



Take Your **PULSE** MAGAZINE

DRY PEAS • LENTILS • CHICKPEAS • BEANS

**GAME OF CROPS;
THE FARMER'S
PULSE DIET;
RESEARCHERS OF
THE FUTURE, AND
MORE!**



and
WHAT'S THE DEAL WITH
SPROUTS?
A SPROUT IMMERSION EXPERIENCE

THE BEST OF TIMES THE WORST OF TIMES

Tim McGreevy,
CEO



Life and farming is a journey of highs and lows. Good prices and bad prices. Good rains and good yields. No rain and devastating droughts. Joy and depression. 2018 is shaping up to be one of those years that will go down as the best of times and the worst of times.

The spring began with one of the most incredible experiences of my life. In early March, my son and his bride invited my wife and I to attend the labor and birth of our first grandchild. Witnessing the painful miracle of childbirth left me teary with gratitude and speechless. (I know the speechless part is probably hard to believe).

The birth of my Granddaughter was followed in late March with Congress passing the FY 2018 Omnibus Appropriation bill. The FY 2018 legislation contained a \$2.0 million appropriation for the Pulse Crop Health Initiative (PCHI) for the first time.

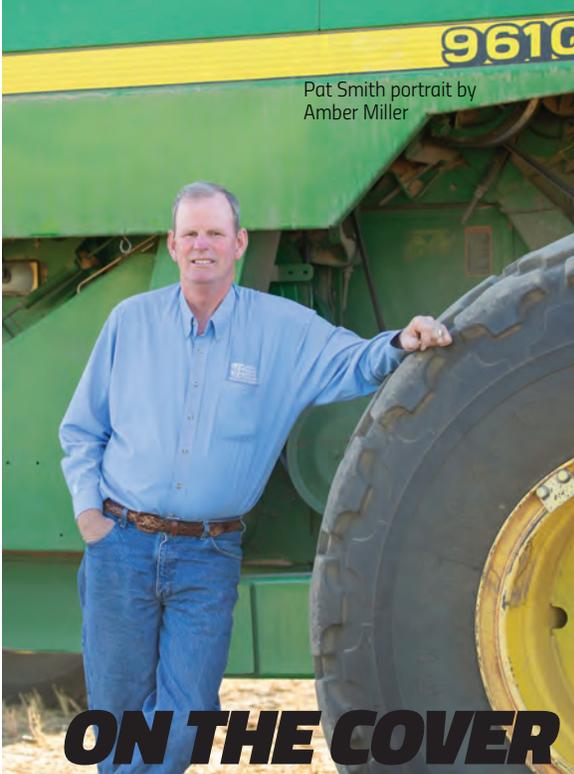


In 2010 the American Pulse Association (APA) was created to unite the members of the pea, lentil and chickpea industry with members of the dry bean industry to achieve common goals. The very first goal of this new APA coalition was to increase research funding for all pulse crops.

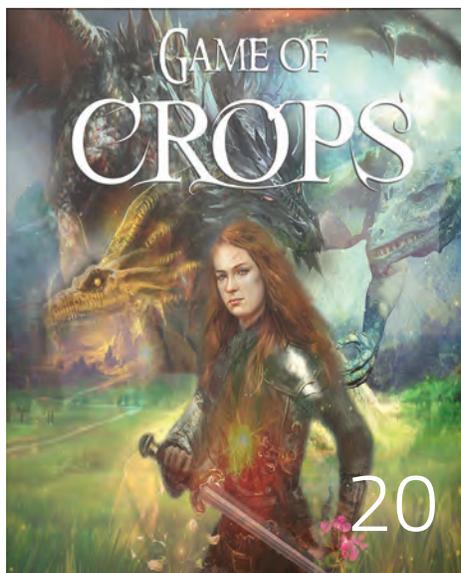
In 2014 the APA and the USA Dry Pea and Lentil Council (USADPLC) worked successfully to include legislative language in the 2014 Farm Bill establishing the Pulse Crop Health Initiative as a research priority. Congress authorized up to \$25 million dollars per year for the PCHI. Getting the PCHI into the 2014 Farm Bill was a difficult task that took our organizations three years to achieve. As it turned out getting the language into the farm bill was only the beginning. The APA and USADPLC spent the next four years relentlessly asking Congress to appropriate funding to the PCHI. On March 26, 2018, The House and Senate approved \$2.0 million of funding for the PCHI. The entire pulse industry owes a debt of gratitude to the chairman of the Senate Agriculture Appropriations Committee, Senator John Hoeven (R-ND) who guided the funding for the PCHI through the entire appropriation process. Many thanks to every pulse industry Senator and Representative on both sides of aisle who supported the funding of the PCHI.

The funding we received for the PCHI in FY 2018 is just the beginning. The Senate Ag Appropriation bill has included a \$3.0 million appropriation for the PCHI in FY 2019. This new research funding will allow our industry to tackle some big research projects

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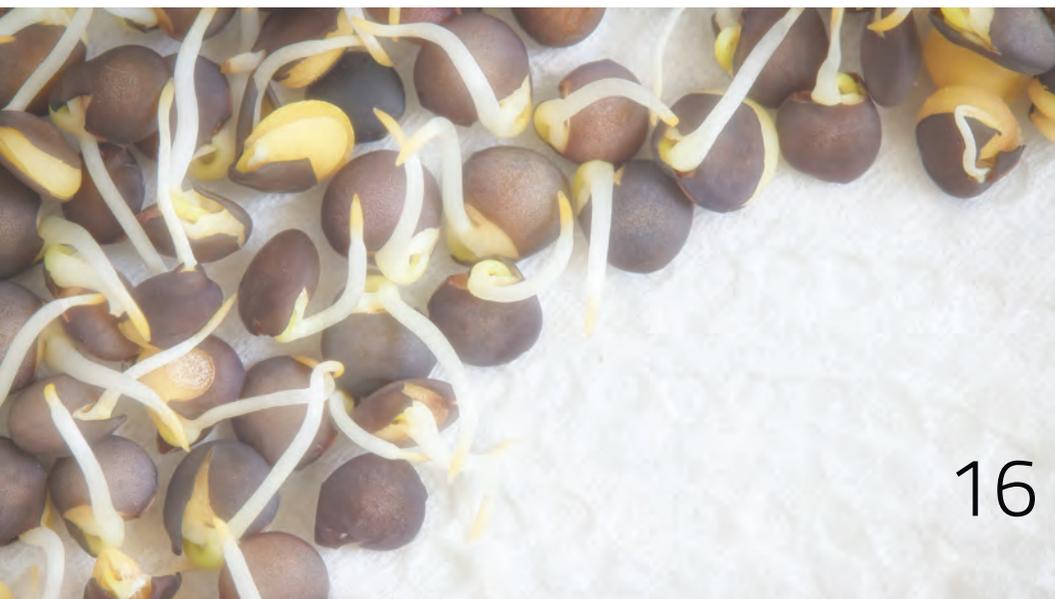
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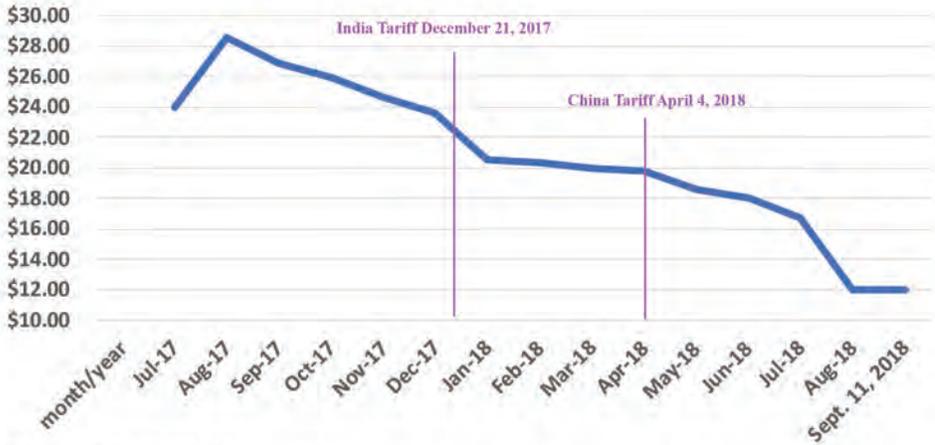


DRY PEAS, BEANS, LENTILS & CHICKPEAS
THE FUTURE OF FOOD

Industry Website
www.usapulses.org



AVERAGE PRICE FOR U.S. LENTILS JULY 2017 - SEPTEMBER 2018 ND, MT RICHLEA LENTILS



Prices reported on a cwt basis
Source: Bean Market News

that will help both our marketing efforts and the productivity of pulse crops for years to come. Be sure to check out the story in this issue of how we plan to spend the PCHI funding to grow the pulse crop industry in the United States. It is the dawn of a new era for pulse crop research in the United States and it was made possible by the entire pulse industry working together to accomplish this big goal.

Those were the best of times. Now for the worst of times.

The challenges for the pulse industry began at the very end of 2017 when the Government of India imposed tariffs on all pulse crops. India is our largest export market for dry peas importing a little over 30 percent (150,000 to 240,000 MT) of our dry pea exports over the past five years. India is also our largest lentil market taking between 60,000 to 120,000 MT of lentils each year which represents roughly 23% of our total lentil exports.

In April 2018 President Trump followed through on his threat to impose a tariff on steel and aluminum. China immediately responded with a 25% tariff on a number of agricultural products, including U.S.

pulse crops. The European Union followed suit by placing a 25% tariff on U.S. dry beans. The EU has not placed a tariff on dry peas, lentils and chickpeas at the time of this writing. However, if negotiations fail between the U.S. and the EU, all pulse crops could face a 25% tariff to the EU. The EU is one of our top three markets for lentils and chickpeas. Spain is our second largest lentil market behind India. In addition, India placed an additional 10% tariff on U.S. pulse crops that went into effect Nov. 2 in response to the steel and aluminum tariffs.

