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Summer/Fall 2014

Take Your **PULSE**

MAGAZINE

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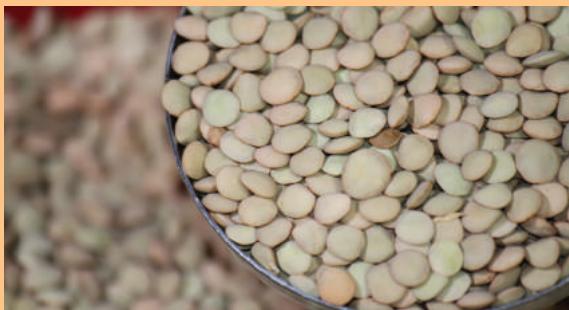
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welcome!

A Summer Wedding

Tim McGreevy, CEO

July 2014 was a special month on the McGreevy Farm. My son Mitchell married his beautiful bride Laura Zimmerman on July 5, 2014, in the middle of my Hard Red Winter wheat field. Mitchell and my daughter-in-law, who I love dearly, spent many hours scouting the perfect location for this life-changing event.



farmers in Palouse as mayweed/dog fennel.

After careful consideration, they chose a venue with the beautiful blue Moscow Mountain range as their backdrop. A stunning view. It also happened to be located in one of the few areas not thinned out by winterkill. Yep. It was the best wheat on the ranch. When I asked why they chose this location instead of a wind blown ridge top where mowing was not required, my daughter-in-law responded in a very excited voice.

"This location has the best daisies. They are so beautiful mixed in with the wheat."

I did not have the heart to tell her that I tried like @#\$% to kill those daisies better known by

My weed control failed miserably in the dog fennel department and it was the primary reason I did not invite any of my farmer friends (insert you) to the wedding. I know what you would have been thinking. You would have grimaced a little and said quietly to your wife,

"Ohh, McGreevy has a real dog fennel problem here. Feeling better about my fields, Martha, for sure. Glad I came to this wedding. Yeah...Feeling better about my farm now, for sure."

Despite my dog fennel problem, the wedding was an amazing event. I think farms should have a wedding every 10 years. We



The Wedding Party L-R:
Nika, Kadin, Maura, Laura,
Mitch

Contacts

Bride and Groom,
Laura and Mitch McGreevy.

were on a first name basis with the county dump workers. Our farm has not been this clean since our big red wooden barn burned to ground 30 years ago. We threw out everything in the barn to make way for an all night barn dance. What we didn't throw out we moved to the old hog shed. I can't find anything!

If you had a drone and flew over my farm this summer you would have wondered who put that "crop circle" on my farm. The day after July 23, 2014, you would have wondered why my wheat crop looked like a prizefighter that had just gone 15 rounds. Still standing but pretty beat up. We don't get much hail on the Palouse. The last hail adjustment (25%) I received was 8 years ago on a field of chickpeas. The July hail event produced silver dollar size hail and amazingly it only took out 30% of my wheat crop. My neighbor's pea and lentil fields were a 90% loss. Thank the Heavens my Mom paid the hail insurance premium. I also want to thank all those crop insurance adjusters especially my adjuster Wes Reihle from Spokane, WA. Crop adjusters have a tough job. They have nervous and upset farmers looking over their shoulders as they objectively try to determine a fair adjustment. My experience was very positive Wes and his sidekick Kelsey walked me through the whole

process and I believe their assessment was accurate.

This is a great issue of Take Your Pulse. There are so many exciting opportunities in the pulse industry. In this issue we explore drones in agriculture, training chefs to cook pulses, using pulses to encapsulate micronutrients and we introduce the new Avondale lentil and Hampton green pea from our breeding program and much, much more.

I hope this harvest was a safe one. I hope your yields and quality were above average. I hope your weed control was better than mine. I hope you have the experience of having a wedding on your farm someday. It's pretty special. Heck, our farm is so clean and trim right now I'm thinking of renting out our place as a wedding venue. Between the winterkill, hail and man made crop circles it might be more profitable than farming.

All the best!



Tim D. McGreevy, CEO/CWO
CWO- Chief Wedding Officer

CHIEF EXECUTIVE OFFICER

Tim McGreevy
mccreevy@pea-lentil.com

VICE PRESIDENT OF MARKETING

Pete Klaiber
klaiber@pea-lentil.com

VICE PRESIDENT OF RESEARCH & MEMBERSHIP SERVICES

Todd Scholz
scholz@pea-lentil.com

FOOD MARKETING MANAGER

Mackenzie Femreite
mfemreite@pea-lentil.com

OFFICE & AUDIT MANAGER

Brenda Udy
udy@pea-lentil.com

MEMBERSHIP SERVICES MANAGER

Kim Monk
kmonk@pea-lentil.com

COMMUNICATIONS MANAGER

Drex Rhoades
drhoades@pea-lentil.com

USA DRY PEA & LENTIL COUNCIL EXECUTIVE BOARD OFFICERS

JOE BLOMS, MONTANA
Chairman

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Secretary / Treasurer

CONTACT INFORMATION

USA Dry Pea and Lentil Council
2780 W. Pullman Road
Moscow, Idaho 83843

Phone (208) 882-3023
Fax (208) 882-6406

INDUSTRY WEBSITE
www.pea-lentil.com

CONSUMER WEBSITE
www.cookingwithpulses.com





ABOUT THE COVER
CIA Chef Lars Kronmark and Registered Dietitian Chef Brenda bond at the CIA workshop hosted by the USADPLC.



