Speakers

Molly McLaughlin – CSU Ph.D. Graduate Student

Molly is a Ph.D. graduate student in the Civil and Environmental Engineering Department at Colorado State University in Fort Collins. She received her Master’s degree in Civil and Environmental Engineering from CSU in 2016 and a Bachelor’s of Science degree in Chemical and Bimolecular Engineering from the Georgia Institute of Technology in 2011. Molly is interested in researching the chemical, hydrologic, and biological processes of ecosystems (soil and water) impacted by resource extraction and changes in land use. Her current research aims to understand the environmental fate and transport of hydraulic fracturing chemicals released to the environment. Prior to starting graduate school, Molly worked at the non-profit Energy Efficient West Virginia in Charleston, WV.

Molly is one of the founding members of the Northern Colorado Graduate Women in Science, a group that works to encourage and support women to enter and achieve success in science engineering. She is also a mentor in the PROmoting Geoscience Research, Education and SuccesS (PROGRESS) program. In her free time, Molly enjoys trail running, gardening and hiking with her dog.

Dr. Joe Brummer – CSU Professor and Extension Specialist

Dr. Brummer has worked for CSU since 1994, first at the Mountain Meadow Research Center in Gunnison for 12 years conducting research and extension programs in the area of high elevation forage and livestock production. I then moved to the main campus in Fort Collins in 2006. I currently have statewide responsibilities in the area of forage production and management with 45% of my time dedicated to research, 35% to extension outreach activities, and 20% to teaching.

Rick Novak – Director of Colorado Seed Program and Extension Specialist

Rick is the Director of Colorado Seed Programs. He is the Manager of the Colorado Seed Growers Association and provides leadership and oversight the Managers of Seed Certification, Agronomy Foundation Seed, and the Colorado Seed Lab. He is involved in several seed education projects including the Seed Technology Education Committee that coordinates eight on-line seed education related courses through Colorado State University. He collaborates with the Colorado Department of Agriculture on seed related topics that affect Colorado agriculture. He is also actively involved in the Association of Seed Certifying Agencies (AOSCA) that was organized in 1919 that is composed of seed certifying agencies in the United States and Canada.

Rick attended North Dakota State University where he received a B.S. in Soil Science with a minor in Crop Science. Prior to being hired as the Director of Seed Programs at Colorado State University, he was with Syngenta for 10 years as the Production and Supply Manager for North America Cereals. Before coming to Colorado, Rick worked for North Central Research Extension near Minot, North Dakota as the Seed Production Specialist.

Dr. Louise Comas – Research Scientist USDA-ARS
Dr. Comas received her PhD from Penn State University, and held research faculty positions at Penn State and UC Davis before joining the USDA-ARS Water Management Research Unit in Fort Collins, CO in 2011 as a Plant Physiologist. Her research focuses on plant physiological responses to seasonally-distributed water deficits (maize and sunflower). In addition to investigating shoot growth, canopy structure and water use, she has a background working with plant root traits, root function, and synchronization with aboveground growth.

**Dr. Kirk Broders – CSU Assistant Professor and Extension Specialist**

Dr. Broders is an Assistant Professor of Plant Pathology at Colorado State University. Since arriving at CSU in August of 2015, Dr. Broders has focused on developing integrated disease management strategies for grain crops, including barley, corn and wheat, in Colorado. The lab has focused on developing improved models for predicting the spread and disease severity of the stripe rust pathogen, *Puccinia striiformis*. They have also been developing a genome-enabled surveillance system to facilitate rapid response to new races of *P. striiformis* in North America. Dr. Broders was also a faculty member at the University of New Hampshire for 3.5 years prior to joining CSU. His research there focused on the ecology and evolution of invasive and emerging plant pathogens. Most recently the Broders lab has been focusing on developing fundamental knowledge on the ecology and epidemiology of the bacterial leaf streak pathogen *Xanthomonas vasicola pv. vasculorum*, which was reported to infect corn in the U.S. for the first time in 2016. Dr. Broders received his B.Sc. in Biology from the University of Nebraska-Lincoln and his Ph.D. from Ohio State University.

**Dr. Frank Peairs – CSU Professor and Extension Specialist**

Dr. Peairs has worked at Colorado State University since 1983, with extension, research and teaching responsibilities in management of arthropod pests of Colorado field crops. His research currently is transitioning from management of Russian wheat aphid, *Diuraphis noxia*, and brown wheat mite, *Petrobia latens*, in winter wheat, to wheat stem sawfly, *Cephus cinctus*. I also have some limited effort in the management of corn spider mites and other pests associated with water-limited cropping systems. Dr. Peairs’ extension programming targets arthropods affecting small grains, corn, alfalfa, dry beans and sunflowers.

