

IDAHO GRAIN

THE IDAHO GRAIN PRODUCERS ASSOCIATION MAGAZINE

FALL 2013



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Harvest Season

WHAT a great time of year. I'm sure harvest is complete for many farmers and continues for those growers in the high country. Early reports that I have heard indicate a good crop for most areas. However dry farms in the southeast region of the state have struggled to pick up the moisture needed for an average crop. That may make for a similar year to last, but hopefully not as severe.

I want to publicly say "thanks" to all of those involved with, and sponsored, the many crop tours and field days held throughout the summer. Great work is being done in agriculture research across the state. We as Idaho farmers are fortunate to have available to us such a powerful network of support from our private and public partners. These field days are a great opportunity to gather, compare notes, ask questions, and to learn from the research and business experts out there.

Barley Agronomist Endowment

On July 25, 2013 the University of Idaho College of Agriculture (CALs) hosted its Tetonia Research Center field day. At this gathering, the Idaho Barley Commission made official its announcement of a \$1 million barley agronomist endowment. Funded through barley grower dollars, the position will be located at the CALs Aberdeen Research and Extension Center. I am glad that my barley assessment dollars will help pay for an expert solely dedicated to the production challenges we face as barley farmers. Overall the Tetonia event was well attended and a great success.

BYU-Idaho Scholarship

Back in mid-May I had the opportunity to represent the IGPA, alongside Idaho Wheat commissioner Gordon Gallup, at an informal event highlighting the creation of an endowed academic scholarship at BYU-Idaho in Rexburg.

Earlier this year, the IGPA and IWC agreed to fund the scholarship to encourage and support students pursuing a degree in production agriculture. We met with Van Christman; Dean of BYU's College of Agriculture and expressed our mutual excitement about the work being done at the school as well as the new scholarship to be available in 2014.

These opportunities and events are only possible because of the great relationship between IGPA and our Wheat and Barley Commissions. We at the IGPA are committed to maintaining these relationships and making decisions that best represent wheat and barley growers.

There are many more topics the IGPA is addressing, so please continue to thumb through our fall magazine. I want to wish "good luck" to those still in harvest and I look forward to seeing you at the IGPA's fall county meetings and at our annual convention, November 13-16 in Spokane, Washington!

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Look for these symbols in headlines throughout the magazine to see at a glance whether an article pertains to wheat issues, barley issues, or both.



WHEAT



BARLEY



WHEAT & BARLEY

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Of Quantity and Quality

I AM often asked by friends and family, “What exactly do you do?” Even after what I think is a thorough explanation of my job and the role of the IGPA, I still receive blank stares from many of these inquiring minds. I come away a little frustrated and begin anew contemplation on how I can better overcome this issue with those I deem “the uninformed”.

The IGPA is no different than any “not-for-profit” organization that represents a group of people with a common bond (and an acronym). Nearly everyone is familiar with a Parent-Teacher Association (PTA) in their local community or much larger national organizations such as AARP, ACLU, or PETA. Maybe I should stop with these last few examples before I anger our readers.

To be more specific, the IGPA is legally incorporated as the “Idaho State Wheat Growers Association” doing business as the Idaho Grain Producers Association. You see, this organization was created in 1957 by a visionary group of wheat farmers from around the Lewiston, Idaho area. Wheat was - and mostly still is - the name of the game for those who farm in those parts.

As the ISWGA became a stronger voice for farmers, the group reached out to its brethren in southern Idaho. It soon became apparent that the production diversity inherent to the growing region of southern Idaho meant changes were necessary. Barley was already an important rotation of many farmers along the Snake River Plain. The clear and natural connection between these two cereal grains made for a natural fit while strengthening the breadth and depth of the Association.

Thus ushered in growth and a name change that we operate under today. The IGPA consists of a staff of two, executive assistant Christie Bauscher and I. Yep, we do everything from lick envelopes to lobby Congress. We write press releases and wax eloquently (or attempt to) over the phone, via email and through social media.

We manage a five-member executive committee, a 20-member board of directors, and collaborate with the staff and members of the Idaho Wheat and Idaho Barley Commission. We contract with a lobbyist whose mission is to ride close herd over the state legislature when in session, and we sit on countless boards, advisory groups, alliances, coalitions, and committees.

All of that can be somewhat overwhelming at times. Given my “Type A” personality, it can certainly contribute to some high blood pressure readings during my annual physical. I strongly believe that the IGPA is all about quality AND quantity. Our staff and our farmer leaders work hard and oftentimes behind the scenes.

From regulations to rules, today’s issues and challenges in agriculture demand close attention and focus on the details. Not everyone gets to live in Jimmy Buffet’s “Margaritaville” (unfortunately) and I know I personally work best when busy and under some pressure. Dull moments are just that...dull.

So when friends, family and maybe even our readership wonder what it is the IGPA really is all about, maybe you now have a better idea. If not, no worries. I’ll still keep thinking of better ways to explain it.

Until then, enjoy this edition of the “Idaho Grain” magazine and best wishes for a fun and festival fall season.



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Collaboration Key to Meeting Ag Challenges

By Cindy Snyder

How agricultural producers around the world will feed 9.5 billion people by 2050 is a topic dominating many forums and panel discussions. Experts talk about utilizing precision agriculture techniques, growing more drought resistant crops thanks to biotechnology advances and fine-tuning fertilizer use. But one component is often missing from those discussions — collaboration.

Kara Knudsen learned that firsthand during a six-week trek through six different countries as a Nuffield Scholar. She is a cattle producer from Queensland, Australia, who visited Robert Blair's Kendrick grain farm in mid-July as part of that trek.

She's not referring to collaboration between a group of local farmers who join forces to market a commodity, but for collaboration between countries that have long considered themselves competitors.

She wrote in a blog post after she returned to Australia, "We need to focus on opening up trade opportunities not only for our commodities but also for our intellect, farmers here can really make huge differences in global food production if they were to partner with other countries less fortunate than ourselves. Collaboration between countries is now more important than ever."

Blair agrees. He had traveled to Uruguay, Argentina and Brazil as a 2011 Eisenhower Ag Fellow. He has also hosted 10 Nuffield Scholars on his farm in the first half of 2013.

"We need to have collaboration between countries and growers to meet the challenges of agriculture as we move forward," he said. "The same issues with biotech, environmentalism and regulations that we face every year are also faced by growers in other parts of the world."

OUT OF THE COMFORT ZONE

Collaboration may be the answer, but it's hard to collaborate with people that you don't know or don't understand. That's why leadership programs like the Eisenhower Fellow or Nuffield Scholar programs are so valuable. The Eisenhower program is strictly for U.S. citizens, while the Nuffield program operates in eight countries.

Both programs encourage producers to meet with other producers around the world. None of the six Nuffield Scholars, all from Australia and New Zealand, who visited Blair's farm were grain



Blair (third from right), State Senator Dan Johnson (far right) and the Nuffield Scholars

producers. Instead, all were livestock producers participating in the global focus tour portion of the 18-month scholar program.

The point of the tour is to show participants a little of what they do know and a lot of what they don't know; and to make connections with Eisenhower fellows and Nuffield scholars around the world.

"The tour gets us out of our comfort zones," said Jodie Redcliffe, a broiler producer from Queensland.

She was surprised to learn how much Communist-era policies still impact agricultural production in Ukraine after more than two decades. They visited one farm that employees 377 people, 60 of which are security personnel. The farm also has a budget for bribes.

India proved to be eye opening for Natasha King, a dairy producer from New Zealand. She was not expecting for servers at restaurants to ignore the women sitting at a table while bringing menus and drinks to the two male scholars.

After learning that India has 120 million farmers in direct comparison to New Zealand's total population of 4 million people, King realizes that she is not the center of her universe any longer. She no longer considers herself a farmer but a food producer who is feeding the world.

"This experience is worth millions of dollars to me, it is worth millions of dollars to my kids, it is worth millions of dollars to my farm, it is worth millions of dollars to my country," she said.

In addition to the six-week global focus tour and attending the Contemporary Scholars Conference that brings Eisenhower and Nuffield participants together; Nuffield scholars are also required to develop a personal study area and to travel again as part of that study. For the tour participants those study areas ranged from developing alternative energy from manure to urban encroachment into agricultural land.

"The world issues are the same all over," said Matthew Ispen from a sheep producer from Victoria, Australia. "The more you talk about the issues, the more you can come up with solutions."

MORE LEADERS NEEDED

But talking doesn't accomplish anything unless there are leaders to develop strategies for addressing those issues and then implementing those plans. Developing leaders within agriculture is potentially the greatest barrier facing agricultural production going forward. It is a challenge here in the U.S and in other countries.

Not everyone can participate in a program that is as intensive and globally focused as either the Eisenhower or Nuffield programs are, but anyone can participate in leadership development opportunities in Idaho.

Blair sees his selection as an Eisenhower Ag Scholar as the culmination of leadership development that began with his involvement in the Latah County Idaho Grain Producers Association as a member. He is now serving as vice president of IGPA. Blair is also an alumnus of Leadership Idaho Agriculture, one of the Kellogg-funded agriculture leadership programs funded across the U.S.

Rather than trying to see the world all at once, Blair suggests starting locally. Participating in LIA allows farmers to make connections across the state with other farmers and agribusiness leaders, and to understand agriculture across the state.

The best part of leadership development, he said, is networking and spreading knowledge you have with others, and bringing some of their knowledge back home with you.

Mary Webb has seen that firsthand. She is a Nuffield alumnus originally from Ireland who now lives in Olympia, Wash. She helped organize the Pacific Northwest portion of the July Nuffield scholar tour.

It's not the formal things you learn when you travel to attend a conference in Boise or Seattle or Dublin, Ireland, that are important, she said. It's the informal things, the things that make you say, "oh."

"We need to take the politics out of agriculture," she said. "How? A little bit at a time that's how you change policy. If you go and do it, take on leadership roles and make the environment better, your life will be better and you will make others' lives better too."

Idaho farmer wraps up presidency; honors brewers at NBGA meeting

SODA Springs, Idaho barley grower Scott Brown of Soda Springs had much to reflect on. He had just completed a two-year term as president of the country's only grower association advocating for the interests of American grown barley and it had been a busy term.

At its summer meeting held on June 11-12, 2013 in Las Vegas, Nevada, the National Barley Growers Association thanked Brown during his last meeting in the president's seat. Mr. Brown's term was marked by some important accomplishments including: two appearances before the U.S. House Committee on Agriculture to emphasize the NBGA's policy priorities; the creation of an annual "Barley & Brews" congressional reception highlighting the importance of American barley farmers; a much strengthened relationship with industry partners; and significant changes to the Association's financial and administrative functions.

While sad for his leadership era to sunset, President Brown also felt at peace. "My time as NBGA president was well spent. There's some pressure when leading a national organization through a rough economy, but the reward is seeing your efforts come to fruition," reflected Brown. "My goal was to leave the Association better than I found it, and I feel I've accomplished that."

Brown's last duty as president was to preside over the annual summer meeting of the NBGA. The Board of Directors considered nearly all aspects of the barley industry while sitting alongside some of its brewing

partners including representatives of Anheuser-Busch/InBev and InteGrow Malt. Topics of the meeting ranged from transportation, international barley trade and energy to water, Farm Bill policy, barley research and marketing.

To honor his efforts as the top leader for American barley farmers, the NBGA presented Scott with a service award. The NBGA also recognized Beer Institute president Joe McLain as its 2013 "Friend of Barley" award winner. McLain was on hand to accept the award for his leadership in partnering with the NBGA to harmonize the groups' legislative agendas and for his strong support of the NBGA congressional event.

President McLain offered the following comments, "I am honored to accept this award on behalf of America's brewers and beer importers. From grain to glass, brewers work closely with barley farmers to give our consumers the very best beer we can," McClain said. "Every year, U.S. brewers purchase 4.8 billion pounds of barley malt grown in just 12 states. It's safe to say that our industries reply upon each other. After all, without barley, there would be no beer."

Brown himself is all too familiar with the symbiotic relationship between barley and beer having coined the popular phrase, "No Barley, No Beer". The catchy phrase provided for much needed levity during a 2011 congressional hearing on the Farm Bill and even made its way onto bumper stickers.

What's ahead for Scott after vacating the presidency? "Just being a farmer" he stated.



