

## Pulse Crop Health Initiative Funded Projects – Fiscal Year 2020

### ***Breeding Projects***

#### **MP3: More protein, more peas, more profit**

FY20 Funding: \$97,653

Clare Coyne (PI), USDA-ARS, Pullman, WA

Rebecca McGee, USDA-ARS, Pullman, WA

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

FY20 Funding: \$78,149

Shawn Kaeppler (PI), University of Wisconsin, Madison, WI

#### **Enhancing the nutritional and functional traits of dry bean through metabolomics, genetics, and breeding**

FY20 Funding: \$217,026

Phil McClean (PI), North Dakota State University, Fargo, ND

Juan Osorno, North Dakota State University, Fargo, ND

Karen Cichy, USDA-ARS, East Lansing, MI

James Harnly, USDA-ARS, Beltsville, MD

Phillip N. Miklas, USDA-ARS, Prosser, WA

#### **Improved short season cowpeas and development of unmanned aerial system (UAS) and other phenotyping tools to advance pulse breeding**

FY20 Funding: \$74,720

Seth Murray (PI), Texas A&M University, College Station, TX

Bir B. Singh, Texas A&M University, College Station, TX

#### **Improving the nutritional value of chickpeas**

FY20 Funding: \$88,000

George Vandemark (PI), USDA-ARS, Pullman, WA

Dilrushki Thavarajah, Clemson University, Clemson, SC

#### **Developing the next generation of flavonoid enhanced dry beans**

FY20 Funding: \$150,283

Phil McClean (PI), North Dakota State University, Fargo, ND

Juan Osorno, North Dakota State University, Fargo, ND

Ray Glahn, USDA-ARS, Ithaca, NY

Phillip N. Miklas, USDA-ARS, Prosser, WA

### ***Sustainability Projects***

#### **Increasing nitrogen fixation potential in pulses for environmental and economic sustainability**

FY20 Funding: \$85,830

Clain Jones (PI), Montana State University, Bozeman, MT

Kevin McPhee, Montana State University, Bozeman, MT  
Perry Miller, Montana State University, Bozeman, MT  
Scott Powell, Montana State University, Bozeman, MT

**Optimizing nodulation in chickpea for enhanced nitrogen fixation**

FY20 Funding: \$24,873

Audrey Kalil (PI), North Dakota State University, Williston Research Extension Center, Williston, ND  
Nonoy Bandillo, North Dakota State University, Fargo, ND

**Field experiments to incorporate pulse crops in cropping systems and assess soil health and plant water use efficiency**

FY20 Funding: \$88,430

Zachary Kayler (PI), University of Idaho, Moscow, ID  
Xi Liang, University of Idaho, Moscow, ID

**Using native rhizobia to improve salt-tolerance in field pea**

FY20 Funding: \$68,617

Christopher Graham (PI), South Dakota State University, Rapid City, SD  
Sen Subramanian, South Dakota State University, Brookings, SD

**Sustainable field pea cropping systems for the Great Plains**

FY20 Funding: \$86,251

Kraig Roozeboom (PI), Kansas State University, Manhattan, KS  
Lucas Haag, Kansas State University, Manhattan, KS  
Augustin Obour, Kansas State University, Manhattan, KS  
Ignacio Ciampitti, Kansas State University, Manhattan, KS  
Zach Stewart, Kansas State University, Manhattan, KS  
John Holman, Kansas State University, Manhattan, KS

**Sustainability and health impact assessment of US pulses**

FY20 Funding: \$72,800

Greg Thoma (PI), University of Arkansas, Fayetteville, AR  
Naomi Fukagawa, USDA-ARS, Beltsville, MD  
Peter Arbuckle, USDA-ARS, Beltsville, MD

**Assessment of soil health and nitrogen economy in lentil and pea cropping systems**

FY20 Funding: \$28,683

Audrey Kalil (PI), North Dakota State University, Williston Research Extension Center, Williston, ND  
Frankie Crutcher, Montana State University Eastern Agricultural Research Center, Sidney, MT

**Winter peas in the wheat-fallow region of the Pacific: Benefits to soil health and cropping systems**

FY20 Funding: \$72,647

Timothy Paulitz (PI), USDA-ARS, Pullman, WA  
William Schillinger, Washington State University, Lind, WA  
Jeremy Hansen, USDA-ARS, Pullman, WA

**Carbon footprint and greenhouse gas emissions under no-till pulse cropping systems**

FY20 Funding: \$100,000

Upendra Sainju (PI), USDA-ARS, Sidney, MT

***Food Technology Projects***

**Optimization in the production of protein hydrolysates from chickpea as novel functional food ingredients in the prevention of type-2 diabetes**

FY20 Funding: \$68,589

Elvira de Mejia (PI), University of Illinois, Urbana, IL

**Tailoring processing strategies to produce the new generation of chickpea proteins and prebiotic oligosaccharides**

FY20 Funding: \$90,000

Juliana Maria Leite de Moura Bell (PI), University of California, Davis, California

Daniela Barile, University of California, Davis, California

David Mills, University of California, Davis, California

**Flavor, nutrition and functional properties of pea protein**

FY20 Funding: \$107,262

Baraem (Pam) Ismail (PI), University of Minnesota, St. Paul, MN

**Impact of Storage on Functionality and Nutritional and Phytochemical Compositions of Pea, Lentil and Chickpea**

FY20 Funding: \$129,730

Clifford Hall (PI), South Dakota State University, Brookings, SD

Atanu Biswas, USDA-ARS National Center for Agricultural Utilization Research, Peoria, IL

