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Promoting Innovation in the Wheat Marketplace

On May 12, 2009 Dr. Brian Fowler of the University of Saskatchewan presented his views on how to promote innovation in the wheat industry to the House of Commons Standing Committee on Agriculture and Agri-Food - Study on the Competitiveness of Canadian Agriculture. Dr. Fowler is undoubtedly Canada's foremost expert on winter wheat and its potential. Therefore we are pleased to provide Dr. Fowler's presentation to the producers of Western Canada.

Thank you for the opportunity to address this Committee. In the time I have today, I will restrict most of my comments to a consideration of the competitiveness of Canadian agriculture as it relates to promoting innovation in wheat breeding programs and market development in western Canada.

In 2006, I made a presentation to the Standing Committee on Agriculture and Agri-Food Review of the Canada Grain Act and the Canadian Grain Commission on the problems associated with the use of Kernel Visual Distinguishability (KVD) in the Canadian wheat quality assurance program. KVD requirements were removed in August 2008. Although the debate still rages, I believe it has been clearly established that KVD acted only as a quality assurance placebo for a stagnated marketing system that was designed to handle Canada Western Red Spring and Amber Durum wheat. KVD restrictions acted to freeze the western Canadian wheat marketplace in the 1940's and severely limited the production opportunities for quality types other than red spring and durum. *The elimination of KVD requirements now allows for the evolution of a much more fluid wheat marketplace based on variety eligibility declarations that provide for an immediate assessment of potential market opportunities.*

The western Canadian wheat cultivar improvement and marketing system is unique in the world and has been widely criticized for suppressing rather than promoting innovation. The Canadian Wheat Board (CWB) has two major target markets, Canada Western Red Spring and Amber Durum. These two classes accounted for 88.3 percent of the western Canadian wheat acreage in 2008 and they have an international reputation for high quality. The CWB quality control system has four key elements listed on its web site that sets it apart from those of competitors. Two of these elements *actively discourage innovation*. 1) *Before a variety can be registered into a milling class it must match the functional performance of reference varieties on all aspects of quality.* 2) *Uniformity is assured through the registration system where strict quality requirements results in very few new varieties being introduced.* Two major wheat classes, a limited number of varieties, strict grading standards, and regional blending that ensure uniformity of export shipments are strong selling points in the industrial wheat market where assembly line milling and baking procedures are used. The requirement that new variety releases in each milling class must match the functional performance of reference varieties is added protection against change creeping into the western Canadian wheat production and marketing system. This rigid photocopy approach to wheat quality may have

served the Canada Western Red Spring and Amber Durum export market well, but it has acted to suppress innovation and prevent the exploration and development of niche markets that are characteristic of a mature marketplace.

The western Canadian wheat registration system is rigidly controlled by the Prairie Grain Development Committee cooperative testing and registration procedures and evaluation teams.

There are three evaluation teams that determine which wheat cultivars farmers can grow in western Canada. The quality evaluation team is made up of representatives from the milling industry, CWB, CGC, etc., but it is the CWB that ultimately determines the market targets. The Grain Quality evaluation team only determines if the lines under consideration match the functional performance of reference varieties for the target wheat class. Only wheat lines that have successfully passed through this registration system may be offered for sale in western Canada. *This restricted view of the wheat marketplace actively discourages innovation resulting in lost opportunities and limited competitiveness.*

The Canadian Food Inspection Agency has recognized the limitations in the Canadian registration system. In an impact analysis statement that was published in the June 2008 Canada Gazette they identified the following issue. *"The current variety registration system lacks sufficient flexibility to address the specific needs of different crop sectors in a rapidly changing agricultural environment. In some cases, the system imposes a disproportionate regulatory burden on developers of new crop varieties and creates impediments to innovation and to the timely availability of new varieties."*