Outgoing NBGA president Scott Brown (left) with incoming president Doyle Lentz of North Dakota.

Congress Still At Odds Over Farm Bill Passage

WEEEKS after the House of Representatives failed to approve a committee-written Farm Bill, Members ultimately passed a measure that excluded the Nutrition Title and permanent authorization for farm programs.

The highly contentious bill, HR 2642, was brought to the floor by the House Republican leadership under strong objection from Democrats, who attempted to slow debate and delay a vote on final passage. The final tally for the legislation was 216-208 with 11 Members abstaining, less than a majority for either side but enough to move the measure forward to conference.

HR 2642 included all titles and amendments of the first Farm Bill that failed on June 17 except the controversial Nutrition Title. Additionally, the bill included language to repeal the 1938 and 1949 permanent farm laws. The House's action would make permanent whatever Title I language might be

eventually agreed to this year.

By contrast, the Senate-approved Farm Bill includes nutrition provisions and maintains the old (permanent) farm laws. It is unusual but allowable to conference such drastically different measures, though producing a conference report both bodies can agree to and the President will sign will prove a major challenge.



At his Kendrick area farm, IGPA VP Robert Blair recently hosted Rep. Raul Labrador to discuss IGPA's Farm Bill priorities.

Along with over 500 other agriculture stakeholder groups, the IGPA registered its concern with the House action to split the Nutrition Title from the rest of the Farm Bill. The IGPA also

opposes the House provisions that repeal the 1938 and 1949 permanent laws. The IGPA feels that excluding the Nutrition Title and permanent law provisions from the Farm Bill weakens the ability to achieve bipartisan majority passage of the legislation.

Both chambers of Congress adjourned for the August congressional recess with no formal plans for a Farm Bill conference during the five week break. Before adjourning for the recess, Senate leaders did name their Farm Bill conferees, but House leaders will likely not follow suit until that chamber acts on a nutrition package, likely in September.

House Republican leaders did propose a plan that would cut \$40 billion over ten years from the food stamp program, officially known as SNAP, in the new legislation. Opponents quickly rebuked the proposal and it's unclear if the plan will move anywhere. Farm programs are currently operating on a one-year extension of the 2008 Farm Bill, which expires on September 30.

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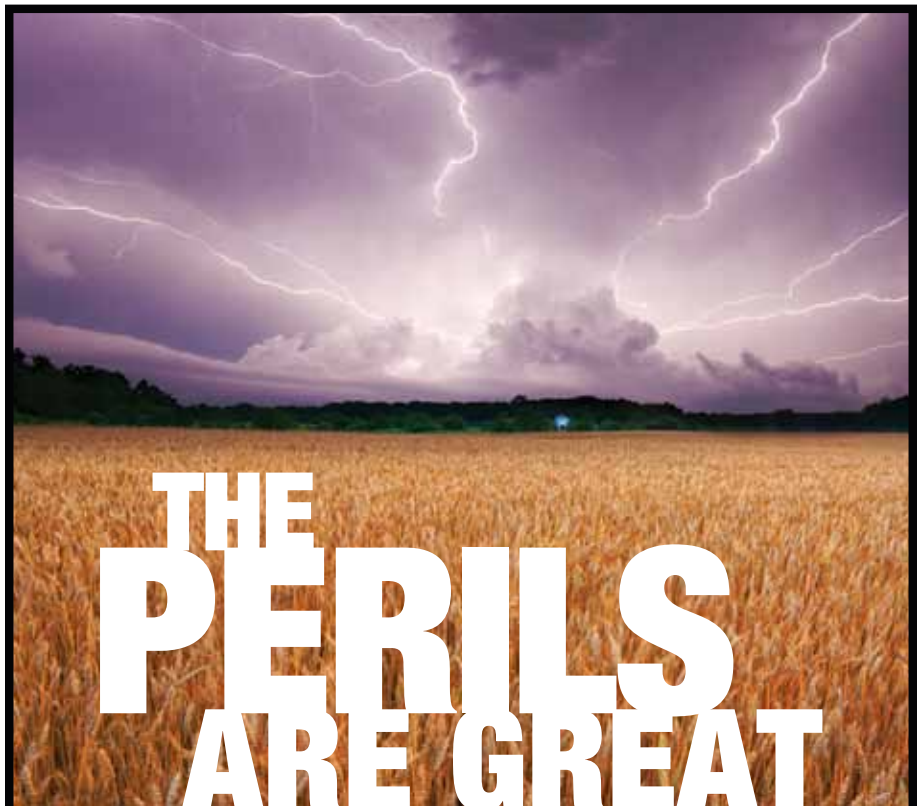
Commodity and Seed Indemnity Funds Update

By Dave Ogden, ISDA Warehouse Control Program Manager

THE Idaho Commodity Indemnity Fund (CIF) is at its maximum allowed fund balance, \$12 million, as of June 30, 2013 and assessments collected from producers ceased December 31, 2012. The Idaho CIF is the third largest fund out of 13 active funds in the United States and Canada. The Indiana fund is largest followed by Wisconsin. The size of the Idaho fund relative to the volume of Idaho grain trade and the types of risk it protects against makes it one of the strongest funds in the nation. The Idaho fund also offers protection to producers who sell crops to licensed buyers in the states of Oregon, Washington, and Utah. Idaho producers and licensed businesses can rightly be proud of the current program and the confidence it gives to both commodity buyers and sellers. The CIF has experienced no failures or claims since 2004. All Idaho producers may enjoy the protections afforded by the CIF simply by selling and storing commodities with Idaho licensed businesses.

The Idaho Seed Indemnity Fund (SIF) is a unique program with no comparable programs in other states or Canada. Since its creation in 2002 the SIF has provided protection to seed producers. Internal assessments indicate the fund provides strong protection for the risks it covers. The SIF has not yet reached its maximum allowed balance of \$12 million, so licensed seed buyers continue to collect assessments from seed producers selling to and storing with licensed businesses. All Idaho seed producers may enjoy the protections afforded by the SIF by selling and storing with licensed Seed Buyers.

Warehouse Control staff plan to be in booths at several 2014 Ag Expos and Cereal Schools. We look forward to meeting with you.



Colby Slade
Insurance Agent

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Farmer, IGPA Officer Sid Cellan Receives Gubernatorial Appointment

On July 10, 2013, Governor C.L. "Butch" Otter announced the appointments of members to the reconstructed Idaho Oil and Gas Conservation Commission. IGPA secretary/treasurer Sid Cellan of Soda Springs was among those receiving an appointment. The panel is responsible for regulating the exploration, drilling and production of oil and gas resources on private, state and federal land in Idaho.



CELLAN

Earlier this year, the Legislature approved and the Governor signed a bill replacing the existing commissioners with five members appointed by the Governor and confirmed by the Idaho Senate. The commission members are experts in oil and gas, geology and water, as well as two landowner representatives – one who owns mineral rights and one who owns land without mineral rights (Cellan).

The Idaho Department of Lands will serve as the administrative agency responsible for supporting the commission's work and implementing rules and statutes related to oil and gas exploration and production.

Cellan will serve the Commission for one year.

The other appointed commission members are:

- James Classen of Boise, representing geological interests, to a four-year term.
- Ken Smith of Boise, representing oil and gas interests, to a four-year term.
- Margaret Chipman of Weiser, representing landowners with mineral rights, to a three-year term.
- Chris Beck of Hayden Lake, representing water interests, to a two-year term.

Idaho Transportation Symposium Highlights Opportunities; Challenges

As a landlocked state, Idaho businesses must be creative to ship its products to market. Idaho grain farmers are well aware that without competitive transportation, any profit will disappear.

Held on July 19 in Twin Falls, the first ever "Southern Idaho Agriculture and Manufacturing Transportation and Logistics Symposium" brought together some of Idaho's most prominent leaders and experts to discuss the opportunities and challenges facing the state and region.

Sponsored by Jerome-based distribution center WOW Logistics, the Mini-Cassia Commerce Authority and the Jerome County Commerce Authority, the one day seminar featured keynote speaker Lieutenant Governor Brad Little.

Little conveyed his bullish view on Idaho's economy but that economic growth should exceed 2 percent annually to be considered adequate. He outlined his views that Idaho's taxes should be fair, simple, clear and predictable and that government should promote increased diversity in Idaho's commodities and economies.



LITTLE

Leading off the distinguished list of industry presenters was former IGPA president and current chairman of the board for Amalgamated Sugar Company, Duane Grant. Grant reviewed the cooperative's history and highlighted its work to overcome transportation challenges. New sugar beet harvest techniques and innovative intermodal handling methods have increased the company's efficiencies and overall bottom line.

Other notable presenters included Handy Trucking CEO Clay Handy and Carl Legg, director of short line railroad operator WATCO Company. Handy focused on fuel prices in Idaho and its impact on the trucking industry. Legg touted WATCO's diversity of services in the rail industry as its biggest competitive strength.

The first symposium attracted over 50 attendees including the IGPA and other industry leaders.

IGPA Honors 2013-14 UI Ag Academic Scholarship Selections

Established over 20 years ago, the IGPA scholarship is awarded to any sophomore, junior or senior pursuing a degree in the University of Idaho College of Agriculture & Life Sciences. The applicants must carry at least a 2.7 Grade Point Average (GPA) and preference is given to students whose parents are active members of the IGPA. The two recipients below received an award of \$2,500 each.

The IGPA is proud to support students choosing to enter a field related to agriculture. The scholarship is known for its generous amount and its focus on leadership, academic skills and application to production agriculture.

Below, meet the 2013-14 recipients!

Raymond R. Mosman

Hometown: Nezperce, Idaho

Year: Junior

Major: Agribusiness

Student organizations and activities you are involved with?

I am currently a member of Beta Theta Pi where I have served as Philanthropy Chair and Secretary, I am a member and portfolio analyst for the Davis Investment Group, I have served as the ASUI Parliamentarian and am currently the ASUI Senate Adjutant, This spring I was selected to be a member of the Vandal Solutions Student Marketing



MOSMAN

The University of Idaho is the perfect school for me to pursue my educational goals, it is large enough to offer a wide variety of courses and professors to tailor my education to fit my needs, yet it is still small enough that students are able to form relationships with professors and can become very involved on campus.

The College of Agricultural and Life Sciences has provided me quality courses in agriculture that I have been able to take, these classes are both useful and relatable to the operation that I grew up on and still work on today, I have been able to take knowledge from these classes and improve our operation and anticipate learning more to implement in the future.

What do you like most about your degree?

The thing that I like most about my degree is that I am able to learn so much from the classes that I am taking that is going to be directly applicable to my career. I plan to take over my family's farm

Group and I have been nominated as the CALS Freshmen and Sophomore of the year.

What do you like best about the University of Idaho?

after graduation and the Agricultural Business Degree is setting me up for a successful career in the agricultural field.

Summer jobs/internships? What are your career goals?

In the summers I work on my family's two thousand acre dry land farm on the Camas Prairie near Nezperce, Idaho. We raise a wide variety of crops including many turf, native and reclamation grass seed production, alfalfa hay and cereal grains. I help on the farm by operating equipment, assisting in operational decisions and marketing. I plan to move back to the farm after I graduate and take over as the fourth generation on our farm.

Tara Stubbers

Hometown: Cottonwood

Year: Senior

Major: Agribusiness

What do you like best about the University of Idaho?

I love the faculty and staff at the U of I. They really care about each individual student and know you by name. They are always willing to answer questions and help you to have a successful future. The size of the campus is perfect. I don't think I have ever walked to class without passing someone I know. It gives the campus a friendly feel to it and helps to make the most of your college



STUBBERS

experience. My most positive experience has been getting involved in the clubs. By getting involved I was introduced to many people who became my

friends and opened up lots of doors for future job.

Student organization and activities you are involved in with the college

College of Agriculture and Life Sciences Ambassador, Clearwater Corn Maze, Collegiate Farm Bureau, National Society of Collegiate Scholars, Student Idaho Cattleman's Association, Agribusiness Club

What do you like most about your degree?

In the Agribusiness department all the kids are farm related and enjoy the same interests as me. They're super nice and a blast to hang out with.

Summer jobs/internships?

Primeland – Summer of 2013
B & A Performance Auto - Summer of 2011
Nanny - Summer of 2010 and 2012

What are your career goals?