**Justin Herman – DuPont/Pioneer Technical Sale Agronomist**

Justin serves as the crop protection expert for DuPont-Pioneer employees and customers residing in 48 counties spanning across SE Wyoming, NE Colorado, Western Nebraska and NW Kansas. As a Technical Sales Agronomist, he works directly with DuPont-Pioneer customers and crop consultants to assist them in building pest management programs that not only achieve their crop production goals, but programs that promote sound agronomic principles and good stewardship of the land and pesticide technologies available.

Prior to his employment with DuPont Crop Protection, Justin held positions as an Agriculturalist for The Western Sugar Cooperative and Research Associate for Colorado State University.

Justin received his Bachelor of Science in Agronomy from Colorado State University and a Master of Science degree in Soil Fertility from Kansas State University.

**Dr. Maysoon Mikha, Research Scientist USDA-ARS**

Dr. Mikha received her PhD from Kansas State University and has been working as a Soil Scientist at the USDA-ARS in Akron, CO since 2003. Her research focuses on soil health evaluation (physical, chemical, and biological properties), soil organic matter dynamic with different management practices in the central Great Plains Region. She also has an extended research experience on carbon and nitrogen mineralization rates in dryland conditions, soil aggregation and particulate organic matter (POM), remediation of eroded soil using organic amendments and on the effect of crop residue removal on soil health and sustainability.

**Dr. Reagan Waskom – Director of the Colorado Water Institute**

Dr. Waskom currently serves as the Director of the Colorado Water Institute and the Chair of the Colorado State University Water Center. Dr. Waskom is a member of the Soil & Crop Sciences department at CSU, where he has worked on various
water related research and outreach programs for the past 30 years, conducting statewide educational and applied research programs on water quality, water quantity, water policy and natural resource issues related to water use. In addition, Dr. Waskom provides oversight for the CSU Extension Water Outreach program and personnel. Dr. Waskom’s current research emphasis is on the integrated use of surface and groundwater, the impacts of shale gas development on water resources, and agricultural water conservation in the Colorado River basin and Ogallala Aquifer.

Dr. Chad Godsey – Owner of Godsey Precision Ag

Dr. Godsey was born and raised on a farm and ranch near Wray in northeastern Colorado. After graduation with a PhD in 2005 he went to work at Oklahoma State University as a Cropping System Specialist in the Department of Plant and Soil Sciences. He served as the State Specialist for most of the oilseeds produced in the state. Most of his research and extension efforts were focused on increasing the efficiency of crop production through use of technology, no-tillage, and crop rotation. In 2013, he started Godsey Precision Ag in an effort to help producers better utilize precision agriculture technologies in the Great Plains and to increase their profitability.

Dr. Raj Khosla – CSU Professor and Extension Specialist

Dr. Khosla is Professor of Precision Agriculture at Colorado State University (CSU). In 2012, Dr. Khosla was named the Jefferson Science Fellow by the National Academy of Sciences. Earlier in 2008, he was named the Colorado State University Monfort Professor.

His main focus has been on “Management of in-field soil and crop spatial variability using innovative technologies for variable rate precision nutrient and water management.

He has co-authored over 300 publications (book chapters, refereed journal articles, extension articles, proceedings, bulletins, reports, popular press articles, digital media, and others) and has been successful in generating over $10 million of funding (as a PI and Co PI) from federal, state, private and international agencies.

He is the Fellow of American Society of Agronomy; Fellow of Soil Science Society of America; Fellow of Soil and Water Conservation Society and Honorary Life Fellow of International Society of Precision Agriculture. Dr. Khosla is the Founder and was the First-President of the International Society of Precision Agriculture.

Russell French – DuPont/Pioneer Strategic Account Manager

Russell French has BS in Agriculture from Kansas State University. Also, he is a Certified Crop Advisor (CCA) with 40 year experience in irrigated and dryland production agriculture in the High Plains. He worked 16 years in consulting and management at Servi-Tech in southwest Kansas. He joined Pioneer Hi-Bred as an Account Manager in Texas and Oklahoma panhandles, NW New Mexico, and SW Colorado in 1992. Currently, he is a Strategic Account Manager working directly with large Pioneer customers located in the High Plains, sales, product placement, and agronomic support of Pioneer Sales Reps and Account Managers with these large growers. He resides in Amarillo TX.

