When It Rains, It Pours...And When It Doesn't

by Daniel J. Duncan, ARDC Director

I don't know about the rest of you, but this summer seems to be "pouring" everything but rain. Things have been so hectic at the ARDC that I feel like it should be the first of July rather than the first of August.

In June Gary Cross, the Director of Foundation Seed, informed me that he was resigning to take a job closer to his family. Gary will be working with Kansas State as an Extension Educator. Gary's last day was July 12. Since then, Bob Medjina Jr., Lisa Moravec and I have been working together to cover Gary's duties. Bob is the Foundation Seed Production Manager and Lisa is the Foundation Seed Office Manager. I have greatly appreciated their help in working through this transition. We hope to have a replacement for Gary before the end of the year.

As we were working through this change another one of our managers, Dick O'Hearn (ARDC Facilities Manager), informed me that he was resigning to take a job in private industry in Lincoln. The job in Lincoln is a move up for Dick and we wish him well. Dick's last day was August 28.

We are currently under a hiring freeze for all State supported positions. The Foundation Seed Director is funded through seed sales, which allowed us to move forward with a search. The ARDC Facilities Manager is funded by State funds, so we are currently in a holding pattern on this position.

In July, we welcomed a new ARDC employee. Jon Korn accepted our open plumbing position. Jon is from Fremont and has worked in that area for some time. Jon is a licensed master plumber as well as having carpenter and electrical skills.

Welcome Jon!!!!

Speaking of rain (or the lack of it)…we have had only 2.36 inches during 11 rain events since the first of June (through August 8). We are running about 50% of normal (0.84 inches) for all of 2002. Kind of depressing to watch the crops suffer, but it could be worse…some areas of the Panhandle have received approximately the same amount of rain for the entire year that we have since June. Of course, less rain has meant more of other things…grashoppers, spider mites and a new pest to the area - the soybean aphid.

Hopefully, when it rains, it will pour and soon...less than 0.25 inches per rain event is not going to replenish our soil profile very quickly…if at all.

Sandhills Simulation, Remote Sensing & A Machine Name Goliath

Article content provided by Bryan Lessivt Center for Advanced Land Management Information Technologies

C ALMIT (the Center for Advanced Land Management Information Technologies) has a long research history at the ARDC beginning with the development of wetlands plots simulating Nebraska’s western lakes. These wetland plots have been used for a variety of research activities ranging from the assessment of satellite imagery of the Sand Hills region to the measurement of greenhouse gases produced by wetland environments. Large tanks located at the site have previously been used for studies of water quality. A constant flow of 50°F well water combined with an overflow system maintains an unchanging water level in the plots and prevents them from freezing to the bottom in the winter. Plants grown in the wetlands include bulrush, cattails, reeds, water lilies, and several underwater species. Many animals now live in or near the wetlands including: redwing blackbirds, yellow headed blackbirds, ducks, herons, frogs, fish, runnels, herons and turtles.

Graduate Student Len Ratcliffe acquires data on based Goliath, a modified detasseling tractor that collects remote sensing data in crop fields.

In Case You Were Wondering....

The Holidays Have NOT Arrived at the ARDC!

H ave you recently caught yourself doing a double-take when driving up Highway 63, just east of the ARDC Research and Education Building? It’s hard not to do a double-take when you look to the north. With virtually all vegetation showing the crisp, brown, dried-up signs of the drought-stricken summer, it’s hard not to notice the perfectly-shaped, very green trees lined up in a row.

If it seems to you that the windbreak miraculously spread out up over night, don’t doubt yourself. And if the windbreak looks too good to be true – again, you are correct.

Researchers are using artificial trees to study how windbreaks protect fields from wind erosion and moisture evaporation. A fifty foot stretch is lined up with sixty

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snakes, skunks, raccoons, deer, and many kinds of aquatic insects.