My ultimate career goal is to own and operate my family farm or ranch. In the meantime, I'd like to work in an agriculture related field, possibly farm finance.

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2013



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John Phipps

Host of U.S. Farm Report, America's longest-running farm TV show, and writer of humor and commentary, John also appears monthly in Farm Journal & Top Producer magazines as a contributing editor.



Mark Gold

As managing partner of Top Third Ag Marketing, Mark can be heard daily on Nebraska radio KRVN, Kansas radio KFRM and Missouri radio KMZU. In addition, Mark is a regular guest analyst on U.S. Farm Report & Ag Day TV.



Hefty Brothers

In addition to their small seed company and agricultural chemical business interests, Darren and Brian Hefty host AgPhD each week on RFD-TV. Hefty Seed Company has grown to 33 stores in 8 states.



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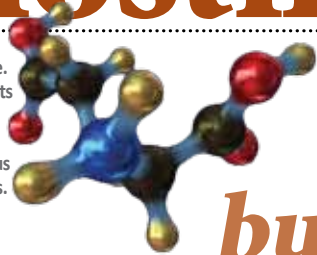
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November 13-16, 2013



Biostimulants

Molecular Model of Glutamine. Amino acids often components of biostimulants, stimulate formation of chlorophyll, plant growth hormones, and various enzymatic systems.



offer promise, but do your homework

By Cindy Snyder

BILL Flory first began experimenting with biostimulants three or four years ago. He was looking for a way to bridge some of the stress gaps that plants experience: too hot, too cold, too wet, too dry, too shallow, too deep.

He's tried inoculants, humic acid and other products. And while he thinks he is seeing some dramatic differences in the field, he hadn't yet harvested the 2013 crop to put yield data to those apparent variations.

"It's another tool in the toolbox," said the Winchester area grain producer and Idaho Wheat Commissioner. Flory has been using direct seed technology on his farm for many years, but was looking for another method to improve soil health. Capturing and utilizing every drop of moisture that falls on his farm that has a 2,000-foot elevation difference from top to bottom is the key to maximizing production.

Although response to some products appears to be dramatic in some areas, Flory admits the response has been lackluster in other areas. He thinks some of that difference may be explained by application timing, plant genetics and plant physiology.

"I do think we see some potential and some response," he said. "We haven't reached any

conclusions yet."

Juliet Marshall, University of Idaho extension cereal pathologist at Idaho Falls, would like to see more product testing by unbiased sources to help growers answers questions that Flory is raising.

It may be that foliar application is more appropriate and effective than soil application, she said. Still, stimulating vegetative plant growth does not always translate into yield gains.

HEALTHY SKEPTICISM

Flory's approach to biostimulants is what Ross Nielson would like other grain producers to mimic. He is the director of business development in eastern Idaho for the biostimulant company Agri-Gro.

"Farmers should have a healthy dose of skepticism but also an equal dose of exploration and innovation," Nielson said. One of his clients is a large nut grower in California who has tested many biostimulant products and intends to keep testing more.

"There is a lot of interest in biostimulants," he said. "Farmers want to find products that will work"

Since World War II, research dollars have poured into the synthetic fertilizer and agricultural protection chemical industries and the resulting products have boosted yields. Research

has also improved farm equipment and allowed further production gains through precision agriculture technology. But farmers and researchers are no longer seeing the dramatic increases in production that they have seen in the past after those new practices were implemented.

Recently research dollars have begun to flow toward biological systems in the form of



Treated on the right — larger and more filled out heads compared to non-treated on the left.

biostimulant products. Biostimulants is a broad term that can include bacterial or microbial inoculants, biochemical materials, amino acids, humic acids, fulvic acid, seaweed extract and other similar materials.

David Beaudreau, senior vice president of legislative and research services for the Biostimulant Coalition, said that very broadly speaking, biostimulants improve the development of the plant often by improving the nutrient efficiency of the plant.

The Biostimulant Coalition is a non-profit organization for companies that develop and market products created from natural or biological sources. The coalition is working with regulators to come up with a definition of what a "biostimulant" is within the U.S. Regulators have argued that biostimulants are not plant nutrients and therefore may not make any nutrient claims or guarantees.

It's that lack of definition and regulation that has earned biostimulants of the past a reputation as "magic potions" or "snake oil." Today's farmers



Manure, an old fashioned biostimulant, provides a wide range of nutrients while improving soil organic matter, soil structure and soil microbial habitat.

are understandably leery of investing in products that carry the stigma of being sold out of the back of a pickup by salesmen who promise a 30 percent yield gain or 40 percent less fertilizer use.

However, the industry appears to be maturing. Nielson worked with Agri-Gro and the Eastern Idaho Entrepreneurial Center to research the biostimulant industry. Through that process he learned many agribusinesses are investing in biostimulants. The McGregor Company, for example, is in the development phase for a biostimulant seed treatment.

While hard data on the biostimulant industry is limited, a recent analysis performed by Markets and Markets showed that the North American market revenue for biostimulant products was \$225.3 million in 2011, \$243.3 million in 2012 and is projected to be \$264 million in 2013. By 2018, the same analysis predicts the market will generate approximately \$473 million in North America and more than \$2 billion globally.

SOIL HEALTH IS A LONG-TERM RELATIONSHIP

Synthetic fertilizers and other chemical products have brought many blessings to agriculture, but also allowed growers to downplay the importance of soil health to plant growth.

“Soil is a living, breathing organism,” Nielson said. Many biostimulant products are marketed as tools to improve soil health or micromanage

soil by enhancing or multiplying microorganism populations. Some critics say that sounds like the products will let farmers micromanage their soils.

Overuse of synthetic fertilizers and short crop rotations are often blamed for killing the beneficial “bugs” in the soil, leaving the ground devoid of life. While those practices have reduced populations of soil bacteria and microorganisms, some microbes are still present.

“The microbes need food, water and air to rebuild populations,” explained Amber Moore, University of Idaho extension soil specialist in Twin Falls. Practices such as planting cover crops, extending crop rotations, reducing tillage and applying manure or compost are proven practices that improve soil tilth. But none of those practices is a

quick fix.

Applying a biostimulant that promises to improve soil quality or plant performance may show immediate benefits if the biostimulant contains a micronutrient either the soil or plant is lacking. But the product may not provide the same benefit the following year unless it's reapplied.

On the other hand, growers may not see the payback from applying manure, including a legume in your rotation or planting a cover crop for several years but the effect will also last longer.

Greg Blaser, an agronomy professor at BYU-Idaho, has done some work with biostimulants.

FOUR questions to ask when evaluating a biostimulant product claim:

- 1) Is the research replicated?
- 2) Was the research conducted by an accredited university or the Agricultural Research Service, or was it done in-house?
- 3) What patterns can be seen in the research? Is the same effect seen across many research sites or in just one region?
- 4) How long has the company been in business?



Sea kelp is a common component of biostimulant formulations.

While he believes there is some value from them, he is a big fan of including legumes — especially alfalfa — in a crop rotation. “Any kind of long rotation will help the soil,” he said adding that planting cover crops and reducing tillage will also help.

Moore has also looked at different biostimulants from fish emulsion to humic acid to microbial inoculants. Her favorite biostimulant is manure. She is just completing the first year of an eight-year manure study looking at a short rotation of wheat and potatoes and barley and sugarbeets.

She was surprised to see organic matter increase by 0.4 percent in the first year. While it may not sound like much to a grain producer, to a soil scientist it is a huge gain and shows that manure can help build soil productivity more quickly than had been assumed. Soil pH also decreased in the first year, which will make nutrients more available for crop uptake in alkaline soils.

“The bottom line is, if you want to boost humic acid using organic matter that is local or planting a cover crop is probably the most economical way,” she said.

However, she doesn't discourage growers who are curious about a biostimulant product from trying it on their own farm like Bill Flory has done. She suggests working with your local extension educator to research products and to help evaluate the results from a couple of strips in a field.

“I know what the science tells me but I don't know everything. I don't know what happens on your farm,” she said. “If you try it and you feel like you are getting a yield bump that is worth more than what you spent on the product, then go for it.” ■



Individual plants taken from the same Texas winter wheat field. The left plant (treated) in the left picture illustrates more tillers per plant than the plant on the right (non-treated). The same is true with the picture on the right; the plants on the left (treated) illustrate more tillers per plant than the plant on the right (non-treated).



IDAHO BARLEY COMMISSION

THE Idaho Barley Commission (IBC) was created in 1988. Its mission is to enhance the profitability of Idaho barley growers through research, market development and information and education. The IBC's Strategic Vision focuses barley check-off revenues on these priorities:

Improving Farmer Productivity and Profitability — develop new barley varieties with improved yield and end-use quality; release North America's only winter malting barley varieties with 30% yield gain on spring types; identify best management practices to optimize inputs; assist growers with marketing and risk management strategies.

Diversifying markets for Idaho barley — strengthen demand in the domestic beer market



and open export market channels for Idaho malting barley; create domestic and international demand for heart-healthy food barleys.

Idaho Barley Production History

- During the past 20 years, Idaho barley acreage has declined 22% from its peak in 1995, but production has fallen at a slower rate (down 12%) due to rising yields. In 2013, we saw a nearly 9% increase in production.
- Idaho will be the largest barley producer in the country in 2013 repeating its top performance

from 2011, with projected output of more than 58 million bushels.

RESEARCH:

- On Feb. 20, 2013, IBC approved a \$1 million Barley Research Endowment with the University of Idaho to create a dedicated Barley Agronomist Research position at Aberdeen. This Barley Agronomist Endowment Agreement was finalized on July 1, 2013 between the University of Idaho Foundation and IBC. Recruitment for the new barley scientist is now underway.
- IBC helps fund barley variety development at USDA ARS Aberdeen (collaboration with Anheuser Busch, American Malting Barley Association and Brewers Association) and Oregon State University. **We are focusing on winter malting barley varieties with 25-30% yield gains and food barley varieties (spring**

North & Southwest

- Represented by Commissioner Tim Dillin, Bonners Ferry
- 8% of Idaho's barley crop
- 2012 planted area - 47,000 acres
77% feed / 23% malting
- Market focus is on domestic malting barley and food and feed barley exports to Asia.
- IBC hosted two Technical Food Barley Product Development training seminars at the Wheat Marketing Center in Portland in March 2012 for Asia team and August 2012 for Latin American team.
- Idaho Barley Trade Mission to Asia in October 2012 resulted in 2013 contract production for food barley in north Idaho.



IBC hosts Japan food and feed barley trade team in Lewiston area in June 2013. Team visited food barley fields under contract with PNW Farmers Cooperative outside of Genesee.



IBC Commissioner Tim Dillin (center) and PNW Farmers Cooperative COO Sam White (second from right) visit leading Taiwan cereal food manufacturer during Idaho Food Barley Trade Mission to Asia in October 2012.



UI Extension hosts cereal field day in Bonners Ferry in late June 2013. Featured in the front left are Doug Finkelnberg, North Idaho grain extension faculty based in Lewiston and IBC Commissioner Tim Dillin who sponsors the extension grain and canola research plots on his Bonners Ferry farm.

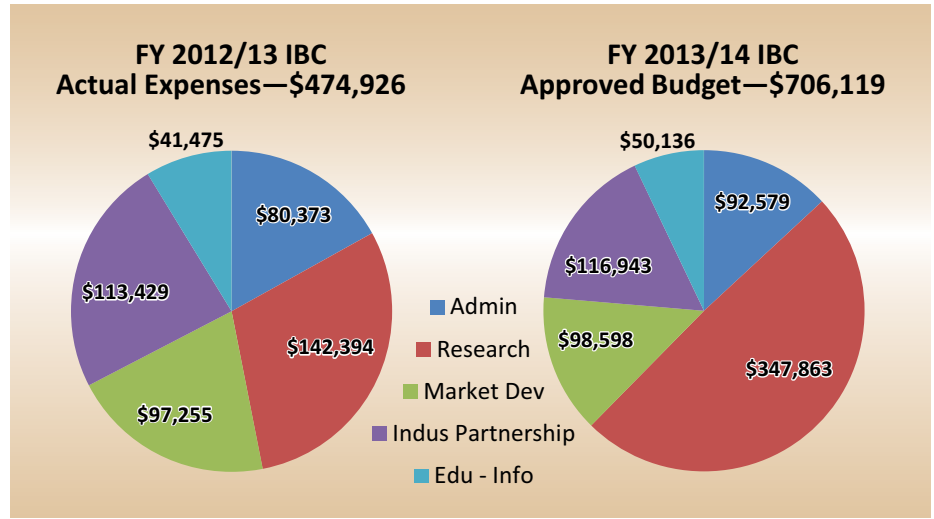
and winter) with high levels of heart-healthy fiber.