Domestic Marketing

The Pulse of Inspiration

Mackenzie Femreite, Food Marketing Manager

Growing chronic health concerns in the US have led the general public as well as government and private industry to take action to provide healthier food options.

According to the Center for Disease Control (CDC): **Obesity** affects 35.7% US adults and in 2012, one-third of adolescents and children were obese. Obesity has more than doubled in children and tripled in

adolescents in the past 30 years. **Diabetes** affects 8.3% of the US population, and is one of the most common chronic diseases in children and adolescents; about 151,000 people below the age of 20 years have diabetes. Health care providers are finding more and more children with type 2 diabetes, a disease usually diagnosed in adults aged 40 years or older. **Celiac's Disease** is expected to be 1-in-133 Americans. In 2010, national health care expenditures totaled \$2.6 trillion. If nothing is done to curtail the upward trend of obesity and diabetes prevalence in the US, the

cost associated with health care in the future could be even more astronomical.

The foodservice industry is now being faced with the task of developing healthy yet appealing menu items and retail products across all channels- consumers, soldiers, school aged children, etc. Pulses are food ingredients gaining recognition for their many health benefits and companies are interested in incorporating them as ingredients to help meet demand of their health conscious consumers. Yet there are few tools to support

inspiring chefs



the industry in adopting pulses and there is not a concrete understanding of what a 'pulse' is at this time.

Upper Left - Chef Lars, instructor for the CIA workshop.

Bottom Left - Chef Lj Klink prepping for one of two pulse cookoffs.

CHEFS IN TRAINING

Upper Right - Chickpea street tacos.

Bottom Right - Chef Lars evaluates some of the culinary delights created by the workshop participants.

In order to encourage, assist and educate the food industry to adopt pulse ingredients in their formulations, the USADPLC has been hosting product development courses at the Culinary Institute of America since 2009. Specific audiences in the food industry including product development specialists, nutritionists, and food marketing professionals are invited to attend. The course has two segments: One, the classroom portion. Participants learn information about how dry peas, lentils and chickpeas function as ingredients and enhance the nutritional value of foods. The course presents key technical information such as product formulations, process flows, the latest nutrition research

findings and marketing options for value added foods that utilize pulses as an ingredient. Two, the kitchen component. Participants get to practice different cooking and baking applications hands-on in the kitchen. Food Marketing Manager Mackenzie Femreite explains, "We want to give these companies the best possible experience with our products. Both segments of the course are instrumental for these companies to start adopting pulses."

It is important that the Council remains a supportive resource to the Food Industry and keep bringing together these influential decision makers to inspire new products and get healthier value added food on the shelves and menu's for consumers!



PULSE RESEARCH

DR. SHYAM SABLANI

Encapsulating Micronutrients

DR. SHYAM S. SABLANI, AN ASSOCIATE PROFESSOR OF FOOD ENGINEERING AT THE WASHINGTON STATE UNIVERSITY DEPARTMENT OF BIOLOGICAL SYSTEMS ENGINEERING, IS WORKING ON A WAY OF DELIVERING MICRONUTRIENTS INTO PREPARED FOODS AND BEVERAGES USING PEA-PROTEIN AS THE DELIVERY METHOD.

Introduction

Dry peas are grown commercially in the Northern Plains, comprised of Montana, North Dakota and South Dakota and the Palouse region of eastern Washington and north central Idaho. These two regions contribute a significant

portion of the U.S. production of dry peas. However, dry pea production is moving into Colorado, Nebraska and Oregon as well.

Nutrition

Both dry and fresh peas are primarily used as a human and animal food resource offering high concentrates of protein, fiber, vitamins and other nutrients for relatively low value.

The nutritional breakdown of a pea consists of 25-33% protein, 33-48% starch, 14-19% fiber, 1-4% lipids, and 3-4% ash. Through an extraction and purification process, pea protein can be concentrated from its base levels of 6% in fresh peas and 25% in dry peas to levels of up to 85%.



FIGURE 1

This high-value protein powder is easy to digest, has an excellent nutritional profile, and is also free of gluten, lactose and cholesterol.

