

# IDAHO GRAIN

THE IDAHO GRAIN PRODUCERS ASSOCIATION MAGAZINE

SPRING 2014



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**A**s we start a new year I am compelled to wonder what 2014 will bring. Will the Farm Bill finally pass or will Congress keep kicking the can down the road? What will prices do for both crops and inputs? What issues will pop up that IGPA and agriculture will have to deal with? How important is research and biotech?

Some of the answers to these questions can be had by individuals but for others it takes a larger and focused voice...IGPA. Rest assured, I know that IGPA has your and agriculture's best interests at heart. We are a strong and respected voice at the state and national level.

The volunteer leaders of IGPA's executive board, full board, and the Wheat and Barley Commissions work hard for you. These volunteers are all remarkable people and bring unique experiences and knowledge to each meeting and event that we participate in. This collective knowledge and experience is extremely valuable on the political battle field.

However, our vision is only as good as the information we have. We need to hear from you. We need to know what your concerns and perspective is to help us shape our policies and be even more effective.

We also need more volunteers at the local level. As farms get bigger and we get older, we need younger people to step up to the plate. IGPA and agriculture needs to keep our volunteer numbers up.

When I attended my first IGPA meeting I thought farm policy just happened because of the will of Congress and USDA. I quickly found out that it was the tremendous efforts of volunteers and organizations like IGPA that shape policy. My eyes were opened to a bigger world.

Please take the time to either consider being a local board member or talk to your neighbor. IGPA and agriculture need good people to be representatives at the policy table instead of environmental activists. If we don't realize the importance of this point our policy will be shaped anyway by people that don't have your best interest at heart. ■

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## Never a Dull Moment



**M**erriam-Webster's dictionary defines a "whirlwind" as "something that involves quickly changing events". That definition very accurately describes the IGPA's work since our last magazine. There's no sign of easing up, and that's exactly how the Association likes it!

The 2013 Tri-State Grain Convention held last November at Spokane, Washington's Davenport Hotel was a record-setting event. Attendance was pegged at 568 people - a 15 percent increase over the 2012 convention. The broad range of workshops and expert speakers were top notch.

Your IGPA leaders and staff are already working with our Oregon and Washington counterparts to prepare for this year's convention slated for November 12-15 at beautiful Skamania Lodge along the Columbia River in Stevenson, Washington. Look ahead in this edition of Idaho Grain for a more detailed report.

January was all about passage by Congress of a new Farm Bill. Done!! After three years of internal debates, tough decisions, and pressing our Idaho congressional delegation for support and action, President Obama signed the "Agriculture Act of 2014" into law on February 7.

IGPA leaders had the good fortune of being on Capitol Hill when the U.S. House of Representatives approved the final bill. Even more thrilling was that each of Idaho's four congressional members voted in favor of the Farm Bill. We would like to think we convinced them to do so (ha). We strongly encourage readers to contact Senators Crapo and Risch and Representatives Labrador and Simpson to thank them for votes.

Closer to home, the Idaho State Legislature convened on January 6 and has maintained a furious pace in hopes of adjourning in mid-March to focus on their primary elections slated for May 20. The 2014 session marks a new chapter for the IGPA's representation in the State Legislature. Lobby firm Kestrel West, led by Kate Haas and John Foster, is the IGPA's new face within the halls of the Idaho Capitol building.

Haas and Foster may be wondering what they got themselves into as the IGPA has had a full plate of legislative priorities in Boise! Difficult issues Kestrel are tackling on the IGPA's behalf include improving Idaho's trespass laws and crop depredation program; changing Idaho DEQ regulation of dust from farm practices; and addressing increased farmer frustration with crop and property damage from poorly managed cattle in certain areas of the state.

With the help of Kestrel West, Idaho's wheat and barley farmers are in good hands. The IGPA is already seeing some great results. The legislature recently approved a \$1.5 million increase to the University of Idaho's agriculture research and extension budget. A bill to help ease Idaho's trespass laws on private landowners through more workable posting requirements sailed through the legislature with no dissenters.

Meanwhile, Bonners Ferry grower Erik Olson and Rockland farmer Cory Kress are representing Idaho grain growers on an Idaho DEQ advisory committee to monitor Idaho's carefully constructed crop residue burning program. We appreciate their service, time and expertise.

Finally, I'm pleased to report that a successful meeting of IGPA farmer-leaders with its counterparts from the Idaho Cattle Association was held in mid-February to address problems with crop damage from wayward livestock. A very sensitive and long-standing issue, the gathering of these industry leaders was a fantastic first step in finding practical solutions. In my view, the discussion was a prime example of why Idaho agriculture is a strong, vibrant industry - its reasonable and respectable people.

As we move closer to the spring season, Idaho farmers will dust off their trucks and tractors and head to the fields. I will have a harder time getting ahold of folks as they turn their attention to the new season. But while the meetings and conference calls will decline some, the IGPA will still be busy working on behalf of the Idaho wheat and barley farmer. Don't hesitate to call us if we can be helpful in any way.

Best wishes for a fruitful and profitable new season! ■



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## CIF and SIF Indemnity Funds Report

By Dave Ogden, Section Manager, IdahoWarehouse Control Program, February 2014

Idaho commodity and seed producers can be proud that their licensing and indemnity programs are some of the best in the nation. The Commodity Indemnity Fund has \$12 million and is one of the best financed funds in the country. It provides generous coverage for contracts including delayed payment or credit sale contracts with up to two years of protection if non-payment for a sale should occur. The Seed Indemnity Fund is the only one of its kind in the nation and is also well financed at \$5.7 million. It provides two years of protection for non-payment like the CIF, and also covers bailment contracts. The CIF has ceased assessment collections for now, and commodity producers need to take advantage of the free protection offered by the fund by selling to and doing business with Idaho licensed companies. The SIF is still collecting assessments and seed producers similarly should take advantage of the protections for which they are paying through their assessments, and should sell to and do business with Idaho licensed seed buyers.

These programs are successful because of the

dedicated work and foresight of many people past and present and include producers, industry representatives, and program staff. The CIF Advisory Committee has six producers and three industry representatives of whom many have served faithfully for a long time. Current serving producers are Frank Suchan of Paul, Russ Zenner of Genesee, Jay Hansen of Malad, Mark Mickelsen of Idaho Falls, John Hartman of Parma, and Joe Anderson of Potlatch. Industry representatives currently serving are Jim Soran of Soranco Bean Co, Inc. in Twin Falls, Jim Pasley of Pasley's Grain, Seed, and Feed in Iona, and Arvid Lyons of Lewis-Clark Terminal in Lewiston. Big thank you to current and past members of the Committee.

The SIF Advisory Committee is comprised of seven seed producers and two industry representatives. Current seed producers serving on the SIF Advisory Committee are Mike Nichols of Parma, Jim Briggs of Marsing, Richard Durrant of Meridian,



Dave Mosman of Craigmont, John Thain of Heyburn, Jerry Inouye of Boise, and Dave Ramseyer of Filer. Seed industry representatives are Brett Lolley of Monsanto Vegetable Seeds in Nampa, and

Gina Lohnes of Trinidad-Benham Corporation in Hazleton. Big thank you to current and past members of the Committee.

Max Wheeler, a Sr. Investigator for the Warehouse Control Program in Twin Falls retired from service in March after nearly 30 years of service to Idaho agriculture. Max worked primarily in the Fresh Fruit and Vegetable program and in the Warehouse Control program during his time with ISDA. Max's excellent understanding of the laws, rules, and technical requirements of his work balanced with common sense applications and a healthy sense of humor is what we all should strive for in our daily service to all agricultural players. We will miss Max and the others who have moved on to other aspects of their lives. We thank them and hope to continue on with their legacy of service. ■

## Idaho Grain Producers are Leading the Way



By Governor C.L. "Butch" Otter

OK, so let's do the math. Idaho is the nation's No. 1 producer of barley, and 80 percent of Idaho's barley is processed for malting into beer. So why is

Wisconsin better known for beer (and cheese) than Idaho?

Oh, I don't really mind. We're hot on Wisconsin's heels in the cheese department anyway. And my business roots with Simplot are in potatoes, so I'm as fine with "Famous Potatoes" as I would be with "Famous Barley."

But I also know the value of barley and wheat, and I'm grateful and impressed by the more than \$1 billion in farm gate receipts that Idaho's 5,000 grain producers generated last year.

The way I see it, part of my job as Governor is to help Idaho grain producers keep expanding their markets, growing their market share and get their wheat and barley to those markets anywhere in the world as cost-effectively as possible.

After all, their profits and prosperity help our rural communities and all of Idaho thrive. Nurturing their success and ours means sustainably investing in the infrastructure necessary for achieving our shared goals.

Whether it is better highways, a well-trained and educated workforce or university research, Idaho's grain producers have always been there to support

what works and what makes sense. What's more, they understand the importance of fiscal responsibility and ensuring that government's financial problems don't get in the way of private progress.

I appreciate the Idaho Grain Producers Association's efforts, along with a strong coalition of fellow stakeholders, to educate Idaho voters about the importance of maintaining and upgrading our roads and bridges for the rest of the 21st century.

Consensus is never an easy thing to achieve. But I'm hopeful that the influence of so many men and women who are pillars of their respective communities will help convince others of the bottom-line need to invest more user fees – fuel tax dollars, registration fees or something else – into our transportation future.

The trucks carrying wheat and barley to market, as well as the cars carrying our families to buy the products made from those commodities, rely on safe and efficient corridors of commerce. So the IGPA's support of coalition efforts to equitably address our long-term transportation needs is both wise and welcome.

Another investment worth making is the funding increase I proposed to the Legislature for the University of Idaho's Agricultural Research and Extension budget in fiscal 2015. It keeps a promise I made to the IGPA and other farm and ranch groups when we had to cut State spending to those program and many others during the Great Recession.

My proposed increase will add research staff in

potato pathology and barley agronomy as well as helping to backfill operational costs. My thanks to our grain producers for their role in the private-sector funding partnerships that were needed to sustain our ag research and extension programs during the economic rough patch. It was a great success for public-private partnerships, which I believe will and must play a growing role in government's future.

Finally, like many of us who grew up on the land and came into our own on the high-desert Intermountain West, I have an innate understanding of the importance of protecting and sustaining our precious water resources. The demands of growth, industry, our people and our communities – and our own sense of stewardship – demand that we do more than preside over the dividing up of scarcity. I have made more active management of our surface and ground water resources among the highest priorities of my administration, and that will continue.

This year I recommended investing \$15 million toward advancing projects to help us prepare for the future by increasing our capacity to store water and better safeguard what we have. I've been pleased to see legislators endorsing an effort that is so critical not just to a more certain future for Idaho agriculture, but for all of us.

So here's to our wheat and barley growers! Here's to the best stewards of the land and its resources that any state could have, and to all the good you produce for Idaho. ■

# 2013 Tri-State Grain Growers Convention Sets a Record

If the 2013 Tri-State Grain Growers Convention is any indication, the status of the agriculture industry in the Pacific Northwest is robust. The three-day event, held November 13-16 at the historic Davenport Hotel in Spokane, Washington, brought together 568 participants ranging from grain farmers, vendors, agribusinesses, researchers, commodity leaders and a few elected officials.

The record crowd attended general sessions and breakout workshops led by expert speakers and panelists addressing the hottest topics, opportunities and challenges facing the industry. Highlights included the tongue-in-cheek comedic talents of Damian Mason, a live radio broadcast conducted onsite by the Hefty Brothers, and a compelling discussion about biotechnology in the Pacific Northwest.