MARKET DIVERSIFICATION:

- Priority is on expanding the malting barley market, with recent focus on craft brewers who represent about 7% of beer output but utilize about 20% of the malt.
- We have launched multi-pronged **FOOD BARLEY INITIATIVE**, involving new varieties with high fiber content, new product development and use of barley foods in school meals.
- Growth markets in Asia and Latin America are being targeted for food and malting barley.

GROWER SERVICES:

■ For past decade, IBC has led national effort to improve federal Barley Crop Insurance. We have made several important gains, including new Specialty Type Barley Insurance and improved revenue coverage.



■ IBC has won more than \$155,000 in competitive federal grants during the past 11 years to conduct grower education in marketing and risk management. In the past year, IBC sponsored workshops and webinars in all regions of the

state, reaching more than 1,200 participants. IBC received another \$18,000 grant in FY 2014 to continue partnering with local county extension faculty on business succession planning, crop insurance and marketing education.

South-Central & East

- Represented by Chairman Dwight Little, Teton, Commissioner Pat Purdy, Picabo and Industry Representative Clay Kaasa, US Barley Director for Great Western Malting Co., Blackfoot.
- 92% of Idaho barley crop
- 2012 planted area - 563,000 acres
82% malting / 18% feed
- Market focus is on domestic malting barley with three malt plants located in 50 mile radius in eastern ID and emerging food barley market.
- Expanding craft brewing throughout the Western U.S. has opened the door for new new research and market collaborations.



UI cereal field day at Ashton in late July 2013. Featured from left are IBC Chairman Dwight Little; IBC Industry Representative Clay Kaasa; Dr. Juliet Marshall, UI cereal agronomist/pathologist, Aberdeen; Dr. Gongshe Hu, ARS barley breeder, Aberdeen; John Zietz, InteGrow Malt, Idaho Falls; Doug Peck and Tim Pella, Anheuser Busch, Idaho Falls.



IBC Chairman Dwight Little addresses participants of first-ever Tetonia Barley & Potato Field Day held in late July 2013 at the UI Tetonia Research Farm. IBC and UI officially announced their new Barley Agronomist Endowment at the Tetonia event.



UI Interim President Don Burnett featured here (far left) at Tetonia Barley & Potato Field Day with IBC Chairman Dwight Little, UI CALS Dean John Foltz and IBC Commissioner Pat Purdy, discussing the IBC's recent \$1 million investment in a dedicated UI barley agronomist research position that will be based in Aberdeen, ID.



Let's Get to Work on the River – Not in the Courtroom

By Kristin Meira, Executive Director,
Pacific Northwest Waterways Association

HAVE you heard? The Lower Snake is in the news again. The Corps of Engineers is finishing work on an unprecedented study of the sources of sediment on the Lower Snake, and how to manage the sediment once it reaches the federal navigation channel. This study, funded at significant taxpayer expense, was specifically requested by the plaintiffs in the last dredging lawsuit that was settled in 2005.

Now that this study is nearly finished, the Corps proposes to do the first maintenance dredging in this part of the system since 2006 - nearly eight years ago. The next most recent dredging on the Lower Snake was in 1999. The quantities proposed for removal are a fraction of what is dredged in other river systems in the region and across the nation. The sediment would be removed during the winter "in-water work window" - the time of year biologists deem best for the fish. The sediment in question is so clean, it will be used downstream on the Snake near Knoxway Canyon to create resting and rearing habitat for juvenile salmon, primarily fall Chinook.

So why all the fuss? This routine, nothing-special maintenance dredging happens to be on a part of the river system served by the four Snake River dams. This fact virtually assures another round of costly litigation, newspaper headlines, fundraising, rallies, and delay.

The same groups who have filed suit so many times in the past are evidently gearing up again. Now that the Corps is completing the sediment study they requested, these groups are changing their tactics and shifting the goalposts. Now these groups want the Corps to study the very existence of barging, which they claim is not economically viable.

We know that barging is good for the environment and for people. The U.S. Maritime Administration notes that barges can carry more freight than other modes, and are the most fuel efficient type of freight transportation. There are also fewer spills associated with barging, and fewer accidents and fatalities. A typical 4-barge tow is the equivalent of about



Port of Lewiston Dredging

140 rail cars, or 538 trucks on the highway. Our group strongly supports rail, trucking and barging - all three must be maintained and efficient for cargo to flow. Take away one entire mode, and there will be significant impacts to the other two.

Our river system is significant to the nation, and plays a big role in ensuring that our country's farmers and manufacturers have the ability to export their goods in competitive international markets. The Columbia Snake River System is the top wheat export gateway in the nation, and second for soy. We're tops on the West Coast for wood exports and mineral bulk exports.

The system is also critical to the economy of Idaho. The most recent data available shows that over 50% of Idaho's wheat is exported, mostly through the Columbia River. In addition, on average 20-35% of the peas/lentils grown in Idaho are exported via the Columbia River. The Port of Lewiston is also an important gateway for containers of high-value Idaho ag products and other cargo.

The Administration and our Congressional delegation recognize the value of this river system, for the cargo that is moving today, and the cargo that will need to move in the decades to come. Our elected officials are not making plans to remove these dams and navigation locks. Instead, they are actively investing in their future reliability and efficiency. For 16 weeks during the winter of 2010-2011, the U.S. Army Corps of Engineers pursued a historic, coordinated closure of the system to enable the installation of three enormous lock gates as well as other system repairs and improvements. Indeed, one of those massive lock gates was installed at Lower Monumental, on the Snake River. These investments in the future of our system were made at the direction of the current Administration and Congress.

Extended lock closures of this kind are very unusual, but are necessary to maintain the integrity of the transportation system. Throughout the closure, PNWA worked closely with the Corps and navigation stakeholders to minimize impacts to river users, other transportation modes, and even overseas

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The Case for Biotech Wheat

'Hasten the day' say Idaho wheat growers

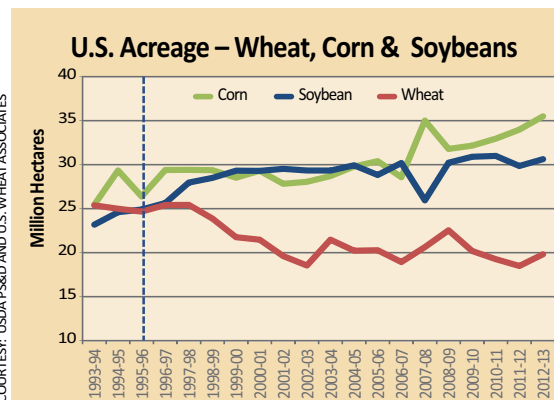


IDAHO wheat growers breathed a sigh of relief on July 30th when Yoshimasa Hayashi, Japanese Minister of Agriculture, Forestry and Fisheries (MAFF) stepped to the podium in his weekly briefing and announced that Japan would immediately resume shipments of soft white wheat from Idaho and the Pacific Northwest. It was welcome news coming just as Idaho harvest was starting.

Japan and Korea suspended new tenders of PNW soft white wheat earlier in the summer when rogue genetically engineered (GE) glyphosate-resistant wheat plants were discovered in an Oregon wheat field. After an extensive investigation, the USDA's Animal and Plant Health Inspection Service (APHIS) issued an interim report that the GE finding appeared to be a single isolated incident in a single field on a single farm. No evidence of GE wheat has been found in commercial channels. Throughout the investigation APHIS emphasized that GE wheat does not pose a health hazard.

Although the tempest has passed, the larger issue of wheat's decline in the American diet and loss of farm acres to corn and soybeans remains. In contrast to wheat, corn and soybeans both benefit from GE traits. GE corn and soybeans were introduced in 1996 and the USDA estimates that 88% of corn and 94% of soybeans grown in the U.S. are genetically modified.

GE corn and soybeans are pushing wheat acres aside because the crops are more profitable for the farmer than wheat, and as an ingredient, GE corn is pushing wheat aside in American supermarkets and restaurants because it is less expensive than wheat for millers, bakers, and food processors.



COURTESY: USDA P&SD AND U.S. WHEAT ASSOCIATES

buyers of Northwest products. This coordinated closure is now being held up as a model for how stakeholders and the Corps can work together.

The recent attacks on barging have centered on flawed studies of the benefits and costs of dredging. Dam breaching advocates claim that the costs of dredging are not balanced by the benefits of barging. Indeed, they claim that "barging is subsidized". Yet our calculations show that the benefits of dredging exceed the costs by at least \$5.5 million, even when just accounting for the benefits to wheat shipments alone. The dam breaching advocates don't use the correct cost of the dredging, they don't use accurate tonnage numbers, and they don't account for employment, cruise boat calls, and a multitude of other economic benefits.

Dam breaching advocates also claim that barging on the Lower Snake is drying up in recent years, and can easily be replaced by rail. Yet they cherry pick their numbers, and ignore the fact that the system was shut down for four months in 2010 and 2011. They ignore the lower wheat exports from the U.S. in 2009. They ignore the worldwide recession that depressed shipping numbers globally, including here at home. Though the latest Corps tonnage figures available are for 2011, our own research indicates that freight traffic on the Lower Snake is rising and currently trending toward pre-recession levels. Indeed, we are expecting improved numbers for 2012.

The groups who are attacking barging and the proposed maintenance dredging are strangely silent on the local, regional and national commitment that has been made to salmon recovery. They do not mention the record fish runs that are occurring with some of our ESA-listed species in the region. A recent federal agency report showed that most populations that spawn in the interior Columbia River Basin have increased in abundance since the first ESA listings in the 1990s. The 2012 counts exceeded historical averages for 2000 and earlier, and also exceeded the more recent 10-year average.

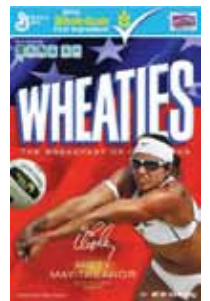
This progress - the product of collaboration between the federal agencies, states, tribes, and countless other stakeholders - should be celebrated. Instead, these groups continue the drum beat for their single desire: dam breaching. Nothing less will do.

It is time for these litigious groups to join with the rest of the region as stakeholders identify common-sense, practical efforts to benefit our iconic fish, while also preserving efficient navigation, emission-free hydropower, and all of the other benefits the dams provide. ■

U.S. farmers are expected to harvest a record 174.4 million acres of corn and soybeans in 2013, and, due to GE traits in corn, Idaho is becoming part of this trend. Idaho harvested 360,000 acres of corn in 2012, an all-time high. Corn is pushing into Idaho fields where a few years ago, non-GE corn would not have survived. Given its dairy industry, the growth of corn fields in the Magic Valley is no surprise. Surprising, however, is the extent to which corn has infiltrated the higher elevation fields throughout the state, such as those in the vicinity of Ririe.

Consumers need look no further than the cereal aisle to see the gains being made by corn-based food at the expense of foods made primarily with wheat. Iconic brand Wheaties, for example, is becoming more difficult to find. According to CNBC, Wheaties market share is under .5%, down from 6.5% several decades ago. The brand has suffered double-digit declines in recent years "due to its high commodity cost" (translation: high cost of its primary ingredient, wheat). Exemplifying the precarious position of the brand, fewer than one in 15 high school students has eaten a bowl of Wheaties.

The cost of a box of Wheaties averages close to \$5 in many supermarkets and is rarely promoted while corn-based cereals are often found in weekly specials at half that price. Much of the recent category growth, including some line extensions within the Cheerios brand, has been made in cereals



Can Wheaties brand survive? Flagship of wheat-based breakfast cereals is being pushed aside due to new corn-based cereals.

