

Pulse Crop Health Initiative Funded Projects – Fiscal Year 2021

Breeding Projects

MP3: More protein, more peas, more profit

FY21 Funding: \$97,813

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

Rebecca McGee, USDA-ARS, Pullman, WA

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

FY21 Funding: \$293,318

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

FY21 Funding: \$78,313

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

FY21 Funding: \$40,000

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

Dilrushki Thavarajah, Clemson University, Clemson, SC

Developing the next generation of flavonoid enhanced dry beans

FY21 Funding: \$174,101

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

Developing chickpea cultivars with radically improved nitrogen fixation rates

FY21 Funding: \$100,289

Douglas Cook (PI), University of California-Davis, Davis, CA

George Vandemark, USDA-ARS, Pullman, WA

Screening of field pea accessions for combined and superior drought-tolerance and enhanced nitrogen fixation in semi-arid climates

FY21 Funding: \$39,383

Donna Harris (PI), University of Wyoming, Laramie, WY

Jim Heitholt, University of Wyoming, Powell, WY

Quantifying, predicting, and parallelizing the examination of post-digestive properties of common beans

FY21 Funding: \$90,860

Christine Diepenbrock (PI), University of California-Davis, Davis, CA

Gail Bornhorst, University of California-Davis, Davis, CA

Li Tian, University of California-Davis, Davis, CA

Paul Gepts, University of California-Davis, Davis, CA

Travis Parker, University of California-Davis, Davis, CA

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

FY21 Funding: \$90,160

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

Shawn Kaeppler, University of Wisconsin, Madison, WI

Chickpea genetic improvement for drought and heat stress resilient grain yield

FY21 Funding: \$46,296

Ramachandra V. Penmetsa (PI), University of California-Davis, Davis, CA

Sustainability Projects

Optimizing nodulation in chickpea for enhanced nitrogen fixation

FY21 Funding: \$24,348

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

FY21 Funding: \$99,243

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

FY21 Funding: \$68,617 (provided in FY20)

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

Sen Subramanian, South Dakota State University, Brookings, SD

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

FY21 Funding: \$49,439

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

FY21 Funding: \$75,224

Timothy Paulitz (PI), USDA-ARS, Pullman, WA

William Schillinger, Washington State University, Lind, WA

Jeremy Hansen, USDA-ARS, Pullman, WA

Sustainable field pea cropping systems for the Great Plains

FY21 Funding: \$87,001

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

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

FY21 Funding: \$100,000

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

Replacing fallow and cover crops with field pea and chickpea in the semi-arid northern high plains: impacts on production and sustainability

FY21 funding: \$119,000

Carrie Eberle (PI), University of Wyoming, Laramie, WY

Cody Creech, University of Nebraska-Lincoln, Scottsbluff, NE

Bijesh Maharjan, University of Nebraska-Lincoln, Scottsbluff, NE

Understanding environmental controls on pea protein

FY21 Funding: \$91,129

Perry Miller (PI), Montana State University, Bozeman, MT

Samuel Koeshall, Clain Jones, Kevin McPhee, Montana State University, Bozeman, MT

Andrea Basche, University of Nebraska-Lincoln, Lincoln, NE

Peggy Lamb, Montana State University, Havre, MT

Mike Ostlie, North Dakota State University, Carrington, ND

Audrey Kalil, North Dakota State University, Williston, ND

Nancy Ehlike, University of Minnesota, St. Paul, MN

Food Technology Projects

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

FY21 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

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

FY21 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

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

FY21 Funding: \$123,328

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

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

Optimizing pulse protein functionality

FY21 Funding: \$80,578

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

FY21 Funding: \$120,000

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

FY21 Funding: \$71,500

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

Minwei Xu, North Dakota State University, Fargo, ND

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

FY21 Funding: \$84,976

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

FY21 Funding: \$81,887

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

Kadri Koppel, Kansas State University, Manhattan, KS

Pulse-fruit aggregate ingredients with enhanced taste, functionality and health attributes for diversified food applications

FY21 Funding: \$67,697

Mary Ann Lila (PI), North Carolina State Univ., Plants for Human Health Institute, Kannapolis, NC

Roberta Hoskin, NCSU, Plants for Human Health Institute, Kannapolis, NC

Marvin Moncada, NCSU, Plants for Human Health Institute, Kannapolis, NC

Slavko Komarnytsky, NCSU, Plants for Human Health Institute, Kannapolis, NC

Haotian Zhang, NCSU, Plants for Human Health Institute, Kannapolis, NC

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

FY21 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

FY21 Funding: \$79,915

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

Supercritical fluid extrusion for improvement of flavor and functionality of pulse flours and protein concentrates

FY21 Funding: \$46,088

Syed Rizvi (PI), Cornell University, Ithaca, NY

Human Health Projects

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

FY21 Funding: \$67,358

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

FY21 Funding: \$279,065

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

FY21 Funding: \$125,516

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

FY21 Funding: \$99,643

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

Mechanisms of dry bean mediated anti-obesogenic activity

FY21 Funding: \$98,870

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

Effects of pulse consumption on maternal and child health

FY21 Funding: \$100,052

Xiaozhong Wen (PI), State University of New York at Buffalo, Buffalo, NY
Todd Rideout, State University of New York at Buffalo, Buffalo, NY

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

FY21 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

FY21 Funding: \$82,777

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

FY21 Funding: \$158,639

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

FY21 Funding: \$28,418

Donna Winham (PI), Iowa State University, Ames, IA

Mack Shelley, Iowa State University, Ames, IA

Andrea Hutchins, University of Colorado, Colorado Springs, CO

Human pulse consumption, the microbiome, and meal satiety

FY21 Funding: \$95,795

Katherine Anguah (PI), University of Missouri, Columbia, MO

Elizabeth J. Parks, University of Missouri, Columbia, MO

Aaron Ericsson, University of Missouri, Columbia, MO

Using pulse resistant starch to ameliorate aging-associated dysbiosis of the gut-microbiome-brain axis

FY21 Funding: \$98,949

Ravinder Nagpal (PI), Florida State University, Tallahassee, FL

Prashant Singh, Florida State University, Tallahassee, FL

Bahram Arjmandi, Florida State University, Tallahassee, FL