Each state held its annual meeting and banquet at the Convention. The



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**SCOTT BROWN**  
Soda Springs



IGPA's new leadership team (from l to r): "Potlatch" Joe Anderson, Terry Kulik, Robert Blair, Sid Cellan and Clark Hamilton.

IGPA adopted new resolutions and policy directions for 2014, installed a new Executive Committee, and honored four individuals for their outstanding contributions to the Association and the industry.

Business was replaced by a little fun on Friday, November 15 as all three states gathered for the grand finale event featuring an auction, banquet and the juggling act entertainers called "The Passing Zone." Thanks to the generosity of many donors, IGPA auction items fetched over \$8,000 to help with academic scholarships and the Idaho Wheat & Barley PAC fund.

The evening also included the raffle drawings to determine the winners of the IGPA's Henry's .22 lever action repeating rifle and the 50 hours use of a John Deere tractor. The lucky winners were Matt Brown (rifle) and Kyle Wangemann (tractor), both of Soda Springs, Idaho.

Plans are already underway for the 2014 convention scheduled for Nov. 12-15 at the scenic Skamania Lodge located in the Columbia River gorge near Stevenson. More details will be posted when available on the website [www.wawg.org/convention](http://www.wawg.org/convention). We look forward to seeing you there! ■



## A Message from Mike Simpson

I want to take this opportunity to give my heartfelt thanks to the wheat and barley growers of Idaho, and to the Idaho Grain Producers Association, for all of your guidance and support as we worked through the 2014 Farm Bill.

I grew up moving pipe and working the potato fields of Eastern Idaho, and I needed the help of Idaho's farmers and ranchers if I was going to be an effective voice for Idaho agriculture as we wrote the 2002 Farm Bill in the House Agriculture Committee. Thankfully then, as now, the grain growers of Idaho were there to give advice, offer common sense wisdom and provide a gentle nudge when needed.

Since that time, I have greatly enjoyed my annual meetings with your organization, your visits to my office and meeting many of your members in their fields or in their communities. My staff and I have benefited a great deal from our interactions

with Steve Johnson and Travis Jones. We've come to rely on them for help on many occasions and we'll continue to seek that help in the weeks, months and years ahead – beginning with implementation of the Farm Bill.

Aside from the Farm Bill there is much more that needs to be done, and I look forward to working with you to advance the cause of Idaho's farmers, ranchers and rural communities.

We need to be vigilant about the impact of unfair foreign trade practices, work to open new markets abroad and seek to ensure agriculture gets a fair shake in upcoming trade agreements.

We need to curb the undue influence of the Environmental Protection Agency in the everyday lives of farmers and stop the Obama Administration's attempts to circumvent Congress through rules and regulations. I am proud to say that over the last three years I have authored legislation that cut the EPA's budget by 20 percent but more needs to be done.

We need to work harder than ever to secure domestic sources of energy, reduce our reliance on foreign oil and bring down energy costs for energy intensive industries like agriculture.

We need to remain aggressive participants in the FDA's implementation of the Food Safety Modernization Act to ensure that the realities of modern agriculture are reflected in final decisions.

We need to continue efforts advancing programs and tax reforms aimed at keeping families on their farms and encouraging young farmers to remain in agriculture.

Finally, we need to protect Idaho's water. As Chairman of the House Energy and Water Appropriations Subcommittee I intend to do just that.

Those are just a few of the many things on which I hope to work with you and the IGPA over the coming months and years. Together, I am certain we can continue making progress of the issues most important to Idaho grain producers.

Again, thank you for your guidance, wisdom, cooperation, support and friendship. Please do not hesitate to contact me, or my staff, if there is ever anything we can do to assist you. ■

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## Wheat Growers Elect New President at Annual Meeting

Kansas wheat farmer Paul Penner was elected as the new president of the National Association of Wheat Growers (NAWG) at the Association's Board of Directors meeting on Thursday, February 27 at the 2014 Commodity Classic convention in San Antonio, Texas.

"I'm very excited to serve as NAWG president and am looking forward to a productive year. I am grateful for the opportunity to serve as president and will work hard to live up to the expectations set forth," said Penner.

Penner farms near Hillsboro, Kansas where he owns and manages a cash grain farm and serves as treasurer of Risely Township. His principal crops are wheat, soybeans, grain sorghum, corn and grass hay. Paul also operates a custom farming enterprise.

Prior to becoming a NAWG officer, Penner held multiple leadership positions at the Kansas Association of Wheat Growers, including serving as the association's president.

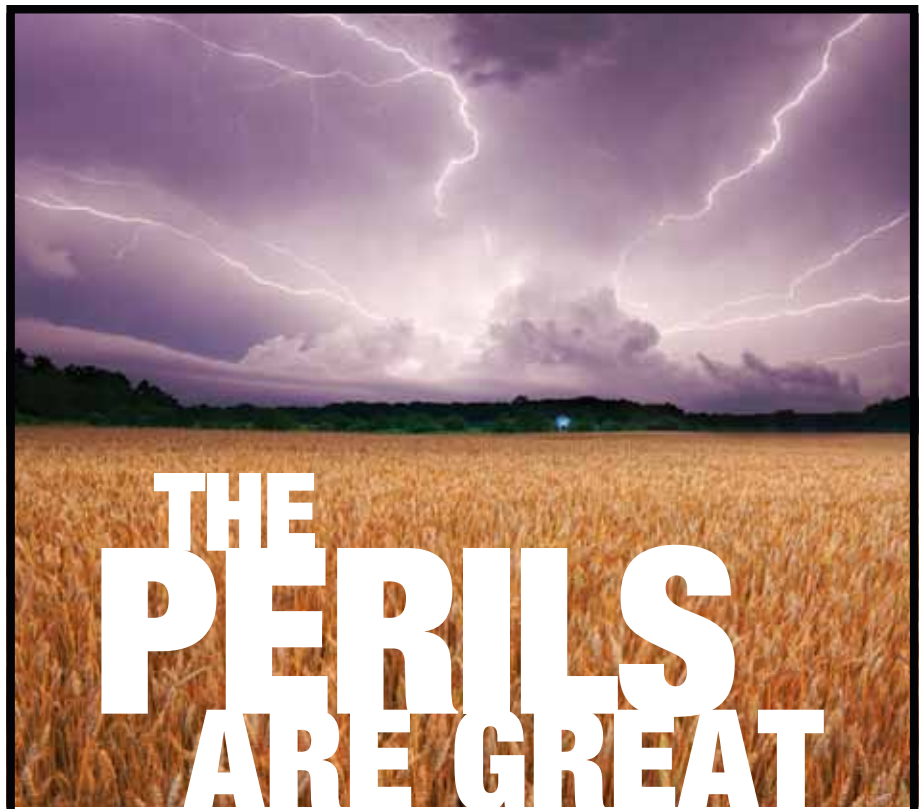
Penner holds a bachelor's degree in business administration and economics with a concentration in accounting from Tabor College. He is also a graduate of the wheat industry's two leadership training programs, the Wheat Industry Leaders of Tomorrow program and the Wheat Organization Leaders of the Future program.

Penner and his wife have three adult children and two grandchildren.

Other NAWG officers elected and installed at the Thursday meeting include:

- Brett Blankenship, Washtucna, Washington, as first vice president;
- Gordon Stoner, Outlook, Montana, second vice president;
- David Schemm, Sharon Springs, Kansas secretary-treasurer; and
- Bing Von Bergen, Moccasin, Montana, immediate past president.

Members of NAWG's Executive Committee, known as officers, commit to serve five years when they first run for the role of secretary-treasurer. The NAWG Nominating Committee and NAWG Board reaffirms their selection each year as they move into new roles on the officer team. ■



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# Barley: The Heart and Soul of Beer

By Chris Thorne

While beer has been made from many different grains through the ages, barley has proven to be the world's most valued brewing ingredient. The word beer itself comes from the old Anglo-Saxon word *baera*, meaning barley.

The relationship between barley growers and brewers is unique. Brewers work closely with our partners in barley production. Barley farmers work to provide the highest quality grain they can, so that brewers can produce the highest quality beer possible.

Every year, U.S. brewers purchase about 4.3 billion pounds of barley and malt. It is an understatement to say our industries rely upon each other. In many ways, barley growers can really consider themselves in the beer business, because without barley, there'd be no beer.

And without beer, there would likely be much less barley. The vast majority of the barley currently grown in the U.S. – roughly two-thirds – is raised specifically for malting purposes, given the price premiums and partnerships that malting barley brings.

This has been a transition for the barley industry, which once relied heavily on livestock markets. But this transition has proven to be a success.

Brewers remain a solid market for barley, consuming about 150 million bushels of barley per year since 1980. Currently, U.S. barley usage is approximately 66 percent food and industrial use, 12 percent export use and 22 percent feed and residual uses. The average American over the age of 21 drinks about 28 gallons of beer per year, translating to about 19 pounds of barley malt per person.

There are challenges to the beer industry. Even as 2012 saw beer shipments rise 2 percent, 2013 proved to be a tougher year with cold, wet weather blanketing most of the country, and everyday American beer drinkers remaining under considerable economic pressure, with lingering unemployment and the loss of the payroll tax holiday cutting into disposable income.

And what many people don't know is that the most expensive ingredient in beer is not barley or hops – but taxes. On a national average, more than 40 percent of what Americans pay at retail goes toward taxes. What we don't want to see happen is a Congress, hungry for revenue, increase an invisible federal tax on beer – an excise tax – as a means of closing gaps for other spending or corporate tax reductions.

The bipartisan Brewers Excise and Economic Relief Act of 2013, known as the BEER Act, would reduce the federal excise tax on beer drinkers and protect them from future tax hikes. This legislation is supported by the Beer Institute and its wide membership of both small and larger brewers. The BEER Act today has more than 91 co-sponsors in the U.S. House of Representatives and 8 co-sponsors in the Senate – sending a powerful message to would-be taxwriters that there is no appetite for increasing federal beer taxes.

The BEER Act is sponsored by Reps. Tom Latham, R-Iowa, and Ron Kind, D-Wis., in the House of Representatives as H.R. 1918, and by Sens. Mark Udall, D-Colo., and Roy Blunt, R-Mo., as S.958 in the U.S. Senate.

Specifically, the BEER Act would roll back the federal beer tax from \$18 to \$9 a barrel. For brewers producing

less than two million barrels annually, the rate would be reduced to \$3.50 on the first 60,000 barrels. For those brewing less than 15,000 barrels, the federal excise tax would be eliminated entirely.

This bipartisan legislation is very important to beer, barley and to other industries that combined contribute \$246.6 billion annually to the U.S. economy. It is supported by both large brewers and small brewers, meaning it doesn't require Members of Congress to pick winners and losers among the industry, but provides fair, comprehensive and equitable treatment.

Whether advocating together in the halls of Washington, DC, or examining crops yields in our High Plains and Rocky Mountain states, major U.S. brewers and barley producers are more tightly connected today than ever before. I encourage you to help support brewers – and ultimately, the most important market for barley producers – by asking your U.S. Congressman and Senators to support the BEER Act.

**Tell your Senators:**

To co-sponsor S. 958, please contact Katherine Howard in Senator Udall's office at (202) 224-5941 or Tracy Heinke in Senator Blunt's office at (202) 224-5721.

**Tell your Member of Congress:**

To co-sponsor H.R. 1918, please contact Ian Manzano in Rep. Latham's office at (202) 225-5476, or Rachel Stanley in Rep. Kind's office at (202) 225-5506.