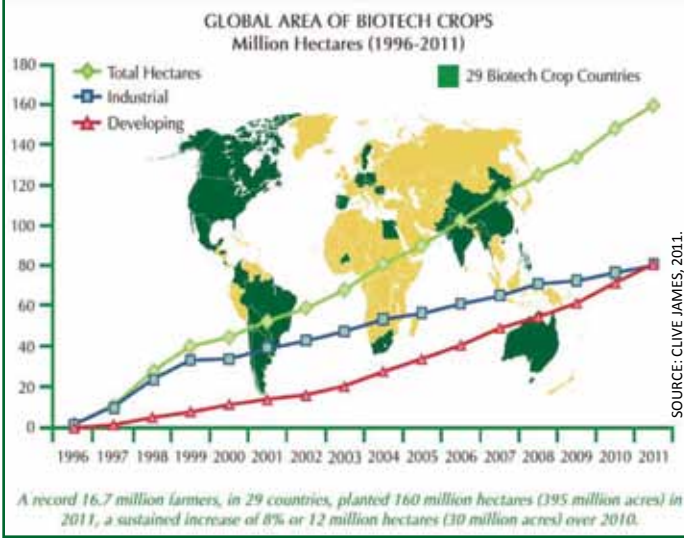
where corn is listed

as the first ingredient. Similar trends are happening in other food categories.

"The shift of crop land from wheat to corn is well-documented," says Blaine Jacobson, Executive Director of the Idaho Wheat Commission. "A parallel shift is happening in our diet as the foods we eat contain more corn and less wheat." In fact, the corn industry estimates that 75% of the products sold in a grocery store come from corn. Research conducted at the University of California-Berkeley examined the source of carbon in the human body and estimated in 2012 that 69% of the



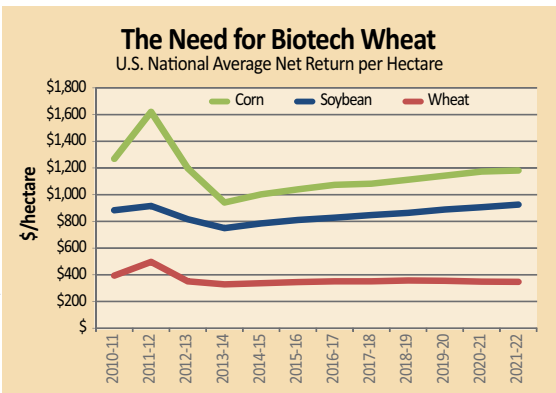
Biotech Crop Adoption — Global 2011



COURTESY: ISAAA AND U.S. WHEAT ASSOCIATES

carbon in Americans originated with corn, compared with less than 5% of the carbon of somebody living in Italy. (Dawson, 2012) "If we are what we eat," said Jacobson, "Americans are corn and soybeans. To continue enjoying wheat in our diets we need to make changes so wheat is more attractive for farmers to grow and food processors to use."

A 2009 paper from U.S. Wheat Associates, National Association of Wheat Growers, Wheat Foods Council, and other industry groups warned that wheat is on a path to becoming a minor crop in



COURTESY: USDA/ERS AND U.S. WHEAT ASSOCIATES

the U.S., unless wheat can become more competitive with corn and soybeans. Net returns per acre to farmers favor other crops in areas where options exist, and the differential is widening. Biotech traits can make a major contribution to changing the competitive equation.

A report from the USDA/ERS stated that "Loss of wheat acreage to row crops, such as corn and soybeans, on the Plains reflects strong genetic improvements in those crops." (USDA/ERS Wheat Baseline, 2009-18). In fact, Kansas long known as the "wheat state" now produces more corn than

wheat. On the horizon for corn are new GE traits to make corn drought tolerant, and those traits will cause the Corn Belt to be expanded further at the expense of wheat. Each GE trait added to corn gives it a profit advantage over wheat. Research conducted by Dr. Bill Wilson at North Dakota State University estimated the penalty to wheat by not having just the one drought tolerant GE trait translates to \$.60/bushel. As GE traits become stacked in corn, its

profit advantage over wheat continues to lengthen.

Besides the shift of farm land from wheat to corn and soybeans, and the diminishing share of wheat-based foods in supermarkets and restaurants, biotechnology in wheat is needed to meet growing world demand for food and to stave off emerging pathogens against which there is no genetic resistance. Lack of access to the latest technology is causing the best plant scientists to work in other crops where new tools can be used. It is also leading to less investment and a weaker infrastructure in

the wheat industry. The response by many wheat growers in Idaho is a call to "hasten the day" when our industry can use biotechnology as well.

Wheat industry leaders have established the Wheat Innovation Alliance for the purpose of finding innovative ways to improve wheat and the way in which it is grown. Members of the Wheat Innovation Alliance are a diverse group including wheat producers, technology providers, millers, bakers, and retailers. Declo grower and former Idaho Wheat Commissioner Mark Darrington is one of the spokespersons for the organization, and he spends time on the road helping educate growers and consumers.

The alliance is a forum for dialogue and consensus-building related to biotech wheat. It promotes wheat as an essential component of the global diet, but also cautions that a number of serious issues threaten its supply. It supports the eventual introduction of biotech wheat as a way to grow more and better wheat with less impact on the environment. It also supports making sure biotech traits in wheat are subject to extensive scientific testing and a tough government approval process. Quality and safety are top priorities for the alliance as biotech wheat slowly but unrelentingly moves ahead.

The "Yin and Yang" for the wheat industry is the need to protect markets while encouraging innovations so that the industry has a future. The GE wheat incident during the summer and the continued migration of growers to crops other than wheat illustrate the counterweights to be balanced. Yin-Yang advises that the

two are interdependent and too much of one can weaken the other. Change needs to be harmonious.

Closing the door to GE wheat traits will cause growers to abandon wheat, while moving too fast will cause markets to close doors. Harmonious change would be implementing reasonable tolerances while making sure high-quality and safe wheat is delivered to the customer, with biotech traits being subjected to extensive testing and tough government approvals. Moving forward on this path is essential to keeping a healthy and robust industry and for U.S. farmers continuing to be a dependable supply for customers who enjoy wheat-based food products. ■

Each GE trait added to corn gives it a profit advantage over wheat.

Idaho Wheat Commission — Educating the Next Generation of Ag Leaders

THE Idaho Wheat Commission recently established a new initiative to help inform college bound high school students about careers available in agriculture. The IWC has partnered with Idaho's FFA organization in selecting students from local FFA chapters to participate in a hands-on workshop at the Wheat Marketing Center in Portland, Oregon.

Applications from FFA teachers from around the state were submitted to the IWC this past spring. Fremont County Ag Teacher Tom Jacobsen was chosen to take a group of students

from his program to Portland. Mr. Jacobsen teaches Botany, Plant Science, Horticulture, Range Science, Ecology and Biology at North Fremont High School in Ashton.

He also conducts an active FFA program where students are involved in hands-on-production of wheat and alfalfa hay as part of his botany and biology classes.

Five Fremont County FFA students and ag teacher Tom Jacobsen, spent a half day at the Wheat Marketing Center where they were shown methods of analyzing wheat and flour quality,

including the falling number test and the wet gluten test. Students observed the actual production of noodles, flat breads and tortillas. All these products are made with Soft White wheat grown in Idaho and shipped to export markets.

While in Portland students also visited a local artisan bakery, a grain elevator and met with representatives from Columbia Grain and U.S. Wheat Associates. The one-day tour provided students insight into "wheat industry" careers in chemistry, food sciences, milling, baking, agricultural marketing, economics and trading.



New Year, New Challenges: Unprecedented Levels of BYDV in Our Winter Grain

By Dr. Juliet Marshall, University of Idaho Extension Specialist in Plant Pathology

ONCE again, unusual weather conditions during the previous growing season (2012-2013) have resulted in an unexpected disease epidemic in our winter wheat and barley. A long, frost-free fall promoted large, healthy winter cereal crops going into the 2012-13 winter. What may have been looked upon as favorable conditions for winter crops were actually also favorable for aphids, capable of vectoring cereal viruses, including the Barley Yellow Dwarf Virus (BYDV). Widespread incidence of BYDV infected winter wheat and winter barley became evident throughout the Magic Valley from Buhl to Murtaugh in April and May (Figures 1 and 2). The widespread nature of the outbreak surprised many pathologists.

Symptoms included yellowing of leaves, stunting of plants both above and below ground (look for small root systems), and irregular heading with small heads in affected plants. Often, the most severe symptoms occurred along field edges and the edges created along the tracks of pivot tires (see pictures). There may also be a yellowing to a very characteristic reddening of leaves of infected weedy grasses in nearby ditch banks (Fig. 4), which also host the virus and aphid vectors. Additional symptoms may also include notching of the leaf margins, twisting, leaf tip scorch, and abnormal development of emerging leaves.

Earlier infections lead to increased yield losses, which can approach 100% in severely affected fields, especially in early-infected winter barley. However, such high yield losses are unusual. Yield reductions of 10-20% are more common, and it is often economically better to maintain the current crop rather than plow it under and replant with beans or corn.

Fall infection occurred late September and early October as large populations of aphids migrated from other crops to newly emerged wheat or barley crops. Aphids are attracted to the lush growth that occurs under irrigation,



Figure 1. Winter barley with Barley Yellow Dwarf Virus infection. May 1, 2013 in the Burley area.



Figure 2. Stephens soft white winter wheat with Barley Yellow Dwarf Virus near Kimberly, Idaho. May 30, 2013.

and often leave plants in dryland corners alone. Those plants emerging earlier or planted earlier were more likely to attract viruliferous aphids. The mild fall led to increases in aphid populations into December before a hard frost reduced their numbers and impact, and subsequent transmission of virus.

There are many species of aphids that can carry the BYDV viruses, but the most common culprits include Bird Cherry Oat aphids and English Grain aphids. Greenbug and corn leaf aphids can also transmit BYDV. The virus strain in the current epidemic was identified by molecular

techniques (by Dr. Alex Karasev, UI virologist in Moscow) and found to be the PAV strain of BYDV. This strain is efficiently transmitted by the Bird Cherry Oat aphid (*Rhopalosiphum padi*) and the English Grain aphid (*Schizaphis avenae*). Aphids can pick up BYDV from infected wild and cultivated grasses, volunteer cereals, and corn. Corn is a "silent carrier" of BYDV, i.e. it is present in the corn plant but does not cause damage to the corn host. The virus is spread only by its aphid vector, and symptom development is greater at temperatures below 75 degrees. The virus is not seed-borne. Reducing crop stress will reduce the effect of the virus on the plant, but yield losses will occur both through reduced grain production as well as reduced test weight.

The most effective way to control this disease is through the use of resistant varieties, but insecticidal seed treatments may reduce the initial spread in fall wheat and barley. Viruliferous aphids can still transmit the virus in the fall before the insecticides kill the aphid. As insecticides lose their efficacy over time, new invading aphids can continue to transmit virus. Insecticidal seed treatments are still highly recommended to reduce initial transmission. A reduction in infection in the fall-planted grain can be achieved by adjusting (later) planting dates to avoid peak aphid activity. However, last year many of the infected fields were not planted early, but were simply actively growing during a long fall that had no killing frosts until well into December 2012.

References: *Compendium of Wheat Diseases and Pests, 3rd Edition.* APS Press. 2010.
Compendium of Barley Diseases, 2nd Edition. APS Press. 1997.
2013 Pacific Northwest Insect Management Handbook.
2013 Pacific Northwest Plant Disease Management Handbook.



Figure 3. Stephens soft white winter wheat with Barley Yellow Dwarf Virus near Kimberly, Idaho. May 30, 2013.



Figure 4. Weedy grass species can also host the aphid vectors and the Barley Yellow Dwarf Virus.

Control recommendations:

CONTROL the colonizing aphid. If Bird Cherry Oat aphid or English Grain aphids are present in high numbers, insecticidal seed treatments will reduce initial infection. (Granular systemic insecticides in-furrow at planting, imidacloprid or thiamethoxam as seed treatments.) Foliar insecticides will reduce secondary spread within the field.

Adjust (delay) the planting schedule to avoid peak aphid activity.

Removal of weed hosts of the virus and or aphids. However, field edges attract aphids so don't leave borders fallow.

Avoid green bridge situations. Spray corn with insecticides prior to planting winter grain to reduce aphid movement from corn into newly planted winter grain.

Virus-resistant varieties provide the best control, but few are available.

