The goal of this monthly newsletter is to serve the best interests of Idaho crop producers. Correspondence and inquiries should be addressed to: Olga Walsh, Cropping Systems Extension Specialist, Southwest Research and Extension Center, 29603 U of I Lane, Parma, ID 83660, Phone: (208)722-6701 (ext. 218), Fax: (208)722-6708, Email: owalsh@uidaho.edu

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University of Idaho Extension improves people’s lives by engaging the University and our communities through research-based education. Our areas of expertise are Agriculture, Community Development, Family and Consumer Sciences, Natural Resources, and Youth Development.

To enrich education through diversity the University of Idaho is an equal opportunity/affirmative action employer and educational institution.
WHAT’S NEW?

Small grains harvest at Parma R&E Center

Cropping Systems team at UI Parma R&E Center has completed the small grain harvest for this year! We’ve had a few great experiments that:

- evaluated wheat and barley variety performance in SW Idaho,
- investigated nitrogen and water demand of wheat for optimum yield and quality,
- accessed effect of micronutrient application on wheat production,
- evaluated subsurface drip irrigation efficacy in wheat for yield, quality and water use efficiency,
- evaluated micronutrient seed treatments on wheat performance, and
- accessed the efficacy of amendments for greater efficiency of phosphorus fertilizers.

Most experiments were harvested with a Massey Ferguson small plot combine harvester.

Olga Walsh, Cropping Systems Agronomist and Extension Specialist, UI Parma R&E Center, and Arjun Pandey, are collecting the by-plot wheat grain samples. Photos by Jordan McClintick and Olga Walsh.

We also conducted nitrogen and phosphorus-response experiments for developing yield potential prediction equations and precise fertilizer application guidelines in wheat.

Kelli Belmont, Cropping Systems Research technician, UI Parma R&E Center, is briefing the team - Jordan McClintick, Arjun Pandey and Tyler Renton - on harvests procedures. Photo by Olga Walsh.

Jordan McClintick and Kelli Belmont are hand harvesting the small wheat plots from the nitrogen response study. Photo by Olga Walsh.
Time to thank collaborators!

The Cropping Systems program at UI Parma R&E Center is grateful to the following sponsors and collaborators for supporting our research and extension efforts:

- **The UI Parma R&E Center**’s farm crew: Craig Robinson, Kevin Sparks, Kent Wagoner, and Dave Ballou
- Growers-collaborators: Mike Goodson and Eric Jemmett + family
- The **Idaho Bean Commission**: especially Andi Wolf, Don Tolmie, and Mike Goodson
- The **Idaho Wheat Commission**: the Commissioners and Cathy Wilson
- The **Idaho Barley Commission**: the Commissioners and Kelly Olson
- **The Mosaic Company**: Kiran Mann and Kyle Freeman
- **The J. R. Simplot Company**: Terry Tindall and Galen Mooso
- **The Bio Huma Netics Inc.**: Rita Abi-Ghanem
- **AgXplore International**: Brandon McMillan
- **The Fluid Fertilizer Foundation**: Dale Leikam
- Take Flight UAS, LLC: Craig Thompson and **Kristin Swoboda**

- **Western SARE**: Kristi Jensen, Kim Anderson, and Teryl Roper
- **Idaho State Department of Agriculture**: Amanda Gibson
- **The Clearwater Supply**: Jim Klauzer
- Special thank you goes to my team: **Kelli Belmont and Jordan McClintick** - you are appreciated and valued!
- All the **UI faculty, staff, administrative and technical support**, who has collaborated and helped in many different ways to make the Cropping Systems program run smoothly - **Thank you!**

**Parma Cropping Systems - big plans for next year**

The UI Parma RSE Center’s Cropping Systems program is expanding quickly to incorporate more comprehensive agronomy and precision agriculture research in crops like winter and spring wheat, barley, dry beans, alfalfa, mustard, corn, safflower, green peas, and cover crops like radish and teff.

We will continue variety evaluations, investigating nitrogen and water use efficiency in cereals, the effect of
micronutrients (seed treatments and foliar products) on wheat yield and quality, and the nitrogen and phosphorus response studies.