*Chris Thorne is the Vice President of Communications for the Beer Institute, the national trade association representing brewers, beer importers and key supply chain partners.* ■



# Idaho Primary Election Critical to the Future of Your Farm

By Travis Jones

May 20th should be highlighted on your calendar. It could determine the future of your farm. The date marks Idaho's primary election, and much is at stake.

As most of you know, the IGPA has traditionally refrained from involving itself in political races despite our obvious preference at times for strong advocates on the state and federal level. This year, however, is different.

Several state legislators and other leaders of our great state are facing a high volume of primary challengers. While the deadline which potential Idaho candidates must meet to formalize their candidacy has not passed at this writing, there are already a slew of challengers with little interest in Idaho agriculture. That should be a cause for concern within the Idaho farm community.

Among those facing a significant threat this year is one of our strongest and longest serving industry champions - Congressman Mike Simpson of Idaho's second congressional district. His opponent is Bryan Smith, a lawyer from Idaho Falls with no discernible connection to Idaho agriculture.

The primary race between Simpson and Smith has received national attention mostly due to the direct involvement by a few extreme deep pocket outsider groups seeking to oust Simpson.

For Idaho wheat and barley farmers, the choice is clear: Congressman Simpson works for Idaho farmers and ranchers.

Simpson has been among our most ardent advocates in Washington, DC. From his work on the 2002 Farm Bill as a Member of the House Agriculture Committee to his efforts on the most recent farm bill, Congressman Simpson has defended family farms and proactively worked on the priorities of Idaho's grain producers. In fact, Congressman Simpson is a past recipient of the National Association of Wheat Growers' (NAWG) "Wheat Leader" award for his diligent work in Congress on behalf of American wheat farmers.

As a member of Congress for over 15 years, Congressman Simpson has tackled issues including tax reform, regulatory reform, passage of trade agreements, and the opening of new markets. He has helped secure federal agriculture research funding to solve problems important to wheat and barley farmers. He has stood up for us when others would not, and has worked hard to promote the importance of agriculture to Idaho's economy.

As the past Chairman of the House Appropriations Subcommittee on Interior and the Environment, Congressman Simpson cut the EPA's budget by more than 20 percent over the last three years, stopped attempts by federal agencies to control the use of Idaho water, and fought against onerous climate change regulations threatening agriculture.

In short, we have a Congressman who has responsibilities crucial to our industry way of life.

Congressman Simpson has always had an open door to the IGPA and our members. He attends almost every

one of our meetings in and outside Washington, DC. He acts when we ask him to act and offers us his advice each and every time we seek it. He is a true friend to agriculture and especially to the wheat and barley growers of Idaho.

The IGPA has decided to be proactive in the state and federal political arena. Why? Because elected officials have a major impact on the future of farming in Idaho and this country. We can no longer afford (literally) to be on the sidelines watching the "team" play without us.

In 2010 the Idaho Wheat & Barley PAC was created to help elect ag-friendly state legislators and officials. In 2013 we created and registered the Idaho Grain PAC with the Federal Elections Commission to allow Idaho farmers to have a say in congressional elections. However these two funds are only as effective as the farmers who support them.

Idaho's primary elections occur on May 20. Primaries usually equate to apathy and thus poor voter turnout. I hope that is not the case this year. Farmers can only blame themselves if they do not show up at the polls to elect leaders that support their livelihoods. The Simpson vs. Smith primary election is a prime opportunity for farmers living east of Boise to choose candidates that support them.

I hope you will join me and the IGPA in re-electing Congressman Mike Simpson and other pro-agriculture legislators on May 20th. Let your family, friends, and neighbors know about the importance of this election to Idaho agriculture. ■



# DS

## Photo Workshops

David R. Stoecklein

"Photographer of the American West"



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*Taken at the July workshop at Bar Horseshoe Ranch, Mackay, Idaho*

### 2014 WORKSHOP DATES:

FEB. 7-9	Bar Horseshoe Ranch, Mackay, Idaho
MARCH 21-23	Bar Horseshoe Ranch, Mackay, Idaho
MARCH 28-30	Saunders Ranch, Weatherford, Texas
MAY 16-18	Saunders Ranch, Weatherford, Texas
JUNE 6-8	Bar Horseshoe Ranch, Mackay, Idaho
AUG. 8-10	Bar Horseshoe Ranch, Mackay, Idaho
AUG. 22-24	Bar Horseshoe Ranch, Mackay, Idaho
SEPT. 5-7	Bar Horseshoe Ranch, Mackay, Idaho
OCT. 10-12	Bar Horseshoe Ranch, Mackay, Idaho
NOV. 7-9	Bar Horseshoe Ranch, Mackay, Idaho

Taylor Stoecklein's Lightroom class will be held on the first day of every workshop.



# China Poised to Become Growth Market for Idaho Wheat Producers

By Steve Wirsching, USW

Fred Schneider, former director of the U.S. Wheat Associates (USW) office in Hong Kong, used an old Chinese proverb to explain the size of the market to first-time visitors. He said, “it is like trying to describe the ocean to a frog that has lived his life in a well. The market is so vast that we cannot begin to comprehend its potential.”

Recently, Fred’s remarks flashed into my head when I stepped off the airplane in China to participate in the USW Crop Quality seminar. This high profile event held in Qingdao, attracted about 120 Chinese millers and wheat buyers. I presented the World and U.S. Supply and Demand Situation and Outlook for wheat. During the seminar when I thanked the Chinese for their wheat purchases, they all applauded because China was the largest single buyer of U.S. wheat year to date. USW has nurtured a close relationship with government officials, flour millers, bakers and grain traders over the last 34 years. The hearty applause was recognition that this effort is finally paying off. Today, China is poised to become a growth market for high quality U.S. wheat. A large Chinese population, steady economic growth,

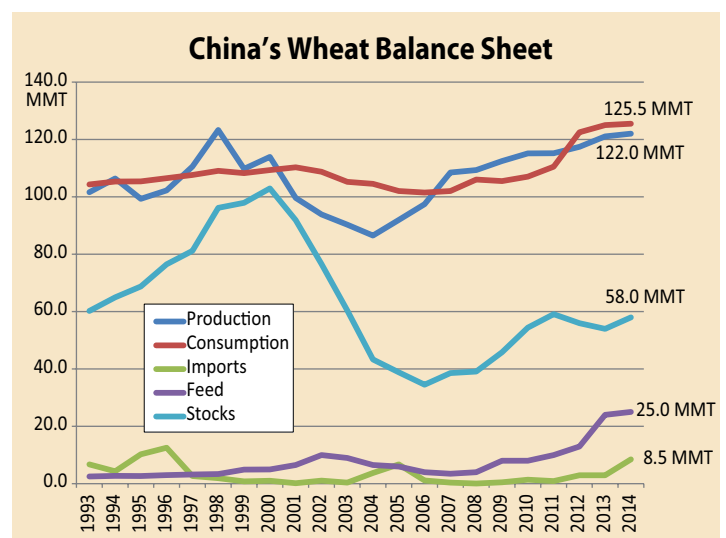
and political reform are creating a new market for U.S. wheat farmers, and opportunities for Idaho wheat producers.

Last summer after a twenty-two week decline in wheat futures, China entered the market and purchased 3.5 MMT (128 million bushels) of Soft Red Winter (SRW) wheat from the U.S. Gulf. This big wheat purchase made many in the wheat industry take note that this country, because of its size, has the ability to move markets.

China’s population is 1.3 billion, accounting for nearly one fifth of the world’s total population. While most of these consumers are poor, incomes are on the rise because of steady economic growth over the last decade. Per capita annual income of the average city dweller is \$9,100 as compared to half that amount only a decade ago. Higher incomes are creating demand for new products. The first thing many Chinese want to improve when they have more purchasing power is their diet. After

generations of want, Chinese are choosing to consume more western-style foods. Fast food chains such as McDonalds, Pizza Hut, Kentucky Fried Chicken, Papa John’s Pizza and Subway are experiencing double-digit growth. Chinese are consuming record levels of pork and chicken, which is fueling demand for feed grains, including wheat.

China is the largest wheat producer and consumer in the world with a harvest of 122 MMT (4,482 million bushels) and domestic consumption of 125 MMT (4,592 million bushels), respectively in 2014. According to USDA estimates, China will be one of the largest wheat buyers in the world this year, import-

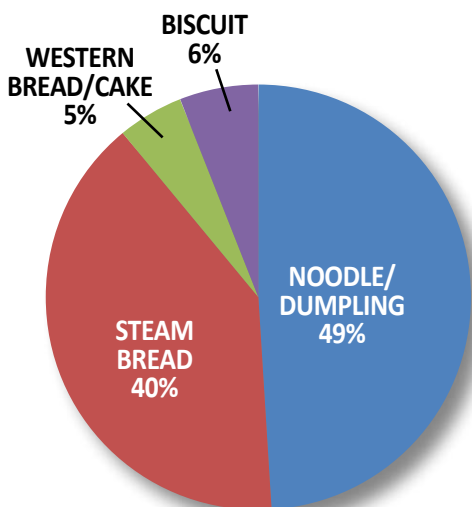




China's primary wheat production region

ing an estimated 8.5 MMT (312 million bushels).

U.S. producers are familiar with China's dramatic increase in pork and poultry production and the corresponding increase in soybean and corn imports. However, many are unaware that China also feeds 25 MMT (918 million bushels) of wheat each year, up from only 3.5 MMT (128 million bushels) only seven years ago. Growing demand for feed has put pressure on China's domestic wheat market. Lower quality domestic wheat is a major feed-grain in China and its higher use has created a market for high quality imported wheat. China's primary wheat production region is Henan province



located in the North China Plains south of Beijing, accounting for 25 percent of total wheat production. Shandong province produces 15 percent of China's wheat, while Hebei and Anhui provinces each account for about 10 percent of total production. Overall, the total area seeded to wheat is 24.1 million hectares (59.5 million acres), comparable to the 22.9 million hectares (55.7 million acres) in the United States in 2013. Winter wheat accounts for about 95 percent of China's production with the remainder being spring wheat.

So how do the Chinese produce nearly twice as much wheat as the United States using virtually the same amount of land? In China, the average farm size is only one hectare (2.4 acres) as compared to the average farm size in the United States of about 175 hectares (434 acres) according to the latest USDA census. These small Chinese farms are intensely managed and 75 percent of them have access to irrigation. In some areas, rural farmers hand weed and carry water to each wheat plant in times of drought.

Like farmers in the United States, individual Chinese farmers decide which varieties to plant. Many of the varieties available in China have high yields but low quality. These semi-hard wheats make good noodles, the single largest use of

wheat in this market, but they lack the gluten strength (protein) to make high quality western style breads. Wheat used for noodles accounts for 49 percent of the market, followed by 40 percent for Chinese style steamed bread. Only about six percent of total Chinese consumption is for biscuits and a smaller amount for western style breads and cakes. China does not produce large amounts of soft wheat (weak gluten) used for cookies, crackers and biscuits.

Chinese mills complain about the quality of their domestic wheat and many prefer to use better quality imported wheat. Mills say that small farmers are using different varieties with a wide range of quality. These same small farmers will also pool the harvested wheat into one large grain bin without regard to end-use functionality. Sometimes even hard and soft wheats are mixed. Under this type of production and grain handling system, it is difficult for the flour mills to buy high protein wheat that is suited for western style breads and very soft low protein wheats that make superior cookies and cakes.

