Winter 2009

Newground™

A grower-to-grower Arysta LifeScience publication for farm management professionals

Trevor Buchanan – The Legacy of the Land

"Straight up – this year we actually had the perfect year. Our crops were just unbelievable."

What happened to $22 wheat?

"A shortage of wheat in a delivery position caused a 'classic short squeeze.' "

Growers' Roundtable on Weather

"Even our tractors have weather stations in them that are like a weather station radio."

BE OUR GUEST

The Currency of Agriculture?
In a word – creativity.

By Dr. Lowell B. Catlett

In the future in the U.S. and Canada, no plant or animal will be grown without a prescription for that animal or plant.

Take it one step beyond and add all the information concerning what consumers want to buy globally and you now have a totally linked system. It's called Franchised Prescription Agriculture (FPA). In a FPA world, no product is produced without a consumer order. That product will be produced exactly for that consumer.

The U.S., Canada and the European Economic Community will prosper during the next two decades. In fact, other than a mild pause or two such as the current economic downturn, the next two decades will see boom times. The baby boomers will assure that it will happen. These boom times will produce the Hyper-Cyber Economy that will be driven by creativity. Those companies and countries that foster it, reward it and use it will "own" the Hyper-Cyber Economy.

Likewise, the agricultural industry will be dominated by Franchised Prescription Agriculture, and the U.S. and Canada will be the world leaders. The profits from FPA will be so large that most people will not believe it possible. Yet a simple example shows it is possible – Bill Gates and Microsoft. We have made a college dropout the richest man in the world, not counting inheritance, because he has made the computer useful to each of us. His currency? Creativity.

Dr. Catlett is a Regents Professor for the Department of Agricultural Economics and Agricultural Business, New Mexico State University.

P.S. Newground *is your magazine. Keep sending us your thoughts on the future of agriculture. It's easy, just email or fax us 250 words or less. Letter mail will work, too.*

Newground, Winter 2009

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How low will it go?
"Pre-buy Inputs for '09"

Ross Grull, owner of Ag Depot in Bozeman, Montana, wrote to us to say, "Market input prices are at an all-time high and most likely are going to go down, down, down." He added that waiting until the last minute to buy "will be the lowest price of '09." With market volatility a given, here's hoping you're right, Ross. Be sure to keep track of the 52-week highs and lows.

Newground™

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Spraying Grasses

How to get good coverage on vertical weeds.

Spraying grassy weeds is a little tricky in terms of optimizing herbicide performance. To get good coverage on a vertical spray target, you'll need to get your water volume, nozzle selection, spray pressure and timing all working for you.

"In most cases, you want to control grassy weeds as early as possible," says Eric Johnson, weed biologist at the Scott Research Station with Agriculture and Agri-Food Canada (AAFC) in Saskatchewan. "Although early is important, the weeds must be emerged to be controlled."

If you're working in a less competitive crop such as flax, a herbicide application applied too early may not result in enough spray retention to give you the control you want. "We found that in some situations where the grass weeds were just emerging or in the one-leaf stage, we didn't get adequate levels of control. It didn't make much difference in a competitive crop such as barley, however, in a non-competitive crop like flax, there was a benefit to applying a bit later between the 2- and 4-leaf stage of the weed."

Start good control by correctly identifying the weeds. For example, in Saskatchewan the dominant foxtail species is green foxtail. Manitoba has yellow foxtail as well as other foxtail types. "Weeds should be actively growing at the time of application," Johnson says. "This enhances their ability to take up and translocate the herbicides."

Grassy weeds have more vertical leaves, making them harder to target and more difficult to wet. Unlike larger and flatter broadleaf weeds, vertical grasses don't intercept larger droplets as efficiently, so it stands to reason that vertical grasses retain smaller droplets better than larger droplets.

"The application somewhat depends on the type of herbicide application parameters you use," says Johnson. "We know growers like to cut their water volumes, and in most cases you can go down to 5 gallons per acre (56 litres per hectare) with most grass herbicides. However, with contact herbicides such as most Group 1/AACase herbicides, using really low water volumes plus very coarse spray qualities can compromise control."

At low water volumes, medium or coarse sprays should be used; very coarse sprays should be avoided. In most studies, water volume appears to have more of an effect on herbicide efficacy than spray quality.

"The Group 2/ALS herbicides, especially those with soil and foliar activity, don't seem to be as affected by these variables compared to Group 1 herbicides," explains Johnson. "The Group 2 herbicides that have soil activity offer a bit more flexibility in application parameters. Selecting those products means you automatically have greater weather latitude and can optimize timing because you can spray with a coarser spray under slightly windier conditions."

Referring to research that compares time of weed removal and spray quality, Johnson says, "We found that although we lost some grass weed control using very coarse droplets, as long as we sprayed at the optimum timing we were able to maintain crop yields. Using coarse to very coarse spray nozzles or low-drift nozzles provides a little more flexibility to apply those herbicides at an optimum timing."

Research conducted by Dr. Tom Wolf, research scientist with AAFC in Saskatoon, Saskatchewan, showed that Everest®, a Group 2 herbicide with soil activity, demonstrated consistent and high wild oat control at all water volumes and spray qualities. There was no significant reduction in efficacy when spray quality was coarser or volumes were lower, even at the low herbicide rate. However, the consistency of control was not as great as it was at the higher rate.

Nozzles are probably the most important part of the sprayer and largely determine the efficacy of the herbicide, the amount of drift and expected outcomes. They are also relatively inexpensive compared to the cost of a sprayer unit, since they usually make up less than one percent of the investment cost. The key differences between most types of nozzles are the materials used (plastic, ceramic and steel), the pressure ranges and fan angles.

Wolf says that the way nozzles are used has the biggest impact on the outcome of the spray application. Identify the optimal overlap for the particular nozzle to make sure there aren't any skips or uneven application. Canopy penetration is best when nozzles are pointed backwards. However, coverage of vertical targets like wheat heads or grassy weeds is best when nozzles are pointed forward.

Using a double nozzle provides the best of both worlds, but they work most efficiently with a coarse spray. A double nozzle with a fine spray will mostly increase drift potential with few other benefits.

"Controlling grassy weeds early and taking the right steps to optimize the herbicide application will help maximize crop yields," says Johnson. "To add flexibility to the timing of application, using Group 2 herbicides with dual foliar and soil activity can be a good option. Making your herbicide application more effective and efficient takes a good applicator making the right product and equipment decisions at the right time."

Wolf says the way nozzles are used has the biggest impact on the outcome of the spray application.

Better Burndowns That Work Harder and Last Longer

Jon Stang and Dale Taroh know how to get a better deal all the way around.

Forty miles southwest of Dickinson, North Dakota, Jon Stang and his father farm a mind-boggling number of acres of wheat, canola and Durum. Their land is in min- and no-till. In the spring, they seed right into the stubble with a drill.