We are initiating a silica response study in winter wheat and a micronutrients evaluation in alfalfa hay at UI Parma and Kimberly R&E Centers. We are also establishing a water/nitrogen and tillage/herbicide study in dry beans, replicated at Parma and Kimberly, and in a cooperating grower’s field in Notus, ID.

We are beginning year one (of three) of a crop rotation study - in collaboration with Montana State University, Oregon State University, and Washington State University - for investigating the economic and agronomic efficacy of biennial canola/mustard.

In collaboration with other University of Idaho faculty, as well as with Montana State University, and Idaho State University, we have several other exciting projects in review/anticipating funding, including:
- developing the monitoring/surveying crops for disease/pest damage utilizing the unmanned aerial vehicles (drones),
- aquaponics (complex production of fish and crops),
- and evaluation of cropping systems for mitigating water limiting growing conditions in the Pacific Northwest.

So 2015-16 will be a challenging and exciting cropping year for us! It’s been almost 1 whole year since I started my appointment at Parma and I’ve been very fortunate to have developed so many successful working relationships. I am truly grateful for all the support and the valuable networking opportunities at the University of Idaho.

University of Idaho to host the International Nitrogen Use Efficiency Conference in August 2016

I’ve been involved with the International NUE meeting since 2004, first - as a graduate student with Oklahoma State University, 2010-2014 – as a Soil Nutrient Management Specialist with Montana State University, and currently maintain the working connections with many meeting participants as a Cropping Systems Agronomist and Extension Specialist with the University of Idaho.

NUE Conference attendees, Fargo, ND, August 6-8, 2012. Photo by Dave Franzen.

The NUE conference started out as a small working group of Oklahoma State
University and the University of Nebraska, the USDA-ARS, and the International Maize and Wheat Improvement Center (CIMMYT), with the first meeting held in Lincoln, NE, in 1996. The legendary Drs. Bill Raun (OSU) and Jim Schepers (UN Lincoln, USDA-ARS) - the pioneers of precision agricultural research and development - were the main drivers behind this conference.

Initially designed as a workshop, discussions and presentations were built to address sensor-based methodologies for increased nitrogen use efficiency in crop production systems. In the past 20 years, the conference has grown to a well-attended international meeting held annually in the first week of August.

The scope of the conference has expanded from corn and wheat to a wide variety of other crops like cotton, sugar cane, forages, sorghum. The recent advances in the unmanned aerial technologies and the currently revised FAA regulations for utilization of the drones for agricultural research has also expanded the discussions at the conference over the years.

Participation and unique collaboration of agronomists, engineers, and extension outreach professionals has significantly strengthened the value and revolutionized the outcomes of the meetings. The conference resulted in many scientific breakthroughs and development of local and regional precision agriculture methodologies that growers around the world are utilizing today for sustainable crop production.

The next year’s meeting will be hosted in Boise, ID, by Dr. Olga Walsh’s Cropping Systems program, UI Parma R&E Center, in August 2016. We are expecting approximately 150 participants from over 40 research institutions, universities, leading agricultural industry, growers, and government agencies from all over the United States and abroad.

Holding the meeting in Idaho will provide an exceptional opportunity to showcase Idaho-based agricultural research, and to especially highlight our precision agriculture achievements. We will also utilize the meeting to conduct educational outreach events for Idaho crop producers. Student participation and presentations are highly encouraged and we anticipate conducting a student poster competition again next year.

NUE Conference attendees, Sioux Falls, SD, August 4-6, 2014. Photo by David Clay.

The scope of the conference has expanded from corn and wheat to a wide variety of other crops like cotton, sugar cane, forages, sorghum. The recent advances in the unmanned aerial technologies and the currently revised FAA regulations for utilization of the drones for agricultural research has also expanded the discussions at the conference over the years.
For more information of the NUE Conference, previously held meetings and attendees, please go to:

For overview of 2015 program and presented talks and student posters, please visit:

I will keep you updated on the 2016 conference. Are you working in the area of precision agriculture, sustainable crop production, remote sensing, crop nutrient management, utilizing the unmanned aerial systems for your agricultural or environmental research - please consider participating and encourage your students to attend and present their work!
Please contact me with any questions and suggestions at: owalsh@uidaho.edu.