A major research focus for the past few years has been in the area of remote sensing as it relates to agriculture. Remote sensing has the potential to reduce both the environmental impacts and monetary expenses associated with farming. CALMIT, as part of its commitment in this area, has developed a research vehicle called “Goliath”. Goliath is designed for rapid data acquisition in the middle of large agricultural plots. It has a 6-foot ground clearance and is designed to go down 30-inch rows without damage to the crop. Goliath is a modified detasseling tractor that has been equipped with a boom. The boom allows for precise positioning of research instruments over the crop canopy. Multiple sensors are attached to the end of the boom, which is then raised and rotated to the desired location. Some of the instruments along with a brief description are as follows:

- Global Positioning System (GPS) – gives the latitude and longitude of the boom to within 1 meter or less.
- Spectroradiometers – a fancy name for instruments that measure, in a set of bandwidths, the incoming (towards the surface) and outgoing (away from the surface) solar radiation. Goliath has two of these instruments and each has 2048 bandwidths.
- Infrared thermometer – measures the temperature of the crop canopy without actually touching it.
- Digital video camera – allows the operator to see what is beneath the boom and a digital ‘snapshot’ is taken as part of the data acquisition. The ‘snapshot’ is used in determining the amount of vegetation cover and gives an idea of the growth stage and vigor of the crop.

Goliath is currently working with the carbon sequestration project at the ARDC. Twice weekly, data is acquired from 36 locations within each of the 3 carbon sequestration areas. Researchers hope to be able to show a relationship between the uptake of carbon dioxide by the crop and the remotely sensed data collected with Goliath.

**ARDC Feature**

**Center for Advanced Land Management Information Technologies - CALMIT**

**Rundquist Leads Research at CALMIT**

Donald Rundquist, PhD is the director of the Center for Advanced Land Management Information Technologies (CALMIT) at the University of Nebraska. He has served in this role since 1986. He also is a professor in the School of Natural Resource Sciences and for the Conservation Survey Division.

Rundquist teaches two courses; one dealing with the practical applications of remote sensing in agriculture and natural resources and one with field techniques as they relate to remote sensing campaigns.

Rundquist has been involved in research and teaching of remote sensing at the university level since the early 1970’s. His special interests include high resolution (spatial and spectral) remote sensing of surface waters and vegetation, field procedures and technologies, and remote sensing as a component of site-specific agriculture.

Rundquist is well-known for his contributions regarding the applications of remote sensing in natural resources, and he has published many articles in numerous professional journals and other publication outlets.

Rundquist received his PhD from UNL in 1977, his MA from UNO in 1971, and his BS from the University of Wisconsin-Whitewater in 1967. All of his degrees were in Geography. He served in the U.S. Air Force, mostly at Offutt Air Force Base, from 1967-1971.

**Browning Receives National Award**

Sarah Browning was presented with an award at the 2002 National Association of County Agriculture Agents (NACAA) annual meeting and professional improvement conference (AM-PIC) in Savannah, GA held in July. Browning serves as Horticulture Extension Educator for Dodge and Saunders Counties.

The NACAA Achievement Award is given to those who have been in extension less than 10 years. One person in Nebraska receives this award each year, which is voted on by all extension educators. Browning was honored for a horticulture-related website that she developed.

Browning designed and created a website, ‘Horticulture Paradise’ which went online in 1998 by pulling together existing University of Nebraska horticulture-related websites and many national resources. The site provides quick and easy access to a wealth of horticulture information for Cooperative Extension staff and the general public.

The site provides extension staff statewide, especially in those counties without horticulture personnel, a ‘one-stop shop’ for information. ‘Horticulture Paradise’ was chosen in 2001 as the North Central Regional Finalist in the NACAA Communications Award, web page category. 'Horticulture Paradise' provides horticulture education for both Dodge and Saunders Counties and is based at the Dodge County Extension Office in Fremont.

**Pittman Wins NU IANR Award**

Deborah Pittman was selected as the May/June 2002 recipient of the Outstanding Employee Award for Managerial/Professional Staff. This award is presented by the University of Nebraska’s Institute of Agriculture and Natural Resources (IANR). This high honor is awarded to only twelve employees from the entire statewide pool of IANR managerial and professional staff each year.

She is the Marketing and Promotions Manager for the ARDC. She is responsible for overseeing marketing efforts, as well as various public relations functions for the 9,500 acre research and education facility, for NU Cooperative Extension in Saunders County and collaborative efforts with other University entities, private industry, commodity boards and the public.

Pittman received a Bachelor of Science degree from the UNL School in Advertising in 1990 and has been with the University of Nebraska for over 5½ years.