Scientists at Washington State University (WSU) are developing a novel use of pea protein to stabilize and deliver micronutrients into foods and beverages. In its basic form, the dry pea protein is emulsified into a thin coating to apply over food products. This method of nutrient delivery is called "microencapsulation." (Figure 1)

Microencapsulation

Microencapsulation is widely used in food manufacturing to protect active food ingredients, including flavor compounds, vitamins, and other micronutrients from oxidation by forming a low-oxygen, permeable coating. This microencapsulated coating masks unpleasant tastes and creates a free-flowing powder to improve consumer acceptability and ease of handling. Carbohydrates such as starches, maltodextrins and corn syrup solids are often used as microencapsulating agents due to their desirable drying properties. However, carbohydrates usually have poor interfacial properties and must be chemically modified to improve their surface activity and effectiveness as encapsulating agents. Proteins have gained considerable attention in the food industry due to their excellent emulsifying, gel- and film-formation properties. Protein coatings are also easily degradable by digestive enzymes, making them useful in food applications for controlled-core release. Animal-derived proteins such as gelatin, whey, casein and ovalbumin are the most common coating materials for encapsulating flavors, vitamins and micronutrients. However, interest in plant-based alternatives is on the rise in the food industry, due to consumer fears of disease (e.g., those caused by prions), as well as moral, religious and cultural prohibitions against the use of animal products.

The Process

Spray-drying is the most commonly used process in the food industry due to its low cost and adaptability

to industrialization. The spray-drying process usually involves an initial emulsification step, in which the carbohydrate or/and protein wall material acts as a stabilizer for the core lipid. An emulsion comprising wall material in the aqueous phase and micronutrient is prepared using homogenizer and microfluidizer systems. The emulsion is then converted into a free-flowing powder through spray-drying. Initial studies conducted at WSU with funding from the USA Dry Pea and Lentil Council and the Bill and Melinda Gates Foundation show that pea protein isolate can be used to encapsulate fish oil containing docosahexaenoic acid (DHA).

Pea protein isolate of a 10% to 15% concentration with 20% fish oil (1 part fish oil: 5 parts pea protein isolate) forms an emulsion that is extremely stable. Spray-drying this emulsion produces a free-flowing powder, which can be used to fortify various foods and beverages, including breakfast cereals, bakery, dairy and fruit juices (Figure 2).

Summary

By targeting the use of pea protein as a high-value food ingredient, we can improve consumer health and increase the competitiveness of the US legume industry.

Better yet, as this new method of nutrient distribution is accepted in the food manufacturing industry, the adoption of the finished encapsulated product is expected to significantly increase the demand for dry peas, along with improving nutrition and consumer health.

MICROENCAPSULATION

Opposite Page - Dr. Sablani oversees work performed in his food research lab at Washington State University.

Above - Technical Assistant Poonam Bajaj emulsifies the pea protein.

Below - Just a sample of the products that can benefit from the pea protein enriched additive.



FIGURE 2

U.S.A. PULSE CROPS



Mackenzie Femreite & Kaye Effertz

Mackenzie Femreite (left) is the Food Marketing Manager for the USA Dry Pea and Lentil Council, responsible for the development of new markets for dry peas, lentils and chickpeas in the U.S., promoting new applications of legumes as ingredients and providing education to the U.S. food industry on these new uses across the country.

Kaye Effertz (right) is the Marketing Director for the Northern Pulse Growers Association which represents pulse producers from North Dakota and Montana. The mission of the Association is to promote dry peas, lentils and chickpeas through industry education, market development, research coordination and government affairs.

David McClellan

Based in Barcelona, Spain, USADPLC's Regional Representative David McClellan has represented USADPLC in Southern Europe, North Africa and the Middle East since 1989. In that time, he has been busy organizing and conducting trade shows, in-store promotions, web-based outreach and other promotional activities for the US dry pea, lentil and chickpea industry. David speaks English, Spanish, French and Italian, and has a comprehensive knowledge of the international legume industry, all of which make him a valuable asset in the Council booth at trade shows such as Alimentaria and Gulfood, where he has become a fixture.



Raul Caballero

After graduating from the Technical University in Mexico, Raul Caballero took a position in food purchasing with Sam's Club Mexico. With the coming of NAFTA, Raul saw an opportunity to use his knowledge of the food sector to serve organizations in the US food industry looking to expand in the Mexican market.

For the past fourteen years, Raul and his wife and business associate, Violeta Picazzo, have provided marketing services to USADPLC for the Latin America region through their company Mercalmentos Consultores (formerly Marketing Solutions Firm). They have played an important part in making the region one of our leading export markets.



Meet the pulse industry marketing reps

AROUND THE WORLD

Johanna Stobbs



EUROPE

Johanna Stobbs began working with the USADPLC in 1997. Today she is the international marketing representative for Northern Europe, Eastern Europe, Russia, Turkey and sub-Saharan Africa. Of all her marketing activities, she most enjoys conducting one-on-one meetings with dry legume professionals from all over the world. As a result, she knows importers, canners and packagers on a first-name basis in many markets, and has earned their trust. Regular travel to the many countries she covers gives her the opportunity to stay current on international market conditions, and to share this information with the USADPLC membership.