Under the World Trade Organization (WTO) free trade agreement China is allowed a Tariff Rate Quota (TRQ) for wheat imports up to 9.6 MMT (352 million bushels). That amount of wheat may be imported at a preferential tariff of one percent ad valorem, while imports above the TRQ pay a duty of 65 percent. Of the total TRQ, roughly 10 percent, or just less than one million metric tons (35 million bushels), is allocated to the commercial sector trade, while 90 percent remains under the control of the government.

China's total wheat imports over the last five years have shown healthy growth. Marketing year to date (June 1, 2013 to May 31, 2014), China has purchased 4.02 MMT of wheat. Wheat purchases from the United States include 3,570 TMT of Soft Red Winter, 333.0 TMT of Hard Red Spring and 174.0 TMT of Soft White wheat, as well



as 4.0 MT of Hard Red Winter. For Idaho wheat producers, it is noteworthy to highlight the solid growth of the Soft White wheat market. When you look at these exports on a calendar year basis, Soft White imports in 2013 reached 280.0 TMT (10.2 million bushels), the highest level since 2004. This growth comes despite phyto-sanitary concerns from the Chinese over *Tilletia Controversa Kuhn* (TCK).

In November of 1999, the U.S. and China signed an Agricultural Cooperation Agreement in which China agreed to accept shipments of U.S. winter wheat that are certified by the USDA/ Federal Grain Inspection Service (FGIS) to have levels of 30,000 spores or less in a 50 gram sample. FGIS collects the samples and the Wheat Marketing Center, located in Portland, Oregon, tests the samples. The Chinese phytosanitary officials remain convinced that TCK fungus is a threat to wheat production, while in the U.S. there is no Food and Drug Administration (FDA) action level and the naturally occurring fungus is not regulated. USW and the



Sino State Farms Grain and Oils Company Team that visited Portland Oregon December 18-19, 2013.

industry are working towards a solution that will provide the needed levels of assurance for the Chinese to further open the market for PNW wheat producers.

Recently, there are signs that China will adopt a more liberal policy allowing more wheat to be imported. China's government officials are looking to world markets to ensure that Chinese consumers' demands for high quality food products are met. Competitive international markets combined with free trade agreements are the way to ensure food security, not previously long held self-sufficiency production targets.

In December of last year, USW hosted a group from Sino State Farms Grain and Oils Company in Portland, Oregon. Many of the same mill managers and government officials that participated in the USW crop quality seminars in Qingdao were on this team. All were very excited to be in the United States learning about our wheat marketing and grain handling system. They also indicated that the Chinese government will issue additional TRQ for 2014 and they are interested in

buying U.S. wheat. Furthermore, they were impressed by the high quality that is available from the Pacific Northwest.

While in Qingdao as part of the in country briefing, Matt Weimar, the

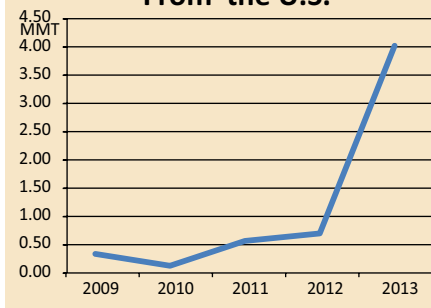


A mini-combine with a header only six feet wide harvests wheat in China.

current Director of U.S. Wheat Associates in China remarked, "China is a large country with many regions and sub-cultures, all at different stages of economic development, but all with a taste for more and better, across a huge population. China's doors have only been open to reform for less than 50 years, but advancements that took Europe and the Americas to accomplish over a couple of hundred years, have gripped China in just three decades. Rest assured, the government of China will continue to take pragmatic steps that open the door for improved trade."

A generation ago, Dr. Lester Brown asked, "Who Will Feed China?" With new technology, functioning markets and good trade policy, we will help feed China. Employing forward-thinking policy, China can become an integrated part of the world economy. Wheat producers in Idaho will have a stake in this growing market as the Chinese develop a taste for high quality soft white wheat.

### China's Wheat Imports From the U.S.



### U.S. Wheat Exports to China by Wheat Class

Crop Year (June - May)	HRW	HRS	SRW	SW	Total thousand metric tons
2013	4	333	3,510	174	4,021
2012	2	475	148	123	749
2011	1	354	102	110	567
2010	2	58	5	63	128
2009	2	116	208	51	377



# Biscuit Line Offers New Possibilities

By Cindy Snyder

**E**ach day, all around the world, biscuits are dunked into coffee or topped with hors d'oeuvres. Thanks to a new pilot-scale cookie and cracker line, more of those biscuits may be made using wheat grown in Idaho.

Cookies and crackers to Americans are classified as sweet biscuits or savory biscuits by the rest of the world. Globally, it's a huge market with sales expected to near \$54.1 billion by 2015, 24 percent higher than in 2010 according to the Global Industry Guide.

To meet that demand, new products are being launched and many of those products contain health claims. Innova Market Insights reports that 10 percent of all global launches in the savory biscuit category last year included the use of whole grains.

While that trend is good news for wheat growers, getting biscuit makers to reformulate recipes to include more soft

## Quick facts about the WMC biscuit line

- Line is "L" shaped
- Short arm of "L" is 8 feet
- Long arm of "L" 40 feet
- Width of line is 2 to 3 feet
- Weighs 7,359 pounds
- Cost \$350,000



Laminating cracker dough on the pilot line.



Wheat Marketing staff, Dave Shelton, Xin Lu, Gary Hou, and Bon Lee making Maria biscuits on the new pilot-scale line.

white wheat grown in Idaho can be difficult. "The hardest thing for a food company to do is new product development," explained David Shelton, executive director at the Wheat Marketing Center in Portland.

That's where the new biscuit or cookie and cracker line at the Wheat Marketing Center comes in. Potential customers can use the line to test different formulations using different wheat blends for quality. Using small batches, they can make modifications to the wheat blend, formulation, bake time or temperature to see what works best. Customers can apply those results to their large-scale, commercial equipment the next day.

A biscuit maker in Central America, for example, would like to switch from using soft red to soft white wheat but found the biscuits did not brown properly to meet their quality expectations. One company representative participated in the WMC's first cookie and cracker technology short course in December 2013 and saw how the Wheat Marketing Center can help improve cookie and cracker products. As a result, U.S. Wheat Associates in Mexico will organize a five-person team from this company to come to the WMC later this year to attend a customized cookie and cracker training course.



Making Maria biscuits which are popular in South Asia, Southeast Asia, and Latin America. PNW Soft White wheat works very well in this product.

Wheat Marketing Center has 16 molds to make cookies and crackers with this line.

"It (the biscuit line) will open their minds to formulations and blends of soft white wheat with other wheats to improve their products," explained Gary Hou, WMC



Maria biscuits are ready for baking.

### CHECKOFF DOLLARS AT WORK

As with other projects at the Wheat Marketing Center, the idea for a biscuit line originated with farmers.

Checkoff dollars from Idaho, Washington, Oregon, Montana and North Dakota paid for the \$350,000 investment in equipment and another \$150,000 to remodel the facility to accommodate the nearly 50-foot line made up of 11 sections arranged in an "L" shape. The new biscuit line is running in the same room as the noodle line, which has been operating for two decades.

The Wheat Marketing Center began working with Roy Chung, U.S. Wheat Associates/Singapore, to develop the biscuit line, which was specially designed for research and education.

Chung, who is a mechanical engineer with 30 years in the baking world, oversaw construction in Bangkok and then had the line shipped to Portland in one 40-foot shipping container.

One of the unique features of the biscuit line is that it has 16 different biscuit molds that were made in Italy. That allows manufacturers to experiment with different shapes and thicknesses from a Maria biscuit to an American soda cracker.

Another key component of the line is that Chung designed it to be process-controlled. That gives researchers and customers the ability to change dwell time in the oven for a batch without bunching up other batches of dough that are already on the line behind it.

While the line itself has functioned well since it began operating in June 2013,

Shelton got a crash course in electricity and fire codes before it was installed. About a month before the line arrived, he learned the line would require a special electrical panel and a transformer.

Most days the line produces small batches as researchers and customers spend time experimenting with different wheat blends, ingredients or bake criteria. However, Hou and his coworkers were involved in a marathon session one day when more than 1,000 were made. Maria biscuits are similar to a saltine cracker but with a semi-sweet taste. They are also one of the most ubiquitous snacks in the world; found in homes from Great Britain to India and Southeast Asia to Latin America. The popular cookie has been around since 1874 when a London bakery created it to commemorate the marriage of the Grand Duchess Maria Alexandrovna of Russia to the Duke of Edinburgh.

Gordon Gallup believes the investment is worthwhile. "The biscuit line greatly expands the number of new foreign customers we can bring into the Wheat Marketing Center to learn how to use U.S. wheat," said the Idaho Wheat Commissioner from eastern Idaho.

Traditionally cookies and crackers in the U.S. have been made with soft red wheat because of the proximity of that growing region to food manufacturers. However, biscuit market share is growing in Korea, Taiwan and China; all markets where soft white wheat has an economic advantage. Brazil is also interested in utilizing more soft white wheat in biscuit manufacturing.

### NEW RESEARCH DIRECTIONS

Hou said partnerships with wheat breeders and technical consultants have ensured both the biscuit line's successful launch and helped refine new research programs for flour functionality.

Hou is planning new research efforts to look at whole wheat crackers. He will characterize soft red and soft white at different strengths to see how that impacts finished product quality. He is also testing different soft white protein levels to evaluate what protein levels are best for use in cookie and cracker products. The aim is to replace soft red wheat in markets where customers prefer soft white wheat for its superior quality characteristics.

One of the questions Shelton and Hou ask when planning new research efforts is: are we spending farmer dollars wisely?

In the case of the new biscuit line, the answer is yes. "Here we are and it's working," Shelton said.

technical director and wheat foods specialist. "I am confident that soft white can be very competitive and can make a very good biscuit."

While some customers will come to use the biscuit line exclusively to experiment with different wheat blends or ingredient functionality, others will come as part of a biscuit short course. The first biscuit short course was held last December and the next is scheduled for May 2014.



Maria biscuits going to the oven (left) and Maria biscuits baking in the pilot-scale oven (above).



# Variable Rate Irrigation:

## So you want to give it a try?

By Bill Marek, Ph.D

### INTRODUCTION

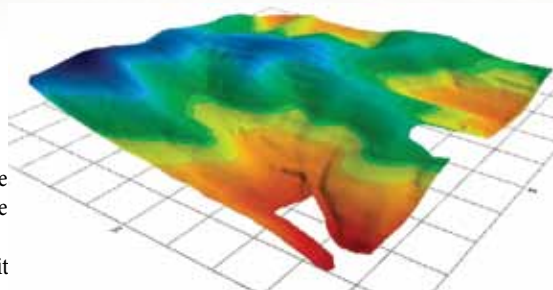
You've heard about Precision Ag and just maybe are thinking about giving Variable Rate Irrigation (VRI) a try. If so, it is likely you have questions such as:

- What can I count on from VRI ... does it really work?
- On a number of my farms I have a lot of sand and I have to regularly fertigate...will (VRI) work for me?
- I am on a fixed watering schedule dictated by the irrigation district, how can VRI help me?
- Does VRI work on forage crops or is it just for corn and other row crops?
- In the heat of summer I like to keep my pivots on to keep a water reserve just in case something happens, can I do this with VRI?

In short, can I avoid the pitfalls by taking steps that ensure intentions for spatial distribution of water translate into agronomic results ... and get a return on my investment?

Before getting started you'll want to take a look at what three years of trials have taught us. Each of the considerations below has been born in the crucible of implementations across multiple crops, climates, soil conditions and topography. We have learned some things about asymmetric water application ... what works and perhaps, more importantly, what doesn't work to bring about measured agronomic improvements to center pivot systems.