I will now turn to the winter wheat experience as an example of how innovation has been frustrated and suppressed. Southern Alberta accounted for nearly 98 percent of the winter wheat produced in western Canada before 1975. This production was disposed of on the domestic market and in foreign aid programs and many farmers still had their winter wheat in storage almost two years after it had been seeded. In 1972, the Crop Development Centre at the University of Saskatchewan initiated a program to expand the traditional winter wheat production area north and to the east into Saskatchewan and Manitoba. In the years immediately following 1977 there was essentially only one cultivar that was tall, prone to lodging, and susceptible to rust. In 1991, the medium tall, lodging resistant, semi-dwarf cultivar CDC Kestrel was released. When its increased yield potential was combined with the management packages that were developed,

farmers in higher moisture areas of the eastern prairies were able to increase yield targets from 45 to 50 bu/acre to 60 to 90 bu/acre and the true potential of winter wheat started to be recognized. However, this dramatic yield increase was accompanied by a decrease in grain protein concentration, which came as no surprise as initial assessment of potential quality classes for the expanded prairie production area indicated that high protein concentration was the only genetic and/or environmental barrier to the production of winter wheat cultivars suitable for all market classes. Unfortunately for winter wheat, the CWB specializes in selling into high protein concentration markets and it made attempts on two separate occasions to have CDC Kestrel de-registered.

A number of highly adapted winter wheat cultivars that once again did not meet CWB standards followed CDC Kestrel as new releases in the 1990's. In spite of their lack of favour, these cultivars were widely accepted by farmers and, according to CWB surveys, accounted for more than 95 percent of the western Canadian winter wheat acreage in 1999 and 2000. In the nine year period from 1999 to 2007, the average commercial yield of winter wheat was 150, 127, and 120 percent of spring wheat in Manitoba, Saskatchewan, and Alberta, respectively. Winter wheat production grew to 1.5 million acres planted in 2007 and it is now western Canada's third largest class with 6.6% of the total wheat acreage. *This major winter wheat expansion was achieved primarily through the production of non-select cultivars and the development of feed and fuel markets that happened more by accident than by design.*

In 2001, the CWB initiated market development work on varieties of winter wheat with superior milling and baking qualities and the class was divided into select and non-select cultivars in 2004. The non-select cultivars continued to dominate production in the eastern prairies and domestic millers continued to purchase and utilize them, especially when their protein concentration was above 11 percent. Another change came in 2007 when the Canada Western General Purpose class was created to accommodate new wheat lines for use in ethanol production and specialized animal feed. However, its creation also removed the non-select cultivar option from the food market. As a result, winter wheat

Cont'd. on Page 2

In This Issue

Promoting Innovation in the Wheat Marketplace	1 & 2
Board of Directors	2
Winter Wheat conditions and trends going into seeding this fall	3
50 Insect Species and Pests in Stored Grain and How to Spot Them	4
Winter Cereals Manitoba Annual General Meeting.....	4

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cultivar registration is now limited to feed/industrial use and a single low return select option that is restricted by grain quality standards that are a photocopy of the class reference cultivar. Additional opportunities exist in the food, feed/industrial and other markets and the innovation that created the recent winter wheat successes must continue to be encouraged. *In today's marketplace, it is difficult to justify a registration system based on narrow and restricted cultivar options when there is a wide range of proven markets that need to be explored.* The following are examples of the market opportunities for winter wheat.

1) Over 60 percent of the wheat traded in the world each year is winter wheat. It is used to produce a large variety of foods that include many kinds and types of breads, cakes, noodles, crackers, breakfast foods, biscuits, cookies, confectionery, etc., items. The Quebec based Moulins-de-Soulanges and Premiere Moisson (<http://www.premieremoisson.com/Home/>) is one example of the successes that can be achieved in these so-called niche markets. Their research and development efforts include a systematic search for new blends of cultivar and crop management specific quality attributes to better supply ever expanding markets.