The NAFTA re-negotiation has recently concluded, which is a positive sign. Mexico is the No. 1 market for dry beans and a top five market for U.S. dry peas and lentils. Unfortunately, the new agreement is a little late as the uncertainty of the negotiations encouraged our customers to look for alternative suppliers.

One of the first actions President Trump did when he became president was to pull out of the Trans Pacific Partnership (TPP). Since that time the 11 remaining countries in the TPP have concluded their negotiations and are in the process of getting it ratified in each

country. When the TPP is ratified U.S. pulse crops will face higher tariffs than our competitors in key Asian markets. The Trump Administration is working on bilateral agreements but they take time to complete.

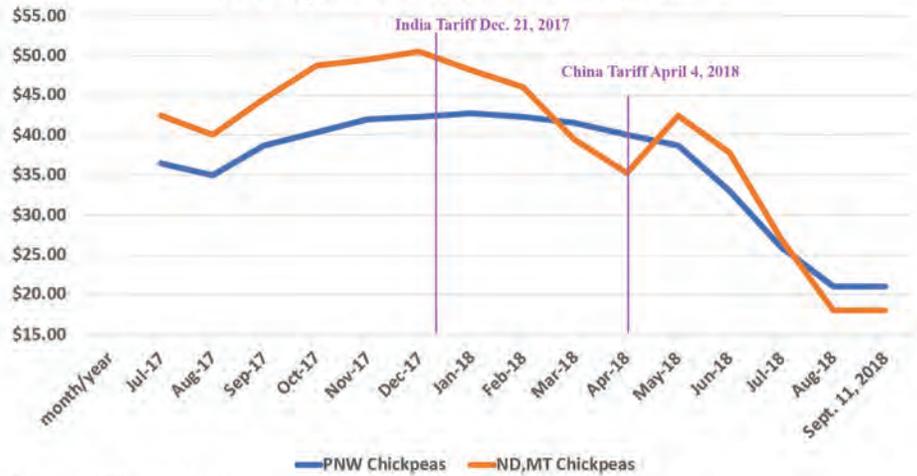
2018 is on track to become the second largest production year for peas, lentils and chickpeas in our history. When you have a big crop year every market is important. Unfortunately, as producers finish the 2018 harvest, it is unlikely that the trade disputes will be settled. Pulse markets have responded to all the uncertainty by dropping like a stone since the steel and aluminum tariffs were imposed in April 2018. Dry pea prices have dropped 30%, Lentil prices 40% and Chickpea prices 49% of their value since the U.S. Steel and Aluminum tariffs were announced. Pulse farmers haven't seen prices this low since early 2003 for chickpeas and 2006 for peas and lentils. Many farmers have asked me how low can prices go. I tell them the USDA Marketing Loan Rate which is \$5.40/cwt. For dry peas, \$11.28/cwt. for lentils, \$7.43/cwt. for small chickpeas and \$11.28/cwt. for large chickpeas. If prices go this low, the government will own a lot of pulses.



2018 is shaping up to be the most challenging marketing year for pulse crops since the late 90's and early 2000's. Prior to 2002 pulse growers did not have a safety net in periods of low prices. Fortunately the USADPLC successfully included dry peas, lentils and chickpeas in the farm program safety net. If prices remain at current levels during this marketing year it should trigger significant PLC and ARC payments for peas, lentils and chickpeas.

2018 could be the year that USDA/RMA Pulse Revenue insurance that was authored by the USADPLC really pays off for pulse producers because the projected price announced in March 2018 is looking to be significantly higher than the harvest price. The Trump administration has recognized the market collapse farmers are facing as a result of the trade war. In July President Trump announced a \$12 billion relief package to farmers suffering from the tariffs imposed by our trading partners. The USADPLC has submitted a request asking the USDA to purchase over 500 million dollars of pulse crops this marketing year to mitigate the damages from the

AVERAGE PRICE FOR U.S. CHICKPEAS JULY 2017 - SEPTEMBER 2018



Prices reported on a cwt basis
Source: Bean Market News

tariffs.

It remains my hope that the Trump administration will resolve these trade wars with other countries quickly and in our favor. Until these trade disputes are resolved it appears that export marketing efforts are in for some rough waters for quite some time.

The silver lining in all these dark clouds remains the growth in our domestic

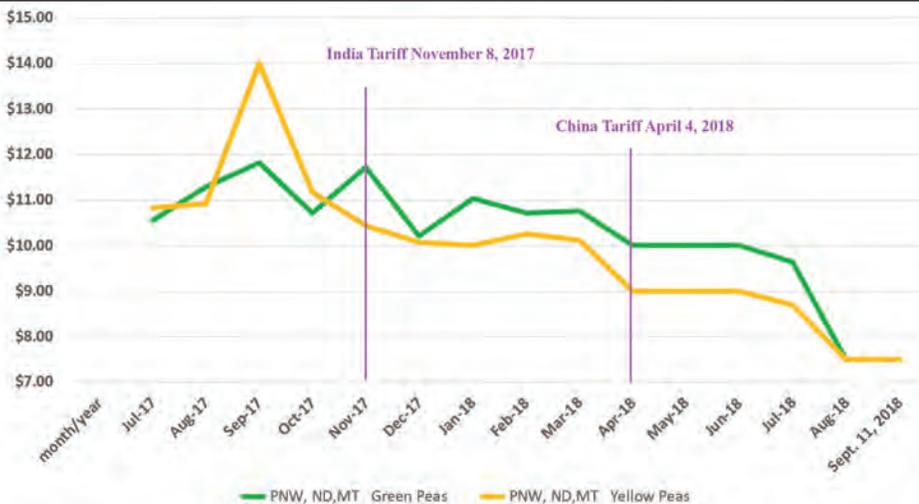
markets. Our domestic marketing efforts continue to expand consumption here at home. New pulse product innovation continue at a torrid pace. The plant-based food movement continues to grow. Starbucks just announced a protein coffee line that includes pea protein.

The long-term future remains bright for pulse crops. We will eventually work through these trade disputes. But it will take time. There have been many times in the past few months where I found myself screaming at the walls in my office. Then I go home and visit my granddaughter Finnley Marie McGreevy who was born March 6, 2018. Life is always good when you are a Grandpa.

All the best!

CEO, Tim McGreevy

AVERAGE PRICE FOR U.S. DRY PEAS JULY 2017 - SEPTEMBER 2018 ND, MT YELLOW & GREEN PEAS



Prices reported on a cwt basis
Source: Bean Market News



The original PCHI Strategy Group

PULSE CROP HEALTH INITIATIVE FUNDED

by Todd Scholtz, VP of Research & Membership Services

This year, after more than eight years of work, the American Pulse Association (APA) and the USA Dry Pea & Lentil

Council (USADPLC) were able to clink the glasses of champagne and celebrate. Congress agreed to provide \$2 Million in funding to support the Pulse Crop Health Initiative (PCHI). In addition, the budget agreement adds \$1 Million in FY 2019 for a total of \$3 Million.

The PCHI, called the Pulse Health Initiative (PHI) in 2010, began as an idea to gain funding for research about pulse crops focused on Nutrition, Functionality, and Sustainability/ Productivity. A meeting of scientists from all over the nation developed a scientific plan listing the current state of research, describing the critical needs

and developing a road map for how funding for the PHI would be allocated.

At the same time, the US Dry Bean Council (USDBC) and the USADPLC joined together to form the APA to better tell the story of pulses and the need for the research described in the PHI. In 2014, the APA scored a major success by gaining an authorization for the Pulse Crops Health Initiative (PCHI) at \$25 Million per year for five years in the 2014 Farm Bill. This allowed funding up to \$125 Million for Pulse Crop Research over five years!

The Industry was soon to learn what the difference between authorization and appropriation meant as it has taken 4 years for the Congress to approve \$2 Million in 2018 and \$3 Million in

2019. It was a long fight but the hard work and determined efforts of the many industry teams visiting Washington, DC and the letters and cards provided by our membership finally paid off. The addition of the PCHI funding has effectively tripled our Research budget for the industry! More importantly, the funding has allowed the research effort to focus a significant effort on research into health and nutrition of pulses, complementing the research already conducted to improve varieties and explore crop management strategies.

This year the PCHI evaluation process considered 39 proposals requesting over \$2.6 Million in funding. The program, administered by the USDA-ARS with the help of the APA/USADPLC Industry Research Committee, awarded \$1.6 Million to 13 proposals to be conducted over the next one to two years.

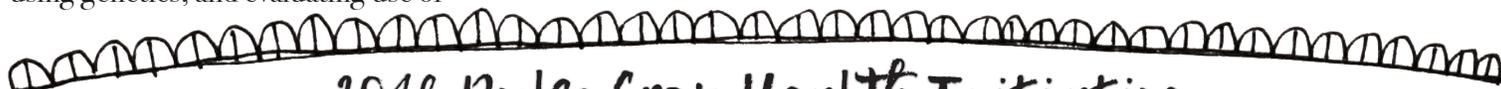
The funded proposals evaluate a wide range of objectives in all three areas of the Initiative. In the area of nutrition and health, proposals set out to evaluate

the anti-obesogenic characteristics of pulses in mice and look for genetic links of certain nutrition traits in beans, peas and chickpeas. Functionality proposals evaluate the protein of pulses, the effects of different processing on oligosaccharides and gut activity, functionality of different pulse proteins, and genetic links to cooking time. In the area of sustainability, the proposals look at a life cycle analysis of pulse crops, improving nitrogen fixation using genetics, and evaluating use of

pulses in cropping systems of the Great Plains.