Lucy Dai

ASIA



Lucy Dai has been the lead person on the USADPLC account at Tractus Asia, Ltd in Shanghai for ten years. Lucy has worked diligently to expand the U.S. dry pea market in China over that time, and as a result, China has become the #2 market worldwide for US pea exports, with US yellow peas going into noodle-making, and green peas into fried snacks. In addition, China now has seven companies fractionating U.S. dry peas to produce protein, starch and fiber. Lucy is also reaching out to Chinese food companies to promote new applications for US pea flours and fractions in order to ensure our continued success in the China market.

INDIA



Shakun Dalal

In January 1986, a USADPLC trade team visiting India met Mrs. Shakun Dalal. The team members were very impressed, and later that year they convinced Shakun to become their marketing representative in South Asia. Since that time, she has been a tireless promoter of US peas, lentils and chickpeas. By forging strong connections with both India's pulse importers and US pulse suppliers, she has played an important role in making India our largest export market. And after twenty-eight years of service, Shakun is still enthusiastic about the opportunities for additional export growth in India and all of South Asia.

INDO
PACIFIC



Dee Richmond

Dee Richmond has been involved in international food market development activities and market research for more than 25 years, including service with the Foreign Agricultural Service in Washington, D.C. and Singapore. Dee and the Agrisource team have been leaders in our efforts to promote pulse flours and fractions in foreign markets. She has often gone above and beyond the call of duty for USADPLC, but never more so than when she bravely continued on a trip in Indonesia despite food poisoning, only to be forced to flee from her hotel room when the toilet overflowed. Despite that misadventure, Dee maintains a busy travel schedule in Southeast Asia on our behalf.



An introduction to the **AVONDALE** Lentil



After years of developing a new variety of green lentil, Dr. Rebecca McGee, a plant geneticist at the USDA-ARS legume research lab at Washington State University has completed the certification process for the lentil formally known as "LC01602300R." The newly branded "Avondale" lentil, named after a small ghost town in the northeast corner of Montana, a region well suited to grow this particular lentil, may soon be available to purchase through your local crop improvement channels.

AVONDALE WAS INITIALLY CONCEIVED FOR THE SOLE PURPOSE OF IMPROVING THE DISEASE RESISTANCE OF THE RICHLEA LENTIL. RICHLEA IS A MEDIUM GREEN LENTIL THAT PROVIDES HIGH YIELDS BUT IS SUSCEPTIBLE TO ASCOCHYTA BLIGHT.

Process

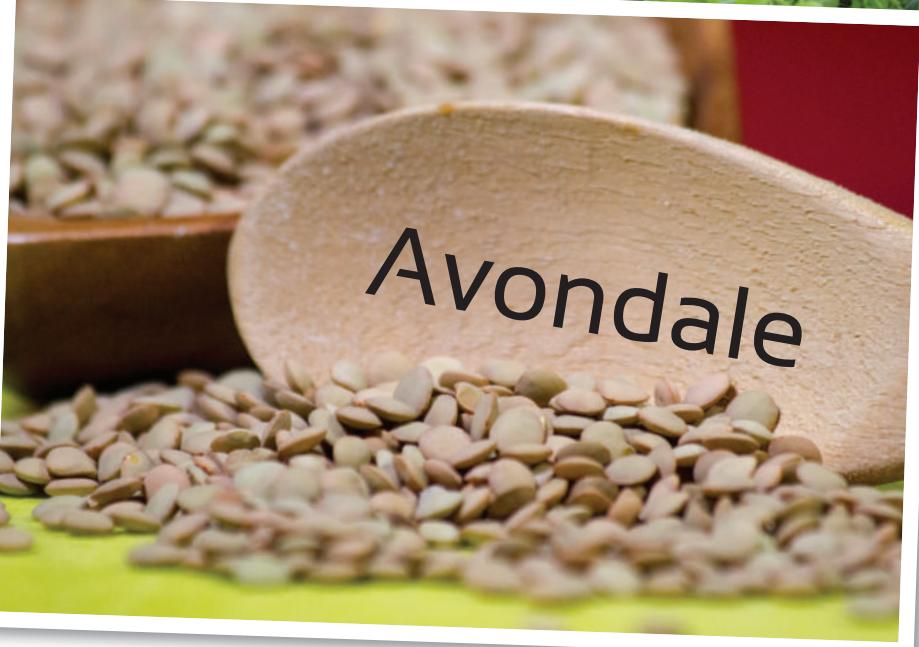
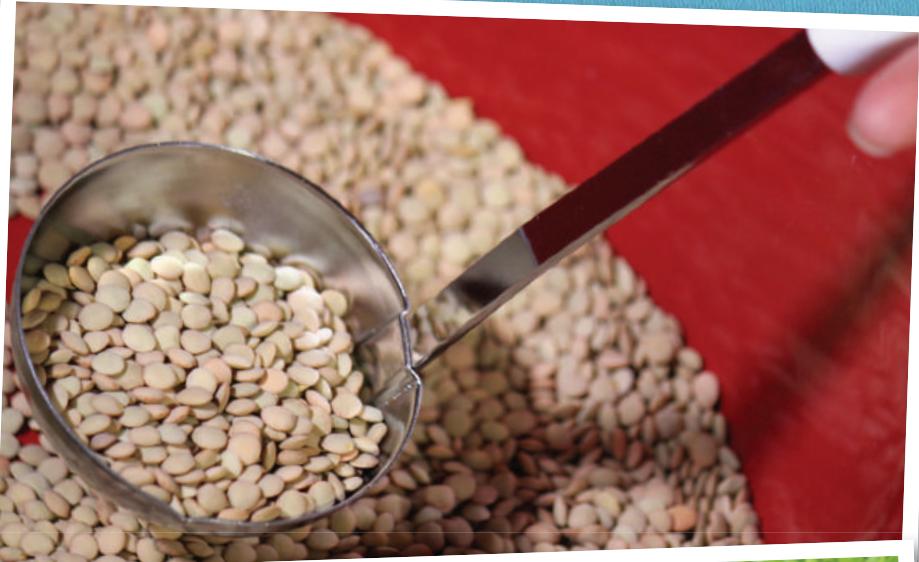
Avondale was developed using a modified bulk-pedigree system, in which the breeder made a cross to combine the attributes of Richlea with a second green lentil released by ICARDA (International Center for Agricultural Research in the Dry Area); a smaller lentil named PI 297754. The cross between these two parents was made in a greenhouse in 1998, and