"When we went to min- and no-till about 10 years ago, we started using burndowns," says Stang. "We've been doing burndowns on all the acres for at least five years. We spray almost every acre in the fall, in fact, this year we did spray every acre, but we had a thin crop this year. It was very dry, and we had a lot of weed pressure after we got the crop off, so we sprayed every acre with Touchdown®."

Their winter wheat burndown usually takes place the first week in September. They plan to seed about the 15th. "When we put in our winter wheat crop, we put 0.3 ounces per acre of Pre-Pare™ down with the Touchdown and sprayed 0.3 ounces per acre of Everest® after the wheat is up," Stang says.

At Ridgeland, in the northeast corner of North Dakota, Dale Taroh is just getting started with winter wheat. "We've had very little experience with it, just a couple of years. We use direct seeding – one pass with a narrow opener. We're looking at about roughly 30 percent soil disturbance. We do a spring burndown primarily for the winter annuals – cheatgrass, pennycress and tansy mustard. Pennycress is otherwise known as stinkweed or sandweed."

Taroh doesn't underestimate the importance of a burndown to stop the weeds from interfering with good crop establishment. "Some years those burndowns are vital," he says. "Before we got into min-till, weed control was becoming a problem. Spring tillage wasn't doing the job. Once we went to chemical applications in a pre-plant burndown, we got acceptable control."

Both Taroh and Stang battle cheatgrass. Stang says he's tried lots of control methods. "It seems that we get better cheatgrass control in the spring when we apply a little Pre-Pare with our glyphosate in the fall. Of course, in the spring we usually come back in-crop and spray another shot of Everest. We found it helps the cheatgrass control, but also our pigeongrass (green foxtail) control is far better with the shot of Everest than with any other grass product we've used."

Stang's been using Everest for four years. He doesn't use it on every acre and makes sure he rotates it with other chemical Groups. He says he's had a chance to compare Discover® to Everest. "After we take our crop off, the fields green up with pigeongrass

and foxtail. But where we used Everest, our fields are much cleaner. The residual effect seems to keep down the foxtail pressure a lot better."

There's little argument that a glyphosate burndown with the addition of a residual herbicide like Pre-Pare conserves moisture.

Taroh has been doing burndowns with glyphosate for about 12 years and has tank-mixed a variety of products – Affinity®, Express® and Everest – with glyphosate to get at the hard-to-control weeds. He says part of the plan is to wring the most he can out of the cost of the glyphosate.

"Certain species are harder to kill with glyphosate than others," Taroh says. "When glyphosate was at $10 or $12 a gallon, we could go with a higher rate and achieve satisfactory results. So adding another chemical like Pre-Pare to your glyphosate is an economical addition."

There's little argument that a glyphosate burndown with the addition of a residual herbicide like Pre-Pare conserves moisture, which positively affects yield. "I would say there is definitely a moisture benefit because you're controlling a lot of the pigeongrass for a longer period of time," says Stang. "So there is a yield difference. What percent, I don't know, but there certainly is more moisture because there's less weed pressure."

Last spring, Stang tried Pre-Pare followed by an Everest application in his spring wheat. He put some Pre-Pare down with his glyphosate, then did an Everest in-crop application. "It worked really well especially on cheatgrass. I'd say it worked exceptionally well on grass control. We've had great luck with Pre-Pare and glyphosate. You can spray when the cheatgrass is really small, and Pre-Pare is very gentle on the wheat."

Pre-Pare is registered for use in the U.S. It is not registered for use in Canada.

Jon Stang and his family

Weeds really are that smart

Tip from the weed experts: Don't do your burndown at exactly the same time every year. Weeds are extremely smart. In fact, in terms of adaptation to adverse conditions, weeds are on top of their game.

Scientists say weeds can show some interesting adaptations in fall burndown applications. Stinkweed, for example, has shown the ability to flower a little later or earlier, depending on when the burndown is usually applied.

The key to outsmarting weeds is to throw them off balance. Consider the size of your weeds, then vary the timing of your glyphosate burndown application. Keep accurate records of your tank-mix partners and be sure to rotate those herbicide Groups.

What's at stake? The major concern is a shift in the weed population. For example, if you go in every time with only glyphosate, you can bet that tough-to-control weeds like cheat and wild buckwheat won't be controlled very well, and eventually those weed populations will dominate the field.

And if you're worried about the health of your soil with repeated glyphosate burndowns, a 45-year study at Agriculture and Agri-Food Canada's Indian Head (Saskatchewan) research farm showed that microbes used the herbicides as a carbon source and microbial activity actually increased.

Trevor Buchanan – The Legacy of the Land

In 1915, the homestead on Trevor Buchanan's farm at Argyle, Manitoba, stood across the road from where it is now. Buchanan, who started farming 12 years ago, is the fourth generation to farm the land. "The previous generations broke the land, which was mainly grass and bush."

Fifteen years ago, cattle were the primary source of income, but grain in the last six years has put cattle on the back burner. Even so, they currently have 120 head and are farming over 3,000 acres. Buchanan says, "When I came into it, we had about 800 acres of land in min-till and seeded with a discer."

The farm ballooned from there. New ideas and equipment come with each generation. GPS was introduced in 2003. "We've got autosteer on everything now. It's a big help, but back in the early days, dad or grandpa would ask, 'What do we need that for?' but now Dad won't go to the field without GPS, and he loves autosteer."

"Sure, min-till helps with weed control, but we're out there to seed, not to control weeds."

Buchanan says wild oats have a long history on the farm. "Historically, wild oats have been our worst weed problem partly because of the lack of control options. Back in the '80s, we had Roundup Ready® canola and limited grass control options."

Buchanan describes their weed spectrum as pretty much the same every year, with the odd weed like cleavers creeping in. "What's changed is the management. We're growing Roundup Ready soybeans and LibertyLink® canola. We use Everest® on wheat – that's a must. We have Group 1 resistance so bad …"

Buchanan says Group 1 resistance showed up in the late '90s. "Resistance to Group 1 has steadily progressed. Actually, the first time I encountered resistance was on a farm I managed in 1996, my first year farming with my dad. We used Achieve® on it and it was a write-off. That's when we found out the problem was resistance."

Buchanan rotates herbicides and also relies on a min-till system to help him keep weeds under control. He uses a "straight-in" seeding system in the spring and one pass in the fall with ¾-inch openers. "We get better placement and depth control with less soil movement for drier times. Sure, min-till helps with weed control, but we're out there to seed not to control weeds."

More acres and more cattle, but the challenges remain firmly in place. "We can't stay home. I have to go out and work," says Buchanan. "My dad drives a school bus, so does my mother. I manage a crop inputs dealership. It's more than a full-time job. It's busy, but it's something we had to do to grow and deal with machinery costs. It's getting close now to where we can maybe stay home, but not quite yet."