Troy Bauder – CSU Extension Specialist

Troy is an Extension Water Quality Specialist in the Department of Soil and Crop Sciences at Colorado State University. He is responsible for conducting statewide educational and applied research programs on water quality, especially related to protection of groundwater quality from impairment to agricultural chemicals. Research and outreach expertise include nutrient and irrigation management, particularly as related to water quality and conservation. Troy received his B.S. degree in Agronomy and his M.S. in Soil Science from Colorado State University. He is actively involved in the family farm in northeast Colorado.

Joel Schneekloth – CSU Extension Specialist

Joe is the Regional Water Resource Specialist for Colorado State University. Joel has been with Colorado State University since 2000. Prior to that, he held a Water Resource Extension Educator position with the University of Nebraska. Joel conducts research and educational programs relating to irrigation and crop production with a primary emphasis upon limited
water supplies. He has conducted research and education programs on drought tolerant corn, tillage and residue management for irrigated corn production, irrigation timing impacts on crop production.
Presentation Summaries

**Molly McLaughlin** - Fate of Hydraulic Fracturing Chemicals Released to Soil and Water Ecosystems

This talk will discuss the degradation (if any) and movement of hydraulic fracturing chemicals that are released to the environment. Additional focus will be given to the environmental fate of hydraulic chemicals that have been injected downhole, and therefore released with produced water. Finally, the impacts of these releases for soil health, crop growth and plant uptake will be discussed as well as the potential for groundwater contamination.

**Dr. Joe Brummer** - Alfalfa and Grass Forage Fertility: Considerations for Improving Your Bottom Line

My presentation will cover fertility considerations for both alfalfa and grass hay production. Topics to be covered include soil testing to determine what nutrients need to be applied, rates and timing of application, differences among fertilizer sources, ways to minimize urea volatilization, and some basic economics of whether it pays to fertilize or not.

**Dr. Louise Coma** - Adapting water management to water scarcity

Improving crop water management continues to be a major need throughout Colorado and adjoining states. Research will be presented on strategic ways to apply deficit irrigation to maintain current yields while providing significant savings in crop water use.

**Rick Novak** - Can Industrial Hemp be an alternative crop on my farm?

Farmers are continually looking for more profitable alternatives for their farm operations. Industrial hemp is a form of *Cannabis sativa* that contains less than 0.3% THC (delta-9 tetrahydrocannabinol). The crop may fit as a sustainable product for some farmers. Hemp is one of the oldest and most useful crops known to man and can be used to make many different products (including paper, textiles, food and fuel). This crop is one example that shows the benefits of growing certified seed. During my presentation, I will review many aspects of this crop: the crop definition, state and federal regulations, certified seed, fertility, weed control, diseases, insects, harvesting, as well as the marketing of the seed and fiber of this crop.

**Dr. Kirk Broders** - Update on Bacteria Leaf Streak of Corn caused by *Xanthomonas vasicola*

The presentation will focus on updating the attendees on our current understanding of the distribution and potential impact of the new corn disease bacterial leaf streak caused by *Xanthomonas vasicola* pv. *vasculorum*.

**Dr. Frank Peairs** - Current Issues in Field Crop Entomology

The presentation will address three current issues in Colorado field crops: wheat stem sawfly, sugarcane aphid, and alfalfa weevil. Wheat stem sawfly field biology, management and distribution in the state will be reviewed and updated. Sugarcane aphid is a new problem on grain and forage sorghum, whose pest potential in Colorado is still unknown. Its field biology
and management will be reviewed. Finally, recent chemical control difficulties with alfalfa weevil, a traditional pest of alfalfa in Colorado, will be discussed.

**Justin Herman - DuPont Zest™ herbicide: A New Grass Control Option for DuPont™ Inzen™ grain sorghum**

Zest™ herbicide + Inzen™ traited grain sorghum provides the first post emergence grass control system in grain sorghum. Stewardship requirements will be met to grow Inzen™ grain sorghum and use Zest™ herbicide. Studies have shown consistent and effective weed control is obtained with a planned program of a soil applied broad spectrum herbicide followed by post emergence Zest™ plus a broadleaf tank mix partner.