VRI is agriculture "by-the-numbers"—quantification of field parameters, grower inputs and geo-spatial yield data. And not just any numbers, but data acquired through (1) accurately calibrated and well maintained equipment, (2) rigorous operational practices, (3) software used to catalogue, store and manipulate numbers and (4) human capital skilled in quantitative analytics.



3D subsoil map of center pivot irrigated wheat field; rendering generated using Electro-Magnetic Imaging (EMI) and Real Time Kinematic (RTK) technology combined with GIS mapping.

When the data described above is bundled with the pragmatism of working through on-farm operational practices and a dogged bias towards agronomics, you learn something very simple and yet very beneficial to your bottom line ... how to remove variability and with it the associated losses in yield. Attention to detail may be a hackneyed expression but oh, so "right-on" if you desire to improve yields. One of our participating growers, who, early on, understood the value of quantification, put it this way:

*If you give the grower a prescription and that's the last you hear from him, variable anything is likely not going to work...he [the grower] needs to be working closely with the current software and his GIS professional in making changes when he sees how the field responds...that is, if he wants VRI to work.*

Exactly how does VRI help you negotiate those parts of the field that drag down yields as a function of soil or topography variations? The notion underlying VRI is that you can manage smaller segments

more effectively than an entire 126-acre field using a uniform water application. By statistically dissecting the acres under a pivot into 60 x 60 "slices" you can better match soil water holding capacity and topographic variability to water requirements for optimal plant production. While it really is that simple, there are seven execution components that will nip away at your solution if you fail to give them the attention they require.

### Consideration 1

Data acquisition and analytics. An integrated Electro-Magnetic Imaging (EMI) sensor together with Real Time Kinematic (RTK) technology are packaged into a mobile system that runs 65' transacts across the acreage. The data is processed into four topographic GIS data layers and two GIS soil stratification maps. The maps are much like the images rendered by a medical MRI device and allow 3D layer-by-layer study. Through advanced analytics the source of yield loss can be defined and answers to detailed questions such as those that follow can be sourced:

- What affected yield in this particular section of the field?
- Was the impact to yield the result of eleva-



An EM imaging sensor integrated with RTK technology in a sled-type instrument, is pulled across the field in 65' transacts. Data generated is used to develop detailed sub surface soil maps.



tion or soil conditions? If soils ... what type of soils?

- Was too much or not enough water provided?
- Was it the irrigation pattern that created lodging or was it weather vagaries?
- Am I providing sufficient volumes of water to mitigate salinity from stunting growth or is the volume of water provided retarding plant vitality?

Armed with quantitative data about the interactive effects of tillage practices, water, fertility and seed, on-farm operations become less of an art form and more of a by-the-number science. In subsequent growing seasons, these data are good predictors of what and where actions are required to put in place preventive measures prior to them becoming problems.

### Consideration 2

Inaccurate operational data. Sprinkler charts are notoriously inaccurate. Why? Because alterations to the system like a change in nozzles, the gear ratio of the wheel drives or a failure to re-run sprinkler charts following a tire change haven't been accounted for. We get it — you're up to your eyeballs with chores. But when you invest to improve irrigation accuracy, you need to make sure all inputs are documented and down-stream operating parameters are accurate. Otherwise good money is simply chasing what will surely be sub-optimal results.

Implementing an accurate solution requires the pivot be certified. The starting point for certification is a simple check of input parameters. Second, is a standard check of (a) speed timing / measurements and (b) a catch-can water test. We strongly urge and recommend these protocols as a fundamental component in the VRI solution.

### Consideration 3

The Pounds per Square Inch (PSI) nemesis. A compelling relationship exists between a rise in elevation and yield decrease ... and elevation isn't the only culprit. Corner arm and end-gun have an equally profound impact on PSI. A pivot beginning to pull "dynamic head" even with a Variable Frequency Drive (VFD), often drops water pressure to levels below the point at which regulators are effective.

When this occurs water is no longer being applied to specifications assumed by the sprinkler chart and implemented by the Rx. The solution is two-fold. First, using an end-of-tower transducer, measure the amount of drop that is occurring. Second, correct for those deficiencies either by further modulating the speed of the pivot or mechanically making improvements to the pump system.

We previously mentioned end-guns and corner arms, but don't forget integrated main-line systems. In these configurations it is crucial that PSI is measured when the combination of pivots

are likely to be run so that effects of drawdown, end-guns and corner systems will exhibit the conditions you need to design to.

### Consideration 4

Start from a full water profile. VRI is neither designed nor able to compensate for deficiencies in the soil-water profile. Where you are entering into an irrigation season and the profile has been depleted either by the previous crop or simply by the lack of winter moisture, it is recommended to pre-water and/or run initial applications at a flat rate schedule. This pattern should be maintained until you and/or your soil-moisture probe indicate the profile is at or near field capacity. Only then should you start into your VRI schedule ... not a minute before!

### Consideration 5

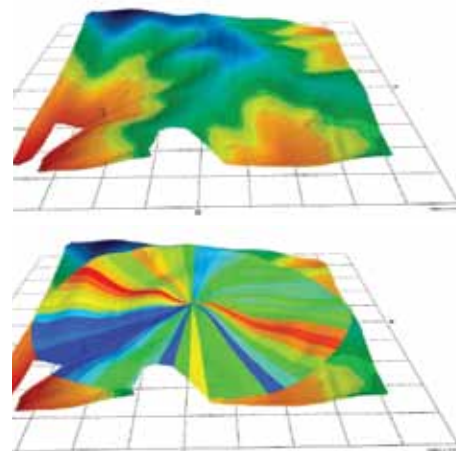
Rx spread. Rx generated by the computer spreads a "base" water application according to the needs of the underlying soil and/or topography. If the differences in elevation or water holding capacity values are large the Rx spread will be large ... and sometimes too large. The mistake here is failing to remember that irrigation is cumulative. So even though you may simply be putting on 0.06" less in any given slice (that doesn't sound like a lot), keep in mind that over a 30-turn season that amounts to 1.8" less water to that segment of the field — now that is HUGE! We have found it best to start with a base Rx that makes small, incremental changes. By closely observing results of the irrigation on the crop and checking soil moisture you will be well positioned to implement subsequent adjustments. More aggressive change to the Rx should be left to later in the season or to year two when it is better understood how the field responds to the change in irrigation practice.

### Consideration 6

The role of geo-spatial-yield data is HUGE. The software allows yield data to be layered on top of topography and EC data. With this configuration the interactive effects of fixed and variable data layers allow you to draw cause-and-effect relationships. It is at this point that you can determine if the increase or decrease in water applied to each of the 60 x 6° sectors has had its intended effect. Yield data analysis complements your knowledge of the field allowing you to use numbers to negotiate refinements in the Rx. You no longer need to concede one portion of the field to meet either a topographic or soil constraint in another part of the field. You only need to think of how to best optimize each 6° sector.

### Consideration 7

In some instances steep slopes and soil conditions cannot be mitigated by the use of VRI prescriptions. The effectiveness of contour tillage practices, soil amenities and other agri-operational practices have their limits. Under these conditions the relevant questions is How do I minimize inputs to best



Top: A 3D subsoil map of center pivot irrigated field with topography accentuated. Bottom: VRI water prescription map, segmented into 6° management zones, using subsoil as the determinate GIS layer. Zones in blue get more water, shading through green to yellow to red zones that get the least water.

protect my investment? For instance, a number of growers report good results reducing seed density, nitrogen applications and water to poor fertility areas. Now, instead of standard plant populations competing for scarce inputs, the available seed can more effectively compete for sustaining nutrients. Quantitative evidence<sup>2</sup> suggests that over-all yield improvement can often best be demonstrated by working within the available constraints rather than boosting inputs.

There are also instances where prevailing winds and solar radiation unevenly impact the field. Here again, dissecting the field into 60 sectors and analyzing the interactive effects of (1) topography, (2) underlying soil and (3) water on yield provides a much clearer image of what can and cannot be done to compensate when these factors are limiting.

### CONCLUDING THOUGHT

Asymmetric water application is the one way a grower can effectively compete in a variable-laced environment. VRI provides a by-the-numbers solution deserving consideration. It is a solution that offers emerging evidence to nudge yields upward while holding the ecological line on water and power.

*The author wishes to acknowledge the contributions of Brett Wilken, Cathy Wilson and Shirl Jackson.*

<sup>2</sup>Rice Production in Water-scarce Environments. T.P. Tuong and B.A.M. Bouman International Rice Research Institute, Manila, Philippines. <http://www.bvsde.paho.org/bvsacd/cd35/6cabl.pdf>





# Resistance and Tolerance of Small Grains to Cereal Cyst Nematode

By Richard Smiley, PhD, Research and Extension Faculty, OSU, Pendleton, OR and Juliet Marshall, PhD, Research and Extension Faculty, UI, Idaho Falls, ID

**C**ereal cyst nematode (CCN; *Heterodera avenae*) reduces yields of small grain crops in the Pacific Northwest. High numbers of CCN have been detected in Idaho, Oregon and Washington. Once introduced into a region, infestations can become very damaging when wheat, barley or oat crops are grown frequently. This nematode does not reproduce on broadleaf crops. It can be spread whenever soil is moved from an infested field to a non-infested field; on farm equipment, vehicles, shoes, animals, root and tuber crops, root-transplant crops, container nursery crops, blowing dust, or furrow-irrigated tail water re-entering a canal.

Yield reductions up to 50% occur in highly-infested fields and the severity of reduction can be minimized by growing susceptible small grains only once during a 3-year rotation. Currently, there are no tillage systems or chemical or biological nematicides that can be used to maintain yields in fields where this nematode is present in yield-limiting densities. Long crop rotations that include a susceptible small grain crop planted no more frequently than once every three years is the only current method for circumventing the losses caused by this nematode.

We are addressing this dilemma by screening wheat and barley varieties to determine how they perform in CCN-infested fields. The most recent studies are being conducted in eastern Idaho. Previous research showed that varieties reacted almost identically to CCN populations in Idaho, Oregon and Washington. In 2012 we determined for the first



Young female nematodes in the white cyst stage on wheat roots. Female cysts are filled with eggs.

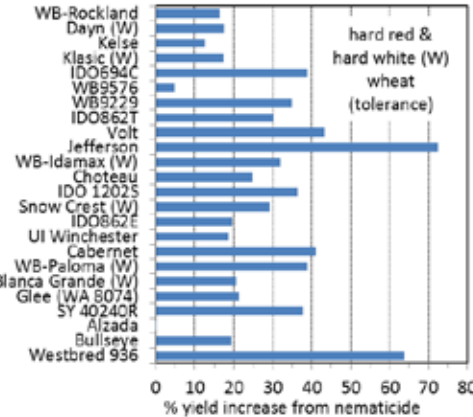
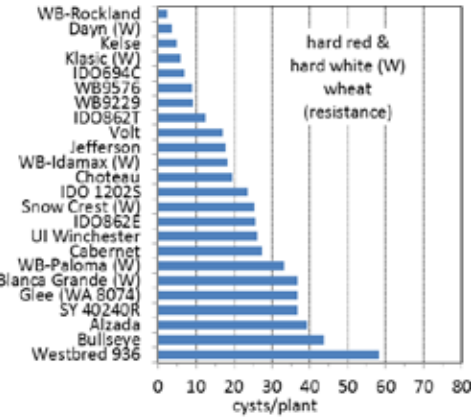
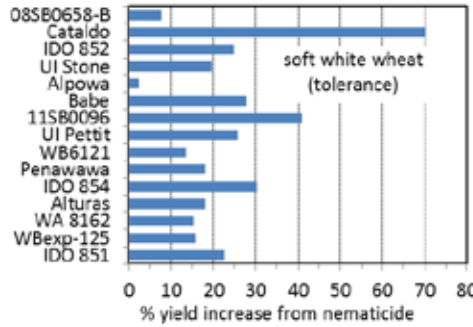
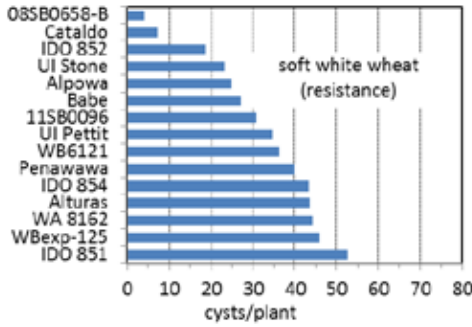
time in North America that levels of resistance and tolerance differ greatly among spring wheat varieties. Results were the same in each state, and are expected to also be applicable to CCN infestations in states such as California, Colorado, Montana and Utah. North American barley varieties were tested for the first time during 2013.