2) Food options exist for soft white, soft red, and hard white winter wheat cultivars with a wide range of functional properties and cultivars with these quality characteristics are presently available in western Canada. The current registration system in western Canada restricts the market options of all these types to the feed/industrial use General Purpose class. Cultivars in the General Purpose class cannot enter the food market unless they go through a buy-back program and the CWB has been extremely reluctant to let anyone pursue these niche food markets. Also, because the PGDC Grain Quality Evaluation team does not conduct quality assessment on General Purpose lines, it is difficult to imagine how the CWB could establish a fair buy-back price. *The CWB has no plans for involvement in the marketing of cultivars in the General Purpose class, so why not allow others to build opportunities in these market niches where the CWB is too big to play?*

3) We import flour and wheat products from countries like France and the USA where they do not have similar food, fuel, and feed restrictions on cultivar registration and use. Ironically, Canada is the largest importer of USA flour, accounting for nearly 50% of their flour exports in 2008. Unless the wheat was imported from western Canada for milling in these countries, the Canadian marketing and registration system prevents the quality types of essentially all of the cultivars used to produce this imported flour from being grown and marketed for food use by Canadian farmers.

4) Some General Purpose wheat cultivars registered in Canada are grown in the USA where they are not discriminated against in the food market. There are no special restrictions on these cultivars entering Canada from the USA as flour or in baked goods, or for that matter as grain for milling. The border appears to have an unexplained discriminatory effect on wheat quality for human consumption where the USA farmer can access Canadian food markets with wheat registered in the General Purpose class while the Canadian farmer is limited to the fuel and feed market - *a sort of Country of Origin Labelling (COOL) marketing restriction in reverse.* The net result is that, while the General Purpose class has created the opportunity for a wider range of market options, efforts to develop these niche markets for wheat are actively being discouraged.

5) A hard red winter wheat line with exactly the same quality profile as red spring wheat quality reference cultivars could not be registered for food uses in Canada. The CWB markets for winter and spring wheat have different quality requirements and a winter wheat with a hard red spring wheat quality profile would not be supported for registration by the PGDC grain quality evaluation team.

SOLUTIONS

1) *The Canadian Wheat Board* should continue marketing all classes of wheat, but its *monopoly*

should be restricted to Canada Western Red Spring and Amber Durum. These two classes account for nearly 90 percent of western Canadian wheat production and they are the focus of CWB marketing efforts.

2) The Canadian Wheat Board has show no interest in market development of the different cultivar quality types within the Canada Western General Purpose wheat class. The CWB monopoly should not be allowed to prevent others from actively operating in markets where the CWB has no interest. For this reason, *the federal government should make immediate use of its power to grant Governor in Council licenses to encourage market exploration and provide the opportunity to expand the markets for western Canadian produced wheat. This action would provide farmers in the CWB area of western Canada the same competitive access to both Canadian and international markets presently available to farmers elsewhere in the world.*

3) Encourage innovation. *The institutions responsible for managing the wheat industry need to rethink their decision-making paradigm and create a more innovative market responsive approach.* Recent attempts to create a more flexible wheat cultivar registration system must be encouraged. The elimination of KVD requirements and the use of variety eligibility declarations now allows for greater flexibility and the development of a more fluid marketplace. The present "dog in the manger" approach that restricts market access must be abandoned. Instead, our objective should be to develop and release cultivars with the special quality attributes that create as many food product and other market options as possible so that ever changing market opportunities can be quickly and accurately assessed on a continuing basis.

The complete text of this presentation can be obtained from Brian.Fowler@usask.ca.

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Winter Wheat conditions and trends going into seeding this fall

Winter wheat seeded last fall has faced some very tough conditions this winter and spring. In Manitoba, crop insurance claims were at a record level this spring and it is difficult to pin it down to any one factor. Delayed snow cover in November and December with very cold temperatures were the first stresses, freezing rain in February and March compounded things and then add some flooding and frosty spring temperatures and we should not be surprised by the final result.

Eastern Manitoba took the worst of it while western Manitoba probably has some of the best-looking winter wheat on the eastern Prairies this year. In Saskatchewan, considering the late seeding and dry conditions of last fall, the majority of the crop came through ok although stand thinning due to winterkill was evident and made for some tough decisions this spring. Fortunately, winter wheat has a strong capacity to compensate and fill in. Still, the delayed start to the season means a lot of the rotation diversity of this winter cereal has been lost.

