



# Elsberry Plant Materials Center 2015 Progress Report of Activities



*The Elsberry Plant Materials Center sits on approximately 215 acres along the Mississippi River bottoms in northeastern Lincoln County.*

## **National Study: Selected Cover Crop Adaptation Trial** *Study Leader: Ron Cordsiemon*

In 2015, the Elsberry Plant Materials Center (PMC) joined 21 other PMCs from across the country to evaluate growth characteristics and production attributes of commercially available varieties of selected cover crops. Eight species of cover crops were identified by the Plant Materials Program to be evaluated (crimson clover, red clover, balansa clover, hairy vetch, Austrian winter pea, black oats, cereal rye, and daikon radish). PMCs were given the option to implement replicated plots, replicated rows, or demonstration plots. The Elsberry PMC elected to evaluate seven of the eight selected cover crops and incorporate them into replicated plots, excluding cereal rye. Soil health and water quality are resource concerns directing the work performed at the center.

On September 24, 2015, the staff at the Elsberry PMC planted 39 varieties of the seven selected cover crops. Data collection varies depending on what type of study each PMC elected to do. The “replicated plot” study that Elsberry staff selected is looking at several variables for each variety or cultivar of cover crops. Evaluations will consist of germination and field emergence, spring green up, bloom and flowering time, plant height, disease and insect resistance,

# 2015



### Plant Materials Center Staff

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### Earth Team Volunteers

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**Nick Adams, Farm Foreman (kneeling), and Ben Bruckerhoff, WAE, take live plant counts from daikon radish plots**

winter hardiness, biomass, N content, and canopy cover. Dry weather delayed germination in most of the cover crops except daikon radish and Austrian winter pea. Both the winter pea and radish germinated and emerged from the soil within days of being planted.

### **Long Term Soil Health and Water Quality Demonstration**

Study Leader: Ron Cordsiemon

In Cooperation with Steve Hefner, WQ Specialist, Jorge Lugo-Camacho, State Soil Scientist, Mark Abney, Asst State Soil Scientist, Dr. Ranjith Udawatta, Univ. of MO

Beginning in August 2015, a group effort began looking at soil health attributes with regards to soil characteristics and water quality in a corn-soybean rotation using cover crops over an extended amount of time. The intended goals of this demonstration is to compare the effect of conventional tillage, no till, and no till with cover crops in a corn-soybean rotation by monitoring runoff in a designated watershed.



**Jorge Lugo-Camcho, State Soil Scientist (kneeling), Mark Abney, Asst. State Soil Scientist (red cap), and Nick Adams (PMC Farm Foreman) collect soil cores and bulk density samples from a corn field within the demonstration area**

The staff will also determine effects of treatments on water quality benefits, on crop agronomy, and on the environment. Other goals will be to quantify changes in soil health parameters among treatments and determine relationships between improvements in soil health and water quality parameters as influenced by treatments.

Assistance from Dr. Ranjith Udawatta allowed the PMC to secure three water quality monitoring structures. These structures are scheduled to be installed in early spring as weather permits. Baseline data will be collected over the course of the next two years and the overall demonstration is scheduled for approximately 10 years.

### **Warm Season Cover Crop Evaluation and Demonstration: Cover Crop Field Trial** *By Jerry Kaiser, Plant Materials Specialist*

At the Elsberry PMC, a field trial was conducted with mixtures of warm-season cover crops drilled on May 6, 2015. This field trial was to collect data on the potential of warm season cover crop mixtures. Individual species were evaluated for compatibility among other WS cover crops and how much biomass a species can produce within a mixture. The warm-season cover crop mixture was made up of the following species, each one representing 15% of the mixture. Cow Pea, Buckwheat, Forage Sorghum, Brown Mid-Rib (BMR), Grain Sorghum, Pearl Millet, Black-Oil Sunflower, and Trailing Soybean. All species were seeded according to NRCS Missouri 340 Cover Crop standard rates.

The species performing the best according to growth potential, high biomass, and ability to survive with other species in a mixture were Forage Sorghum, (BMR) Pearl Millet and Cow Peas. Cow Peas had the ability to tolerate the shading and upright vining growth

habitat that did well with the Forage Sorghum and Pearl Millet. Buckwheat provided quick cover, but was shaded out by the developing species mentioned. Grain Sorghum and Trailing (Bobwhite) Soybean did survive in the understory and produced seed but were minor components. The Black Oil Sunflower developed but was also shaded out with no viable seed being produced. A final biomass was harvested after a season ending frost in October. The overall average of standing biomass was 7.7 dry tons/acre for the five month growing season.



Forage Sorghum, Cow Peas and Pearl Millet the dominate species in that order produce the amount of 9.7 average dry tons of biomass on this date in August 25, 2015.

The time between the end of August and the end of October biomass decreased by 2 tons because of leaf drop and residue on the soil surface for some of the species.