In 2013 we screened the spring wheat and spring barley entries in Juliet Marshall's regional testing program in an irrigated circle near St. Anthony, ID. The 84 entries included 15 soft white spring wheats, 6 hard white spring wheats, 18 hard red spring wheats, 19 two-row malting barleys, 6 six-row malting barleys, 17 two-row feed barleys, and 4 six-row feed barleys. Each entry was planted into replicated plots. Half of each plot was treated with an unregistered nematicide (available for research use only) to reduce the reproduction rate of the nematode and to assist the plant in over-

coming initial damage caused when these nematodes first invade the young roots.

Resistance was measured by digging up plants after head emergence, washing the roots, and counting the number of new white female nematodes produced on roots of individual plants. When the plants die, these egg-filled females also die and the female body converts into the brown cyst that protects the eggs. Low numbers of newly formed cysts indicates a resistant reaction. High numbers of cysts indicate a susceptible reaction. The cyst count data was then validated by collecting soil samples after harvest and determining whether the cyst data was correlated with the number of eggs that could be extracted from each pound of soil.

Tolerance was measured as the difference in grain yield for nematicide-treated and untreated plots. Grain was harvested



### Spring wheat resistance and tolerance to cereal cyst nematode

Soft white	Res.	Tol.	Hard red	Res.	Tol.
08SB0658-B	MR	T	Kelse	MR	MT
Cataldo	MS	VI	WB-Rockland	MR	MI
Alpowa	S	VT	WB9576	MS	VT
IDO 852	S	MI	IDO694C	MS	I
UI Stone	S	MI	WB9229	MS	I
115B0096	VS	I	Choteau	S	MI
Alturas	VS	MI	IDO 1202S	S	I
Babe	VS	MI	IDO862T	S	I
IDO 851	VS	MI	Jefferson	S	VI
IDO 854	VS	I	Volt	S	I
Penawawa	VS	MI	Alzada	VS	VT
UI Pettit	VS	MI	Bullseye	VS	MI
WA 8162	VS	MI	Cabernet	VS	I
WB6121	VS	MT	Glee (WA 8074)	VS	MI
WBexp-125	VS	MI	IDO862E	VS	MI
<b>Hard white</b>	<b>Res.</b>	<b>Tol.</b>	SY 40240R	VS	I
Dayn	MR	MI	UI Winchester	VS	MI
Klasic	MR	MI	Westbred 936	VS	VI
WB-Idamax	S	I			
Blanca Grande	VS	MI			
Snow Crest	VS	MI			
WB-Paloma	VS	I			

by using a small-plot combine. A high level of tolerance was indicated when yield was not appreciably increased by the application of a nematicide. Intolerance (or sensitivity) was indicated when the yield of a variety was significantly increased by application of nematicide. Resistance and tolerance vary independently because the nematode invades roots and causes physiological damage (a hypersensitive reaction) regardless of whether or not the variety is resistant or susceptible, and whether or not a nematicide has been applied. The early

damage can occur as soon as the roots begin to emerge and may extend for a month or more after emergence. The resistance reaction occurs many weeks after the roots were invaded. Individual varieties can be characterized by any level of response ranging from resistant and tolerant, resistant and intolerant, susceptible and tolerant, or susceptible and intolerant. Another way to think about these traits is as follows. Resistance influences the production efficiency of the next-planted intolerant crop; e.g., it either does or does not leave an increased number of nematodes in the

soil at the end of the growing season. Tolerance influences the production efficiency of the current crop; e.g., the yield is either maintained fairly close to that which is expected in non-infested fields (tolerance) or is greatly reduced by root damage caused by the nematode (intolerance).

For maximum production efficiency in fields infested by CCN, growers and their advisors must consider both resistance and tolerance in the management of small grains. The optimum situation for managing CCN is to plant a variety that is resistant as well as tolerant. But within some of the market classes there may not be a variety that carries both of these traits. The worst-case scenario is for a grower to plant into an infested field a variety that is both susceptible and intolerant. That would lead to reduced yield for the current crop and also increase the level of risk to the next-planted intolerant crop. So, what are the best options if there is no ideal variety in the market class of interest to you, or if your agronomic or economic circumstances won't allow you to choose an ideal variety that might be available? If you have a field that is highly infested with CCN, based on soil testing, and your field will

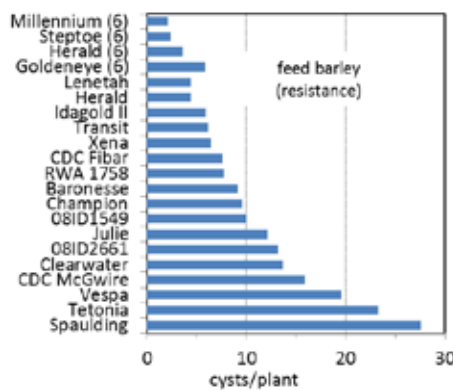
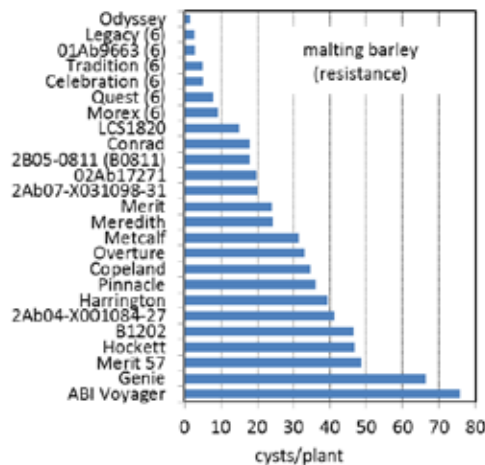


These roots show a range of plant root response to CCN nematode in Idaho. Numbers indicate severity of root response on a rating scale from 1 to 5.

be in a 3-year rotation that includes only one susceptible small grain crop (wheat, barley or oats), you may wish to plant the most tolerant variety available, regardless of its level of resistance or susceptibility. That would maintain optimal yield in the current crop and the two years of rotation to a non-host crop (any broadleaf crop) or fallow will reduce the nematode density in soil during the 2-year 'sanitizing' period. If your field will be in a 2-year rotation, such as potato rotated with a small grain, the short rotation is unlikely to reduce the nematode numbers adequately to protect the next planting of an intolerant small grain crop. In 2-year rotations it is very important to choose a variety that carries as much resistance and tolerance as possible. That would reduce the level of risk to the next-planted cereal crop and also maintain yield in the current crop.

**In this report** we present a series of charts showing resistance and tolerance data for spring wheat varieties tested during 2013. Only resistance data is presented for spring barley entries; we also measured tolerance but the method we used to apply nematicide to barley caused a phytotoxic reaction that did not occur on wheat, either during 2013 or during previous years. We will change our application procedure during 2014 to provide tolerance data as well as resistance data for these spring cereals.

When reviewing the charts it is important to also understand that severe root abnormalities occurred on almost all plants (>99%), regardless of whether or not we applied a nematicide. The nematicide did not impede the earliest damage caused when the nematodes first invaded the roots, but did impede the feeding and reproduction by the maturing females. Since the early damage to roots was fairly uniform in treated and untreated plots, any yield improvement from the application of nematicide was not equal to growing that same variety in a field where CCN was not present. Yield improvements measured in our work are therefore highly conservative



with respect to the genetic capability of these varieties in non-infested fields. But even with that limitation, our conservative measurements showed that yields of intolerant (sensitive) varieties of spring wheat were reduced by as much as 70% in these trials, which is consistent with results of our field studies during previous years.

We identified varieties that have very different resistance traits within different market classes of wheat and barley. This information can be used to improve production efficiency in infested fields.

Charts showing quantitative data for resistance and tolerance are shown side-by-side to show differences in these traits for individual entries of wheat. The table presents categories of resistance and tolerance. Categories of resistance are very resistant (VR = less than one cyst/plant), resistant (R = 1 to 3 cysts), moderately resistant (MR = 3 to 6 cysts), moderately susceptible (MS = 6 to 12 cysts), susceptible (S = 12-25 cysts) and very susceptible (VS = more than 25 cysts/plant). Categories of tolerance are very tolerant (VT = less than

### Spring barley resistance to cereal cyst nematode

2-row malting		6-row malting	
Odyssey	R	01Ab9663	R
02Ab17271	S	Legacy	R
2Ab07-X031098-31	S	Celebration	MR
2B05-0811 (B0811)	S	Tradition	MR
Conrad	S	Morex	MS
LCS1820	S	Quest	MS
Meredith	S	<b>2-row feed</b>	
Merit	S	Herald	MR
2Ab04-X001084-27	VS	Idagold II	MR
ABI Voyager	VS	Lenetah	MR
B1202	VS	08ID1549	MS
Copeland	VS	Baronesse	MS
Genie	VS	CDC Fibar (hulless)	MS
Harrington	VS	Champion	MS
Hockett	VS	RWA 1758	MS
Merit 57	VS	Transit	MS
Metcalf	VS	Xena	MS
Overture	VS	08ID2661	S
Pinnacle	VS	CDC McGwire	S
<b>6-row feed</b>		Clearwater	S
Millennium	R	Julie	S
Steptoe	R	Tetonia	S
Goldeneye	MR	Vespa	S
Herald	MR	Spaulding	VS

5% yield increase in response to nematicide application), tolerant (T = 5% to 10% increase), moderately tolerant (MT = 11% to 15%), moderately intolerant (MI = 16% to 30%), intolerant (I = 31% to 50%) and very intolerant (VI = more than 50% yield increase). In the charts and tables, entries are ranked from the most resistant to the most susceptible within each market group.

This report represents data from a single season but some wheat varieties that were also tested during 2012 showed similar traits during 2013. Nevertheless, all entries are being re-examined during 2014 to either prove that they are valid, or to identify any discrepancies. The ultimate goal is to incorporate varietal ratings into a revision of the cereal cyst nematode extension bulletin (PNW Ext. Bull. 620), of which the current version is available without cost at <http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/18917/pnw620.pdf>.

