and hurdles of this evolving industry, and determine what part you might play in its future. Information about the conference can be found at *www.gtmconf.ca*.

Starter Fertilizers with Canola – Too Much of a Good Thing?

by Brian Hall, Edible Beans & Canola Specialist, OMAFRA, Stratford

Seed-placed phosphorus (P) fertilizer is one of the most efficient means of applying phosphorus, often with better results than broadcast application. Starter fertilizers work very nicely with cereals and corn, aiding stand establishment and boosting yields. In winter wheat, starter fertilizer MAP has shown up to an 8 bu/ac yield advantage in Soil & Crop trials.

Canola Less Responsive

Canola, on the other hand, is less responsive to seed-placed fertilizer. In the first 30 days of wheat plant’s life it uses fifteen pounds per acre of phosphorus. Corn uses four pounds per acre in the first 25 days. Canola uses 3 lbs in the first 35 days (5-leaf stage). Seed phosphorus content is enough to support canola seedling growth for about 7 days. After that time the seedling requires an external phosphorus source from the soil or fertilizer. Canola is recognized as a better scavenger of soil nutrients than many crops. Not only does canola produce longer root hairs, it releases organic acids that help it extract nutrients from the soil.

More Sensitive To Burning

Canola is also much more sensitive to seed-placed fertilizer than corn or cereals. Corn, wheat and spring cereals are monocotyledons plants. This means the seed sends out the shoot and root from the ends of the seed, and the seed remains basically intact. The seed coat protects the plant as it emerges. Canola and soybeans are dicotyledons. As the canola plant emerges, the two halves of the seed split apart. Fertilizer can burn the tender heart of the plant that is no longer protected by the seed coat.

Research

A recent University of Saskatchewan study confirmed the higher sensitivity of canola to starter fertilizer (Figure 1). There were no significant differences in canola emergence at rates up to 20 kg/ha of phosphorus, applied as MAP (11-52-0), but at 30 kg/ha canola emergence was reduced to 83%.

Plant phosphorus uptake in the first 4 weeks of growth increased in response to seed-placed P as expected, as did overall growth (Figure 2). Spring wheat was much more responsive to seed applied phosphorus in plant uptake than canola. There is some evidence to suggest that on low testing phosphorus soils, canola does benefit in early growth and yield from starter phosphorus.

Fig. 1 Effect of seed row phosphorus (MAP) on canola emergence

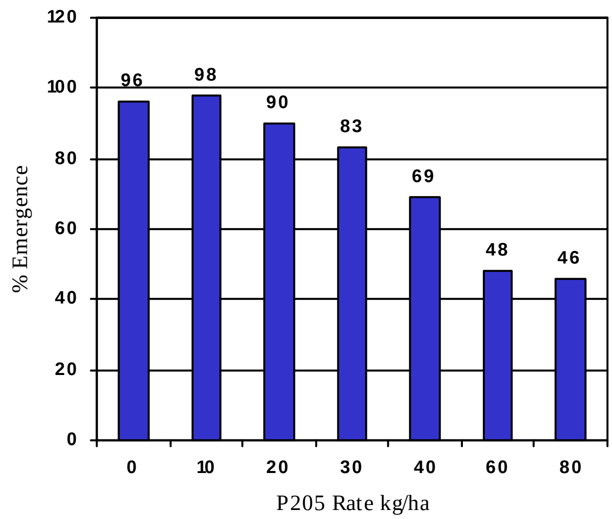
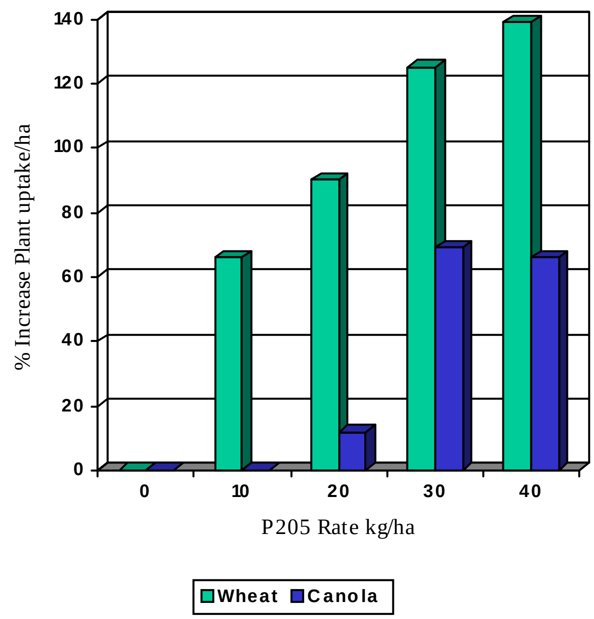


Fig. 2 Effect of seed row P on canola and spring wheat plant uptake.



Adapted from Crop Tolerance & Response to Seed-row Fertilizer, University of Saskatchewan, 2005.

OMAFRA Recommendations

The OMAFRA recommended rate for spring canola is a maximum 20 kg/ha (18 lb/ac) phosphate fertilizer be drilled with the seed as superphosphate or monoammonium phosphate (MAP). Nitrogen, except as MAP and potash, should not be applied with the seed. Table 1 compares the maximum safe rate of a couple of fertilizer types placed with the seed for canola and spring grain. Seed placed fertilizer injury is less likely to occur in a year with good soil moisture.

	Spring Canola	Spring Oats/Barley or Spring Wheat[1]	
	All soil types	Sandy or Sandy Loam soils	Loams, Silt or Clay Loam soils
	Maximum safe rate Fertilizer kg/ha		
MAP (11-52-0)	40	350	450
19-19-19	0	80	80
8-32-16	0	229	291
6-24-24	0	183	233

[1] For information on maximum safe rate of nutrients on spring cereals or other crops refer to OMAFRA Agronomy Guide 811 (pg 47), Soil Fertility Handbook (pg 171), of on the web http://www.omafra.gov.on.ca/english/crops/pub811/2fertmat.htm#table230