Overall, the quality of all the proposals received was very good. The USDA-ARS was able to accomplish this in a short time frame. The ARS received the funding in April and with the help of the APA/USADPLC, developed a Request for Proposals (RFP), distributed the RFP, received

proposals, conducted a scientific review, prioritized the proposals and processed the awards and established contracts prior to September 30th, the end of the Federal Fiscal Year. Our thanks and appreciation go out to Dr. Michael Grusak, the administrator of this Initiative and the rest of the ARS evaluation team. It has taken a long time to actually see the PCHI funding and we look forward to continuing with this project. 🌱



2018 Pulse Crop Health Initiative Funded Projects

Hidden Nutrition: Understanding the encapsulation dynamics of the cotyledon cell to optimize consumer acceptability and nutritional benefits of dry beans

Karen Cichy
USDA-ARS, East Lansing, MI
\$69,500

Ray Glahn
USDA-ARS, Ithaca, NY
\$30,000

Donna Winham
Iowa State University, Ames, IA
\$71,227

MP3: More protein, more peas, more profit

Clare Coyne
USDA-ARS, Pullman, WA
\$178,217 (funding for Years 1 and 2)

Flavor, nutrition and functional properties of pea protein

Baraem (Pam) Ismail
University of Minnesota, St. Paul, MN
\$173,694 (funding for Years 1 and 2)

Increasing nitrogen fixation potential in pulses for environmental and economic sustainability

Clain Jones
Montana State University, Bozeman, MT
\$66,481

Development of efficient, genotype-independent gene-editing systems for common bean and chickpea

Shawn Kaeppler
University of Wisconsin, Madison, WI
\$78,149

The effect of food processing on fermentable oligosaccharides from pulse crops in human colon and its microbiota

Sean Liu
USDA-ARS, Peoria, IL
\$61,146

Enhancing the Nutritional and Functional Traits of Dry Bean Through Metabolomics, Genetics, and Breeding

Phil McCLean
North Dakota State University, Fargo, ND
\$69,868

Karen Cichy
USDA-ARS, East Lansing, MI
\$60,166

James Harnly
USDA-ARS, Beltsville, MD
\$73,000

Phillip N. Miklas
USDA-ARS, Prosser, WA
\$39,055

Sustainable field pea cropping systems for the Great Plains

Kraig Roozeboom
Kansas State University, Manhattan, KS
\$85,837

Optimizing pulse protein functionality

Brennan Smith
University of Idaho, Moscow, ID
\$74,308

Sustainability and health impact assessment of US pulses

Greg Thoma
University of Arkansas, Fayetteville, AR
\$84,407

Mechanisms of dry bean mediated anti-obesogenic activity

Henry Thompson
Colorado State University, Fort Collins, CO
\$165,793 (funding for Years 1 and 2)

Comparative Analysis of Chickpea, Dry Pea, Lentil and Dry Bean for Human Health Traits

Henry Thompson
Colorado State University, Fort Collins, CO
\$84,953

Improving the Nutritional Value of Chickpeas

George Vandemark
USDA-ARS, Pullman, WA
\$137,728 (funding for Years 1 and 2)



THE PULSE FARMER'S DIET A JOURNEY OF AWARENESS

By Elizabeth Burnstead

Sometimes the answer is right under your nose. See how these farmers and industry members changed their quality of life with pulses.

The ever-growing demand for dry beans, dry peas, lentils, and chickpeas has revolutionized the pulse industry and provided opportunities for farmers to diversify their operations. Since pulse crops are water efficient, drought tolerant, and frost hardy, farmers across the United States are capitalizing on and reaping from their benefits.

However, pulses aren't just helping these farmers fiscally, but physically as well. Pulses are an excellent source of protein, fiber, and other key nutrients, and thus are a great inclusion in any diet, especially for those looking to lose weight. For such individuals, pulses

are more than just a crop they grow or a product they work with on a daily basis. Pulses were the key to beginning their weight loss journey and unlocking their new lifestyles.

CHAD NICKELS

Chad Nickels is a black-eyed pea grower in Muleshoe, Texas. Among other uses, his family's vodka manufacturing company distills his pulses into vodka. Chad began his weight loss journey with pulses after receiving alarming news from his doctor. "They found two tumors: one in my sinus cavity and one in my hip, both of them benign. By then, I weighed 240 pounds and my knees and back bothered me," Chad explained. "I decided that I needed to get my weight under control and eat healthier. The doctors were doing everything they

could to make me healthy so it was time for me to do the same."

His plan was simple: cut out all sugars and simple carbohydrates, and replace them with proteins and pulses. "I started eating a lot of proteins. My meals consisted of any meats like fish, chicken, and beef combined with pulses," said Nickels. Nickels took the Half Cup Habit pledge literally, "Just Add Pulses" (see next page) and included pulses into every meal; black bean burritos was his favorite go-to recipe.

Pulses provided key nutrients such as protein, fiber, and complex carbohydrates that allowed Nickels to maintain high energy levels throughout the day. "I found that when you eat pulses, you are not as hungry; you stay full for



← CHAD NICKELS & WIFE, KAYLA ↻

longer, and you don't want to eat a lot," said Nickels, "I ended up not eating as large of portions as I used to."

As a member of the American Pulse Association (APA), Nickels always heard about the benefits of including pulses in your diet but was never strict about adding them in his own. However, after choosing to include them, Nickels lost 50 pounds in under six months, hitting his weight goal of 190 lbs. "Growing up in the pulse industry, you hear of all the benefits of pulses," said Nickels, "I don't know why I didn't try this sooner."

IVAN SACKETT

Rather than embarking on a typical diet, Ivan Sackett of Fall Creek, Wisconsin, decided to make a total lifestyle change with pulses. Ivan owns Clearwater Janitorial, LLC, a successful commercial janitorial company. He was introduced to the weight management power of pulses by his brother, Wade Sackett, who works for Chippewa Valley Bean. "I used to eat pulses before, but I never made it a priority to eat them," said Sackett, "I wanted to cut out sugar but also incorporate pulses because of all the benefits I had heard about them." Sackett began his pulse lifestyle change with the goal of losing some weight and having greater energy levels throughout the day. "I wasn't trying to make it a diet. I was looking for a doable yet easy to maintain meal plan," said Sackett.

Sackett adds a handful of beans to his regular meals, which makes his goal of incorporating pulses easily attainable. "I have a container of kidney beans, and I just throw a handful of them in whatever I am cooking, whether it is taco meat or scrambled eggs; I put them in everything!" said Sackett. Red kidney beans are Sackett's pulse of choice, though he also enjoys black-eyed peas and black beans.

Over two years later, Sackett has seen great results and continues to add pulses to his everyday meals. "I applied for life



BEFORE

IVAN SACKETT

insurance two and half years ago, and the insurance company gave me a high life insurance rate because of my blood test results," said Sackett, "I made a lifestyle change, and six months later, I applied with a different company. All my numbers were good, and so I got the most affordable rates." Since making the change, he has lost 35 pounds and reports higher levels of energy. "I continue to eat pulses because it is more than just weight loss; it's healthy eating."



AFTER

JIM HERMANN

Five years ago, Jim Hermann, an Idaho dry pea, lentil, and chickpea grower, joined Weight Watchers to lose weight, and without intending to, began his pulse journey. While in the program, he quickly noticed how many points his regular, everyday foods cost him. “I remember seeing all the normal foods I ate with really high points. I ended up running out of points by the end of the day, and I would be left starving. I had to find a way to get more out of what I was eating,” said Hermann, “that’s when I started incorporating pulses into my diet more.” Pulses have a high fiber content and thus use up fewer points on Weight Watchers, which allows Hermann to get more out of his everyday foods, all while losing weight. The versatility and taste of pulses also helped Hermann stay on track and meet his goals. “I started exploring new recipes and new things; I got really excited, and then I lost a lot of weight, so it was fun,” said Hermann.

As a pulse grower, Hermann always ate pulses but never made a grand effort to incorporate them into his diet. Five years later, adding them into his meals has become second nature. “I try to incorporate them into most lunch and dinner meals. I probably eat 5-6 cups of pulses a week,” said Hermann, “it’s just a part of what we do now for all of our meals.” Hermann is constantly looking for new ways to incorporate pulses into his diet, with the majority of his inspiration coming from the USA Pulses Instagram page, who post new recipes and ideas daily. “Many think of pulses as soup ingredients, but my wife and I have embraced them and made some delicious meals, especially from that Instagram page,” said Hermann, “my next step is to try and incorporate some chickpea flour into my homemade bread!”

This journey was not just a diet for Hermann, though, it was a lifestyle change.



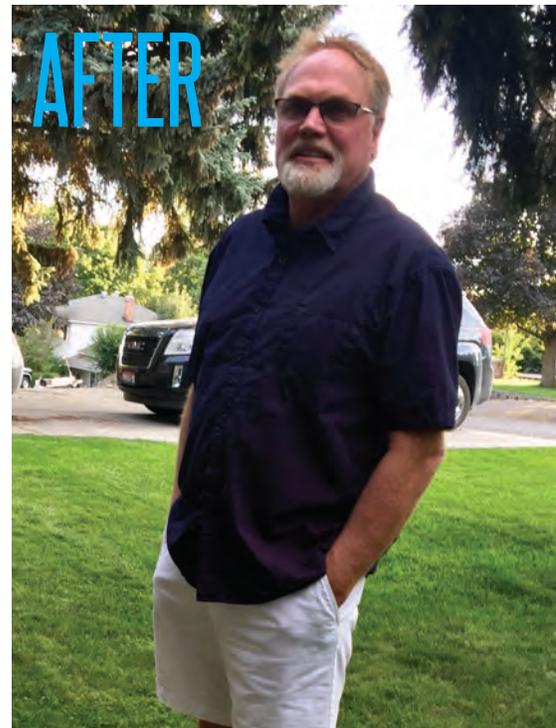
JIM HERMANN

After losing 50 pounds, Hermann feels better than ever and has managed to maintain his new healthy weight, all thanks to a balanced diet and the inclusion of pulses. “After losing that much weight, I have a lot more energy,” said Hermann, “I have low blood pressure, and my cholesterol is excellent; the doctors are impressed.”

Not only are pulses helping people lose weight, but they are also helping them maintain their health. Donny Zimmerman, a Washington pulse grower and type 1 diabetic, has seen great success in monitoring his A1C levels and cholesterol, all thanks to pulses. “Eating pulses regularly has dramatically improved my cholesterol and A1C levels in the last few years,” said Zimmerman. “It has also led to an improved overall health.”