With the cold spring and delayed growth of spring-seeded crops, we are going to be facing additional challenges. A key challenge will be getting harvest completed early enough to keep winter wheat in rotation this fall. As a result, there may be less winter wheat acres although experienced growers will do their best to maintain some acres because of the rotational benefits. A goal will be having your winter wheat at the three-leaf stage of growth before freeze-up. In eastern Manitoba, any acreage that couldn't be seeded this spring may be a good option for winter wheat, provided the stubble is in good enough shape to trap snow.

Variety trends

Canada Western Red Spring (CWRS) is by far the largest class of wheat grown across the Prairies, followed by Canada Western Amber Durum (CWAD). In Saskatchewan and Alberta, these two classes, CWRS and CWAD, account for more than 88 per cent of the total wheat acreage. In Manitoba, CWRS makes up 81 per cent of the total provincial acreage devoted to wheat production.

Remaining wheat acres on the Prairies (about 12 per cent) is seeded mostly to the smaller minor classes. The increasing winter wheat acreage means Canada Western Red Winter (CWRW) now ranks as the third largest wheat class at seven per cent of the total prairie wheat acreage. CWRW ranks as the second largest wheat class in Manitoba, and third largest in Saskatchewan and Alberta.

The CWRW Select contract program segregates Select varieties of CWRW that show improved milling and baking quality characteristics and offers premiums for growers delivering into the program. Eligible Select varieties are: AC Bellatrix, AC Readymade, AC Tempest, CDC Buteo, CDC Osprey, McClintock, Norstar and Radiant. Check the CWB web site for full details on 2010-11 CWRW Select contract program.

Variety survey results show that farmers right across the Prairies are increasingly seeding varieties that are eligible for Select status. For example, Saskatchewan, adoption of Select varieties increased by more than 20 per cent bringing the provincial total to 81 per cent, while in Alberta 94 per cent of winter wheat acres are seeded Select. Manitoba showed a slight decline down to just under 21 per cent. In total, Select acreage is now more than 60 per cent of the total CWRW class acreage (see Figure 1).