It's taken plenty of get-up-and-go to keep this fourth-generation family farm going. "We've got the off-farm work to increase our income," he says. "We also seed and swath an additional 400 acres in addition to our own; this year we combined another 600 acres. Our equipment is older, not brand new. We can't justify the depreciation on new equipment."

Off-farm jobs plus managing a farming operation don't leave the family much wiggle room. But once in a while a crop year kicks in that makes Buchanan thank his lucky stars. "Straight up – this year we actually had the perfect year," he says. "Our crops were just unbelievable. It was a challenge to get them off in the rain, but soil conditions were just about perfect. Only about six miles north, in the Interlake region, it was awfully wet."

So far, the financial crisis and a drop in wheat prices haven't taken a toll on the Buchanans. "With off-farm income we haven't had credit problems," he says. "We've been able to cash-flow a lot of things,

which has helped. Markets – when is the right time to sell – well, that's an ongoing battle."

He says that bin storage has been a small issue, but in the past couple of years they have addressed that. "Some of the new acres came with bins, so we don't have to unload as much crop off the combine. As for buying inputs, well, I have the best of both worlds there. At the dealership, we're always on top of new things. We see what's working and what's not on other farms. Not that you want to see something not work for a guy, but as a dealer I see a lot more than most."

Buchanan says he wants to put his money where his mouth is. "I try new varieties before anyone else does. Since I'm a dealer, I get them a year in advance of anyone else. I do a lot of trials. The new trials take a little bit of time, but in the end, they pay off because we find the right variety for next year or different practices."

He also plants in the fall, which takes some pressure off their equipment. "We only have one combine so fall planting stretches seeding out. Then we do barley, oats, canola, soybeans and yellow peas and a little bit of spring wheat. Some of the newer crops are soybeans and ryegrass. This will be our fourth year for soybeans, and we're into our second year with ryegrass."

Buchanan has identified some opportunities with ryegrass. "It's breaking up our rotations for weeds. And along with the winter wheat, it really helps with weed control. It's also breaking the disease cycles and reduces the workload. If we can get 800 acres out of the way before spring, that's a big deal. It means a lot at seeding time."

So exactly how does Buchanan handle the time pressures between the farm and the dealership?

"Really good people work with me and for me. I don't have to babysit them. I can sneak away and get some stuff done. Anyway, it's only two miles to the field."

Off hours are spent with his family – his wife, Christine, and children, Alexis, nine, Brooklyn, seven, and Riley, five. Buchanan also has one brother and one sister. "They never had the desire to farm. My brother is an RCMP and my sister is a banker. I'm safe either way. Even in the economic downturn, we're well protected."

"Historically, wild oats have been our worst weed problem partly because of the lack of control options."

Photos courtesy of the Buchanan Family

Trevor Buchanan, bottom right, and his family

What happened to $22 wheat?

A look back at an unforgettable year for prices with lessons worth remembering for 2009 and beyond.

For one brief shining moment last winter, the world price of hard red spring wheat touched $22 per bushel. Before long, the price started heading south fast, eventually bottoming out at $6 or so.

When the price of a commodity triples in less than a year, then returns to square one in just months, it's worth taking a look at the replay and asking why it happened.

To Bill Wilson, professor of Agricultural Economics at North Dakota State University, 2008's roller-coaster wheat market was caused by three main factors: low stocks coming out of 2007, months of panic buying and the impact of new players in the grain markets.

Low stocks. "Coming out of the 2007 crop, there was a shortage of wheat worldwide, which produced the lowest stocks-to-use ratio in history," says Wilson. This shortage was the result of poor wheat yields by major producers in 2007, and in the case of drought-ravaged Australia, two straight years of outright disaster.

Panic buying. Emerging from the summer of 2007, the sentiment in the market had gone far beyond mere fretting about the tightness of stocks. By October and November 2007, some of the world's major wheat processors were genuinely concerned whether they could physically obtain the amount of wheat they needed for day-to-day business. These big players, especially in Japan, began to try to accumulate as much wheat as they could as quickly as they could.

Wilson explains that by early winter 2008, global supply/demand balance sheets for spring wheat were looking grim. With no new crop of hard spring wheat available until August, where would the market find the wheat it needed?

"At that point, many of the larger traders began buying as much cash wheat as they could, off-setting these purchases in the futures markets," says Wilson. "Then a shortage of wheat in a delivery position caused a 'classic short squeeze.' Wheat by this point was fundamentally at about $14 or $15 a bushel, but this short squeeze boosted it up to $22."

Index funds. Wilson notes that a significant number of open contracts in Chicago are held by index funds – large investment pools seeking to duplicate the financial returns of a physical commodity, in this case wheat. In the heat of the wheat panic early in 2008, close to 60 percent of open contracts were held by these funds.

"They are known as 'passive longs,'" explains Wilson. "They own large, long positions. The effect is that when these large longs decide to liquidate, you get very damaging pressure on prices."

By the early spring, spurred by high prices, the world's producers announced their intention to boost 2008 wheat plantings dramatically in Western Europe, the former Soviet Union and North America's Northern Plains. After two years of drought, Australian growers were also back in business. In North Africa, wheat was unthreatened by drought for the first time in several years.

The worldwide shortage of wheat suddenly didn't look so bad. Index funds took the hint and pulled the plug. Next stop for wheat: $6 and change.

Marketing plan, market discipline

What will be the impact of the 2008 bull market in wheat? Errol Anderson, an analyst with Calgary-based Pro Market Communications, begins with the positive by saying that, at the end of the day, and despite the year's hair-raising volatility, a lot of grain growers booked a very handsome profit.

"This created an immense amount of wealth for producers," says Anderson. "The lesson coming out of 2008, though, is that producers must be disciplined marketers, and that begins with having a marketing plan."

It's said that financial markets operate on a prevailing emotion that see-saws between greed and fear. If that's true, record high prices for wheat brought out the greed in some players. Producers who would have jumped at $7 wheat in 2006 saw no reason to sell as wheat hit $10, then $15, then $20 during the winter of 2008.

To Anderson, it is precisely in such volatile times that a marketing plan shows its true value.

"When wheat was rallying like crazy, we as brokers had a difficult time getting people to price their grain," says Anderson. "In my view, the effort to try to pick the top is fruitless. But the ability to sell into a rising market is a marketing skill, and that is what a plan and discipline can do for you."

"When wheat was rallying like crazy, we as brokers had a difficult time getting people to price their grain."

A grain marketing plan involves far more than a decision of whether to price grain or not, or deliver grain to an elevator or not. A marketing adviser can put clients in touch with a variety of strategies and financial instruments that increase returns while managing price risk.