Pulses are beneficial to our bodies because they are a complex carbohydrate, full of fiber, and contain beneficial micronutrients, which help our bodies digest slower and avoid blood sugar spikes and crashes. According to Becky Garrison, RDN, and Director of Domestic Marketing, pulses are proven to help maintain blood sugar levels and cholesterol.

“I like to use the analogy that blood sugar levels should be like the small and gradual rolling hills of the Palouse,



rather than steep mountain peaks and deep valleys. The deep valleys – or blood sugar crashes – is when hunger quickly sets in, energy levels drop, and someone acts “hangry” as the term goes,” said Garrison. “With pulses, those valleys don’t occur.”

Garrison also agrees that pulses have benefits far beyond weight loss. “Beyond helping lose or maintain weight, pulses may help reduce the risk of heart disease, high blood pressure, Type 2 Diabetes, and even some types of cancer,” said Garrison. “They also help us to stay full and energized longer as compared to other foods!” >>>





PULSE FARMER RECIPES



NICKEL'S - TEXAS BLACK-EYED CHILI

INGREDIENTS

1 CUP OF DRY BLACK-EYED PEAS
 1 LB. GROUND CHILI MEAT, GROUND SIRLOIN OR
 GROUND TURKEY DEPENDING ON PREFERENCE
 1 ½ CUPS CHOPPED ONIONS
 1 ½ CUPS DICED CELERY
 1/8 TSP. GARLIC POWDER
 1-2 TSP CHILI POWDER
 1/8 TSP CUMIN
 1 TSP SALT
 1/8 TSP BLACK PEPPER
 1 ½ CUPS TOMATO PUREE
 CAN ROTEL WITH GREEN CHILE
 1 CAN BEEF OR CHICKEN BROTH

DIRECTIONS

SORT, WASH AND RINSE PEAS. PLACE IN LARGE BOWL, COVER WITH WATER. SOAK COVERED WITH TOWEL OVERNIGHT. FROZEN OR CANNED BLACK-EYED PEAS MAYBE SUBSTITUTED FOR THE DRY PEAS. BROWN MEAT, ADD ONIONS AND CELERY AND COOK SLIGHTLY. ADD TOMATO PUREE, ROTEL TOMATOES, SEASONINGS AND BROTH. SIMMER OVER LOW HEAT UNTIL CHILI THICKENS AND PEAS ARE TENDER. FOR SOME THIS MAY BE TOO MILD. IF YOU LIKE IT "HOT", YOU CAN KICK IT UP A NOTCH BY ADDING MORE CHILI POWDER, GREEN CHILE OR YOUR FAVORITE HOT SPICES TO MAKE IT A TRUE TEXAS CHILI.



SACKETT'S - CHOCOLATE CUPCAKES

INGREDIENTS

1 15oz CAN CHICKPEAS, DRAINED & RINSED
 3 LG. EGGS
 1/2 CUP HONEY (or PURE MAPLE SYRUP)
 1/3 CUP UNSWEETENED COCOA POWDER
 1 tsp BAKING SODA
 3 TBSP COCONUT OIL, MELTED
 GHIRARDELLI DARK CHOCOLATE CHIPS

DIRECTIONS

PREHEAT OVEN TO 350 DEGREES. PREPARE 12 MUFFIN CUPS LINED WITH MUFFIN PAPERS. PLACE CHICKPEAS, EGGS, HONEY, COCOA POWDER, BAKING SODA, COCONUT OIL, AND EXTRACT IN BLENDER OR FOOD PROCESSOR. COVER AND BLEND UNTIL SMOOTH. DIVIDE BATTER AMONG CUPS. TOP EACH CUPCAKE WITH 4 CHOCOLATE CHIPS. BAKE 12-20 MINUTES UNTIL TOOTHPICK COMES OUT CLEAN. LET COOL AND ENJOY! 🍌





PAT SMITH IS

WRITTEN BY LIZ AUNE & DREX RHOADES

DEDICATED TO PULSES!

FROM PULSE FARMER TO PULSE CHAMPION

The town of Kendrick, Idaho is a small, quaint farm town located along the southern border of Latah County near the Potlatch River. The city itself has a total area of less than a half square mile and boasts roughly 300 residents. Although small in size, the community has banded together with nearby town, Juliaetta to increase community outreach, development and education initiatives. It is here where pulse grower, former USA Dry Pea & Lentil Council Chair, Idaho Commission Chair, and current pulse smoothie aficionado Pat Smith and his wife Annette have chosen to reside and where they raised their two sons, Aaron and Jason.

About that affection for pulse smoothies, it's an indication of how dedicated Pat is to the U.S. pulse industry. "In the morning I'll have a pulse smoothie. I'll put chickpeas in a blender, put in some various fruit that I have, even spinach if my wife is making it for me. Add a little coconut milk and orange juice and blend that up and that's what I have for most every breakfast."

When younger, the idea of eating chickpeas, let alone grow them would have been a foreign concept. Pat graduated from nearby Troy High School and later attended the University of Idaho. His original plan was to become a civil engineer, but six weeks into the program he decided a degree in Agricultural Business better fit

his career plans. It turned out to be a good move, for it led to meeting Annette, who was there working toward a bachelor's degree in Elementary Education. Annette was from a farming family as well, who worked a 700-acre spread in Endicott, Washington.

After college graduation, Pat started out his career in agriculture for the first decade working at Whitman & County Growers which is now known as The Pacific Northwest Farmer's Cooperative.

"At that point in time, I guess everybody gets a little itch. It was ten years and my dad called me up one day and said, 'Hey, I have this opportunity to come down and farm the land.'"

“Farming came second nature to me,” said Pat. “I grew up on a farm in Troy, went away to college, worked for the grain industry for ten years, and came back to the farm in 1990 to farm with my dad.”

Pat is a 3rd generation farmer. His family has been growing pulses in Latah County for over 100 years and will continue to do so as long as the weather stays conducive to growing pulses. Pat continues to farm two sections from his family farm, 700 acres on American Ridge and another 700 acres in Troy on Burridge.

“It’s rewarding, but it’s challenging at times. There’s great adversity in some of the things you do but there’s also something new to do throughout the season. It’s not just the same job all the time.”

For all of those people that think farming is easy, Pat will gently remind them of the reality of the profession. “Some people say, ‘Great, it’s good to be your own boss.’ And I remind them that, “Well, mother nature’s my boss and I try to work with her to the best of our ability. It’s exciting for me to go out and plant a crop and see it come to fruition. See it grow, nurture it, try to get the best you can out of it, and unfortunately after that, we’re at the mercy of the market as far as what we can do.”

But he’s quick to point out the positives as well, such as enjoying the camaraderie with other farmers. “It’s fun on a rainy day to go in and tell horror stories about what happened to this piece of equipment or this or that. It’s just really enjoyable.”

Part of Pat’s pulse rotation includes small brown pardina lentils for the Spanish market and also red chief lentils, as well as chickpeas. His advice to new farmers interested in growing pulse crops is keeping it simple.

“You want to look and see what the neighbor’s doing. I would encourage people to just put your foot in the door, in the water, a little bit at a time, so you don’t come up with a failure,” Pat explains, but adds this warning: “You have to look at chemicals that have been previously put on the ground because they have long residual and they have the potential to damage that pulse crop.”

Pat’s association with the USA Dry Pea & Lentil Council came to be shortly after returning home to farm. He first joined the Western Pea & Lentil Growers Association (renamed the Western Pulse Growers Association), and then was recruited as a USADPLC board member before being



elected as Chair. His involvement representing the pulse industry has led to a better understanding of the big picture regarding the role of pulse crops in United States agriculture.

“I think by being involved in the commission and also doing the traveling going to Washington D.C. and educating our senators and congressmen about the health benefits, we see a lot of facts that a lot of the general public probably doesn’t see as far as high in fiber we are,” Pat reflects. “It’s been a really good crop to grow and to see those health benefits.”