Blog & Twitter update

Since January 2015, our Idaho Crops & Soils Blog has had visitors from 32 countries around the world, and from 37 U.S. states. Our visit counter is showing “485” as of today, 08-25-2015, but this is inaccurate due to a crash of the Sitemeter system this spring, which forced us to restart our visitor count in the end of March. The actual visitor count should be over 600.

- Visit our Blog and subscribe for updates!
- Growers are encouraged to submit questions related to cropping systems, nutrient management!

Our Twitter account (@IDCrops) has 60 followers since February 2015. We are following 159 agricultural organizations and research institutions associated with sustainable agriculture around the world. We posted 105 tweets so far spreading the word about our activities, achievements and upcoming events.

Follow us on Twitter! @IDCrops
Innovations that shaped precision agriculture revolution

This is a Part 2 (of 3) of this article that will feature several top technologies that revolutionized the way farming is done. The Part 1 came out in the Crops & Soils news, Issue 7 (July, 2015): The Part 2, I will focus on Automatic Steering and Planting Control, Active Crop Sensors, and Electric Conductivity.

- **Automatic Steering and Planting Control**

Many growers agree that the automatic steering was one of the first technologies that really caught their attention. The auto steering has made operating farm machinery easier, less tiring and dangerous by improving the driver performance and efficiency. Many complete lines of GPS guidance and assisted steering systems allow for incredible repeatable sub-inch RTK corrections. The EZ-Steer system turns the steering wheel automatically by combining a friction wheel and a motor with guidance from a GPS-display. The system allows completing field applications quickly and accurately; it enables growers to operate day or night and in dusty or low visibility conditions. In addition, the advanced terrain compensation equipped with sensors enable to calculate the precise position in the field which helps to minimize skips and overlaps, especially in areas with uneven terrain, slopes, and rough ground.


Automatic planting control allows turning planter sections on or off row-by-row according to maps and previously seeded passes. Automatic section control has been shown to save between 4.5 and 7% savings due to eliminating double planting and skips.

• **Active Crop Sensors**

![Image of Active Crop Sensors](http://www.nue.okstate.edu/VRT_rig_pictures.htm)

The sensor-based technology that has revolutionized the way many growers approach fertilizing their crops around the world has started in the 1990s at Oklahoma State University. The timeline of development and implementation of the GreenSeeker Sensor is outlined in detail in OSU Extension publication: “The History of the GreenSeeker™ Sensor”.

Initially, the sensors developed in 1989 were intended for detecting and spraying weeds. Later on, the sensor-based systems have been expanded to nutrient management. Currently, the crop sensors are utilized worldwide for a variety of farming operations, including detection of water limitation and nutrient deficiencies, accessing crop damage due to extreme weather conditions, pest infestations and disease.

A variety of crop sensors is currently available on the market. The benefits and utilization of sensor-based technologies and guidelines for crop sensor use can be found in UI Extension publication (BUL 896): “Nitrogen Management in Field Crops with Reference Strips and Crop Sensors”.

• **Electric Conductivity**

![Image of Electric Conductivity](http://www.veristech.com/)

The electric conductivity (EC) has been found useful in mapping in-field variability. It’s clear that it is difficult to variably manage crops without mapping that variability first. The efficacy of EC mapping has been promoted and commercialized by Veris Technologies since 1996. Soil characteristics such as soil texture, water-holding capacity, organic matter content, yield potential, nematode pressure, soil pH, can be accessed by measuring soil EC.

There are examples of successful utilization of soil EC information for variable-rate seeding, nutrient management and irrigation applications. Research has shown that soil EC measurements may be more useful in some regions than others. The
usefulness of soil EC knowledge for crop management is detailed in LSU Extension publication: "What is Soil Conductivity?"

GUEST CONTRIBUTION

Soil Test Comparison

- by Jim Ekins, Area Water Educator, UI Extension Northern District
GET TO KNOW ID AG
Focus On Dry Beans

University of Idaho Extension publications: "Crop Profile for Dry Beans in Idaho" and "Soil Fertility and Bean Production" showcase the importance of bean production for Idaho agricultural sector and detail the best management practices for successful and sustainable dry bean production.