Maybe you sold at $20 last winter and haven't looked back. Maybe you said no-thanks to $15 then sold at $9 on the way down. However you made out in the 2008 wheat market, Anderson believes you'll do better in the long run with a formal plan and qualified advice.

"Even with the volatility in the market today, there is ample opportunity to make money," he says. "We don't know where the bottom is or where the top is, but when some profits are there on the table, it's important to look at selling."

Why are these men smiling?
They hit the market highs last spring.

Grain bags promise easy harvest, cheap storage

Photo Courtesy of Grain Bag™ Storage System

Used widely in Argentina and elsewhere, grain bagging systems are getting a good long look from North American growers.

Here's a harvest management dilemma for you. You have a nice-looking crop on rented land, 10 miles from the home farm, with two combines, one grain cart and only three men to do everything. What's your next move?

To Humboldt, Saskatchewan, producer Reg Puetz, that's an easy one. He'd pack the grain into 9.3 mm polyethylene bags and leave it in the field until manpower, equipment and available time allow him to pick it up. Puetz is an early adopter of a grain bagging system that promises to keep grain in good condition in the field for up to two years.

Puetz, who's bagged canola, wheat, barley and oats over the past three harvests, sees a good fit for his operation.

"We have lots of rented land, and you just can't justify the cost of grain bins for all that rented land because you don't know if you're going to be farming that land from one year to the next," he says. "I think that the interest on the grain bins alone would pay for the bagging."

Based on his experience, Puetz is a believer in the system's ability to maintain the grade of the grain stored and keep it beetle-free. He's bagged malt barley as high as 16 to 17 percent moisture. Periodic re-checks with the maltsters always came back positive. For Puetz, the extraction process is relatively straightforward. He moves grain from bag to truck at about the same pace as operating a 10-inch auger, if not faster.

"We have lots of rented land, and you just can't justify the cost of grain bins for all that rented land."

Puetz bought his grain bagging system from Craig Yeager with Grain Bags Canada in Lake Lenore, Saskatchewan. While the idea of environmentally stable field storage might be new in North America, this technology has been a long time coming.

"In Argentina in the past there was no real infrastructure for hauling grain," says Yeager. "The grain bag took what had been exclusively cattle land and made it into grain land. They store more grain in bags than we produce in all of Canada. You fly over that part of Argentina and it's nothing but grain bags as far as the eye can see."

Yeager's basic package sells for $48,000. That gets you a unit that moves grain into the bag, an extractor that gets grain out of the bag plus a supply of 9.3 mm (0.36 inches) three-layer polyethylene bags. Each bag can hold up to 12,000 bushels of grain. For smaller volumes, simply cut as needed and seal the bag shut. The sealing and the thickness of the bag, Yeager explains, allow the grain to maintain quality over time.

"The plastic will actually deflect heat," he says, "so the grain will be cool and moisture will stay the same. Once the bag is sealed, the grain will consume the oxygen in the bag within 24 hours. Since insects need oxygen to survive, you don't get bugs in the grain."

For Yeager's growing list of customers – 250 of them in 2008 alone – the key selling points are cost savings, convenience and flexibility. It might be some time before plastic grain bags carpet North America's grain-growing regions, but given the high cost of fuel, equipment and storage, this retailer expects to stay busy.

Jon Bagley, Brandon, MB

Edward Grenier, St. Leon, MB

Brian Hnatko, Westlock, AB

Grain bags – Questions to ask

To Grant McLean, it's not difficult to see why growers would take a shine to grain bagging.

"The real advantages are for larger producers, especially farmers who don't have storage," says McLean, cropping management specialist with Saskatchewan's Ministry of Agriculture. "It can improve field efficiency in that you're not trucking grain long distances."

As part of their due diligence on grain bag systems, McLean recommends that producers satisfy themselves on several issues.

1. Durability of plastic. The quality of the polyethylene is obviously key. While grain bags have a track record in places like Argentina and Australia, standing up to North American conditions could be a different proposition. How well, for example, can the plastic resist the efforts of a hungry deer? If you happen to lay the bag on a rough patch of ground, could it tear open?

2. Insurance. Check with your insurance provider to determine precisely how claims of loss would be treated, compared to permanent grain storage.

3. Disposal. Can bags be recycled once used, and if so, where?

4. Grain condition. "To me, one of the unknowns is where the moisture in the grain goes," says McLean. "I don't know anybody who's done research on that. What can happen with hot spots in the grain over periods of time? I'd think that most producers would look at grain bags for relatively short-term storage: three months, four months, maybe up to six months."

For more information, and a slide show of how bagging and extraction work, visit www.grainbagsystem.com.

THE WORLD'S FOOD SUPPLY

Improving the Nutritional Quality of Crops

Biofortification carries the potential to improve nutrition in many of the world's staple foods.

It won't be long before North American farmers start using nutrient management practices to improve the nutritional quality of the crops they grow. Researchers are working to identify nutrient management practices that not only improve crop production and yields, but also improve nutritional quality. Increasing trace element content is the key.

Many of the world's staple foods such as rice and wheat have fairly low levels of trace elements. According to the World Health Organization, deficiencies of trace elements, particularly zinc and iron, are one of the major causes of childhood death and disability around the world.

"In many areas, particularly in developing countries, poor-quality soils and local subsistence diets are accentuating trace element deficiencies," says Dr. Cynthia Grant, research scientist with Agriculture and Agri-Food Canada in Brandon, Manitoba.

Often referred to as "hidden hunger," trace element deficiencies affect cognitive ability, immune system health and mortality rates, particularly in children. "There are huge efforts around the world to increase the content of trace elements in food. These efforts include HarvestPlus, an international initiative partly funded by the Bill Gates Foundation."

HarvestPlus, a global alliance of institutions and scientists, is seeking to improve human nutrition by breeding new varieties of staple food crops that have higher levels of micronutrients. The process is called biofortification.

"With HarvestPlus, the improvement of crop genetics will allow for higher uptake of trace elements, providing soil nutrition is adequate, at the same time as allowing local farmers to reproduce the seed themselves," says Grant. "This provides a long-term solution at little additional cost or effort per year."

North America tends to have soils that are fairly rich in trace elements because soils are young, have higher soil organic matter content and haven't been greatly leached. "We're fortunate and should try to take advantage of this opportunity to increase the demand for our crops internationally," says Grant. "We've initiated a research project to look at impacts of various agronomic practices, tillage systems and preceding crops on crop yields and the content of trace elements."

The emphasis is on zinc, iron, copper and manganese because those elements are so important nutritionally. For other trace elements like cadmium, a heavy metal, reductions are desired. Crops include red wheat, Durum wheat, barley, flax, canola and soybeans.

In order to build up a reserve of information, Grant is including an analysis of the trace element content in all of her research. "We're also looking at the protein content in grains, oil quality in canola and soybeans and other factors related to food. We want to determine how management practices affect the nutritional quality of the grains and oilseeds," she says.