Hampton Pea (PS05100736)

Hampton field pea is a smooth green pea released in 2014 with PVP Title V. It is a spring planted, semi-leafless variety that is resistant to Pea Enation Mosaic Virus and Bean Leaf Roll Virus, as well as Fusarium Wilt (Race 1) and Powdery Mildew.

On top of that, it sports good partial resistance to *Aphanomyces* Root Rot. Hampton is named after Richard O. Hampton, professor (emeritus) at Oregon State University. Dr. Hampton is a plant pathologist who worked on many viral diseases infecting legumes. Hampton has performed well in the Pacific Northwest, and is ranked high in selected Montana locations. Look for certified seed soon, as there should be 11,000 lbs of breeder seed available in February to make Foundation Seed for 2015.

The proposed license manager for the Hampton pea is the Washington State Crop Improvement Association (WSCIA).



subsequent generations were grown in the field from 1999 to 2000. Harvested seed from each generation was cleaned and sized using a floor-model clipper with screens sized to remove foreign material and inferior seed. During the winter of 2000-2001, single seeds from the previous generation were grown again in a greenhouse and seed from each plant was harvested separately and then grown in the field in Pullman, Washington in 2001. The best plot was chosen in the field

The Avondale Lentil

Specifications

- Height: 36cm; or 14 inches plus
- Maturity: 97 days
- Plant Height Index: 0.95
- Avg. Seeds/Pod: 2

Introduction

"Avondale" is a Medium Green (Richlea) market-class lentil with yellow cotyledons and a greenish seed coat.

Description

With a plant height index 0.95, it has excellent resistance to lodging (flattening).

The small ovate leaflets have an acuminate apex and obtuse base. The foliage is similar to other Richlea class lentils and it has white flowers. The mature pods are light tan, straight and have no constriction. The hundred seed weight is 5.64 g.

It consistently out-yields Merrit and Brewer by 10% and 14%, respectively. From 2005-2012, its average yield is 1237 lbs/acre compared to 1120 lbs/acre for Merrit and 1058 lbs/acre for Brewer.

It has high levels of partial resistance to Stemphylium blight (caused by *Stemphylium botryosum*).

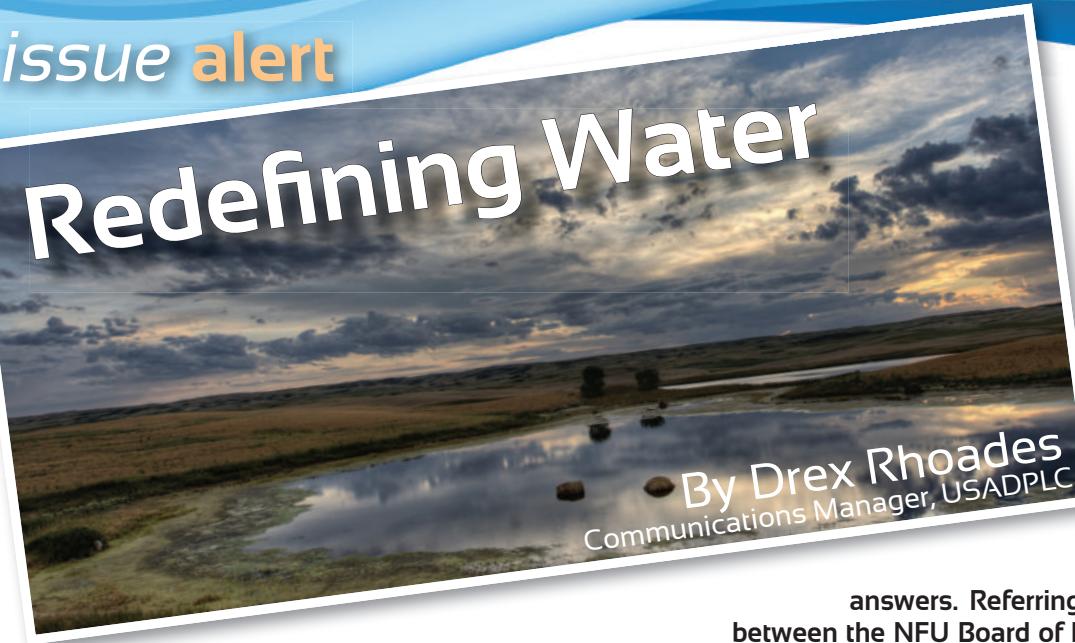
based on maturity, height, and lodging tolerance and was assigned selection number LC01602300R.