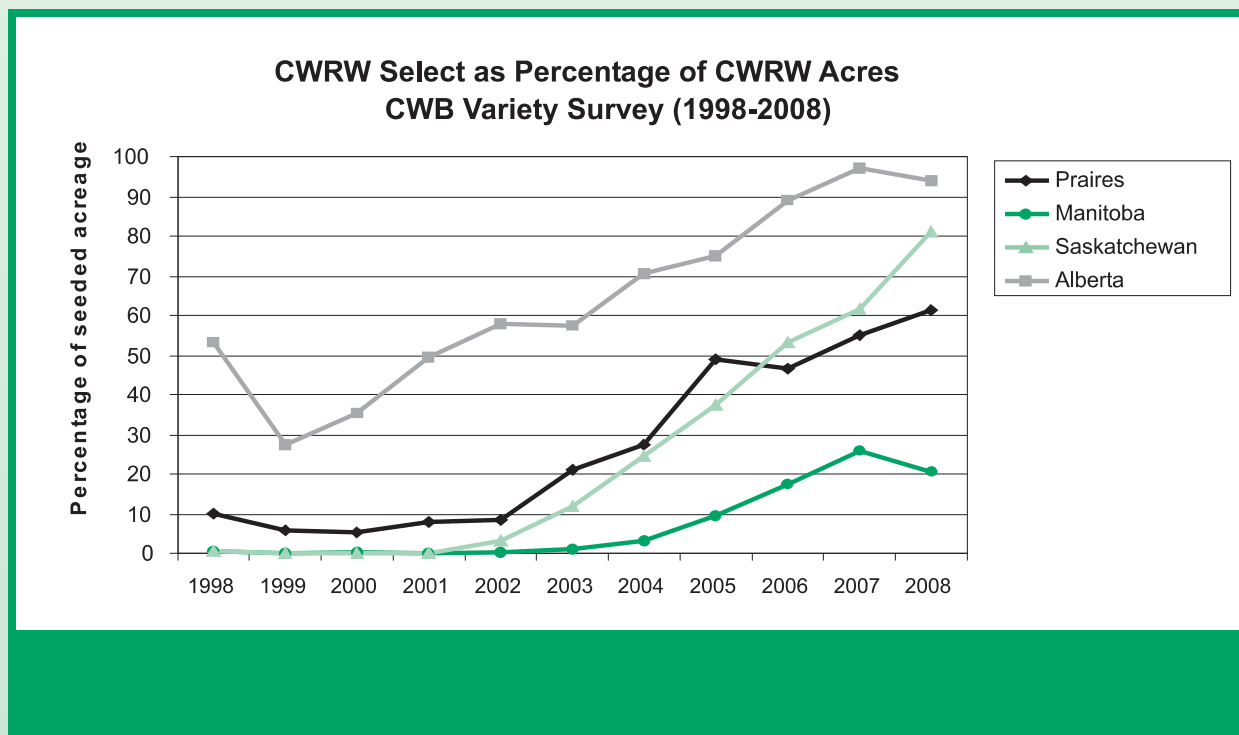


Figure 1. Trend in CWRW Select acreage adoption

In Saskatchewan, CDC Buteo increased to more than 58 per cent in 2008 and remains as the top variety ranking within Saskatchewan by far. The increase in acreage for CDC Buteo comes at the expense of CDC Raptor and CDC Clair acreage. CDC Raptor ranks a distant second place at 10 per cent of total acres, while AC Bellatrix, Radiant and CDC Osprey range from eight to five per cent and round out the top five varieties. Other varieties such as CDC Clair, CDC Falcon, McClintock, CDC Harrier, and CDC Kestrel make up the remaining acreage.

In Manitoba we see little change since 2007. CDC Falcon continues to dominate provincial acreage at more than 73 per cent. CDC Buteo acres held steady at 14 per cent, while McClintock declined slightly to six per cent. These top three varieties account for 93 per cent of the province's winter wheat acres. The remaining acreage is made up of CDC Raptor, CDC Clair, CDC Harrier, and CDC Kestrel.

Variety declarations: know what you grow

The variety registration system for wheat remains a cornerstone of the quality assurance system. With the removal of kernel visual distinguishability (KVD) as a registration and regulatory requirement, the grain handling industry has introduced a declaration system as part of the quality management system for western Canadian wheat.

As well a new class of wheat called Canada Western General Purpose (CWGP) was created to facilitate the introduction of new wheat varieties intended for ethanol and feed purposes. The creation of this class of wheat allows the registration of wheat varieties to serve industrial and feed markets without the same variety registration restrictions that exist for milling and baking quality wheat classes. No quality criteria or testing has been established for the evaluation and registration of CWGP wheat varieties. Registration requirements for this class focus solely on agronomic yield and disease resistance performance. In order for CWGP varieties to succeed, they will need to deliver yield performance for feed and ethanol, which is the intended purpose of the class.

So what do these changes mean for winter wheat growers? It means there are many more varieties available. Understanding the adaptability, yield potential and marketability of wheat varieties for your region should be the cornerstone of your decision.

Although there is now more choice than ever when deciding what to seed, what you put in the ground, will impact your delivery opportunities at harvest. You now have to declare that the variety or varieties you are delivering meet the registered variety eligibility requirements for the intended class of wheat. For example, with winter wheat, choosing to grow CDC Buteo allows you to deliver into the CWRW class. Depending on the quality, you may achieve CWRW Select. Choosing to grow CWGP varieties locks you into the CWGP class.

More information on variety declarations as well as class eligibility lists can be found at: <http://www.grainscanada.gc.ca/wheat-ble/ds-sd/gpwd-pglbeng.htm>.