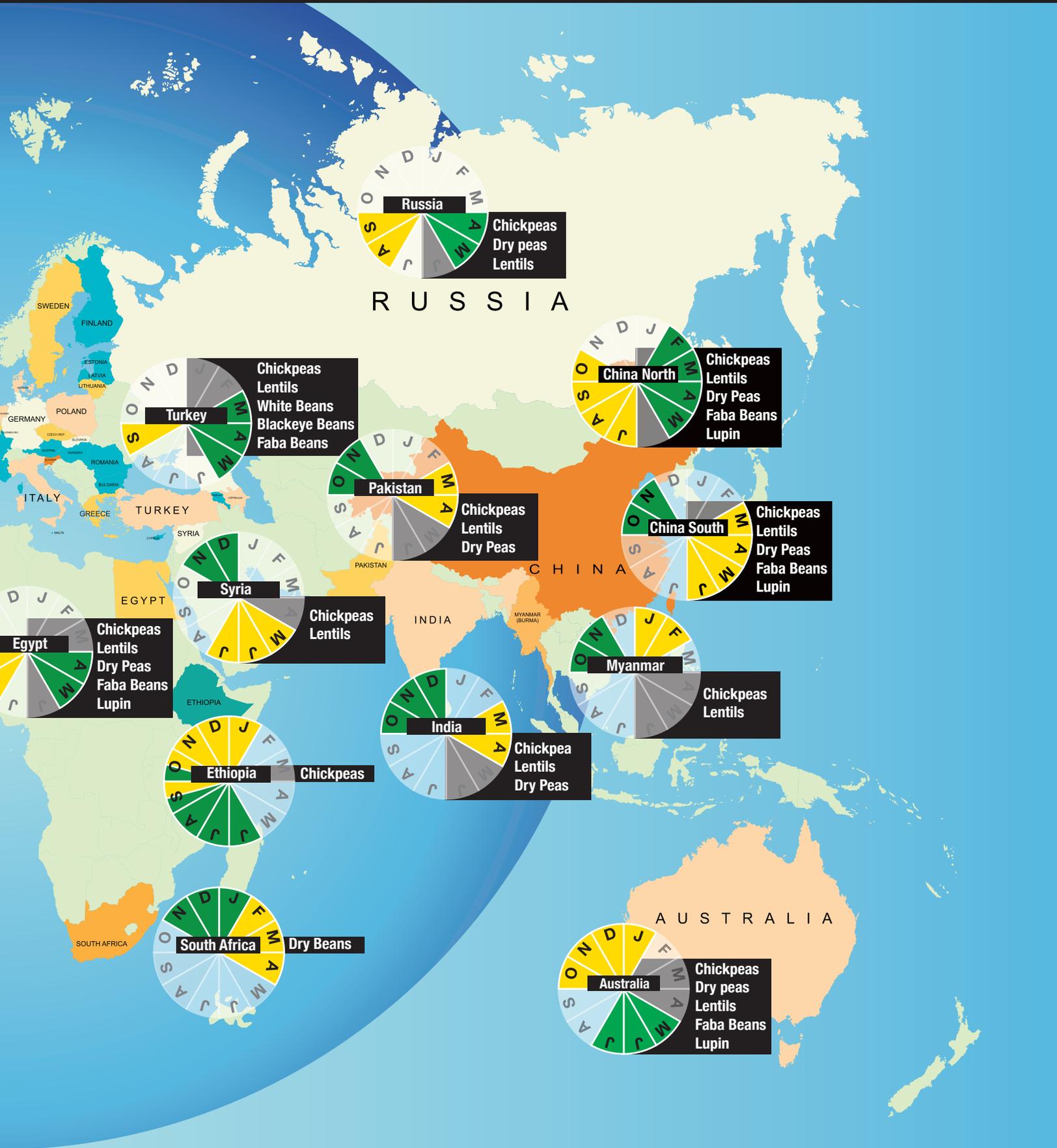
Pat finished his last term as the USADPLC chair this past June but will continue to champion the cause of pulses as he will serve on the American Pulse Association’s board for this upcoming fiscal year. He will continue to serve on the Idaho Pea & Lentil Commission and as a member of the Western Pulse Growers Association as well. When asked about the future of the pulse industry, Pat’s outlook is rather bright.

“We started the pea and lentil industry here in the Palouse, but pulse farming has taken off and is expanding,” Pat muses. “There’s large acreage increases in Montana and North Dakota. Just recently, South Dakota has joined our coalition, and Nebraska is considering a checkoff. We’re even talking to people in Arizona that are growing them. I think the future of the industry is really taking off.” 

Global Pulse Pro



Production Calendar





AMANDA BECK
PHOTOS COURTESY OF JUSTIN EILER,
NORTH DAKOTA STATE UNIVERSITY



PULSE RESEARCHERS *OF THE* FUTURE

WRITTEN BY
KATIE JONES

In universities across the western U.S., students of pulse research are hard at work tackling global issues such as malnutrition in emerging markets, global sustainability of food production, climate change, and obesity and chronic disease in Western Society. Pulses have a small carbon footprint, can improve soil health, and offer an affordable source of nutrients when eaten regularly. The tools being developed by today's researchers will improve pulse production, increase consumer acceptance and consumption of pulses, and ensure better disease resistance. This research will help breeders, growers,

and processors ensure the growing popularity of pulses for the future.

These students are from all corners of the globe but have one thing in common – a passion for pulses!

Tucked away in a lentil and dry pea breeding lab at Washington State University, Yu Ma might be found excitedly running tests on seeds or small sections of plant tissue. She is identifying genetic markers for traits of interest to pulse breeders. Yu Ma overcame language and cultural differences, along with the distance from her family, to study pulses at the university, and in spite of these difficulties, she is incredibly optimistic.

Studying pulses for the last nine years, when asked what her favorite thing is about her work, she enthusiastically said, "I just love pulses!"

Growing up in Shijiazhuang, China, Yu Ma found her love of plants on her own. Her father was the first in her family to get a bachelor's degree, in mathematics. She thinks she got the gene for science from him. She was intrigued by high school lessons in the law of inheritance and Gregor Mendel's pea studies.

It was during her own bachelor's studies toward a degree in biotechnology that Yu Ma knew she wanted to focus on plants and genetics. She went on to

attain an M.S. degree at the Chinese Academy of Agricultural Sciences in Beijing and began mapping the genetic traits of pulses.

She spends her time at WSU in the lab studying pulses and developing genetic markers for traits of interest to breeders. Her work focuses on locating markers for traits such as disease resistance to powdery mildew in peas. The research will expedite the breeding process, leading to more robust pulse cultivars that will benefit pulse breeders and the pulse industry.

Yu Ma emphasizes that pulse crops are important. “They are packed with vital nutrients. By identifying markers with traits of interest or marker-assisted selection, we can help speed up the pulse breeding programs.” With the current interest in pulses sweeping the U.S. food industry, these nutritional powerhouses are poised to deliver the punch product developers need.

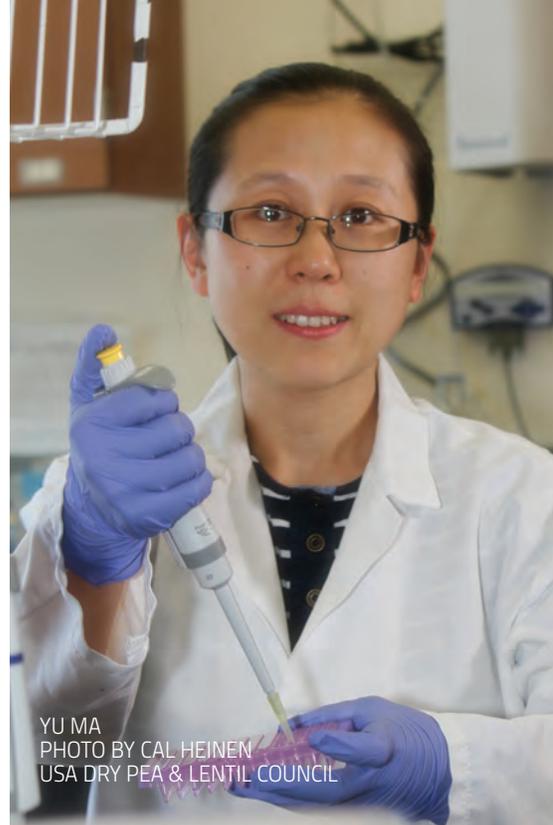
The flavor, texture, and processing time of the pulse must be consistent. Amber Bassett, a PhD student at Michigan State University’s Plant Breeding and Genetics department, is tackling the

issues of flavor and cooking time in dry beans.

Bassett grew up in Knoxville, Tennessee. Her mother was the first in her family to attend college, where she achieved two M.S. degrees, in math and statistics. Her mother taught Bassett the value of education, but her interest in plants and food is her own. “Plants fascinate me. They have a stillness, yet they are so adaptable and resilient.”

Bassett’s undergraduate degree is in biochemistry and cellular and molecular biology from the University of Tennessee. She found her way to Michigan State University and began working with Karen Cichy on the cooking time of dried beans. The research interested Bassett because of the positive impact it could have on pulse consumption globally.

“In many parts of the world, pulses are the main source of protein. This research could help people more quickly cook and consume beans. This [reduced cook time] could have a great impact for people still cooking on fire, with limited water access, and [could] positively contribute to people’s health,” Bassett said.



YU MA
PHOTO BY CAL HEINEN/
USA DRY PEA & LENTIL COUNCIL

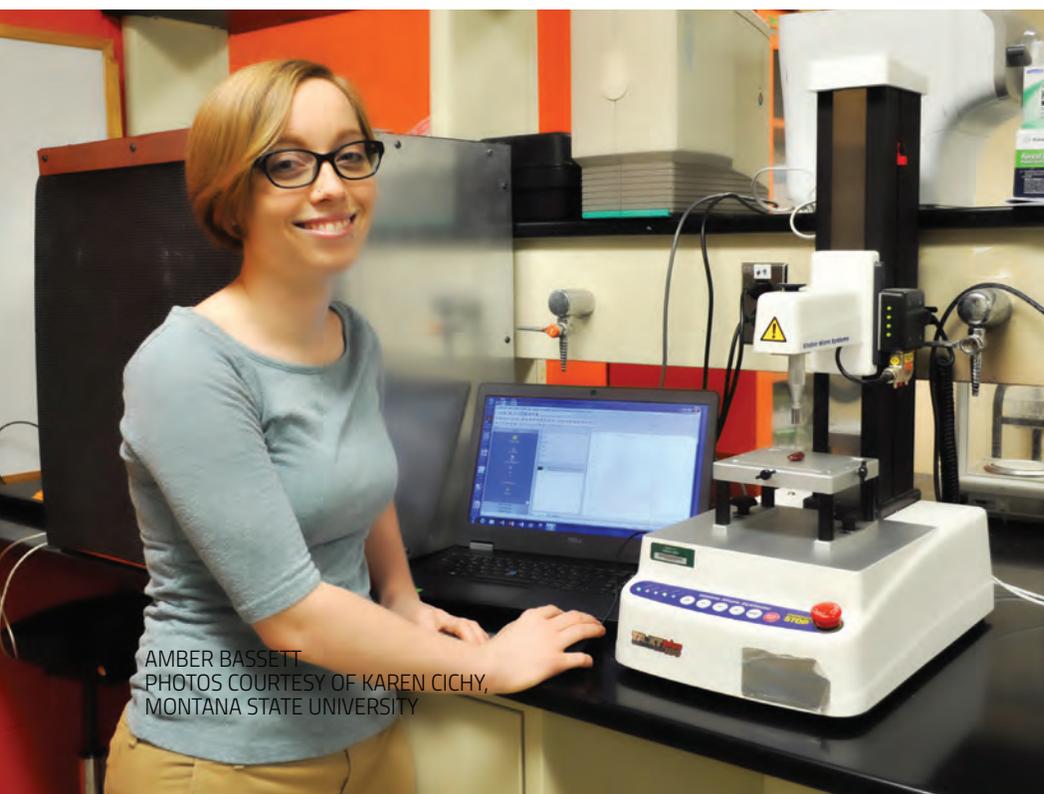
Bassett’s research uses a large group of diverse bean lines to create a catalog of the genes (map) involved in cooking time and flavor of pulses.