Amber Moore, UI Extension Soil Specialist is discussing bean studies with Idaho Bean Commissioners Don Tolmie and Michael Goodson, UI Kimberly R&E bean field day, August 12, 2015. Photo by Olga Walsh.

Experimental research plots in a bean nutrient management study conducted at Shewmaker’s Farm, near Kimberly, ID. UI Kimberly R&E bean field day, August 12, 2015. Photo by Olga Walsh.

Bean researchers study nitrogen fertilizer options.
The Idaho dry bean production is split approximately as follows:

- **Pinto beans ~ 42%**
  - Appearance: medium ovals; mottled beige and brown
  - Flavor: earthy flavor, powdery texture
  - Culinary: closely related to red kidney beans; when cooked, lose natural mottling on skins and turn brown; most often used in refried beans, Tex-Mex, Mexican dishes
  - Try them in pinto bean applesauce raisin cookies or southwest lasagna.
  - Cooking Time: 1½ to 2 hours.

- **Pink beans ~ 17%**
  - Appearance: small, pale-pink; turn reddish brown when cooked
  - Flavor: rich, meaty with slightly powdery texture
  - Culinary: related to kidney beans; often used in chili; a favorite in Old West (U.S.) recipes
  - Try them in pink beans with chicken breasts, oranges & walnuts or cajun bean, corn & shrimp bisque.
  - Cooking Time: 1 hour

- **Small red beans ~12%**
  - Appearance: dark red color, similar to red kidney but smaller
  - Flavor: similar to red kidney
  - Culinary: also called Mexican red beans; hold both shape and firmness when cooked; most often used in soups, salads, chili, Creole dishes
  - Try them in kidney bean & cheesy rice casserole or shrimp & red beans creole.
  - Cooking Time: 1 to 1½ hours

- **Great Northern beans and**
  - Appearance: flat, kidney-shaped, medium-sized, white
  - Flavor: mild, delicate, take on flavors of other foods with which they’re cooked
  - Culinary: popular in France in cassoulet (a white bean casserole); in U.S., traditionally prepared as Boston baked beans
  - Try them in pasta with beans & greens or sage-roasted pork tenderloin with beans.
  - Cooking Time: 3/4 to 1 hour
• **Garbanzo beans ~8%**
  ✓ Appearance: beige to pale yellow
  ✓ Flavor: nutlike taste, buttery texture
  ✓ Try them in a grilled tuna & bean salad or make your own falafel.
  ✓ Culinary: called chickpeas; especially popular in Middle Eastern, Indian dishes — hummus, falafels, curries
  ✓ Cooking Time: 1 to 1½ hours

• **Black beans ~10%**
  ✓ Appearance: small ovals with deep black skins; dark-cream-to-gray flesh
  ✓ Flavor: mild, sweet, earthy; soft texture
  ✓ Culinary: sometimes called turtle beans; used in classic Latin American, Caribbean and Southwestern (U.S.) cooking in soups, stews, sauces
  ✓ Try them in black bean brownies or Mexican black bean and spinach pizza.
  ✓ Cooking Time: 1 to 1½ hours

• **Cranberry beans, and**
  ✓ Appearance: small rounded beans, ivory color with red markings that disappear on cooking
  ✓ Flavor: creamy texture; subtle, nut-like taste
  ✓ Culinary: a favorite in northern Italian, Spanish and Portuguese cuisines
  ✓ Try them in cranberry bean pizza.
  ✓ Cooking Time: 3/4 to 1 hour

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Information on appearance, flavor and cooking - from [US Dry Bean Council](#).

The Idaho Bean Commission’s web-site has a [list of over 25 Idaho bean dealers](#) and the basic information about their operations, contact information, and links to their web-pages.
Discover a variety of cool recipes that incorporate beans put together by the Idaho Bean Commission! The list includes everything from main dishes and appetizers to even beverages and desserts!

Idaho is renowned for production of exceptional quality bean seed. The seed quality is assured by rigorous quality control, which includes:

- Strict land eligibility regulations
- Seed source verification/traceability
- Intensive weed management
- Strict combine harvest cleanliness and care to prevent seed contamination and damage.
- Conditioning/using ICIA-approved plant or under direct supervision of an Idaho Crop Improvement Association (ICIA) representative.
- Laboratory testing to verify seed quality.