### **PMC Hosts 3<sup>rd</sup> Annual Soil Health Workshop**

*Sponsored by Lincoln County SWCD, Univ. of Missouri Extension, and USDA-NRCS*

On November 5<sup>th</sup>, the Lincoln County Soil and Water Conservation District, University of Missouri – Extension, and the USDA-NRCS Elsberry Plant Materials Center held its 3<sup>rd</sup> Annual Soil Health Workshop. The day began by participants meeting at the Lincoln County Fairgrounds. Approximately 100 participants attended the event. Those who

braved the rainy weather were able to visit with sponsors and also view various types of equipment associated with no-till and soil health practices. The group then loaded up on two charter buses and traveled to the Ellis Farm in Silex. The group was able to see a highboy cover crop seeder operate and also a couple of different fields that were planted to cereal rye and oilseed radishes.



Jerry Kaiser, Plant Materials Specialist, leads a tour of the cover crop variety trial which gave participants a chance to see how different cover crops performed prior to going into the winter months

The event then moved to the Elsberry PMC, where despite some rain, participants were able to view over 40 different species of cover crops planted at five different dates beginning August 14 and planted every two weeks thereafter. Also, the tour included stops at the cover crop variety trial where seven selected species were being tested for several plant and performance characteristics.

During lunch at the PMC shop building Lauren Cartwright, NRCS Agricultural Economist, demonstrated a Cover Crop Economics Decision Support Tool. The remainder of the afternoon was engaged listening to farm owners who had incorporated cover crops into their farm management plan. The heavy rains prevented the group from visiting the farms scheduled in the afternoon. Overall, the day was a considered a success and a lot of valuable information was exchanged amongst the participants.

## Technology Transfer

### **Presentations**

- Cordsiemon, R.L. 2014. Introduction to the Plant Materials Program – Elsberry Plant Materials Center. Ellisville, MO. Center for Creative Learning.
- Cordsiemon, R.L. 2014. Drill Calibration and Seedbed Preparation. Lake of the Ozarks, MO. Tan-Tar-A Conference Center.
- Kaiser, J.U., Casey P.A. 10/2014, Conservation Planning, Plant ID Training; Univ. of Missouri, Bradford Farm, Columbia MO.
- Kaiser, J. U. 11/2014, Field Presentation on Cover Crop Species Demonstration Plots, Elsberry Plant Materials Center.
- Kaiser, J.U. 11/2014, Cover Crop Species Characteristics for Crop Consultants, Peoria, Illinois.
- Cordsiemon, R.L. 2015. Biological Control of Invasive Woody Species Using Small Ruminants. Lake of the Ozarks, MO. Tan-Tar-A Conference Center.
- Kaiser, J.U. 3/2015, Cover Crop Field Day, Stoddard County and New Madrid County, Missouri.
- Kaiser, J. U. 3/2015, Soil Health and Cover Crops, Cape Girardeau, Missouri.
- Cordsiemon, R.L. 2015. Introduction to USDA-NRCS and the Plant Materials Program. Chesterfield, MO. Chesterfield Valley Auto Museum.
- Kaiser, J.U. 6/2015, Cover Crops to improve soil health for resource concerns, National Walnut Council, Elsberry Plant Material Center.
- Cordsiemon, R.L., Kaiser, J.U. 2015. Walnut Council Conference and Tour. Elsberry, MO. Elsberry PMC and Forrest Keeling Nursery.
- Kaiser, J.U., Cordsiemon, R.L. 7/2015 Area 2 Missouri Plant Materials Update, Perry, Missouri.
- Cordsiemon, R.L., Adams, N.A. 2015. PMC Tour for SWCD Student Summer Employees. Elsberry, MO. Elsberry PMC.
- Kaiser, J. U. 7/2015, CenUSA Bioenergy, Madison, Wisconsin.

Kaiser, J. U. 8/2015, Saturation Tolerant Forage Crops, Agricultural Watershed Institute, Decatur, Illinois.

Cordsiemon, R.L., Kaiser, J.U. 2015. Soil Health Workshop. Elsberry and Troy, MO. Lincoln County Fairgrounds and the Elsberry PMC.

### **Publications**

Cordsiemon, R.L., Kaiser, J.U., Adams, N.A. 2015. Elsberry Plant Materials Center 2014 Progress Report of Activities.

Kaiser, J.U., On Farm Field Trials Using Cover Crops Years 2013-2014.

Kaiser, J.U., 2015 Seed and Woody Vendors of Elsberry Releases.

Kaiser, J.U., 2015 Foundation Seed Prices.

These and other publications can be accessed by going to the Plant Materials Website at <http://www.nrcs.usda.gov/wps/portal/nrcs/site/plantmaterials/home/>.



**Migrating ducks were feeding in one of the bottomland fields on the Elsberry PMC. They were feeding on leftover grain in a study plot where Charlie Ellis, Univ. of MO Extension, is evaluating nitrogen availability using selected cover crops. This photo was taken March 5, 2015.**