*We thank Mr. Dale Daw for providing land and on-site assistance, the Idaho Wheat Commission, Oregon Wheat Commission and Washington Grains Commission for funding, and OSU and UI support staff for assisting in this research.*



# 2013 Idaho Spring Wheat Variety Performance

By Juliet Marshall, Extension Specialist Aberdeen, and Kurt Schroeder, Extension Specialist Moscow, Department of Plant, Soil and Entomological Sciences, University of Idaho

## YIELD SUMMARIES

Idaho spring wheat varieties are evaluated each year to provide performance information to help growers select superior varieties for their conditions. Because of similarities among spring wheat and spring barley tests, details about spring wheat test design and interpretation of the information presented in this article can be found in the preceding article '2013 Idaho Spring Barley Variety Performance Tests and 2011-2013 Yield Summaries.' Agronomic performance data for spring wheat are summarized by state districts in Tables 1-3. Former Districts III and IV results, now part of the Southern and Eastern Districts, are presented for soft white spring wheat in Table 2 and for hard spring wheat in Table 3. Yield data are given for individual sites while other agronomic data are averaged over all the sites of each table. Bushel/ Acre yield results are based on 60 lb/bu at 11% moisture. Lodging ratings are the percent of a plot that is lodged, and in some tables not reported due to minimal or no lodging. More detailed lodging information is available on the UI cereals website <http://www.extension.uidaho.edu/cereals/>. Average values are presented at the bottom of listings and are followed by a least significant difference (LSD) statistic at the 5% level. Average yield results from variety performance trials in 2011, 2012, and 2013 are presented in Table 4 for all districts, with 3-12 site/years of data summarized for each districts.

**Table 1. Dryland spring wheat performance in Northern District, 2013.**

Variety	Yield				Four Site Average				
	Craigmont	Genesee	Moscow	Bonnors Ferry	Yield	Test Weight	Height	Hardness	Protein
Soft white	bu/A				bu/A	lbs/bu	inches	0-100	%
Alturas	55	79	77	89	75	60	32	24	10.6
Babe	65	85	76	87	78	61	32	23	10.4
Cataldo	60	68	78	83	72	59	31	24	11.3
Diva	59	83	88	102	83	61	35	32	10.6
JD <sup>c</sup>	56	70	78	93	74	61	36	29	11.5
Penawawa	51	70	83	73	69	61	33	27	11.4
UI-Stone	64	79	88	87	79	61	32	23	10.6
WB1035CL+	60	79	76	91	76	61	33	35	12.4
WB6121	58	84	76	103	80	61	31	31	11.9
WB6341	62	83	87	115	87	60	31	26	10.3
Whit	54	83	83	105	81	60	34	28	11.6
<b>Average</b>	59	78	81	93	78	61	33	27	11.1
<b>LSD (0.05)</b>	6	9	10	10	4	0.4	1	--	--
<b>Hard red</b>									
AP-Bullseye	63	77	67	95	75	61	29	89	13.4
Buck Pronto	58	66	60	72	64	59	31	79	14.2
Cabernet	59	69	62	89	70	59	27	63	13.1
Glee	62	85	72	101	80	60	33	75	13.0
Jefferson	57	80	69	88	74	59	32	78	13.3
Kelse	55	73	67	88	71	59	34	75	13.8
UI-Winchester	57	76	64	78	69	59	31	67	13.3
WB9518	57	74	57	101	72	59	29	85	14.0
WB9879CLP	62	72	61	86	70	60	32	78	13.5
WB-Expresso	61	75	52	98	72	59	30	81	14.0
WB-Fuzion	62	77	58	83	70	59	33	84	13.6
WB-Hartline <sup>w</sup>	63	78	78	102	80	58	32	62	12.8
WB-Volt	57	75	63	99	73	60	31	93	12.8
<b>Average</b>	59	75	64	91	72	59	31	78	13.4
<b>LSD (0.05)</b>	8	7	11	9	4	0.5	1	--	--

c = club  
w = white

**Table 2. Irrigated and Dryland Soft White Spring Wheat Performance in Eastern Districts, 2013.**

Variety	Yield					Average				
	Irrigated		Dryland			Irrigated Yield	Test Weight	Plant Height	Lodging	Protein
	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs	bu/A	lb/bu	inches	%	%
Alpowa	107	98	93	86	65	96	61	32	4	11.7
Alturas	110	115	102	76	61	101	61	31	6	11.1
Babe	103	100	89	82	64	94	61	32	8	11.9
Cataldo	107	93	91	78	53	92	61	31	0	11.9
Penawawa	115	99	95	76	62	96	61	33	9	12.4
UI Pettit	117	96	95	82	56	98	62	28	0	11.3
UI Stone	118	115	104	78	58	104	62	31	1	11.7
<b>Average</b>	112	107	99	78	59	99	61	31	4	12.0
<b>LSD (0.05)</b>	14	9	16	17	11	7	1	1	8	0.7

# Tests and 2011-2013 Yield Summaries



**Table 3. Irrigated and Dryland Hard Spring Wheat Performance in Eastern Districts, 2013.**

Variety	Yield					Yield bu/A	Test Weight lb/bu	Plant Height inches	Lodging %	Protein %
	Irrigated		Dryland		Average					
	Rupert	Aberdeen	Idaho Falls	Ashton	Soda Springs					
<b>Hard Red</b>	bu/A					bu/A	lb/bu	inches	%	%
Bullseye	94	106	99	73	---	93	63	28	3	15.4
Cabernet	89	101	87	66	---	86	62	27	1	14.5
Choteau	90	104	91	84	60	92	61	32	4	15.2
Glee	88	104	82	77	51	88	62	30	3	15.1
Jefferson	90	110	85	66	58	88	62	30	4	15.4
Kelse	92	107	93	76	63	92	62	31	0	15.4
UI Winchester	84	95	76	78	68	83	62	29	1	14.7
Volt	88	112	93	76	59	92	63	31	0	14.7
WB9229	92	104	98	75	---	92	61	27	0	15.6
WB9576	91	98	81	79	---	87	61	27	0	16.5
WB-Rockland	81	78	79	73	---	77	61	26	0	16.5
Westbred 936	79	64	78	72	51	73	58	28	0	15.1
<b>Hard White</b>										
Blanca Grande	85	95	83	69	64	83	63	27	0	15.1
Dayn	97	119	111	86	60	103	62	31	0	14.1
Klasic	89	85	74	65	58	78	62	23	0	15.0
Snow Crest	90	88	85	57	---	80	61	26	3	15.3
WB-Idamax	85	93	96	80	---	88	61	28	2	15.0
WB-Paloma	89	86	87	74	---	84	62	29	0	15.2
<b>Durum Wheat</b>										
Alzada	99	82	72	77		83	61	29	8	15.5
<b>Average</b>	90	98	87	73	59	87	61	29	1	15.1
<b>LSD (0.05)</b>	10	10	11	18	11	6	1	2	5	0.9

**Table 4. Spring Wheat Yield Average for 2011-2013 in Idaho.**

Site/Years	District		
	Northern 3	Eastern 12	Eastern (Dryland) 3
	Yield (bu/A)		
<b>Soft white</b>			
Alpowa	-	110	45
Alturas	75	108	50
Babe	73	109	44
Cataldo	-	97	46
Diva	80	-	-
JD*	76	-	-
Penawawa	67	103	46
UI Pettit	-	105	44
UI Stone	77	113	51
WB-1035CL+	70	-	-
Whit	76	-	-
Average	74	106	47
LSD (0.05)	3	4	5
<b>Hard Red</b>			
Buck Pronto	68	-	-
Bullseye	71	100	-
Cabernet	65	96	-
Choteau	-	100	40
Jefferson	71	98	41
Kelse	68	100	45
UI Winchester	70	96	43
Volt	-	98	38
WB-Expresso	71	-	-
WB-Fuzion	66	-	-
WB-Rockland	-	85	-
Westbred 936	-	83	39
<b>Hard White</b>			
Dayn		110	43
WB-Hartline	79		
WB-Idamax	-	99	-
WB-Paloma	-	95	-
Blanca Grande	-	95	43
Snow Crest	-	91	---
Klasic	-	90	44
<b>Durum</b>			
Alzada	-	100	-
<b>Average</b>	70	96	42
<b>LSD (0.05)</b>	3	4	5





# 2013 Idaho Spring Barley Variety Performance

By Juliet Marshall, Extension Specialist Aberdeen, and Kurt Schroeder, Extension Specialist Moscow, Department of Plant, Soil and Entomological Sciences, University of Idaho

## VARIETY TESTING

Spring varieties of wheat and barley are evaluated each year to provide performance information to help growers select superior varieties for their growing conditions. The tests are done using growers' fields or experiment station locations and the varieties are grown under conditions typical for crop production in the area. Varieties are included in these tests based on their potential adaptation in an area and commercial use of a variety. The number of entries is limited due to resource constraints. Individual plots were planted as 7 rows spaced 7" apart for 14' to 25' in length and replicated 3 or 4 times in a randomized complete block design. Plots in North Idaho that were direct seeded were 5 feet wide with five paired rows, three inches apart with ten inches from center to center of paired rows.

## INFORMATION SUMMARIZATION

Agronomic performance data for 2013 spring barley tests are summarized by district in Tables 1-3. The state is divided into the Northern, the Southern, and the Eastern Districts. Previous Districts III and IV have been included in the Southern and Eastern Districts, respectively, and results are presented for 2-row barley in Table 2 and for 6-row barley in Table 3. Yield data are reported for individual sites while other agronomic data are averaged over all sites of each table. Bushel/acre yield results are based on 48 lb/bu at 11% moisture. Lodging ratings are the percent of a plot area lodged. Plump percentage is based on cleaned grain retained on a 6/64" screen. Thin grain percentage is clean grain passing through a 5.5/64" screen. Average values are presented at the bottom of listings and are followed by a least significant difference (LSD) statistic at the 5% level.

Average yield data from variety performance trials in 2011, 2012, and 2013 are presented in Table 4 for all districts. These data represent results of 4-12 site/years and can be a good indication of long-term performance of a variety.

## INFORMATION INTERPRETATION

Average past performance of a variety is the best indicator available to predict future performance potential. Variety performance

can vary from location to location and year to year. The results reported in this article are for 2013 trials; previous results can be found in the spring 1992 to 2013 issues of Idaho Grain Magazine. Average performance over locations and years more accurately indicates a variety's relative performance. Try to evaluate as much information as you can prior to selecting varieties. Yield is a primary characteristic used to select varieties, but disease resistance, maturity, lodging tendency, and quality characteristics such as test weight and plumpness are also important variety selection considerations. Also consider that plots are managed according to the average expected yield, latest varietal maturity, and / or performance of the surrounding crop in a grower's field, whether wheat or barley. Varietal performance may not reflect actual performance in your field when a specific variety is managed for optimal economic performance.

Reported small differences among varieties in yield and other characteristics are usually of little importance due to chance differences in tests. Utilize the LSD statistic to determine the true difference between varieties. If differences between varieties are greater than the 5% LSD value, the varieties are considered

"significantly different." This means that there is a 9.5 in 10 chance that the reported difference between varieties is a true difference and not due to other experimental factors or chance variation. If no significant differences are determined for a trial, n.s. is used in place of the LSD.

## FURTHER INFORMATION

Variety performance information for winter wheat and winter barley has been published in the fall issues of Idaho Grain. An excellent Extension Publication for barley producers is "Idaho Spring Barley Production Guide" (Bulletin No. 742) that was updated for 2003, (see the Idaho Ag Communications website at <http://www.cals.uidaho.edu/edcomm/catalog.asp> under "crops" and "cereals"). For spring wheat producers, "Irrigated Spring Wheat Production Guide for Southern Idaho" (Bulletin No. 697) can be ordered on the same website. All these publications are free through the University of Idaho Agriculture Publications (ph. 208-885-7982) or contact your county Extension Office. Additional Idaho small grain variety performance information is available on the web at <http://www.extension.uidaho.edu/cereals/>.