All management practices – fertility, preceding crop and the tillage system – influence not just crop yield, but also the chemistry and biology of the soil. These factors can mobilize trace elements or, in some cases, lead to reduced availability. The basic background level of trace elements in the soil will also have an influence.

"Selenium in food products tends to be much more bioavailable to the body than supplements, so being able to provide it through grains, for example, would be great."

Preliminary results show fertilization has varying effects on the trace elements. In some cases, applying higher fertilizer rates may dilute trace elements. Although there is an increase in the overall uptake of the available trace elements, the concentration in the grain decreases because of the higher yielding crop. In other cases, the fertilizer seems to mobilize trace elements in the soil, resulting in both a yield increase and an increase in trace element concentrations. Grant emphasizes this is a "good news" story because eventually producers will have more crop to sell with better nutritional quality.

Selenium is an example of a trace element that can easily be increased with a fertilizer program. Applying only a few grams per acre can result in very large increases in selenium concentrations. However, selenium is one of the elements with the narrowest range of toxicity in humans and animals; levels must be carefully managed. In comparison to other trace elements, selenium tends to be very high in cereal grains.

Much of the Prairies and Great Plains have relatively high levels of selenium, although in some pockets it is low. In many countries, where selenium levels are low, efforts to increase levels through crop fertilization and food supplementation have been in progress for years. For example, the UK and other parts of Europe are noticing that the level of selenium in the overall diet is actually decreasing. This is partly related to the increase in local production of wheat and the reduction in imports of wheat from countries with higher levels of selenium.

"Recent research is showing that higher levels of selenium than were thought to be important in the past may be beneficial in reducing the risk of prostate and other types of cancer," says Grant. "Selenium in food products tends to be much more bioavailable to the body than supplements, so being able to provide it through grains, for example, would be great."

Although Grant won't have conclusive results for a few months, preliminary findings show that nutritional qualities of grain and oilseed crops are impacted by agronomic practices. As market demands arise, Grant says she thinks growers will find it easy to adjust management practices to produce crops with high nutritional quality. ❧

Major Weed Infestations

To rescue yield, hit 'em hard.

A one-two punch is emerging in the battle against wild oat and green foxtail in wheat. Growers are pulling out two heavy hitters, Pre-Pare™ and Everest® to control their worst grassy weed problems in fields where yield is all but guaranteed to take a dive.

In September, Jon Stang burned off his grassy weeds with an application of Pre-Pare tank-mixed with Roundup® before planting winter wheat on his farm near Regent, North Dakota. A month later, to make sure his hard-to-control weeds got checked, he went back in with an Everest application. He says this worked well for him now that burndowns are a regular part of his field preparations.

"At one time, we didn't burndown all the fields. We'd 'vibrashank' down the weeds we had before we seeded. But when we went to min-till or no-till, we started to burndown more often."

Wild oat infestations

If you're battling wild oats in min- or zero-till, you basically have two lines of defense: prevent seed production and/or encourage germination of seed reserves.

According to Alberta Agriculture, the spring following seeding, up to 80 percent of seeds usually germinate, and the second spring following seeding, up to 97 percent. The remaining 3 percent may have what is termed "deep-seated dormancy" and can germinate for up to 12 years.

A Pre-Pare plus glyphosate tank-mix burndown is a good way to check fierce wild oat competition. North Dakota State University small grains specialist Kirk Howatt at Fargo, says, "Flucarbazone [the active ingredient in Pre-Pare and Everest] is a fairly reliable pre-emergent product. It is very good on foxtail, and as a post-emergence product, very good on wild oat."

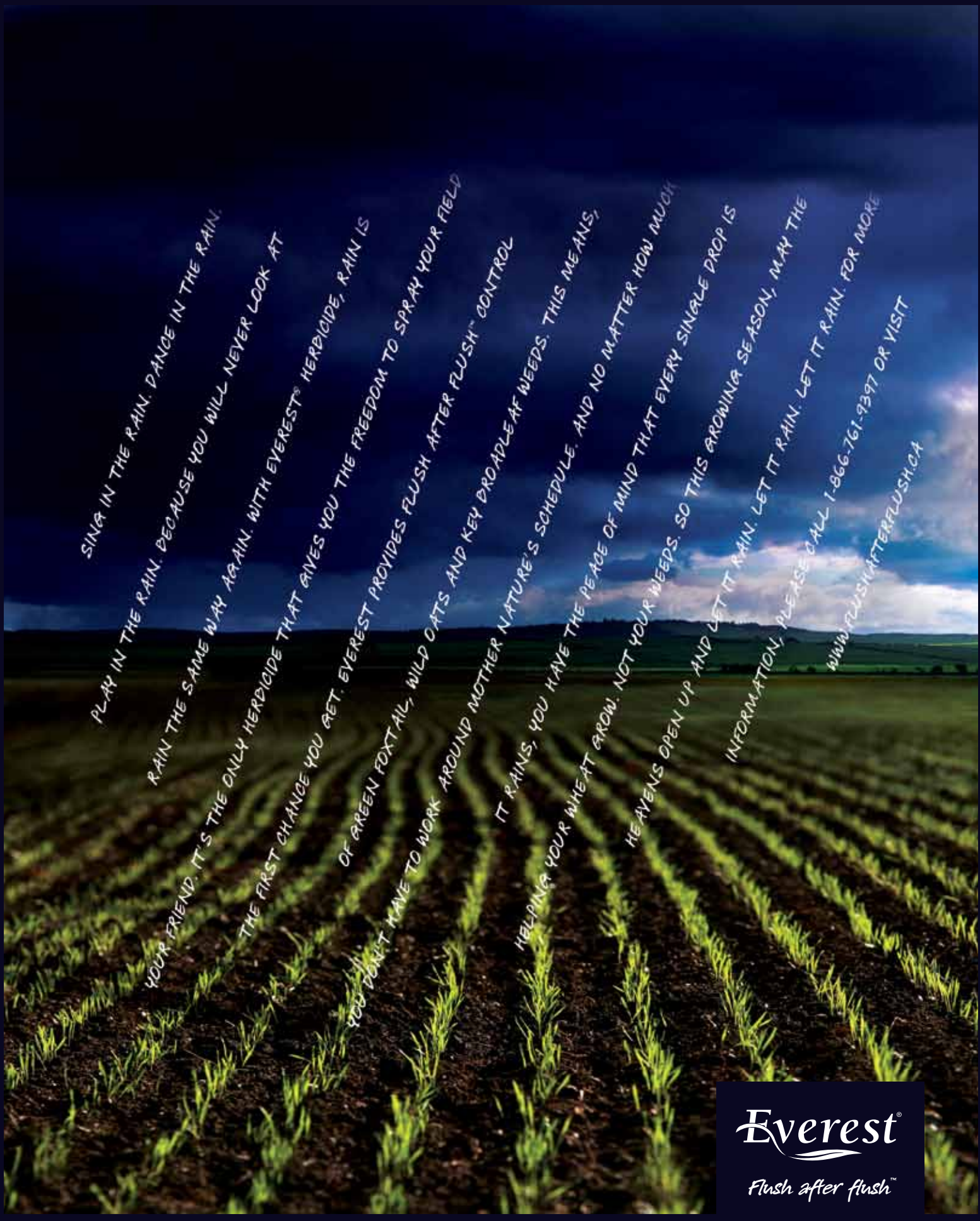
Howatt adds: "It has a lot of activity on early mustards and on pigweeds, which may come up a little later. It also has activity on some other broadleaf weeds. Keeping that crop canopy open for the wheat plant early in the season really seems to promote crop establishment and enable more vigorous spring growth. The wheat canopy closes a little sooner, eliminating weed problems that sometimes emerge later in the season."