Sharing Solutions

Extension field days introduce new varieties to limit risk to grain yield



THE dog days of summer allow time for growers to attend field days and see the new varieties being developed by PNW wheat breeders.

Emerging production concerns are also discussed by the extension agronomists and breeders. Led by UI research and extension personnel, and conducted in grower cooperator fields throughout the state, the Small Grains Performance Trials display entries from both public and private breeders. Comparative yield data, agronomic data, and quality information from these trials are published in January as the UI Small Grains Report (southern and central Idaho) and Small Grain and Grain Legume Report (northern Idaho).

At the Tammany field day in Shoshone County, Tabitha Brown, WSU research associate, described a management practice using GPS controlled precision application of lime to elevate soil pH. UI Regional Extension Educator Doug Finkelnburg explained, "In some areas soil pH is so low that legumes can't fix nitrogen. Then wheat planted after the legume crop does not receive the expected nitrogen benefit. Also, nitrogen from chemical fertilizers is not available to the plant in low pH soils."

Finkelnburg also asked growers to be mindful of potential hybridization between wheat and Jointed Oat Grass when using "imi" gene herbicide tolerant wheat varieties. "Jointed Goat Grass and wheat hybridize occasionally, so the potential exists for the "imi" gene to be transferred to Jointed Goat Grass," he cautioned, adding that, "Most interspecific hybrids are sterile, but just one fertile hybrid plant could lead to herbicide resistant Jointed Goat Grass in a few years." Growers were urged to spray

for Jointed Goat Grass in fallow fields before planting "imi"-gene wheat varieties.

Glee (HRS) from WSU and **UI Stone** (SWS), both looked promising in the north Idaho trials. **Glee** has good HTAP stripe rust resistance and resistance to Hessian Fly. **UI Stone** boasts high yield and a novel disease packaging including Stripe Rust resistance.

Field days in south central and south eastern Idaho were hosted by Dr. Juliet Marshall, UI Extension Specialist in Plant Pathology, and local extension educators. They highlighted current year growing conditions, disease pressure, and new varieties. Dr. Marshall gave mini-pathology clinics at each field day, linking area pathology problems with new varieties that might work better under disease pressure. Stripe rust was observed in most of the spring wheat trials, prompting Dr. Marshall to describe the limitations of high temperature adult plant resistance (HTAP) to stripe rust. "Warm temperatures are necessary to activate the HTAP resistance to stripe rust and keep it active. When conditions turn cool the resistance weakens." She noted Idaho had SW winds and moisture coming up from California this year, a perfect scenario for stripe rust spores blowing in and causing infection. "Cool nights are favorable for infection and disease development, allowing stripe rust to spread even if a variety has HTAP resistance."

Another disease, Fusarium Head Blight (FHB), caused by the fungus *Fusarium graminearum*, was prevalent in more fields this year. Corn is a host for the fungus and as corn production increases in the irrigated regions of Idaho, FHB will become more problematic on wheat. Grain with FHB

infection may contain DON toxins at levels too high for human or animal consumption. Generally grain is still accepted at the elevator but growers can expect a dockage on the sale if DON toxin is present. Recently released varieties, **UI Stone** and **WB Volt** (HRS), have resistance to FHB. Both varieties have good yield potential and very good baking and milling quality.

UI Stone's tolerance to Cereal Cyst nematodes (CCN) allows good grain yields even under pressure from CCN. **WB Rockland** (HRS) has both tolerance and resistance to CCN. Rockland's yield is below average, but when CC nematode is limiting yield, Rockland has the potential to out yield non-tolerant varieties. Rockland's resistance also results in reducing nematode populations in the soil.

Marshall reminded growers that some new varieties do not have Dwarf Bunt resistance. "Don't skip the seed treatment on something like **Yellowstone** (HRW) that is susceptible. Seed treatments will control Dwarf Bunt but you have to use them." Marshall's preference is planting Dwarf Bunt resistant varieties like **Curlew** (HRW), **Promontory** (HRW), and **Utah 100** (HRW) from Utah State University.

Barley Yellow Dwarf Virus (BYDV) was observed in winter wheat and barley fields in the Magic Valley this year. It is mainly vectored by Bird Cherry Oat and English Grain aphids. "Avoid planting early to let the frost kill aphid vectors on corn so they can't move into the winter wheat as it emerges," Marshall recommended. "Insecticidal seed treatments will control the aphids on wheat seedlings and reduce the spread of BYDV."

A check variety in the trials, **Deloris** (HRW), is notable for its excellent end-use quality. Marshall cited **Deloris** as a variety that benefits from sulfur application when planted under irrigation. The plants use sulfur to form di-sulfide bonds in proteins, resulting in the functional strength of proteins desired by bakers.

Norwest 553 (HRW) and **Artdeco** (SWW) are high yielding lines with European genetics and end-use quality that meets PNW quality targets. **WB Keldin** (HRW), another variety of European heritage, has performed well under irrigation, showing excellent straw strength with high yield and short stature. However, Marshall cautioned that these varieties may not have disease resistance or adaptation growers expect in PNW genetics. "Cold tolerance, snow mold tolerance and dwarf bunt resistance are critical for varieties planted in many of our production areas."

SY Ovation (SWW) is high-yielding with excellent stripe rust resistance, but in some locations showed more lodging in 2013 than in previous years. **SY Ovation** was one of the top five winter wheat varieties planted in Idaho for harvest 2013.

Crown rot has been a problem in several fields in eastern Idaho this year. **Skiles** (SWW), is a WSU variety with resistance to multiple diseases including crown rot, Cephalosporium stripe, and

moderate stripe rust resistance. It has average yield and protein combined with good cold tolerance.

Syngenta has the license to market a new “Yellowstone-type” variety, **Clearstone** (HRW), with 2 gene “*imi*” herbicide resistance, developed by Montana State University. Like Yellowstone, **Clearstone** is susceptible to Dwarf Bunt, so Marshall strongly recommends using a seed treatment if planted in areas where dwarf bunt is problematic.

Stem saw fly, a frequent problem in Montana and some higher elevations in Eastern Idaho, has been seen in fields this year. Montana State University released two new solid stem wheat varieties, **Bearpaw** (HRW) for dryland and **Judee** (HRW) for irrigated production. Solid stem varieties presently offer the main source of resistance to sawfly.

Jianli Chen, Aberdeen wheat breeder for UI, presented **UI Silver** (HWW) developed for dryland production. It has HTAP stripe rust resistance, Dwarf Bunt resistance, good yield, and end-use quality equal to **Snowmass** (HWW). Foundation seed of UI Silver is available for planting 2013. **UI Grace** (HWW) a single “*imi*” gene herbicide resistance variety was highlighted and is comparable in yield to **Golden Spike** (HWW).

Dr. Juliet Marshall, UI Extension Specialist demonstrates symptoms of crown rot on wheat to BUY-ID students and growers attending the Ashton field day.



Hard white wheat is the preferred raw material for whole wheat baked goods and noodles. Dr. Chen noted “Hard white wheat is in demand for domestic and foreign buyers, but there isn’t enough to go around. US domestic markets take all the hard white wheat Idaho can produce.”

Dr. Chen expects to release hard white spring wheat lines **IDO694C** and **IDO1203S** in early 2014. These irrigated varieties have good stripe rust resistance. **Dayn** (HWS) was released by WSU as a possible replacement for **Klasic** (HWS) or **Snowcrest** (HWS). It has a good disease package but is susceptible to Hessian Fly. Dale Clark, product manager from Monsanto, observed that, “WestBred’s hard white spring variety, **Paloma**, is expected to replace **Idamax** because of its performance and better straw strength and stripe rust resistance.”

Growers attending the Small Grains Performance Trials this summer got a run down on the disease and agronomic issues facing wheat in 2013. They were introduced to new varieties and best management practices that can limit their risk to loss of yield. Watch for more new developments in wheat varieties as PNW breeders, public and private, continue to tackle grain production issues. Hope to see you at the field days next year! ■

Idaho Wheat Commission Hosts Kenyan Phytosanitary

KENYA may currently be a small market for the United States, but despite increased demand, there is a large phytosanitary barrier preventing U.S. soft white (SW) sales. Kenyan phytosanitary officials are concerned that flag smut from the Pacific Northwest could infect domestic supplies, so they require that wheat shipments are certified not to come from areas where the disease was historically reported. However, the prevalence and risk of flag smut in the United States is now so low — thanks to effective seed treatments — that there has not been field research or a disease specialist for flag smut since the last researcher retired in 2000.

To address this barrier, U.S. Wheat Associates (USW) collaborated with the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS), the Idaho Wheat Commission, the Washington Grain Commission, Washington State University and the University of Idaho collaborated to bring three members from APHIS’s Kenyan counterpart — the Kenyan Plant Health Inspectorate Service (KEPHIS) — to the Pacific Northwest June 22 to 29. The goal of the visit was to reassure Kenyan phytosanitary authorities that there is virtually no risk of flag smut affecting Kenyan wheat production as a result of wheat shipments from the Pacific Northwest.

The team met with university researchers and wheat breeders in Idaho and Washington in addition to visiting wheat farms and field plots. Meetings proved to be extremely effective in convincing the Kenyan officials that their prohibitively stringent phytosanitary measures were not scientifically

justified. **Following several years of discussions, this visit was instrumental in getting KEPHIS to agree to end their import prohibition and permit wheat to be imported by Kenya from the PNW** subject only to a few conditions. Most notably, they request that APHIS monitor surveillance for Flag smut (*Urocystis agropyri*) in Washington,



Members of the Kenyan Plant Health Inspectorate Service: (left to right) Dr. Abed Kagundu, Mr. Allan Mweke, Dr. Esther Kimani

Idaho and Oregon with the assistance of plant pathologists in those states.

While the Kenyan market for U.S. wheat has historically been small, wheat consumption has grown by an average of 10 percent annually since 2000. Domestic wheat production can satisfy just 25 percent of consumption and even a one-time 10 percent increase in U.S. wheat exports would be valued at \$1.4 million. Additionally, eliminating an unjustified phytosanitary barrier eliminates the risk to sales to other, potentially larger markets.

Did You Know...

- The capital of Kenya is Nairobi.
- Kenya is home to approximately 44 million people.
- The majority of the people in Kenya are Protestants.
- Kenya is roughly the same size of Texas at 362,040 square miles.
- Kenya was a British colony between 1895 and 1963.
- Most of the people in Kenya are either very rich or very poor.
- Kenya has only two seasons — one rainy season and one dry season.
- After coffee, Kenya’s biggest income generator is tourism.

- For the Kenyans, however, coffee is considered an export product, not something for local consumption. The local favorites are tea and beer.
- Demand for wheat and wheat-based products cannot be met by domestic production. Domestic production only meets a third of its national wheat requirements with imports filling two-thirds.
- Wheat stem rust (Ug99) and low yields due to farmers’ use of recycling/saved seeds, and high cost of farm inputs continue to limit wheat production in Kenya.
- Kenyan environmentalist Professor Maathai won the Nobel Peace Prize in 2004. She was the first African woman to do so.

Demand for U.S. Wheat is High as Chinese Millers Visit Idaho



Chinese trade team and wheat industry representatives at the BYU Idaho field plots.

STARTING 25 years ago, U.S. Wheat Associates (USW), the export market development organization representing wheat farmers in overseas markets, saw demand for high-quality flour growing in many developing nations. Such growth has been accelerating in the past several years and is particularly evident in the People's Republic of China.

With checkoff funding from U.S. wheat farmers and matching funds from USDA's Foreign Agricultural Service, USW and partner organizations like the Sino-American Baking School in Guangzhou have laid a foundation for growth by demonstrating the quality, reliability and value of U.S. wheat to Chinese millers, bakers, food processors and government officials.

"We showed that U.S. wheat has the variety and consistently superior baking performance the rapidly expanding Western-style food industry in China needs," said Matt Weimar, USW's regional vice president who directs U.S. wheat export promotion programs in China.

Even though China has been relatively self-sufficient in wheat production since the mid-1990s, imports of high quality U.S. wheat jumped in marketing year 2011/12 (June – May) when China imported more than 22 million bushels of U.S. hard red spring (HRS), soft white (SW), soft red winter (SRW) and hard red winter (HRW) — three times what it bought in 2010/11. Chinese imports increased to 29.4 million bushels in 2012/13.