“Another piece to understand when mapping the flavor of pulses is that we still know very little about people’s preferences. In the US most people eat them canned, and added seasonings cover the natural flavor notes.” Bassett has worked with a trained sensory panel to evaluate the flavor profiles, intensity, and texture of many different experimental types of beans. The panel has described the presence of beany flavors such as vegetative, earthy, starchy, sweet, and bitter.

They also evaluate the texture of seed coat. How thick is it? Is it hard to chew?

How grainy is the texture when the pulses are cooked?

“You might expect that every black bean will taste like a black bean – that they are all going to taste the same. But we’ve been evaluating a lot of different seed types and a lot of germplasm, and



AMBER BASSETT
PHOTOS COURTESY OF KAREN CICHY,
MONTANA STATE UNIVERSITY

Continued on Page 18 >>>

that's not true. There is a lot of variety within seed type," Bassett added.

Revealing flavor preferences through her research will ensure a bright future for pulses. Beck says, "We have this opportunity and this amazing crop, and if all it takes is to focus on what people like and try to target that, you could expand people's diets. Even if it's something as simple as finding a good way to process beans [to make] pasta, bread, a snack bar, or something else."

What better way to feed future generations than with pulses? In countries like Puerto Rico, pulses are eaten for breakfast, lunch, and dinner. They are a major part of the diet.

Cecilia Monclova-Santana grew up in Toa Baja, Puerto Rico as a city kid without a family history in agriculture or higher education. The first in her family to attend university, she earned her bachelor's degree in agronomy and an M.S. degree in plant pathology at the University of Puerto Rico Mayaguez (UPRM).

Through the plant breeding and genetics collaborative PhD program between North Dakota State University and the

UPRM, Monclova-Santana landed a summer internship in the US. When searching for a place to complete her PhD, she returned to NDSU to study dry bean rust with Julie Pasche. This experience brought her "from rust lab to pulse lab."

Monclova-Santana's focus on evaluating dry bean rust is similar to that of an FBI profiler working a case. She studies the rust population to understand the races present, how they behave, the population dynamics, and which genes in the pulse cultivars the rust has overcome. Her rust profiling will enable breeders to select the best cultivars with resistance to the pathogen.

Rust has been known to adapt and overcome the pulses' resistance to infection. In 1996, North Dakota lost 16% of the pulse crops due to a bean rust epidemic, at an estimated cost of \$12 million. Monclova-Santana says, "As a farmer, every penny counts! You only have one harvest a year." Monclova-Santana hopes her research will allow breeders to create more resistant cultivars that will get good yield and reduce the need for fungicide, creating more cost savings for pulse growers.

Monclova-Santana jokes "I have a PhD in beans. I love to tell people 'Eat more beans!'"

Profiling and controlling pathogens such as rust will have a huge impact on pulse growers in North Dakota. In the U.S., pulses are commonly grown on family farms such as the one where Amanda Beck grew up in Minot, North Dakota.

Although Amanda Beck's father raised a variety of crops that included pulses, it wasn't until she was an undergrad that she decided to study plant pathology. Beck worked a summer internship as a crop scout. She spent her days monitoring crops' health, stage of growth, weeds, diseases, pests, and nutrient de-

ficiencies. Providing recommendations to the growers helped them manage any issues their crops were having.

It was at this time that Beck said she noticed something, "Pulse crops seemed to be the ones struggling the most with pest issues. So that's what inspired me to work with pulses. They may not have a whole lot of herbicide or pest solutions."

Beck's research in plant pathology at North Dakota State University has kept the needs of the growers in mind: Her work with Pea Seed-borne Mosaic Virus (PSbMV) in field peas led her to develop a risk assessment model to examine cultivars. Beck works with over 20 pea cultivars to detect the presence of genetic resistance to PSbMV.

Each cultivar's level of risk is denoted on a 10-point scale.

Beck knows firsthand the struggles growers face. The risk assessment model will allow growers to limit yield loss by selecting the best cultivar for their crops. "We are able to provide them with answers at the end of the season and direct them in the best way to manage these diseases," she notes.

The future of pulse research is in good hands. These outstanding students represent only a handful of the dozens of graduate students working on pulse crops. They come from diverse backgrounds and areas of pulse research yet they all know the research will have global impact. Climate change, dietary related illness, malnutrition and hunger can be addressed with an increase in pulse production and consumption. The pulse industry is moving forward to meet these challenges. Yu Ma, Bassett, Monclova-Santana, and Beck share a passion and drive that will mean success for all those involved in the global journey of pulses from seed to plate! 🌱



CECILIA MONCLOVA-SANTANA
NORTH DAKOTA STATE UNIVERSITY

Author: Becky Garrison, Director of Domestic Marketing



Seriously What's the fuss all a' **SPROUT**?

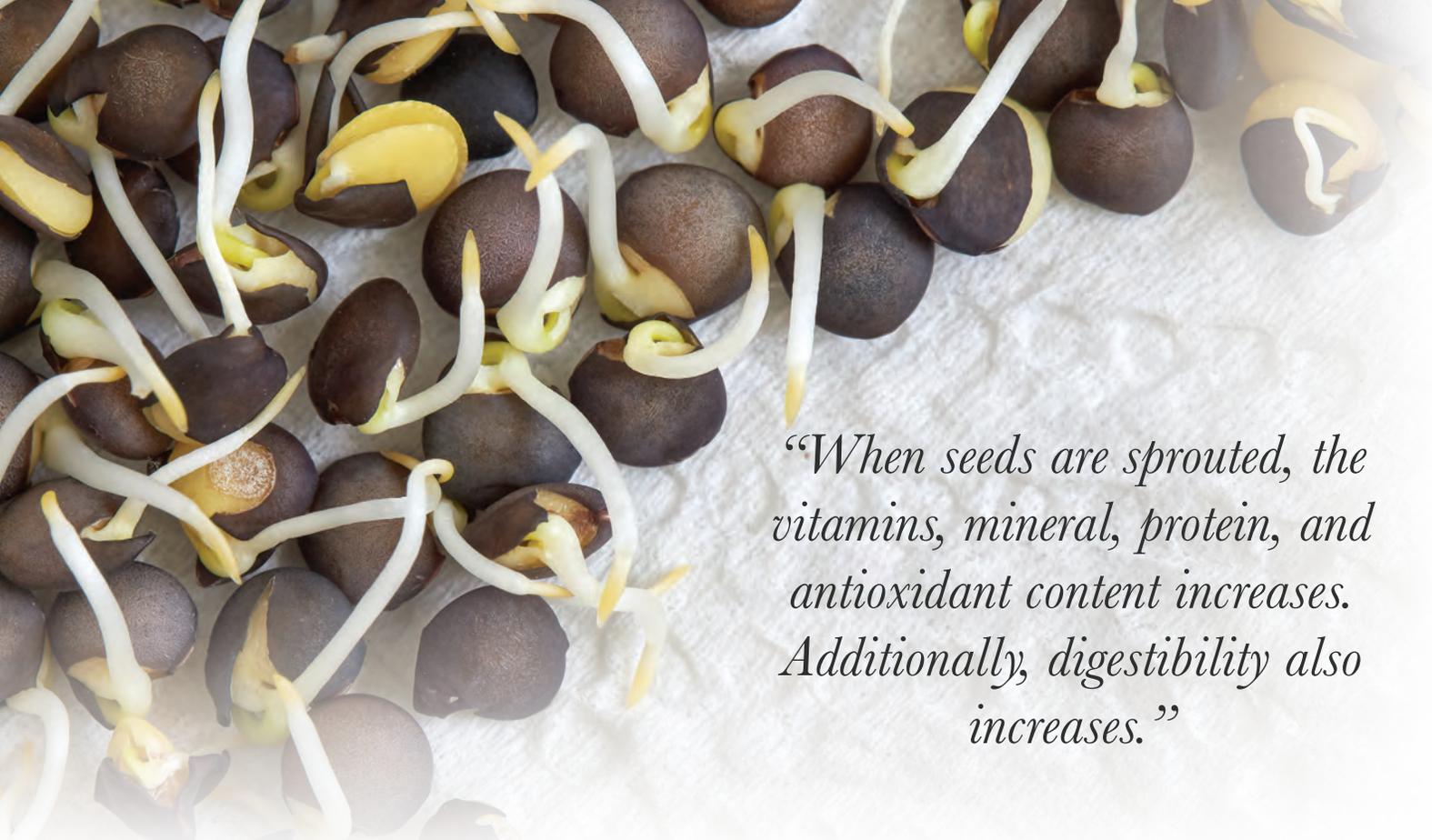
For most of us, sprouting might bring back early memories of grade school experimentations and watching seeds grow as an introduction to the world of science. But fast forward to 2018 and this long-standing practice of germinating seeds in a jar is gaining popularity among consumers as a mainstream food trend. From smoothies to salad toppings to baked goods, sprouted ingredients can be found in many types of dishes. Sprouted pulses can be found at the store or used as ingredients. Or you can try making them at home!

Mung bean sprouts, commonly used in Eastern Asian cuisine are a well-known sprouted pulse on the market.

But many pulses are suitable to be sprouted. Mung beans and lentils are the easiest and fastest pulses to sprout. Chickpeas, adzuki beans, and whole peas are also great for sprouting but will require a couple more days in the jar to germinate.

And as the sprouting trend gains momentum, food bloggers, influencers, and celebrity chefs continue to sprout new ideas for consumers to choose from an array of pulse varieties when it comes to sprouting. Yes, pun intended.

Sprouting is the germinating process of seeds, legumes (specifically pulses), grains, and even some types of nuts. The process allows seeds to rest in a warm and moist environment for 2-5 days to reach the stage >>>



“When seeds are sprouted, the vitamins, mineral, protein, and antioxidant content increases. Additionally, digestibility also increases.”

between a hard seed and a blossoming new plant.