Howatt began working with Pre-Pare/Everest applications in 2005 at the research farm near Fargo. Other NDSU researchers are also studying the technique. "We've had the Pre-Pare/Everest combination work the best, with a definite benefit to the system, in an environment that encourages the early germination of broadleaf weeds," he says. "We know we're always going to get early germination of wild oat. The soil product is able to suppress and prevent that first flush of weeds. You get further into the season before there's competition for the crop, and the crop does better. By the numbers, there are not more tillers produced or more plants, but it tends to be a healthier, more vigorous crop and tends to produce more yield. The yield improvement varies from just a couple percent to almost 10 percent. Sometimes you can get a 6- to 8-bushel benefit."

In terms of timing, Howatt says: "Early season competition with wild oats can be really severe, particularly if populations are higher, so waiting until the broadleaves have emerged can end up causing fairly substantial yield losses."

If time is running out in the spring, it's easy to eliminate pre-emergence weed control from the schedule.

Pre-Pare is registered for use in the U.S. It is not registered for use in Canada.



Arysta LifeScience

Take Your Holidays – Time away ultimately puts money in your pocket

Do you know someone who makes a point of telling you how little vacation time they take? The person who's proud to say they once took two straight weeks off, mind you, that was during the Nixon administration?

Farmers and ranchers, generally speaking, take far fewer holidays than urban folks.

Anne Stevick, for one, has a certain amount of sympathy for this position.

"There are a couple of reasons why farmers don't get away more often," says Stevick, who farms with her husband Quentin near Pincher Creek, Alberta. "First, there's a lot of work to do. Second, it's hard to find somebody to stand in for you. You can draw on neighbors and relatives for only so long, then it costs you a lot to hire someone to take care of your place while you're gone."

"Today we have become so accustomed to overwork, it's like the smog in Los Angeles."

In spite of it all, the Stevicks have made it a personal priority over the years to take time away from the farm, often travelling for a couple of weeks at a stretch. Now in their mid-50s, they'll tell you this practice has allowed them to enjoy life more and renewed their interest in agriculture.

Their vacations began as driving holidays around Western Canada visiting customers. Later, they broadened their horizons with trips to New Zealand and Uruguay. If all goes according to plan, they'll visit Australia in 2009.

Some producers will make the calculation that every day away from the farm costs them money. Anne Stevick is a firm believer that the opposite might be true. Time away ultimately puts money in your pocket.

"I heard a speaker once who said, 'Spend more time working on the business than working in the business,'" Stevick says. "You need to get away because you come back with a clear head and some new ideas."

When Maureen Wilt hears people brag about never taking holidays, she's not impressed. Wilt, associate professor at the University of Central Missouri's College of Health and Human Services, gives this syndrome a more clinical name: overwork.

"We tend to minimize the very real health concerns that are posed by overwork," says Wilt. "Men who don't take regular vacations are 32 percent more likely to die of heart attacks, and 21 percent more likely to die early of all causes. Women have 50 percent more risk of heart attack. Health is an important priority that I think is tragically ignored by many."

Wilt cites research indicating that a major health concern of farmers is the risk of injuries due to accidents. Many farm accidents can ultimately be traced to lack of sleep, a frequent side-effect of overwork.

Wilt notes that in Japan, there's even a legal term to cover the most extreme consequences of this tendency. The word in Japanese is karoshi, meaning death from overwork. Families of those who work more than 80 hours of overtime per month are eligible for a payment in the event their loved one dies on the job. And it happens.

For the sake of their health, Wilt urges farmers to take these risks seriously and be proactive about taking time off.

"Today we have become so accustomed to overwork, it's like the smog in Los Angeles," she says. "People who aren't from there are amazed that people in L.A. can live under such bad conditions. It's like that with overwork. We see it as a normal way of life, but people from other countries are amazed at how little time we take off and don't know how we do it."

Creativity is good for business

The North American economy is changing, and with it, the agricultural economy. Producing low-cost commodities or goods is no longer the ticket to success that it once was. Increasingly, sales and market share go to those with the ability to create new technologies, develop new products and cultivate new brands.

As Catherine O'Keefe explains, the innovators of tomorrow are unlikely to be the sleep-deprived of today.

"Productivity actually increases when people get vacation and downtime," says O'Keefe, senior instructor in Health and Leisure at the University of Alabama. "The creativity that is needed for new and entrepreneurial ideas rarely happens when we're sitting at a desk. We need to get away to have the time to get our heads around what's important to us."

Looking back on 30 years of business success and more than a few vacations, Anne Stevick thinks it's no coincidence.

"As farmers, when you walk out your front door, you're at work," she says. "We have realized for a long time that if you can get away now and then, it just makes a big difference to your day-to-day job and to your life."

Farming – Tough business, tough decisions

According to expert Randy Weigel, the single most important factor that separates the executive from the farm owner is that the executive operates within an organization. The farmer is the organization. When a mid-level executive makes faulty decisions, it probably won't cause a break-up of the organization. The farm owner, on the other hand, often faces decisions that can make or break the entire operation.