As the last marketing year ended, the U.S. Department of Agriculture estimated that China held about one-third of the world's total wheat stocks and its harvest was underway. However, frost damage and harvest time rains reportedly hurt domestic crop

quality. At the same time, world wheat prices were significantly lower than last year, presenting an excellent buying opportunity. And China is certainly taking advantage. As of August 1, just four weeks into the new marketing year, China has purchased 131.5 million bushels of U.S. wheat or 28 percent of total U.S. commercial wheat sales so far this marketing year. While most of that wheat is soft red winter, China's strong demand is helping support prices for all U.S. wheat classes.

"China is clearly looking to the United States to help bolster its wheat supplies," Weimar said.

To help Chinese millers learn how to use the U.S. grain marketing system to gain more value out of our competitive pricing and high quality, a team of milling executives and purchasing managers sponsored by USW and, in part by the Idaho Wheat Commission, recently visited Idaho and several other states.

The six team members toured grain facilities, met with wheat researchers and talked directly with farmers on their farms in Idaho as well as in Oregon, Montana and North Dakota.

"They have indicated they see a huge potential moving forward of shipping more soft white out of the PNW," Idaho Wheat Commission executive director Blaine Jacobson told the Capital Press newspaper Aug. 7 during the trade team's visit to the Brigham Young University-Idaho wheat research plots.

Also during that visit, Ming Xi Wang, a trader who runs a mill and purchases wheat on behalf of the other millers as director of Laizhou Defeng Grains Industry Co., told Capital Press his organization has

already received two shipments of Northwest wheat this season. One was hard red spring wheat and the other was soft white wheat.

Wang said the trip has also given him a "face-to-face, in-depth knowledge" of the U.S. wheat industry, along with its exporting and logistics systems.

"In the future, I think when I purchase U.S. wheat I will pay more attention on buying different classes of different specifications," Wang was quoted as saying.

The ability to meet the unexpected high-volume demand from China mostly before the new wheat crop is available for shipment highlights the U.S. system's unique reliability. Being first to market is an advantage. Yet all wheat buyers know they can rely on the United States to meet their ever-changing needs because of the crop quality information and trade service provided by USW through checkoff funds from U.S. wheat farmers and matching funds from USDA's Foreign Agricultural Service as well as consistent production and quality and an efficient, transparent marketing system.

The opportunity to sell even more U.S. wheat in China is likely to grow. The affluence and busy urban lifestyles that increased demand for higher-quality wheat and flour are expanding outside major Chinese cities. There will be challenges, but USW will be there to give our partners and customers the technical know-how and personalized trade servicing needed to ensure that U.S. wheat remains China's first choice for imported wheat supplies.

Cookie/Cracker Line Installed at Wheat Marketing Center

EQUIPMENT specially designed to bake pilot-scale cookies and crackers finally arrived at the Wheat Marketing Center (WMC) in July. For over two-years the Wheat Marketing Center has been developing in-house protocols for crackers (biscuits) which are consumed around the world, including the U.S.

Now that the biscuit line has arrived, the WMC can begin taking the next step in working with foreign and domestic customers to develop crackers/biscuits utilizing U.S. wheat. WMC will use blends of Soft White, Hard White, Hard Red Winter, and Hard Red Spring wheats to come up with a combination of wheats that will be comparable or exceed

blends already being utilized and to develop new products for overseas customers.

The pilot-scale cookie/cracker equipment, the second one of its kind, was designed especially for the Wheat Marketing Center by U.S. Wheat Associates consultant Roy Chung. The new cookie/cracker line will allow Wheat Marketing Center's staff of professional scientists and consultants to develop an expertise in yet another major wheat-based food.

WMC will target biscuit /cracker markets in Asia and Latin America enabling U.S. wheat, and especially Soft White wheat, to better compete with other wheat producing countries in Asia and other markets worldwide. Soft White wheat characteristics of low protein and low

moisture make it ideal for cracker products. The new cookie/cracker equipment will allow professionals at WMC to help demonstrate the benefits of U.S. wheat over competing wheats.

Idaho wheat growers in conjunction with Montana, Oregon, Washington and North Dakota helped fund the new equipment which cost roughly \$350,000. Wheat Marketing Center staff has the equipment up and running and has already been used in two whole grain products short courses. Customers from Korea, Thailand, Guatemala, Brazil and Columbia as well as the United States have shown interest in the new equipment. The first biscuit (cracker/cookie) short course is scheduled for December.



2011-2012 Idaho Winter Wheat Variety Performance Tests and 2010-2012 Yield Summaries

By Juliet Marshall and Brad Brown (retired), Extension Specialists, Department of Plant, Soil and Entomological Sciences, Doug Finkelnburg, Extension Educator, Nez Perce County, University of Idaho

Variety Testing

Idaho winter wheat varieties are evaluated each year to provide performance information to help growers select superior varieties for their growing conditions. The tests are conducted using farmer fields or university experiment stations, 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 or 5 rows spaced 10" apart for 14' to 25' in length and replicated 3 or 4 times in a randomized complete block design.

Table 1. Dryland Winter Wheat Variety Performance in the Northern District near Lewiston, Genesee, Moscow, Bonners Ferry, Craigmont and Tensed, 2011-2012.

Variety or Selection	Seed Yield						Test Weight		
	Lewiston	Genesee	Moscow	B. Ferry	Craigmont	Tensed	Average	Average	Protein
	-----bu/acre-----						lb/bu		
Soft White Wheat									
AP-Badger	82	93	98	65	101	82	87	56.7	11.0
AP700CL	77	98	108	80	70	67	83	58.3	11.8
ARS-Amber	64	88	111	80	96	84	87	57.9	11.2
ARS-Chrysal*	82	80	75	88	107	90	87	57.8	10.9
ARS-Crecent*	75	88	121	67	107	104	94	57.3	10.5
Artdeco	89	97	105	72	96	79	90	57.8	10.7
Bitterroot	77	102	100	75	86	100	90	58.4	10.9
Botail	91	99	108	59	107	102	94	55.6	10.8
Brundage-96	67	93	117	70	85	85	86	57.7	11.5
Bruneau	72	101	92	73	84	97	87	57.3	10.9
Cara*	70	95	96	64	99	102	88	56.2	11.6
Chukar*	68	94	104	71	98	87	87	55.6	11.2
Kaseberg	77	95	121	60	96	90	90	57.0	10.8
Madsen	68	87	106	72	84	93	85	57.6	11.8
Mary	81	99	120	76	95	103	96	59.1	11.0
ORCF-102	83	86	116	68	91	97	90	58.5	11.5
Simon	75	81	98	63	78	74	78	55.9	11.7
Skiles	79	96	85	54	103	80	83	58.0	11.7
Stephens	64	93	99	55	63	68	74	57.5	11.6
SY-Ovation	79	89	104	58	100	86	86	59.2	11.3
UICF-Brundage	78	91	107	68	87	85	74	57.5	11.3
WB-1066CL	60	81	102	64	85	53	74	60.4	12.9
WB-1070CL	84	79	94	53	68	52	72	60.9	12.6
WB-456	68	80	89	65	82	89	79	60.5	12.6
WB-523	83	90	95	55	98	65	81	58.9	11.5
WB-528	84	101	116	75	78	68	87	59.8	11.6
WB-Junction	80	88	108	92	81	86	89	60.3	11.3
Trial Average	76	91	103	69	89	84	88	58.1	11.4
LSD (0.05)	9	16	20	12	10	21	7	0.8	--
Hard Winter Wheat									
Alligo	78	86	109	73	88	88	87	57.2	11.8
Azimit	77	93	92	58	80	80	80	56.3	12.1
Boundary	51	91	113	46	102	102	84	58.7	12.0
Eddy	75	93	104	67	93	93	88	62.9	12.3
Esperia	65	74	78	47	78	78	70	60.4	13.2
Genesis	67	88	109	60	86	86	83	58.9	12.5
Norwest-553	75	100	103	70	81	81	85	60.7	12.4
UI-Silver (W)	61	91	121	57	103	103	89	59.7	12.0
UI-SRG	57	83	114	78	95	95	87	60.6	12.4
UICF-Grace (W)	40	72	93	61	70	70	68	58.4	13.4
WB-Arrowhead	72	97	94	53	68	68	75	59.4	12.3
WB-Rimrock	51	89	117	61	100	100	86	60.2	11.8
Trial Average	64	89	104	60	87	87	82	59.5	12.3
LSD (0.05)	13	7	19	12	7	10	5	0.6	--

* Club Wheat
(W) = White

Agronomic performance data for winter wheat are summarized by state districts in Tables 1-5. Northern District results are presented in Table 1 and Western Idaho results are in Tables 2 and 3. Southern and Eastern Districts results are presented for irrigated trials in Table 4 and for dryland trials in Table 5.

Information Summarization

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 60 lbs/bu. Lodging ratings are the percent of a plot area lodged, and in some tables not reported due to minimal lodging. 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 2010, 2011, and 2012 are presented in Table 6 for all districts. These data represent results of 3-16 site/years and can be a good indication of long-term performance of a variety.

More detailed information is available on the UI cereals website <http://www.extension.uidaho.edu/cereals/>.

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 2012 trials; previous results can be found in the 1992 to 2012 issues of Idaho Grain

Table 2. Irrigated Soft White Winter Wheat Variety Performance at Parma, 2011-2012.

Entry	Yield		Protein %	Test Wt. lb/bu	Height in
	Early ²	Late			
	-----	bu/A -----			
Soft White					
AP 700 CL	114	-	-	-	-
AP Legion	131	109	7.8	59.0	41
Bitterroot	119	-	-	-	-
Bruneau	128	112	7.6	59.9	38
Cara	114	100	8.4	57.2	36
Goetze	102	100	8.0	58.7	36
ID0663	135	109	8.3	59.8	38
ID98-19010A	105	86	8.0	60.6	32
KW 902	112	-	-	-	-
KWhr7001	134	-	-	-	-
KW 7033	141	-	-	-	-
LWW-04-4009	140	108	8.3	59.8	38
Mary	109	102	7.9	60.8	36
ORCF102	103	102	7.8	60.1	34
Skiles	100	101	8.7	60.2	37
Stephens	95	127	8.7	61.3	35
Tubbs 06	119	102	8.7	59.3	37
WA8092	126	94	8.2	59.9	40
WB 456	116	109	8.6	59.6	39
WB 523	131	111	8.2	61.0	37
WB 528	120	118	9.2	62.2	36
WB 1070CL	115	112	8.8	60.4	37
WB Junction	114	124	8.2	60.9	37
YS 210	108	-	-	-	-
YS 215	138	-	-	-	-
YS 221	111	-	-	-	-
YS 261	107	-	-	-	-
2153A	129	-	-	-	-
Average	118	107	8.4	60.2	37
LSD ($\alpha = .05$)	22	20	0.8	0.6	1

² Early and Late planting dates were September 30 and November 9



Magazine. Average performance over locations and years more accurately indicates varieties' 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 it be 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 Magazine and on the University of Idaho Cereals website: <http://www.extension.uidaho.edu/cereals/>. Additional information is available on the University of Idaho catalog website: <http://www.cals.uidaho.edu/edcomm/catalog.asp>. Look for publications as pdf files under "Other Cereals Publications." In addition, publications are free through the University of Idaho Agriculture Publications (ph. 208-885-7982) or contact your county Extension Office. ■

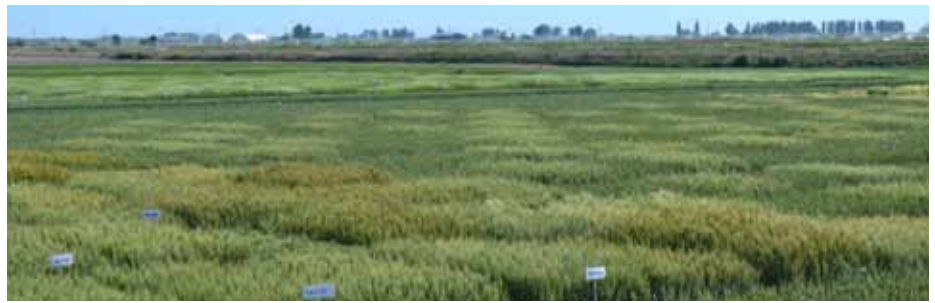


Table 4. Irrigated Winter Wheat Variety Performance in Eastern and Southern Districts at Kimberly, Rupert, Aberdeen, 2011-2012.