Although some folks claim sprouts take on a different flavor profile, most consumers are drawn to the nutritional benefits sprouts offer. Sprouting increases the nutrient bioavailability of the seed. When seeds are sprouted, the vitamins mineral, protein, and antioxidant content increases. Additionally, digestibility also increases.

Why is this? Plants are designed to prevent growth until conditions are

just right. When the environment is favorable, enzymes within the plant seeds are activated to breakdown starch into smaller molecules that are easily digested for growth. Complex molecules are broken down in the germination process, meaning sprouted foods can be easier to digest. During sprouting, metabolic enzymes that allow essential fatty acids, starches, and vitamins to be more available for absorption.

Pulse sprouts are commonly eaten raw, but most types can withstand heat without becoming mushy. Adding them

to soups, taco meat, or baked goods may be the perfect nutritious addition to your weekly menu.

Hop onto www.usapulses.org to find some delicious recipes that use sprouted pulses as a main ingredient. Try the Lentil Sprout Spring Rolls with Shrimp, the Chickpea Banana Berry Smoothie Bowl, or the Sprouted Mung Bowl with Coconut Quinoa Beet Tahini. Or just try adding sprouted pulses to everyday recipes – breakfast, lunch or dinner! Find them at the grocery store or make them at home. It’s easy! 🌱



Lentil Sprout Spring Rolls with Shrimp



Chickpea Banana Berry Smoothie Bowl



Sprouted Mung Bowl with Coconut Quinoa Beet Tahini

Courtesy of thefirstmess.com

You Know You Make Me Wanna Sprout!



Sprouts are grown in environmental conditions where bacteria can thrive. Just like other raw produce, sprouts can be more susceptible to contamination. It is therefore recommended by the FDA that sprouts be stored in the refrigerator and are not recommended for populations at risk such as pregnant women or the elderly.

WHAT YOU WILL NEED:

- 1 cup whole dried pulses (such as chickpeas, green peas, Beluga lentils or adzuki beans)
- 1 quart mason jar with screw top lid or rubber band
- Water
- Plastic mesh screen or cheese cloth

DIRECTIONS:

1. Wash dried pulses and remove any foreign objects.
2. Place pulses in the mason jar, covering the top with the plastic screen or cheese cloth and securing on with the lid ring. Fill mason jar with cool water and rinse the pulses a couple of times. Fill the mason jar again with cool water and allow to sit overnight on the counter.
3. Drain pulses and rinse a few times. Drain the pulses thoroughly and set the mason jar on its side to begin the growing process. Be sure to keep the jar out of direct sunlight or the pulses may dry out too quickly.
4. Rinse and drain the pulses twice a day for 3-4 days until the growing sprouts are about ½ inch long and a small green leaf is beginning to form.
5. Once your sprouts have formed, give them a final rinse and replace the screen with mason jar lid and move to the fridge to store. Sprouts will stay fresh up to one week.
6. Enjoy your newly grown sprouts in sandwiches, smoothies or soups, or top your favorite salad, burger, omelet, or tacos with them. Happy sprouting to you! 🌱



GAME OF CROPS

DR. MARY BURROWS

CO-AUTHORED BY DR. LYNDON PORTER AND DR. JULIE PASCHE

GAME OF CROPS

MANAGING PULSE ROOT ROT

Pulse crops have changed the landscape in the Northern Great Plains for the better. Unfortunately, along with new crops come new pests that typically accumulate and become more severe over time. Root rots are a persistent and severe problem in pulse crops that were first recognized in North America in the early 1900's and rapidly impacted growers of fresh and canning peas. That industry moved from the east coast to the Midwest to the West to avoid root rot issues, particularly *Aphanomyces* root rot. Root rots often go unseen, silently causing yield or quality losses, and very few management tools are available.

New growers of pulses do not see root rot problems for at least 4 cycles of a highly susceptible crop (pea, lentil) and often wonder why the plant pathologists are so concerned about root rot that often needs wet conditions to exacerbate the problem. Pulse crops compensate very well for stand losses, and yield losses are often erratic with no above-ground disease symptoms. You have to dig up plants to see discolored roots, and let's face it, all crop plant roots are brown by the end of the season. This makes it difficult to identify the true

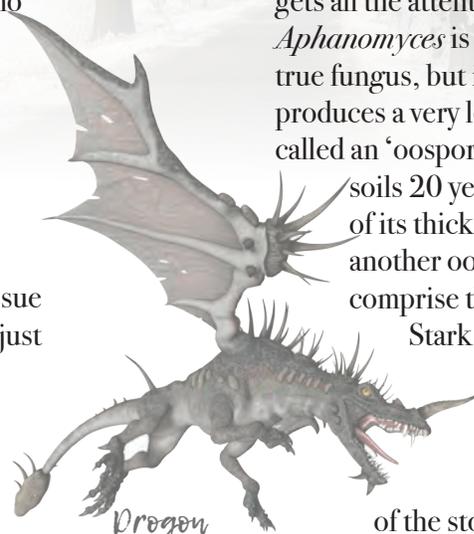
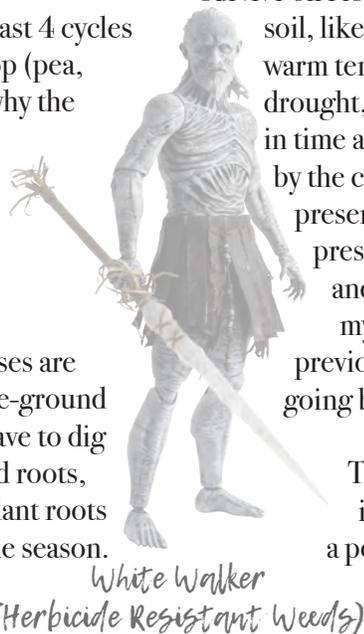
cause of the problem. Short rotations between susceptible crops increase the amount of inoculum in the soil until the whole crop crashes. Currently, peas and lentils are unable to be grown in longstanding pulse production areas in Canada and North Dakota. There are no fungicides and no resistant varieties available in our toolbox of standard management techniques. Complicating the issue is that root rots are just plain complicated! Fungi exist in the soil that have long-lived or short-lived spore structures, survive on residue or in soil, like cool or warm temperatures, like water or drought, have different patterns in time and space, are exacerbated by the crop health status, the presence of nematodes, the presence of other fungi and bacteria including mycorrhizae, and by previous crops, potentially going back decades.

To try to clarify the root rot issues in pulses, let's use a popular television show, *Game of Thrones*. It's a show about complicated

family relationships and dragons. We're going to consider each family like a family of fungi and fungal-like pathogens, and the dragons are going to be our management strategies.

The big central player in this story that gets all the attention is *Aphanomyces*. *Aphanomyces* is an oomycete, not a true fungus, but it looks like a fungus. It produces a very long-lived resting spore called an 'oospore' that can survive in soils 20 years or more because of its thick wall. Together with another oomycete, *Pythium*, they comprise the family 'Stark.' The Stark family is known in the show to live in a cold place, their motto is 'Winter is Coming,' and at the beginning of the story we think the main

character, Ned Stark, is going to be our king at the end of the story. Turns out, he gets his head chopped off by the Lannisters (stay tuned for their fungal analog). Much like peas and lentils exhibiting the symptom of 'post-emergence damping off,' *Aphanomyces* has a limited number of hosts: peas, lentils, and alfalfa are the most widely planted in the Northern Great Plains. Chickpea and fava bean are resistant. *Pythium* has a very broad host range, but it is reasonably easy to manage with the seed treatment fungicide metalaxyl or mefenoxam. It prefers cool wet conditions that predominate in the spring, whereas *Aphanomyces* prefers higher soil temperatures and





Fusarium species complex

- Have a complex relationship with oomycetes and other pathogen groups
- Can cause widespread destruction and death
- Closely related (incestuous?)
- Live on crop debris (gold from the Iron Bank)



infects later in the season after most fungicide seed treatments are effective. Metalaxyl-resistant *Pythium* has been identified in the Pacific Northwest, but has not yet been found in Montana or North Dakota.

Speaking of complex relationships, the Lannister family represents *Fusarium*. Their motto is 'Hear me Roar,' and this is ironic because plant pathologists in Canada and the US probably misdiagnosed *Aphanomyces* for years because by the time the samples arrived at the lab late in the season, the only thing that could be detected in root tissues was *Fusarium*. There is a complex, some may say incestuous relationship (two of the main Lannisters, who are twins, have children together) among the *Fusarium* fungi, and the disease itself is caused by a number of closely related species. *Aphanomyces* and *Fusarium* interact to cause more severe disease and losses, much like the Lannisters and Starks won the Iron Throne from the Targaryens. The Lannisters (and *Fusarium*) cause widespread destruction and death to a number of families (and crop species), especially when Cersei Lannister blew up the Cept of Baelor with wildfire. Seed treatment fungicides could be that wildfire.



Rhizoctonia

- Form 'fungal mats' in soil
- Facilitated by the green bridge
- Some host specialization
- Cause root and crown rots (sneaky and clever)
- Disrupted by tillage



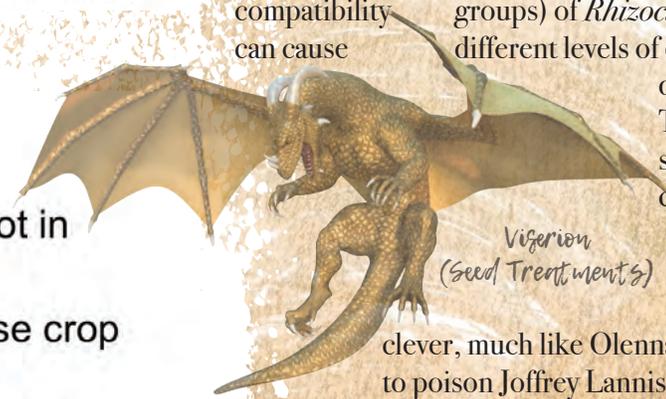
Another important family in the story and in the soil is *Rhizoctonia* (House Tyrell) whose motto is 'Growing Strong.' *Rhizoctonia*, commonly known as bare patch in cereals, forms hyphal mats in the soil that can be disrupted by tillage (their entire family except one was killed in the Cept of Baelor). There are a number of anastomosis groups (sexual compatibility groups) of *Rhizoctonia* that can cause

different levels of disease on different crops. They also have some pretty complex family relationships and are sneaky and clever,

much like Olenna was sneaky to poison Joffrey Lannister by hiding the poison on a necklace worn by Sansa Stark during the wedding feast between Joffrey and Margaery Tyrell. Sansa was a former fiancée of Joffrey.