LC01602300R was grown in a non-replicated observation trial in 2002 at the Washington State University Spillman Research Farm. Between the years of 2003 and 2013 the breeding line was evaluated in replicated yield trials in both Washington and Idaho to evaluate performance, yield and disease resistance. The breeding line was also grown in yield trials in Montana from 2008-2013 and in North Dakota from 2006-2012 (excluding 2007). LC01602300R performed well in all locations and was particularly suited for the Northern Tier, yielding well and standing strong.

Status

Breeder seed was made in 2011, increased by the Washington State Crop Improvement Association (WSCIA) at the WSU Irrigated Research Station in 2012; and at the USDA Plant Materials Farm in Pullman in 2013 and sent to New Zealand for a counter-season increase in 2013-2014. There is an estimated 6,000 lbs. of breeder seed available from the New Zealand increase. Foundation and registered seed is currently being made in Washington and Montana, and a PVP application (Title V) has been submitted.

Redefining Water



By Drex Rhoades
Communications Manager, USADPLC

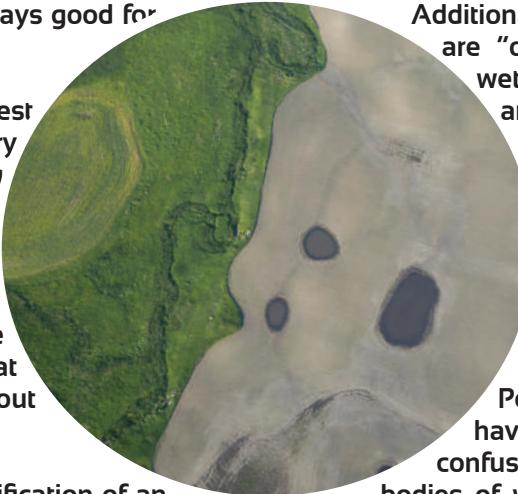
The Environmental Protection Agency is redefining the definition of "Waters of the United States" and some think it could make your land unusable for farming.

The EPA is working hard to change public opinion about its new proposed changes to the Clean Water Act (CWA), specifically the newly expanded parameters of what makes up a body of water in the U.S. In an 88-page document submitted for public comment in April of 2014, the proposed rule was touted as clarifying the definition of water, as it relates to the CWA. This promises to be a tough sell for farmers, since an EPA change is not always good for agriculture.

"We know that we haven't had the best relationship with the agriculture industry in the past," says Nancy Stoner, Acting Assistant Administrator for Water, but we are committed to listening to farmers and ranchers and ... our proposed rule takes their feedback into account." Stoner tweeted recently that the proposed rule will exempt farm ponds and ditches that are constructed through dry lands without year round water.

Who wouldn't welcome additional clarification of an already murky definition? The National Farmers Union (NFU) jumped on board; calling the act "ag friendly," and noting the rule "clarifies Clean Water Act jurisdiction, maintains agricultural exemptions and adds new exemptions, and encourages enrollment in USDA conservation programs."

Detractors of the rule, such as the American Farm Bureau Federation (AFBF) warn that under the proposed rule "almost any low spot where rainwater collects could be regulated." In a response to a blog entry written by Stoner, the AFBF takes issue with the EPA's definitions of "tributaries" and "adjacent," claiming these definitions "make it impossible for a typical farmer to know whether the specific ditches or low areas at his or her farm will be 'waters of the U.S.', but the language is certainly broad enough to give agency field



staff plenty of room to find that they are!"

Now, initial supporters of the proposed rule appear to be scratching their collective heads as well. In a letter to EPA Administrator Gina McCarthy, the NFU appears to be finding the new rule to create more questions than answers. Referring to a phone conference held between the NFU Board of Directors and McCarthy, the letter claims, "The general sense was that the proposed rule has created less clarity, not more as intended."