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50 Insect Species Pests in Stored Grain and How to Spot Them

Insect pests that harm stored grain are attracted to it by its temperature, odour or pheromones. Some species feed on whole, sound grain while others feed only on damaged grain, fungus or organic dust accumulations. To manage insect infestations, it helps to know what kind of insect you have and what methods may work best to control it.

The Canadian Grain Commission offers a variety of resources on its web site, www.grainscanada.gc.ca, to help producers and grain handlers prevent, identify and control insect infestations. Follow the links to find the topic, Managing the quality of stored grain at <http://www.grainscanada.gc.ca/storage-entrepose/mqsgm-mgqge-eng.htm>

In Canada, there are approximately 55 000 species of insects, but only a few of them are considered pests. The Canadian Grain Commission recognizes over 50 species of insects as pests of stored grain. Online resources about these pests include information about:

- Ecology – where the pests are found
- Damage – which stored products are attacked and what the damage looks like
- Life history – how the pests develop and in what conditions
- Control – how to control the pests

As well, the information features drawings and photographs to help you identify insects. For some species, the site also has short videos that show live insects in their food source.

Blaine Timlick, entomologist at the Canadian Grain Commission, emphasizes that prevention is the best way to control infestations. He recommends monitoring your grain for insect infestation. He also recommends that you take steps to make your freshly stored grain less attractive to insect pests. The best recipe for keeping your grain free of infestation is to:

- Clean in and around your bins
- Use structural insecticides only in bins intended for cereals
- Aerate your grain to dry it or to bring its temperature below +15°C as quickly as possible

The Canadian Grain Commission is a federal government agency. It is the regulator of Canada's grain handling industry and the official certifier of Canadian grain.

For more information contact: Blaine Timlick
Canadian Grain Commission
Telephone: (204) 983-2788
Email: blaine.timlick@grainscanada.gc.ca

2009 CROP DIAGNOSTIC SCHOOL

The annual Manitoba Crop Diagnostic School will be held July 7 - July 17, 2009 at the Ian N. Morrison Research Station in Carman, MB. Our daily sessions are designed to refine the diagnostic skills of agronomists and producers involved in field scouting and assessing crop health. Join us for a unique learning environment to help you scout fields and recognize potential problems. We will have you assessing, scouting, and identifying while giving you a non-biased whole-perspective approach towards farming. For more information please visit www.cropdiagnostic.ca or call 745-5663 to register. Cost is \$160. Don't miss this opportunity, Register Now!

Winter Cereals Manitoba Annual General Meeting

Winter Cereals Manitoba held their Annual General Meeting in Portage La Prairie on April 15, 2009. Members in attendance were introduced to the 2009 Board of Directors and brought up to date on the organizations activities and financial position.

Jake Davidson, Executive Director advised members that in the first 6 months of levy collection (ending December 31, 2008) the Manitoba organization collected approximately \$148,000.00 in levy revenue and after all expenses were paid WCMI ended the year with a reserve fund of \$136,000.00 which will be used in part to fund critically needed research into new varieties and agronomic practices.

Davidson noted that it is important that the organization build a solid reserve fund before committing significant dollars towards any specific research projects as fluctuations in the size of the winter wheat crop can be considerable due to annual variations in the weather at seeding time. Once the organization makes a commitment to a project it is imperative that we have the funds in reserve to fund the project through to completion.

In a year with low levy revenue WCMI must have the funds available to maintain both the day to day operation and pay any long term research obligations.

WCMI announced that for spring 2009 we are pleased to be a sponsor of the Winter Wheat Survival Schools and the very popular Crop Diagnostic School which provide invaluable information to all winter wheat producers.

WCMI concluded the meeting by asking all producers to send in their suggestions on potential research projects for WCMI funding.

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Phosphate efficiency in winter wheat

Proper phosphate fertility is crucial to quick emergence, vigorous growth, tiller initiation, and overall stress tolerance. However, P fertilizer use efficiency is extremely low. Up to 90% of applied fertilizer phosphate becomes tied-up in the year of application.