Variety	Kimberly	Rupert	Aberdeen	Average	Test Weight	Spring Stand	Heading Date	Height	Lodging	Protein
	----- bu/acre -----				lb/bu	(%)		(in)	%	(%)
Soft White Winter										
SY Ovation	187	134	147	156	60.1	100	5/30	35	3	9.0
Kaseberg	170	138	153	154	58.6	99	6/1	34	3	9.6
Mary	167	149	141	152	60.5	99	5/31	33	3	9.5
Bruneau	161	151	141	151	59.9	99	6/2	36	4	9.6
Agripro Legion	163	139	149	150	58.2	99	6/2	38	3	9.5
AP Badger	161	137	141	146	57.5	99	6/1	33	3	9.6
Agripro Salute	170	139	129	146	58.8	99	6/1	36	3	9.5
WB-1070CL	165	134	136	145	62.9	99	5/24	32	3	10.0
Bobtail	160	137	137	144	56.5	97	6/1	32	3	9.1
WB-Junction	167	129	137	144	61.2	98	5/27	34	3	8.7
Stephens	163	137	132	144	59.1	99	5/31	34	3	9.6
Brundage	162	143	126	143	61.0	91	5/26	33	3	9.3
UICF Brundage	159	126	142	142	58.9	99	6/1	32	6	9.4
UICF Lambert	149	134	143	142	58.8	100	5/31	38	3	9.7
Madsen	155	118	152	142	59.4	98	6/3	36	4	10.4
AP700 CL	155	129	141	142	58.9	99	6/2	38	3	9.8
Ladd	156	133	133	141	59.4	99	6/3	34	3	9.6
ORCF-102	158	129	135	140	59.9	98	6/2	38	3	9.4
AP Legacy	154	126	141	140	59.2	99	6/1	37	3	9.3
WB 528	151	136	131	140	59.9	99	6/1	33	3	9.6
Brundage 96	154	136	127	139	58.7	99	5/30	34	3	8.9
ORCF-101	151	126	135	137	59.9	99	6/1	35	3	9.8
Bitterroot	154	120	128	134	59.4	99	6/3	37	9	8.9
Coda*	134	124	141	133	60.4	99	6/5	39	29	10.6
Skiles	149	128	119	132	60.4	99	6/1	32	3	8.9
Cara*	126	118	141	129	57.4	99	6/6	36	3	10.0
WB 456	152	118	109	126	62.0	97	5/25	31	3	9.4
WB-1066CL	153	113	105	124	61.9	99	5/30	37	3	9.5
Average	158	132	135	142	59.8	98	5/31	34	4	9.5
LSD ($\alpha = .05$)	12	16	24	10	0.7	5.3	1.5	1.3	6.0	1.3
Hard Red and White (W) Winter										
Yellowstone	164	121	173	153	62.3	97	5/27	40	10	11.0
Keldin	172	129	153	152	62.6	97	5/27	34	0	11.2
Utah 100	164	129	157	150	60.5	100	5/31	40	4	11.6
Altigo	158	132	153	148	57.5	97	5/26	32	0	10.6
Judee	152	127	163	147	63.1	99	5/29	36	18	12.1
Deloris	157	113	169	146	62.4	97	5/31	42	32	11.5
Moreland	161	125	151	146	61.0	98	5/25	34	0	12.4
WB-Arrowhead	153	124	151	143	62.4	98	5/27	38	8	10.8
Norwest 553	154	118	156	143	61.3	94	5/29	32	0	11.5
Manning	151	107	164	141	61.3	97	5/27	36	43	11.9
Promontory	154	111	157	140	62.9	93	5/26	38	4	10.6
Garland	143	122	151	139	59.5	99	6/1	30	15	12.5
Eddy	151	113	150	138	63.2	98	5/28	35	2	11.3
Golden Spike (W)	136	124	153	138	60.4	98	5/31	38	44	11.8
Whetstone	162	119	132	138	62.2	98	5/24	34	0	12.6
AgriPro Paladin	148	113	151	137	62.2	90	5/29	35	0	12.1
Boundary	148	110	153	137	61.1	98	5/31	37	8	10.6
Greenville	152	118	134	135	60.0	94	5/27	31	0	11.4
Juniper	147	109	147	134	62.0	99	5/30	44	8	13.0
Azimit	140	110	146	132	56.4	95	5/26	30	0	11.0
AP503 CL2	156	106	124	129	63.6	96	5/25	33	0	11.8
Bonneville	128	100	144	124	61.5	100	6/2	42	21	13.8
Average	152	117	152	141	61.3	97	5/28	36	9	11.6
LSD ($\alpha = .05$)	14	19	20	10	0.8	6.1	1.3	2.8	13.5	1.0

Table 3. Irrigated Hard Red Winter Wheat Variety Performance at Parma, 2011-12.

Entry	Yield			Protein	Test Wt.	Height
	Early ²	Late	bu/A			
Variety	----	----	----	%	lb/bu	in
Altigo	135	103	8.2	57.2	33	
Azimit	121	104	8.3	57.3	32	
Esperia	97	-	-	-	-	
Genesis	109	-	-	-	-	
Hoff	104	90	8.8	62.3	39	
Moreland	122	108	9.0	61.4	36	
Norwest 553	118	91	8.8	60.3	33	
WBArrowhead	108	102	9.4	62.3	40	
WB Keldin	100	117	8.7	61.9	37	
Average	119	88	8.7	60.4	36	
LSD ($\alpha = .05$)	12	13	0.6	0.8	3	

² Early and Late planting dates were September 30 and November 9

*Club wheat



2011-2012 Idaho Winter Wheat Variety Performance Tests and 2010-2012 Yield Summaries

Table 5. Dryland Winter Variety Performance in Southern Idaho, 2012

	Rockland	Ririe	Average	Test Weight	Spring Stand	Heading Date	Height	Protein
	----- bu/acre -----			lb/bu	(%)	Julian	(in)	(%)
Soft White Winter Wheat								
AP700 CL	-	19.6	-	57.3	53	6/22	21	16.2
Bitterroot	-	25.4	-	59.7	54	6/22	20	14.8
Bobtail	-	19.2	-	55.1	39	6/22	19	13.1
Brundage	-	18.5	-	57.0	48	6/19	20	14.3
Brundage 96	-	22.1	-	55.4	66	6/21	18	15.5
Bruneau	-	25.8	-	57.9	49	6/22	20	13.4
Coda	-	25.8	-	60.1	54	6/23	18	15.1
Eltan	-	29.0	-	58.4	66	6/23	20	15.3
Kaseberg	-	15.6	-	53.9	25	6/22	17	14.1
Ladd	-	16.7	-	54.7	26	6/22	18	15.7
Madsen	-	21.4	-	58.1	54	6/23	19	16.3
Mary	-	19.6	-	57.6	28	6/21	20	15.1
ORCF-101	-	21.8	-	58.0	34	6/22	20	15.8
ORCF-102	-	24.7	-	58.5	38	6/22	21	15.1
Skiles	-	17.4	-	57.4	22	6/23	18	14.8
Stephens	-	20.0	-	56.3	55	6/22	23	17.4
UICF Brundage	-	24.3	-	56.0	56	6/21	20	15.2
UICF Lambert	-	21.4	-	56.9	40	6/22	18	15.1
WB 528	-	20.0	-	56.6	38	6/22	17	15.4
WB-1066CL	-	21.1	-	58.4	39	6/21	20	14.7
WB-1070CL	-	19.6	-	58.2	43	6/18	20	15.5
WB-Junction	-	24.3	-	57.9	65	6/18	20	14.5
Average	-	21.1	-	57.3	43	6/22	19	15.1
LSD ($\alpha = .05$)	-	6.2	-	1.9	28.7	1.3	3.1	-
Hard Winter Wheat								
Altigo	36	15	26	53.1	71	6/5	21	12.8
AP503 CL2	32	20	26	60.3	73	6/4	21	13.9
Azimit	21	15	18	53.4	68	6/6	17	14.1
Bearpaw	26	20	23	58.2	85	6/6	19	15.1
Bonneville	30	16	23	60.5	89	6/13	22	14.3
Curlew	32	17	24	59.7	78	6/8	24	16.2
Deloris	37	17	27	58.6	83	6/11	24	14.1
DW	22	19	21	58.6	89	6/8	21	13.3
Garland	28	13	21	56.5	75	6/10	18	15.4
Gary	30	18	24	58.7	74	6/10	23	14.1
Golden Spike	30	20	25	58.9	84	6/9	23	13.9
Greenville	28	20	24	57.5	84	6/6	19	13.5
Judee	30	20	25	59.5	87	6/6	20	14.9
Juniper	33	18	25	59.8	76	6/9	27	14.1
Keldin	38	21	30	58.1	83	6/6	20	14.8
Lucin-CL	36	19	27	59.7	79	6/7	25	14.0
Norwest 553	26	7	16	58.5	53	6/8	19	15.7
Promontory	20	20	20	58.2	88	6/7	20	15.1
UI Darwin	32	20	26	60.1	89	6/8	24	14.5
UI LHS (W)	26	17	21	57.7	87	6/12	22	13.3
UI Silver (W)	30	22	26	60.6	76	6/8	23	13.9
UI SRG	30	19	25	57.6	91	6/7	25	14.3
UICF Grace (W)	34	17	26	57.8	81	6/6	26	15.5
Utah 100	32	19	25	57.7	84	6/10	24	13.1
WB-Arrowhead	26	18	22	57.5	86	6/6	22	14.9
Weston	26	17	22	59.5	74	6/8	25	14.3
Yellowstone	35	24	29	59.3	85	6/6	21	15.0
Average	30	18	24	58.3	79	6/8	22	14.4
LSD ($\alpha = .05$)	8	6	7	1.7	14	2	3	



Table 6. 2010-2012 Winter Wheat Variety Average Yield Performance

Site/years	Northern District	Western District	Southern/Eastern District	
	Rainfed	Irrigated	Irrigated	Dryland
	16	6	9	3 Soft, 6 Hard
Variety	----- bu/A -----			
Soft White Winter				
AgriPro Legion	-	139	136	-
AgriPro Salute	-	-	138	-
AP Badger	96	-	136	-
AP Legacy	-	-	130	-
Bitterroot	101	-	132	21
Brundage	-	-	132	16
Brundage 96	94	-	131	19
Bruneau	102	135	139	20
Cara*	100	-	-	-
Chukar*	97	-	-	-
Coda*	-	-	121	23
Goetze	-	108	-	-
Madsen	99	-	131	17
ORCF-101	-	-	132	20
ORCF-102	98	110	132	21
Simon	94	-	-	-
Skiles	96	119	132	17
Stephens	-	125	130	19
Tubbs 06	-	111	-	-
UICF Brundage	96	-	131	21
UICF Lambert	-	-	134	18
WB 456	-	-	127	-
WB 528	100	-	134	18
WB-Junction	-	-	136	16
Average	98	121	132	19
LSD ($\alpha = .05$)	4	6	5	3
Hard Red and White (W) Winter				
AgriPro Paladin	-	-	119	-
Bonneville	-	-	113	26
Boundary	88	-	125	-
Curlew	-	-	-	27
Deloris	-	-	130	29
DW	-	-	-	25
Eddy	-	-	122	-
Esperia	78	-	-	-
Garland	-	-	122	24
Gary (W)	-	-	-	25
Golden Spike (W)	-	-	124	25
Hoff	-	106	-	-
Juniper	-	-	-	26
Manning	-	-	123	-
Moreland	-	121	128	-
Norwest 553	94	113	135	-
Promontory	-	-	127	21
UI Darwin (W)	-	-	-	24
UI LHS (W)	-	-	-	27
UI Silver (W)	-	-	-	25
UICF Grace (W)	-	-	-	26
UI-SRG	92	-	-	-
Utah 100	-	-	139	27
WB-Arrowhead	-	-	134	-
Whetstone	-	-	128	-
Weston	-	-	-	23
Yellowstone	-	-	136	29
Average	88	121	127	26
LSD ($\alpha = .05$)	4	6	6	3

*Club wheat
(W) = White





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