**Dr. Maysoon Mikha - Soil Health and Soil Management in the Great Plains Region**

Taking the Native American Proverb “We do not inherit the earth from our ancestors, we borrow it from our children” to heart, gives us good incentive to care about soil health, the foundation of our existence. Soil health is defined as the soil capacity to sustain plant production, perform as an active living system, support animal health and their productivity, preserve and/or improve air and water quality, and ultimately support human needs. Soil health is also known as soil quality, with more emphasis on the soil biological component and its rule on soil nutrient dynamics. Soil organic matter considers a foundation of sustainable agriculture and is influenced by management practices. High soil organic matter content could improve soil function, diversity, and health through its positive influence on soil chemical, physical, and biological properties. The majority of soil organic matter is associated with the surface soil layer, the first couple of inches, and could be susceptible to loss through wind or water erosion, excessive tillage, and drought conditions. In the Great Plains Region, management practices that replenished soil organic matter through maintaining surface crop residue, utilizing organic amendments as a nitrogen source, eliminating tillage practices, and reducing fallow frequency have been found to increase soil organic matter, improve soil microbial diversity, and enhance grain yield. Multi-disciplinary collaboration is necessary to maintain healthy soil, reduce soil degradation, and enhance soil sustainability.

**Dr. Reagan Waskom - Ag Water Conservation - Is Use It or Lose It a Concern?**

Water rights in Colorado are based upon the principle that a water right is a legal right to beneficially use a portion of the public’s water without waste or speculation (termed a usufructuary right). The term “use it or lose it” is commonly associated with the incorrect belief that by maximizing the amount of water diverted, regardless of the need, one can enhance or preserve the magnitude of a water right in a future transfer or protect it from some other reduction. Efforts to reduce diversions for conservation or efficiency purposes raise a similar concern for some people: that in reducing the amount of water diverted, some portion of the water right may be lost. Because of this, “use it or lose it” is commonly seen as a barrier to implementing water conservation measures and efficiency improvements. In an effort to better understand how the term “use it or lose it” is being used and under what circumstances the term is being used accurately and where it is being used erroneously, CWI convened a twenty member stakeholder group composed of experts to analyze Colorado statute and administration on the topic and agreed on major points that could be made in educational materials to clarify what the law has to say about “use it or lose it.” The talk will cover the law in the context of Ag water conservation and efficiency.

**Chad Godsey - How Does Soil Sampling and Fertilizer Recommendations Play a Role in Today’s Precision Ag?**

The presentation will focus on understanding the basic approaches of fertilizer recommendations and soil sampling. Often times in today’s high-tech farming world these “old technologies” are over-looked but these items have a big impact on producer’s profitability. We will also briefly discuss how these items fit into today’s precision ag playing field.

**Dr. Raj Khosla - Mapping Variability for Precision Irrigation**

Precision Agriculture has been around for over two decades. The first decade had a strong focus on quantifying spatial variability in soils, the second decade spent significant time on science and technology of precision management of nutrients. Now, with increasing adoption of Precision management techniques and practices there is interest in expanding the concept of Precision Agriculture to other major inputs (water, seeds, pesticides, etc.) How do we extend the concept across the board? Is technology available to achieve desired results? What about science? Do we have a consensus on managing variable rate irrigation in spatially variable soils? This presentation will share the findings of on-going work at Colorado State University on precision irrigation systems and science.
Russell French - High Yield Irrigated Corn: Implementing Research and Adapting for Profitable Production

Irrigated corn producers on the High Plains are frequently confronted with issues that affect the profitability of their operations. The rapid adoption of new methods and technologies that preserve profitability is important for the economic sustainability of High Plains farmers. Traditional research is one method of identifying best management practices that may improve grower productivity and profitability. However, dissemination and implementation of research across broad geographies can be challenging. The scientific method often precludes investigation across a diverse set of variables common within and across farms. Private industry can augment implementation of scientific methods identified as profitable best management practices by employing resources necessary for wide scale spatial and temporal demonstrations. Furthermore, these investigations can be instrumental in prompt identification of processes and practices that improve producer efficiencies and/or profitability. The work and investigations summarized in this paper will demonstrate the use of spatial and temporal observations to identify best management practices for multiple nitrogen (N) applications through corn development. Also, the extension of university research on P and K starter fertilizer and its adoption and implementation by growers will be discussed.

Troy Bauder - Water Quality in the South Platter River: Nitrate Content, History, Trends and Possible Sources

The presentation will be about groundwater quality in the South Platte River with an emphasis on nitrate concentration, history, trends and potential sources.

Joel Schneekloth - Influences of Tillage and Residue Management with Irrigated Corn Production

Tillage and residue management are important in irrigated management as water supplies become constrained. Under a current project at Akron, tillage and residue management are being investigated on the impact of water and nutrient management. Along with production measurements, impacts to soil water infiltration, soil water usage and soil biology are being measured.