Role of phosphorus in the plant

Achieving high winter wheat yields requires two critical factors: winter hardiness and rapid spring re-growth/vigor. Both factors are directly influenced by the phosphate (P) nutrient status of the plant. Adequate P nutrition promotes rapid emergence and establishment in the fall, allowing the plants to achieve optimal root and shoot growth and nutrient acquisition prior to dormancy. This promotes winter hardiness and a greater probability of the crop withstanding adverse environmental conditions.

Upon spring re-growth, plants with adequate phosphate exhibit enhanced seedling vigor, which encourages both root and shoot growth in the plant. Phosphate also promotes tiller initiation, an important component of achieving high yields. University research reveals plants with sufficient P produce 29% more grain heads, and consequently 29% higher yields than plants with limited phosphate. Proper P nutrition also speeds up maturity.

Phosphorus in the soil

Understanding the nature of phosphate in the soil is key to understanding where and how to enhance P fertilizer use efficiency.

1. Only 10 – 30% of the P fertilizer applied in a given year is used by the crop as a result of the P being bound. Because of this, P fertilizer use efficiency is the poorest of all major fertilizer nutrients.
2. Fertilizer P is easily and quickly bound in the soil by calcium (Ca), magnesium (Mg), iron (Fe) and aluminum (Al). Once the fertilizer P is bound, it is unavailable to the crop.
3. Phosphate availability is highest within a soil pH range of about 6.6 to 6.8. At lower pH levels (<6.5) the majority of the P is bound by Fe and Al. At higher pH levels (>7.0) the P fertilizer is tied-up by Ca and Mg.
4. Phosphate is very immobile in the soil. As a result, a crop's root system must grow toward the P that remains available.

For years the common practice to ensure that a crop was not deficient in P was to simply apply more phosphate fertilizer. An inoculant called JumpStart® offers producers the opportunity to maximize efficiency of P fertilizer applied in the current year, as well as previous years.

What is JumpStart®?

JumpStart is a wettable powder that is applied to the seed. The active ingredient in JumpStart is the patented, naturally occurring fungus, *Penicillium bilaii*. The fungus colonizes (grows along) the root producing organic acids that break the bonds that hold P in mineral/unavailable forms, increasing the amount of P available to the plant.

JumpStart's role in P efficiency

JumpStart ensures the phosphate in the proximity of the root system is made available, providing the crop access to a large pool of soil P that is typically not available, much of this from bound fertilizer P from previous year's fertilizer applications. Further, JumpStart acts as a P fertilizer efficiency tool in that it slows the binding of fertilizer P, particularly with Ca and Mg, keeping the current year's applied P in an available form for a longer period of time.

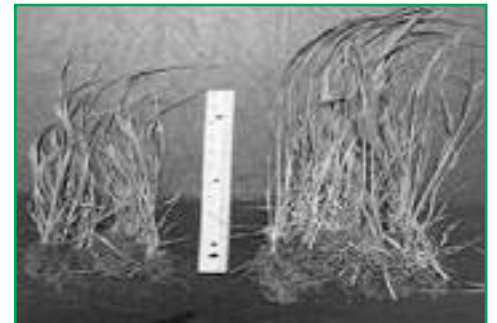
JumpStart benefits

The benefits of using JumpStart to enhance your phosphate efficiency include better root and shoot development for improved vigor, emergence, and stand establishment. Better stand establishment increases stress tolerance which improves winter survival and increased tillering which ultimately leads to higher yields.

For more information on JumpStart, please contact Novozymes Biologicals at 1-888-744-5662 www.bioag.novozymes.com

Better crops/Vol. 86 (2002, No. 4), International Plant Nutrition Institute.
Source: Dr. B. Fowler, University of Saskatchewan, Winter Cereal Production.
37 farmer-conducted split-field trials conducted since 2005 demonstrate that JumpStart increases winter wheat yields by an average of 7%.

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