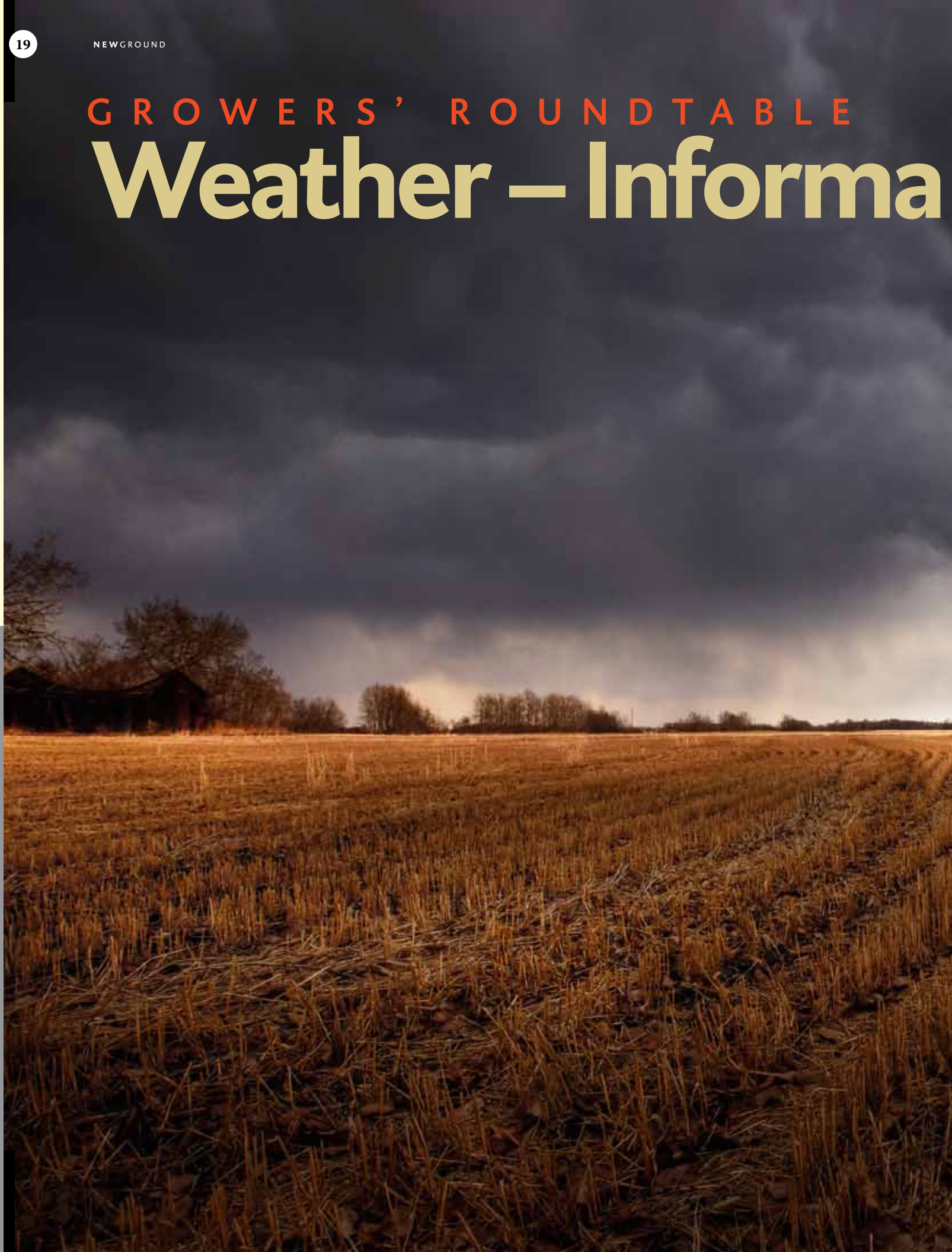
Work lives Compared

Farm Owners	Mid-level Executives
Machinery breakdown	Ineffective supervisor performance
Disease outbreak	Change in policy or procedure
High debt load	Poor relationship and supervisor/subordinate
Physical illness at critical time	Major reorganization
Loss of help when needed	Work interrupted by new priority
Weather-caused delay	Transferred against will
Government regulations	Lack of job security
Heavy workload	No participation in decisions
Commodity uncertainty	Office politics
Father-son operating team	Role ambiguity
Equipment or facility purchase	Difficulty delegating authority

Source: Randy R. Weigel, Human Development Family Life, Iowa State University.

GROWERS' ROUNDTABLE

Weather – Informa



tion & Predictions

Growers use every available means to get an accurate read, but as one grower says, "You take your chances, I guess."

At Crystal City, Manitoba, producer Garry Reimer spends 10 minutes every morning and evening checking online weather reports. Mike Wolff at Lindsay, Montana, checks into NOAA (National Oceanic and Atmospheric Administration) weather on his two-way radio. Another Manitoba grower, Kevin Coubrough, near Portage la Prairie, checks into the Environment Canada weather site and likes his technology.

Newground: Where do you get your weather information?

Garry Reimer: I listen to the radio, mostly in the house. We have access to a station close to Langdon that's an NOAA station that gives us weather reports 24 hours a day. It's constantly going and comes in nice and clear. I also get information off the Internet.

Mike Wolff: I get weather mostly off a local radio station on my two-way radio. They've got NOAA weather that comes out of Glasgow about 150 miles away, but they also give local reports. It's pretty good.

Kevin Coubrough: We get weather off the Internet. I check it just about every day. I also check the Environment Canada site and the Weather Network. We also listen to the radio. Actually, the elevator about 10 miles straight north has one of those Weather Bugs. We can access that online, too, and it gives us other aspects like wind speed, but for wind speed, we have those little hand-held devices.

Newground: Are you able to measure wind direction and speed with them?

Coubrough: Yes. It's a little hand-held digital reader that you carry with you. It's worked well for us; we've used it the last three years. When things are a little iffy, at least you can dial in and see exactly what the situation is with the wind. There are probably a dozen different makes.

Reimer: I rely on online weather reports from Accuweather, NOAA and National Weather Service from the States. We're just eight miles from the border. If all three say the same thing, then it's usually fairly reliable. And like most producers, I watch the sky.

Wolff: We're in eastern Montana and usually half crop and half fallow. I don't spend much time gathering weather information. I just listen to weather reports in the pickup while I'm driving down the road. Usually I'm doing something else.

Newground: What technology helps you keep farming when weather conditions are leaning toward adverse?

Coubrough: We have a windscreen on the sprayer. It's pretty beat up now after 10 years. And we put up rain gauges. Our land is spread out in a 20-mile radius, so we probably have half a dozen rain gauges just to keep track of moisture. But as for predicting weather, it's usually back to the old crystal ball. You take your chances, I guess.

Reimer: We've had a windscreen on our pull-type sprayer for at least 20 years. Now everything is protected. Seed goes from the air cart right into the ground. I can remember years ago when we sowed with a drill, we were sometimes concerned that wind would suck the canola out from the meter. There was a little gap from the meter to the downspout tube, and wind would blow it out of there. Now that's totally enclosed; you don't have to worry about it. On the combine, there are those swath or wind guards on the pickup that help protect the swath from the wind.

Wolff: We've got windscreens and Turbodrop® nozzles on the sprayer. We've used that combination since about 1992. It's made a huge difference. When there's wind, we can spray longer. I've sprayed in a 20 mph wind before with that set-up.

(continues next page)

"Even our tractors have weather stations in them that are like a weather station radio so we can tune into the weather any time."

Newground: You don't worry about drift?