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

FY20 Funding: \$99,250

Sean Liu (PI), USDA-ARS, Peoria, IL

Mukti Singh, USDA-ARS, Peoria, IL

Devin Rose, University of Nebraska, Lincoln, NE

Amanda Ramer-Tait, University of Nebraska, Lincoln, NE

Andrew Benson, University of Nebraska, Lincoln, NE

**Optimizing pulse protein functionality**

FY20 Funding: \$79,180

Michael Colle (PI), University of Idaho, Moscow, ID

Girish Ganjyal, Washington State University, Pullman, WA

**Improving pulse protein properties for expanded functionality using naturally derived polymeric polyphenols**

FY20 Funding: \$90,000

Joseph Awika (PI), Texas A&M University, College Station, TX

Audrey Girard, Texas A&M University, College Station, TX

Miara Riaz, Texas A&M University, College Station, TX

**Development of meat analogues with germinated pulse protein extracts**

FY20 Funding: \$76,520

Bingcan Chen (PI), North Dakota State University, Fargo, ND

Minwei Xu, North Dakota State University, Fargo, ND

**Effects of extraction methods on lentil and dry beans extract composition and structural modifications: from extraction efficiency, functional and biological properties to fouling of industrial UHT equipment**

FY20 Funding: \$99,902

Juliana Maria Leite de Moura Bell (PI), University of California, Davis, California

Daniela Barile, University of California, Davis, California

David Mills, University of California, Davis, California

**Effects of roasting parameters on the functional and organoleptic properties of lentil flours**

FY20 Funding: \$72,458

Girish Ganjyal (PI), Washington State University, Pullman, WA

Rebecca McGee, USDA-ARS, Pullman, WA

**Developing and utilizing functionally enhanced pulse proteins as novel food ingredients**

FY20 Funding: \$79,910

Yonghui Li (PI), Kansas State University, Manhattan, KS

Kadri Koppel, Kansas State University, Manhattan, KS

**Dough rheology, baking performance, and bread sensory quality of pulse-fortified whole wheat flours**

FY20 Funding: \$89,020

Yonghui Li (PI), Kansas State University, Manhattan, KS

Kaliramesh Siliveru, Kansas State University, Manhattan, KS

Kadri Koppel, Kansas State University, Manhattan, KS

**Thermal and nonthermal processing of pulse protein concentrates: Impact on functionality and nutritional value**

FY20 Funding: \$84,723

Carmen Moraru (PI), Cornell University, Ithaca, NY

Alexandra Hall, Cornell University, Ithaca, NY

***Human Health Projects***

**Pulse Resistant Starch: Interplay Between Processing, the Microbiome and Health**

FY20 Funding: \$69,063

Darrel Cockburn (PI), The Pennsylvania State University, University Park, PA

**Understanding the Pulse-Gut relationship and its role in modifying systemic inflammation and insulin sensitivity in humans**

FY20 Funding: \$214,347

Indika Edirisinghe (PI), Illinois Institute of Technology, Bedford Park, IL

Amandeep Sandhu, Illinois Institute of Technology, Bedford Park, IL

Britt Burton-Freeman, Illinois Institute of Technology, Bedford Park, IL

**Gut microbiota dependent and independent impacts of dietary pulses on pre- and postprandial metabolism and inflammation in overweight/obese humans**

FY20 Funding: \$56,164

Mary Miles (PI), Montana State University, Bozeman, MT  
Brian Bothner, Montana State University, Bozeman, MT  
Carl Yeoman, Montana State University, Bozeman, MT  
Seth Walk, Montana State University, Bozeman, MT  
Colleen McMilin, Montana State University, Bozeman, MT  
Wan-Yuan Kuo, Montana State University, Bozeman, MT  
Mark Greenwood, Montana State University, Bozeman, MT

**Comparative analysis of chickpea, dry pea, lentil and dry bean for human health traits**

FY20 Funding: \$99,311

Henry Thompson (PI), Colorado State University, Fort Collins, CO

**Mechanisms of dry bean mediated anti-obesogenic activity**

FY20 Funding: \$98,693

Henry Thompson (PI), Colorado State University, Fort Collins, CO

**Identifying the role of pulses in a healthful diet: Metabolomic signatures of dietary pulses and their benefits on cardiometabolic risk factors**

FY20 Funding: \$171,262

Brian Bennett (PI), USDA-ARS, Davis, CA  
John Newman, USDA-ARS, Davis, CA  
Francene Steinberg, University of California-Davis, Davis, CA

**Pulse consumption improves gut health, metabolic outcomes, and bone biomarkers of postmenopausal women**

FY20 Funding: \$83,138

Edralin Lucas (PI), Oklahoma State University, Stillwater, OK  
Brenda Smith, Oklahoma State University, Stillwater, OK  
Sam Emerson, Oklahoma State University, Stillwater, OK  
Jiangchao Zhao, University of Arkansas, Fayetteville, AR  
Guadalupe Davila-El Rassi, Oklahoma State University, Stillwater, OK

**Protective effects of dietary pulse flours on the transgenerational influence of maternal obesity**

FY20 Funding: \$157,064

Todd Rideout (PI), State University of New York at Buffalo, Buffalo, NY  
Michael Buck, State University of New York at Buffalo, Buffalo, NY  
Mulchand Patel, State University of New York at Buffalo, Buffalo, NY

**National consumer survey of pulse consumption and views**

FY20 Funding: \$56,487

Donna Winham (PI), Iowa State University, Ames, IA  
Mack Shelley, Iowa State University, Ames, IA  
Andrea Hutchins, University of Colorado, Colorado Springs, CO