**Table 1. Dryland spring barley performance in Northern District, 2013.**

Variety	Yield				North Idaho Average					
	Craigmont	Genesee	Moscow	Bonnors Ferry	Yield	Test weight	Plant Height	Lodging	Plumps	Thins
Feed	bu/A				bu/A	lb/bu	inches	%	%>6/64	%<5.5/64
Aquila	76	92	69	131	92	51	30	8	90	2
Baronesse	76	95	80	130	95	51	27	15	85	4
Camas	83	95	72	127	94	52	29	16	87	4
Champion	82	107	70	124	96	54	29	17	73	7
Clearwater	70	97	67	95	82	55	28	18	75	8
Lenetah	83	97	73	129	96	51	28	21	88	3
Millenium (six-row)	67	86	70	122	86	49	27	0	72	9
Radiant	81	101	68	121	93	51	28	16	78	7
Spaulding	86	98	76	140	100	52	28	12	82	6
Tetonia	77	100	73	137	97	51	28	14	81	6
Vespa	77	112	73	136	99	51	25	9	88	3
<b>Malt</b>										
CDC Copeland	70	92	49	128	85	51	30	17	77	7
Genie	82	102	63	126	93	50	25	16	91	3
CDC Meredith	78	97	75	126	94	49	28	19	85	4
Odyssey	79	109	60	127	94	50	27	19	87	3
Overture	77	99	58	132	77	52	26	14	81	5
Tradition (six-row)	62	87	63	138	87	50	32	19	83	3
<b>Average</b>	77	98	68	127	92	51	28	15	82	5
<b>LSD (0.05)</b>	9	11	8	15	5	0.7	1	3	3	1

# Tests and 2011-2013 Yield Summaries



**Table 2. Irrigated Two-Row Spring Barley Performance in Eastern Districts, 2013.**

Variety	Yield				Irrigated Average						
	Rupert	Aberdeen	Idaho Falls	Ashton	Yield	Test Weight	Plant Height	Lodging	Plumps	Thins	Protein
Feed	bu/A				bu/A	lb/bu	inches	%	(% > 6/64)	%	%
Baronesse	123	138	141	94	124	51	30	28	87	5	12
CDC Fibar*	82	100	90	70	86	58	34	53	80	7	16.3
CDC McGwire*	123	125	129	92	118	58	32	26	64	14	12.6
Champion	147	164	154	110	144	53	32	21	91	3	13.4
Clearwater*	103	114	107	82	102	57	32	35	65	14	15.1
Herald	157	141	144	98	135	49	33	2	86	5	13.0
Idagold II	129	141	136	95	125	51	26	15	82	6	13.2
Julie*	129	129	120	85	116	59	31	20	86	4	15.5
Lenetah	135	152	148	111	137	53	33	26	92	4	13.4
RWA 1758	136	144	139	116	134	52	30	31	90	4	12.0
Spaulding	136	161	150	99	137	53	32	21	86	6	13.2
Tetonia	131	147	143	108	132	52	32	27	83	7	12.3
Transit*	91	134	107	68	100	57	33	17	80	6	15.3
Vespa	162	150	145	101	140	52	29	35	90	4	13.1
Xena	145	144	156	101	136	52	31	25	90	4	12.9
<b>Average</b>	121	135	130	93	120	55	31	26	83	6	13.8
<b>LSD (α = .05)</b>	20	19	15	20	9	1	2	13	9	5	0.9
<b>Malt</b>											
ABI Voyager	128	147	140	93	127	51	33	21	93	3	10.7
B1202	124	125	131	93	118	51	32	39	87	5	10.7
Conrad	111	136	134	101	120	51	30	47	88	5	10.8
Copeland	112	152	138	100	126	52	35	26	91	3	11.1
Genie	128	139	126	99	123	50	28	56	82	7	10.9
Harrington	100	135	115	84	109	50	32	49	76	9	11.3
Hockett	123	132	124	95	119	52	33	47	88	5	11.3
Meredith	124	119	128	89	115	50	31	47	86	6	11.0
Merit	115	135	139	103	123	50	34	34	81	9	10.8
Merit 57	105	130	134	98	117	50	33	36	81	8	11.0
Metcalfe	116	128	127	78	112	51	33	39	87	6	11.0
Moravian 115	125	129	127	88	117	49	27	45	88	5	10.9
Moravian 143	151	133	138	81	126	49	28	29	89	4	11.3
Moravian 69	139	141	122	104	127	49	27	37	75	10	10.5
Odyssey	128	132	137	102	125	49	28	32	86	6	10.6
Overture	97	114	127	112	113	46	30	56	80	9	11.5
Pinnacle	125	147	139	94	126	53	33	24	95	2	11.4
<b>Average</b>	120	134	133	97	121	50	31	37	85	6	10.9
<b>LSD (0.05)</b>	21	14	12	14	8	1	2	13	7	4	0.6

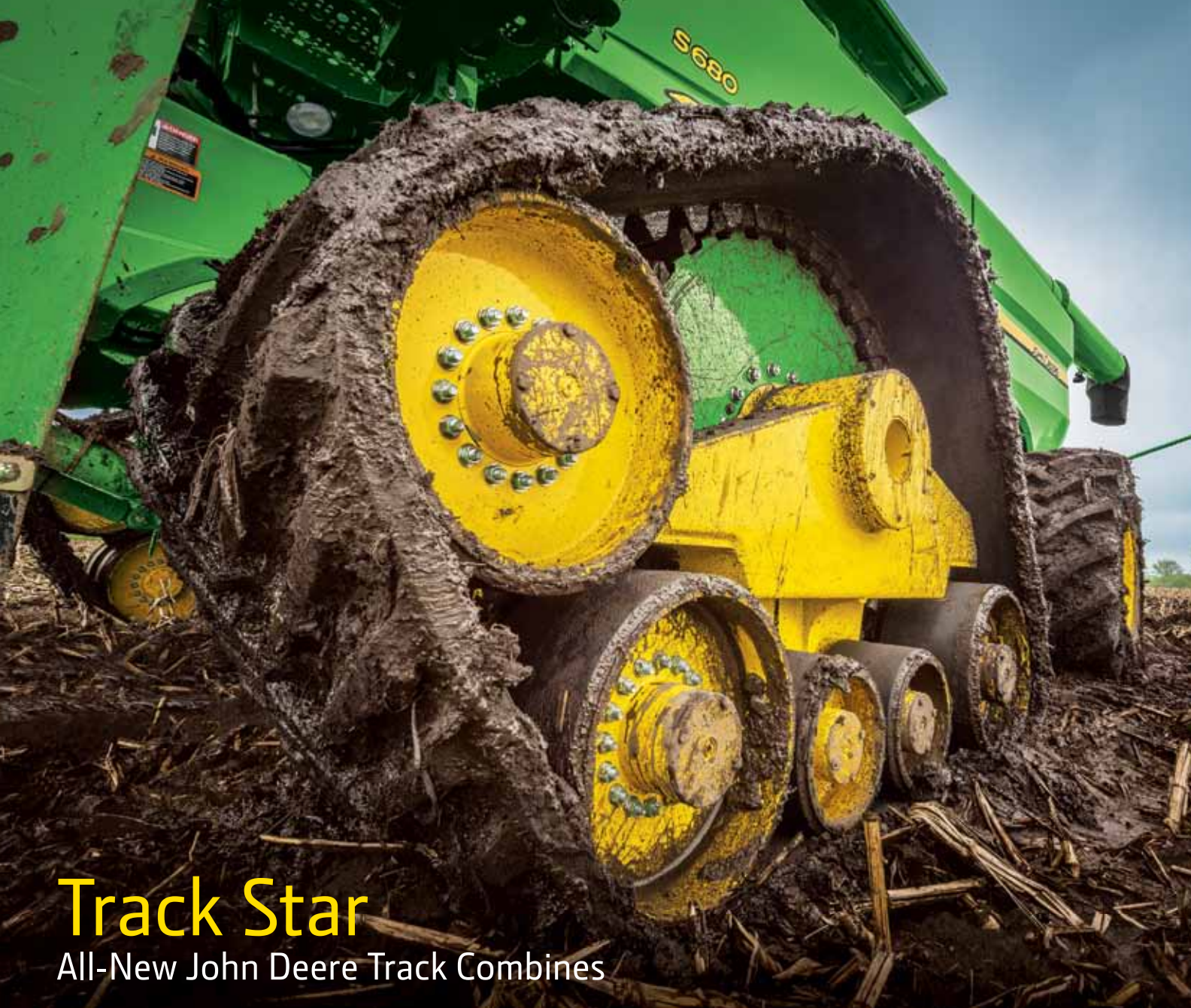
\* indicates hullless variety

**Table 3. Irrigated Six-Row Spring Barley Performance in Eastern Districts, 2013.**

Variety	Yield				Average						
	Rupert	Aberdeen	Idaho Falls	Ashton	Yield	Test Weight	Plant Height	Lodging	Plumps	Thins	Protein
Feed	bu/A				bu/A	lb/bu	inches	%	(% > 6/64)	%	%
Goldeneye	117	163	148	100	132	51	33	17	85	5	12.4
Gustoe	115	140	152	91	124	49	34	21	82	6	11.9
Herald	110	161	156	92	130	49	34	8	68	11	11.5
Millennium	98	139	169	90	124	48	33	28	84	6	11.4
<b>Malt</b>											
Legacy	104	131	150	83	117	50	34	39	89	3	13.3
Maja	122	145	146	95	127	50	34	25	89	4	12.4
Morex	101	132	150	84	117	50	35	29	81	7	11.5
Quest	89	127	156	88	115	51	36	23	87	4	12.7
Tradition	113	143	141	97	124	51	34	23	92	2	12.4
<b>Average</b>	110	147	154	93	126	50	34	23	84	6	12.1
<b>LSD (0.05)</b>	16	15	23	24	10	1	2	10	5	3	0.6

**Table 4. Spring Barley Yield Average for 2011-2013 in Idaho.**

Site/Years	District	
	Northern	Eastern
<b>2-Row Feed</b>	<b>4</b>	<b>12</b>
Aquila	95	-
Baronesse	99	130
Camas	103	-
CDC Fibar*	-	86
CDC McGwire*	-	115
Champion	106	145
Clearwater*	83	104
Idagold II	-	130
Julie*	-	113
Lenetah	99	137
RWA 1758	-	132
Spaulding	105	144
Tetonia	104	134
Transit*	-	97
Xena	-	145
<b>Average</b>	<b>99</b>	<b>125</b>
<b>LSD (α = .05)</b>	<b>6</b>	<b>6</b>
<b>2-Row Malt</b>		
ABI Voyager	-	133
B1202	-	117
Conrad	-	126
Copeland	97	126
Harrington	-	106
Hockett	-	120
Merit	-	116
Merit 57	-	120
Metcalfe	-	116
Moravian 115	-	114
Moravian 69	-	128
Pinnacle	-	131
<b>Average</b>	<b>97</b>	<b>122</b>
<b>LSD (0.05)</b>	<b>-</b>	<b>5</b>
<b>6-Row Feed</b>		
Goldeneye	-	141
Herald	-	131
Millennium	-	139
Steptoe	-	129
<b>6-Row Malt</b>		
Celebration	-	117
Legacy	-	128
Morex	-	112
Tradition	92	125
<b>Average</b>	<b>92</b>	<b>129</b>
<b>LSD (0.05)</b>	<b>-</b>	<b>6</b>



# Track Star

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