Outline

- Primary causal agents of root rot in pulses = Families in GoT
- Management strategies for pulse crop root rots = The Three Dragons



Now that we've covered the complex relationships between the main families of fungi and oomycetes causing root rot in pulses, how do we manage them? Well, that is as confusing as the Game of Thrones

books and television show, and neither have an ending quite yet. We can think about it like we think about the three dragons that the Mother of Dragons, Daenerys Targaryen, hatched in a funeral pyre for her first husband, Khal Drogo. The big dragon that is directly under the control of Daenerys is called 'Drogon.' He could be considered crop rotation: it's a big issue, it can be managed, but it also has its dangers. The second dragon, Viserion, is fungicide seed treatments. Viserion ends up being wounded by an ice spear thrown by the Night King, the head of the whitewalkers (the bad zombies). He emerges from the ice as a wight, breathing blue fire and destroying the wall that protects the humans in the story. Viserion is fungicides because fungi and oomycetes can develop resistance to fungicides, they change and the chemistry can no longer control the disease. The last dragon, Rhaegal, is resistant varieties *because dragons don't exist either.*

Stakeholder groups, industry, university researchers and extension have been working together to provide knowledge, education and solutions to growers to help mitigate this intractable disease complex across North America since the early 1900s. At this time, the best recommendation we can give pulse growers are to use longer (4y+) crop rotation intervals between peas and lentils to try to slow the build-up of pathogens in the soil and extend the time the soil will be viable for

Management

- Timely weed and volunteer control
- Crop rotation (*Rhizoctonia* species tend to be host-specific, but some isolates like AG-8 in OR/WA infect wheat, barley, pea, lentil)
 - *Rhizoctonia solani*: Cereals/monocots
- Fallow period
- Soil disturbance (disking)
- Variety resistance, if available

pulse production. The Canadians have literally spent millions of dollars trying to solve the root rot problem, and progress is very slow. Root rot on pulses is new to us, but it is not a new problem and we can learn from the past in order to not make the same mistakes. 🍏

"THE LAST DRAGON, RHAEGAL, IS RESISTANT VARIETIES BECAUSE DRAGONS DON'T EXIST EITHER."

Plant Pathology Priorities

- Chickpea:
 - Develop *Ascochyta*-resistant varieties.
 - Identify new chemistries for fungicide resistance management with a particular focus on metalaxyl-resistant *Pythium* and *Ascochyta* blight
 - Develop insect, disease, and weed pest forecasting models.
- Lentil:
 - Develop improved management strategies for *Fusarium* and *Aphanomyces* root rots.
 - Develop forecasting methods for white mold.
 - Develop rigorous fungicide usage recommendations for management of white mold.
 - Identify viruses and determine resistant varieties, starting in the PNW.
- Dry Pea:
 - Research management of *Fusarium* species complex (identification, variety resistance, fungicide efficacy).
 - Investigate pathogen movement in seed and seed treatments for management.
 - Quantify soil and risk for root rot with an emphasis on *Aphanomyces*.
 - Develop improved management strategies for *Aphanomyces* root rot.





MRL's, MRL's, MRL's!

A friendly warning from Vice President of Research and Member Services, Todd Scholz

It has happened again. This year, a shipment of lentils to Japan was found to have 2-4,D residues. This is a problem. According to trade rules and government protocols, if pesticide residues are found on a crop that are not allowed or exceed Maximum Residue Limits (MRLs), then the Japanese government can inspect every shipment from the offending country—the USA—adding cost to the shipments in both time and money.

The USA Pulse Industry has worked hard over the past 53 years to build a reputation as the quality supplier of the world. US product has a reputation as the best in the world because our exporters work hard to maintain quality product in a timely and dependable manner. Because of this reputation, US product commands higher prices and everyone in the value chain benefits—including producers. But, maintaining that reputation requires everyone's attention.

2-4,D is not labeled on lentils or any pulse crops for that matter. Producers should be extremely careful when using it even on fields bordering pulses to prevent drift or accidental application to the pulse crops. If a producer suspects a pulse field is treated, the treated area

should be segregated and not combined with the untreated part of the field. This is part one of the producer's responsibility for quality—to follow the label.

Communication is the second part of the producer's job. Processors and first purchasers need to know the quality of their product and that includes what crop protection products were used in growing the crop. Armed with that information, the processor can segregate the crop and market it separately. Without that information, your crop could contaminate an entire bin, changing the value of the entire lot.

Even labeled products can be a problem. This spring, a court in California ruled in favor of a groundskeeper with cancer who claimed it was caused by glyphosate (Round-up®). A jury found Monsanto responsible for \$279 Million in damages. Immediately following this ruling, the Environmental Working Group (EWG) published an article which claimed dangerous pesticide residues were found on breakfast cereals like Cheerios® and Quakers Oats®. The article described residues measured in parts per billion, a level which required individuals to eat over 118 pounds of breakfast cereal in a day to reach the dose of glyphosate still considered safe by EPA.

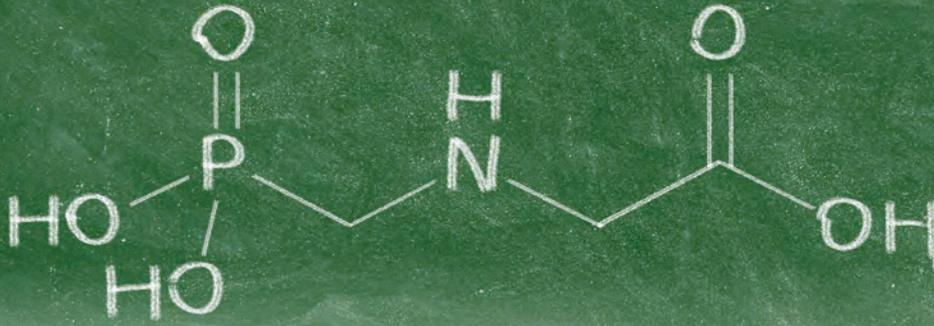
Well respected scientific analysis by the National Institute of Health (NIH) and the World Health Organization (WHO) have found glyphosate to be safe. To consumers, these facts do not matter when considering feeding your children food tainted with “harmful pesticides”.

As a result of the controversy over glyphosate, some pulse crop processors have asked producers not to use it as a Pre-Harvest Aid. Processors are reacting to some international customers including India and the EU that have considered not accepting shipments with glyphosate residues present.

There are valid reasons to use glyphosate on pulse crops. There are also markets that will accept the use of glyphosate. Your processor or first purchaser need to know whether the crop is treated or not so they can take action to help market your crop. Communication is the best policy.

MRL's will continue to be a concern for all pulse crops. The US pulse crops are the best quality in the world and MRL's are a part of the definition. The crop protection plan for your crop helps to define the quality of your crop. You should follow the label and communicate with your processor to insure you are producing a quality product. Quality is worth it! 🌱

THE $C_3H_8NO_5P$ ← GLYPHOSATE
FACTSHEET



GLYPHOSATE AND CANCER

The National Institutes of Health (NIH) and the Joint FAO/WHO Meeting on Pesticide Residues (JMPR) both recently reaffirmed glyphosate does not cause cancer.

The jury's decision differs from the overwhelming evidence from government agencies and scientists from around the world that have found no link between glyphosate use and cancer.

More than 800 studies, the National Institutes of Health and regulators around the world have concluded that glyphosate, can be used safely and does not cause cancer.

The legal issue in the court case was about Monsanto's duty to inform users. It was not about science. Juries are human and they responded to the plaintiff with sympathy. The case will be appealed.

Glyphosate acts by stopping a specific enzyme, EPSP synthase. This enzyme is found ONLY in plants. Since humans and animals do not have the enzyme, glyphosate has no effect on them.

GLYPHOSATE AND THE ENVIRONMENT

Glyphosate binds to soil. It does not leach and does not run off.

Glyphosate has undergone extensive ecotoxicology testing over the last 40 years. It produces no toxic effects to mammals, birds, fish, or invertebrates at realistic environmental exposure levels. Some formulations of glyphosate contain a surfactant that may affect some organisms if they are exposed to high levels.

That is why some formulations are labeled for use in water, others are prohibited from entering water.

Glyphosate does not bioaccumulate thus does not magnify through the food chain.

Glyphosate is broken down by bacteria in the soil.

GLYPHOSATE AND FOOD

The Environmental Working Group (EWG) released a report claiming they found trace amounts of glyphosate in breakfast cereal. The EWG has a long history of spreading misinformation about a variety of topics including vaccines.

The highest residue level reported by EWG is not even remotely close to any level of concern. The EPA and other regulatory authorities have strict rules about contaminants in food. The EPA sets daily exposure limits at least 100 times below levels shown to have no negative effect in safety studies.

Even at the highest level reported by the EWG (1,300 ppb), an adult would have to eat 118 pounds of the food item every day for the rest of their life in order to reach the EPA's limit. 118 pounds of oatmeal is 228 servings every day. That equals 3,658% of the daily recommended intake of fiber.

FDA has been testing certain foods for glyphosate residues. While the final report is not yet available, the agency has said it found no pesticide residue violations for glyphosate in "preliminary testing" of samples of soybeans, corn, milk and eggs.

Facts supplied by the Washington Friends of Farms & Forests.



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