Wolff: We do a little, but it's not nearly as risky as it would be without the windscreen and Turbodrop nozzles. It also depends on where you're spraying. If I'm spraying strips then I've got to be more careful.

Newground: How do you relate the forecast to your chemical applications?

Coubrough: We check rainfastness when we're spraying and decide to spray or not accordingly. There's always a chance of rainfall. Sometimes you take a risk, depending on the chemical. If it's a fairly inexpensive chemical, maybe you can afford to take a chance, but if it's relatively expensive, it's not really worth the risk. Rainfastness has never been a problem. If anything, temperature in a cool year can present more of a problem. We use Everest® more for the rotation option than because it is rainfast.

Reimer: We wouldn't make a last-minute decision on picking a chemical based on rainfastness – like picking up chemical in the morning, thinking it might rain later in the day, and I want to spray now. We wouldn't usually do that. But when we make the herbicide selection earlier, before spraying season, then rainfastness is taken into account, for sure.

Newground: Do you read the label directions that come with your chemicals?

Reimer: Chemicals are quite an expense so, yes, we read the instructions. You don't want adverse weather conditions to affect performance, which could mean the chemical doesn't work.

Wolff: Most chemicals nowadays are pretty rainfast – like within an hour or half an hour – so that's not as big a problem as it used to be. If it's going to rain during the night, I won't spray in the evening.

Coubrough: If we're going to worry with chemicals, it's probably more about how heat affects some chemicals. With Liberty® and chemicals like that you have to be careful. Sometimes they won't work if the temperature isn't warm – and others get a little too hot.

Reimer: If we're worried about rain in spraying season, we can check the national radar satellite map, as well as the more local ones, and even get local radar from North Dakota that comes into our area. It easily covers our territory, and very often the rain comes from there. We'll try to assess the speed of the storm. If the leading edge of the system or the rain has moved, say, 80 miles in two hours, we know it's coming at us at 40 mph.

Newground: How has your use of weather knowledge changed?

Coubrough: I guess I probably pay more attention to it now than in the past. Even our tractors have weather stations in them that are like a weather station radio so we can tune into the weather any time we want on the tractor. If you're doing something where weather is a concern, and you want an update right away, it's right there.

Reimer: Watching the weather on the computer is just great. We've been doing it since 1995 – as soon as we had the Internet. It's also a help trucking grain in the winter. We truck a lot of grain to Velva, North Dakota, which is close to Minot. We'll check to see what the weather might be down there and whether there's a chance of snow or a storm. We can also find out where the wind is from and what the temperature is. Accuweather will look 15 days ahead and try to predict it. The reports aren't very reliable that far ahead, but it's as good a guess as any, and it's always interesting to see if they're right.

Life is complicated. Your herbicide shouldn't be.

When it's time to control grassy weeds in pulse, flax, canola and other broadleaf crops, don't complicate things. Use the herbicide that works the first time, every time–genuine SELECT® Herbicide. To learn more, see your retailer or visit www.arystalifescience.ca/select.

Select®

The no-hassle herbicide

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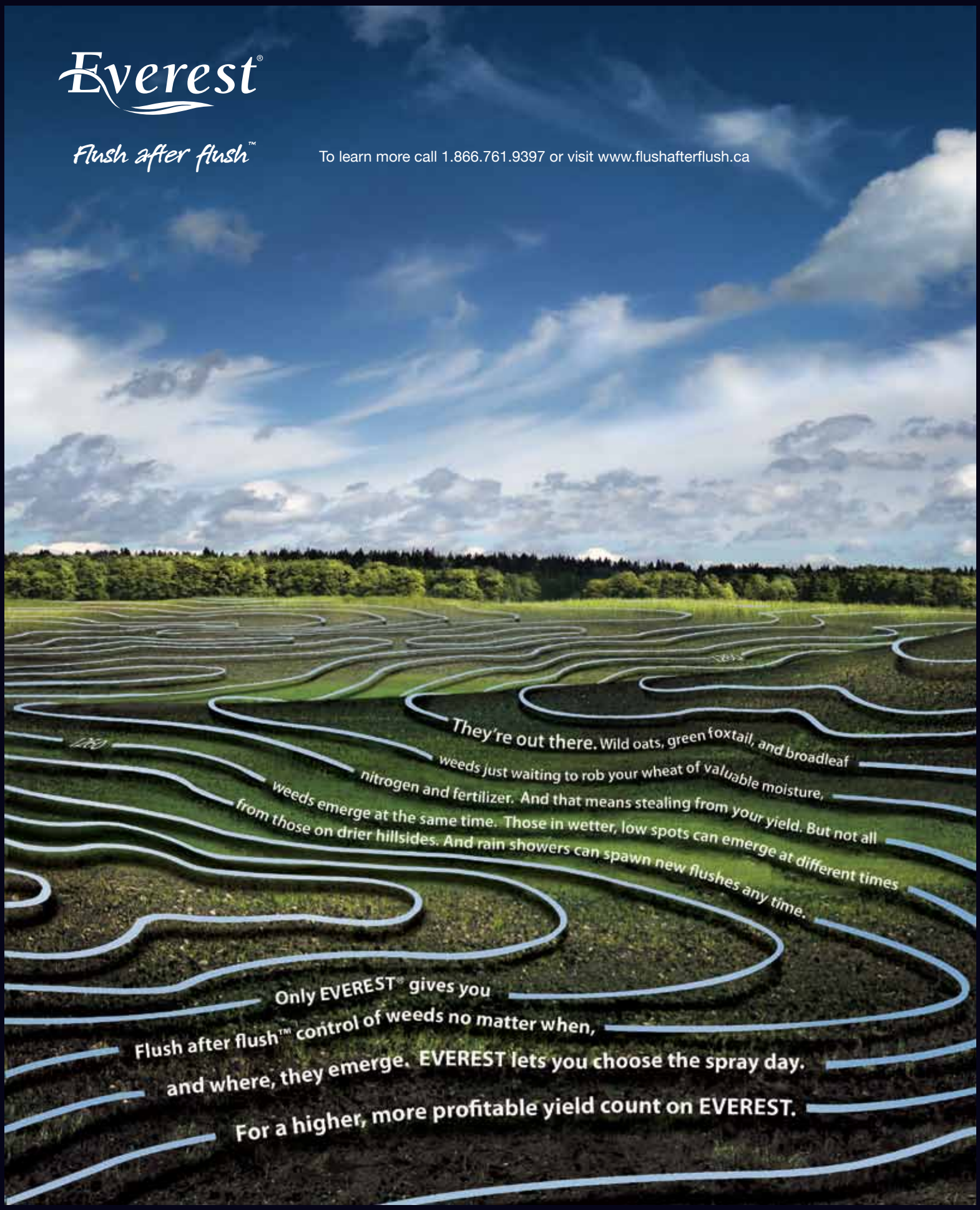

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