Indeed, goodwill statements made by Stoner and McCarthy are hard to take at face value when compared to the Congressional Research Service (CRS) summary report issued to members of Congress in May that stated "Proposed changes would increase the asserted scope of CWA jurisdiction and also by application of definitions, which would give larger regulatory context to some types of waters, such as tributaries."

Additional categories listed for regulation are "other" waters, including seasonal wetlands (dry most of the year), among other miscellaneous waters that are adjacent to jurisdictional waters. What constitutes any of these "other" waters is left to the interpretation of EPA representatives according to the new rule.

EPA's deputy administrator, Bob Perciasepe admits the agency may have inadvertently "created bona fide confusion" in attempting to define what bodies of water fall within the scope of the CWA. Perciasepe, who spoke with the National Corn Growers Association this July concedes that the agency may have "messed up" in developing the interpretive rule.

Congress apparently agrees. More than 260 representatives and senators oppose this new definition, and there is a bill being introduced that aims to block EPA from issuing the rule.

Public comment on the rule has been extended to October 20, 2014, so it is time to contact your congressman or senator if you wish to weigh in on this new EPA definition. The USADPLC will continue to follow this controversial issue.

Certified Seed and PVP, Title V

What the Heck!?

By Todd Scholz

"What do you mean, I can't purchase or sell a certain pulse crop variety except as a class of Certified Seed?" "Isn't Certified Seed just a way for the Crop Improvement Association to make money?" "Royalties?" Didn't I already pay for this variety once?"

The newly licensed varieties of lentils, dry peas and chickpeas developed by the USDA-ARS Grain Legume Research Unit in Pullman are raising a lot of questions with growers and seed dealers alike.

Over ten years ago, the USADPLC boards directed the industry to establish a license program for USDA-ARS developed pulse crop varieties that would give first access to US producers, protect the genetics of the variety, give fair access to US seed dealers, and return value to the breeding programs.

A variety proposed for release by the breeder is evaluated by the Variety Release Committee and can be recommended for release as germplasm, as a public variety or as a variety with Plant Variety Protection (PVP). A second committee, without the scientists, recommends the variety for PVP, for PVP Title V (as a class of certified seed), or as a public release (no license). If recommended for PVP, this committee recommends an agent as the licensee for the variety tasked to administer the sub-licensing of the variety. (All of these committee actions are recommendations to the owner of the varieties—USDA-ARS.)

The WSCIA has agreed to serve as the industry licensing agent, submitting the PVP license application, allocating seed to license holders using WSCIA standard operating procedures,

FOUNDATION SEED

is the progeny of Breeder or Foundation Seed Stocks produced under control of the originator or sponsoring plant breeding institution, or person, or designee thereof. As applied to certified seed, Foundation seed is a class of certified seed, which is produced under procedure established by the certifying agency for the purpose of maintaining genetic purity and identity.

REGISTERED SEED

is the progeny of Breeder or Foundation seed handled according to procedures prescribed by the certifying agency so as to maintain satisfactory genetic purity and identity.

managing the licenses and tracking the seed to insure integrity in the program. In addition, the WSCIA administers the royalties charged for each variety. Royalties are allocated to WSCIA for administration of program, including the cost of the PVP registration—15%, USDA-ARS as owner of variety—10%, and the remainder is put in a research fund for use by the USDA-ARS Grain Legume Research Unit for the breeding program.

This system is returning funding to the research program to provide additional varieties with improved traits. In addition, the Title V requirements insure genetically pure seed certified by an outside inspector—State Crop Improvement. The Crop Improvement tag guarantees that the seed is weed and pest free and that the seed producer has met prescribed standards.

Seed is the most basic input for pulse crops. Usually, it is the least expensive input but it provides the



CERTIFIED SEED

is the progeny of Breeder, Foundation, or Registered seed so handled as to maintain satisfactory genetic purity and identity and which has been approved by the certifying agency.

greatest impact on the outcome of the crop. Howard G. Buffet, philanthropist and the son of Warren Buffet, reinforces the urgency of starting each season with quality seeds when speaking of the ability to feed the world. "Each of us has about 40 chances to accomplish our goals in life. I learned this first through agriculture, because all farmers can expect to have about 40 growing seasons, giving them just 40 chances to improve on every harvest." Seeds begin each of those 40 chances and quality seed will improve the outcome.

Todd Scholz is the Vice President of Research and Membership Services for the USA Dry Pea and Lentil Council.

new technology



By Drex Rhoades

ATTACK OF THE

DRONES!



Photos: (above) Robert Blair with his first fixed wing UAV. May, 2013. Photos courtesy of Rhonda Blair. (below) A generic UAV drone. (right) Youngest son, Logan Blair with a new six prop drone used on Three Canyon Farms.

It sounds like the title of a future Star Wars sequel, but drone technology isn't just a high tech fantasy. The technology is here, now, and a lot closer to your farm than you might guess.

Drone technology could revolutionize the agricultural industry, boosting crop health, reducing costs and increasing yields.

Robert Blair is a dry land farmer in Kendrick, Idaho, who grows a diverse group of crops, including pulses on his family's 1500 acre Three Canyon Farms. He is a pioneer of sorts, using an emerging technology to become a better farmer. While high tech gadgets are nothing new to agriculture, Blair is pushing the envelope. He is part of a growing movement to use military aviation technology, equipped with robotics and advanced sensors to grow better crops assisted from the air.

In fact, Blair is the first farmer in the United States to own and use an Unmanned Air Vehicle (UAV) on his farming operation. Blair uses his fixed wing UAV to capture video and still photos that help monitor his crops, which include rotations of peas, chickpeas and lentils, for early signs of disease and to get real-time data on yields.

"Instead of scouting a field the normal way, walking through or driving a four-wheeler, now we're seeing the whole field and we're being proactive," Blair stated.

"A farmer knows his fields because they've been farming them for years. If you could just see a picture, you can gather a lot of information."

Although Blair also uses a helicopter drone for smaller fields, most of the field work is done using a rigid foam drone plane flying a grid-pattern above his 1500 acres, gathering field data to input into computers with

specialized software to analyze the information. "A UAV can cover that distance in a half-hour and it covers every square inch. If you covered that same distance, walking or driving, it would take you hours," Blair stated.

UAV technology is relatively new to U.S. agriculture, but the potential is vast and the technology proven. Japan has successfully utilized unmanned aviation technology for the last 15 years, primarily to precision spray pesticides and fertilizers. Agriculture is considered by many to be the perfect commercial fit for drone technology because farms are usually far enough away from areas where flight safety are areas of concern.

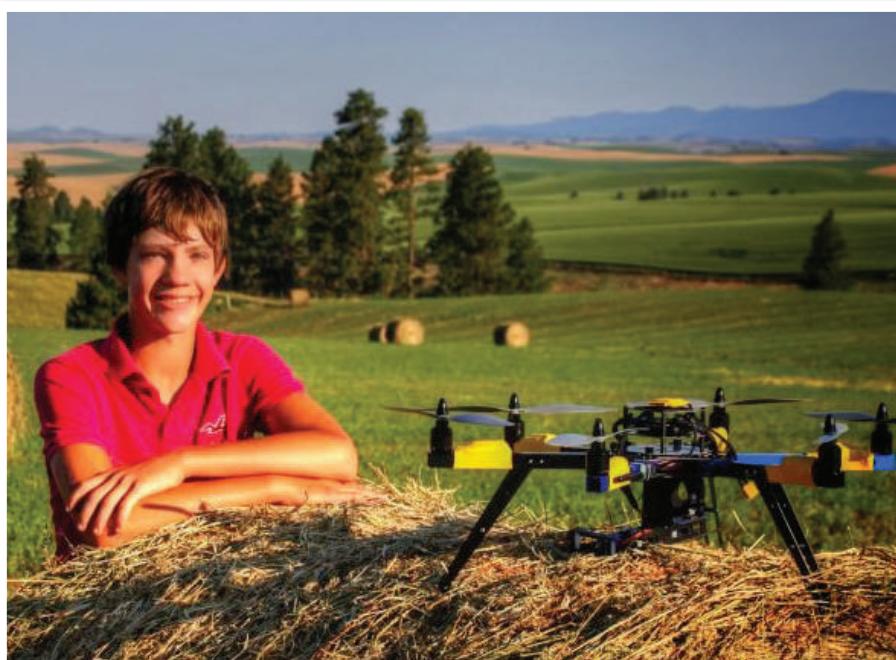
Now, many U.S. startup companies are on the rise touting the latest and greatest in UAV technology. However, many would-be contenders in the projected \$3 billion agricultural UAV market are in a holding pattern, waiting for the Federal Aviation Administration (FAA) to finalize its regulations for commercial drone use.

That isn't stopping Blair from legally using his drones, nor does it faze Washington State University researchers using UAVs to advance crop-monitoring science. "When the airspace opens, that's not the time to start research," claims Sindhuja Sankaran, a WSU assistant professor using optical sensors and infrared technology on UAVs to monitor different crops.

Currently, only non-commercial users of the technology like these researchers are given the go-ahead by the FAA, but are required to apply for a certificate of authorization. The FAA doesn't yet regulate farmers who want to use drones to fly over their crops, but the activity has to fall under recreational rules for model aircraft flying.

"Our elected officials need to understand the good that UAV's can do for our industry," Blair stated. "Our government wants us to be better stewards and wants us to better manage our resources. This technology can help, but is being hindered by the lack of response by Congress and especially by the FAA."

As exciting as such an emerging technology is for pulse farmers, it is not hard to imagine how flying a drone over the family farm can appeal to the next generation. Blair's oldest son, Dillon, is excited by the potential of the technology. "I think it's pretty exciting, for sure," Dillon said. "To think a simple remote control plane like this can help with the productivity of so many different crops is just amazing."





2780 W. Pullman Road - Moscow, ID 83843
Email: pulse@pea-lentil.com - Ph: 208-882-3023



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