Letters of nomination were submitted in support of the candidate’s qualifications by staff and faculty that work closely with Pittman. Excerpts from letters in support of her nomination state: the quality of her work would be difficult to duplicate within the University of Nebraska system and private industry; she touches virtually everything we do - she increases attendance at programs, makes clientele/students feel comfortable and welcome, and makes employees feel better about working at the ARDC; she continually develops creative methods for children to learn about plants and agriculture in the tours she provides; and she has outstanding people skills and has been an important catalyst in allowing the university, commodity groups and private industry to work together to develop a very successful Ag Awareness Program.

Pittman and her husband, Daren, live in Lincoln.
plastic trees to shelter part of an 8-acre field. The difference in air pressure and wind speed on both sides of the windbreak are being monitored.

“The artificial trees are helping NU researchers study how windbreaks protect fields from wind erosion and moisture evaporation,” said Jim Brandle, windbreak ecologist in NU’s Institute of Agriculture and Natural Resources.

“A 50-foot stretch of plastic trees shelters part of a fallow field at the ARDC. Research began in August and will continue through early October. During the first few weeks, researchers are monitoring the difference in air pressure and wind speed on both sides of the windbreak. They’ll then completely refill the soil moisture profile with irrigation and monitor moisture as it’s lost,” Brandle said.

The research team has spent more than 25 years studying windbreak benefits with real trees. However, plastic Christmas trees have one big advantage for this project — uniformity. This consistency provides precise volume, surface area and structure measurements.

“Basically, we’ve made a complicated system as simple as we can,” Brandle said. “We did a very similar study last summer on a real windbreak and found that we had too many things we couldn’t explain.”

In this study, uniformity allows researchers to rearrange branches to simulate different tree structures without changing the total volume and surface area, he said. This is critical since they hope to discover how structure affects windbreak benefits.

The plastic trees also will eliminate evaporation variables, Brandle said. Prior studies yielded imprecise data because live trees and crops added to water loss, he said.

The 6-foot trees are secured in vice grip-like holders on triangular racks. The racks rest on sensors which measure temperature, wind speed, moisture loss and the amount of force on the windbreak, Brandle said.

Data helps researchers adjust mathematical equations in a computer model of the microclimate, or altered conditions, the windbreak creates, he said.

“The model’s predictions are only as good as your understanding of the real world,” Brandle said.

Comparing the model’s predictions to field results, researchers will be able to address complicated questions about windbreak protection under different tree, climate and wind scenarios. These questions will help provide focus for future research.

“The artificial Christmas tree research also might provide information that someday could be used to specially design windbreaks for optimal field protection,” Brandle said.

“Once we understand the relationship between structure and microclimates, we can design structures to meet farmers’ needs,” he said.

The NU research is part of the Shelterbelt Agroforestry Modeling System project, a collaboration between NU’s Institute of Agriculture and Natural Resources, Iowa State University and the U.S. Forest Service. The project generates and applies weather, crop growth and economic data to determine which microclimates most benefit different crops. “Data already developed through this research helps examine windbreak benefits for soybean and corn crops in Nebraska, Minnesota, Indiana and Iowa,” Brandle said.

A similar windbreak study will be conducted next year using live trees to shelter a 40-acre field.

A U.S. Department of Agriculture National Research Initiative grant helps fund this research, which is conducted in cooperation with IANR’s Agricultural Research Division.

Keep Current .. Visit these UNL Websites!

**Drought Information**
http://ianrhome.unl.edu/drought/

**2002 Farm Bill**
http://farmbill.unl.edu/

**West Nile Virus**
http://www.ianr.unl.edu/pubs/animaldisease/gl1464.htm
The first site is a NebraskaGuide. On the other, learn how West Nile Virus testing is keeping pathologists and staff busy at the University of Nebraska-Lincoln’s Veterinary Diagnostic Center.

**ATTENTION**

4th Grade Teachers

If you are a 4th grade teacher and are interested in teaching your students about agriculture in a hands-on learning environment - then you may want to consider attending the Ag Awareness Festival on October 2, 3, 9 or 10. Register online at http://ardc.unl.edu/AAFForm.htm. Space is limited - so register today!  

Learning About Agriculture

One of the best ways to teach the public about how much agriculture affects all of us - is to start with the youth. A group of children visiting from Saint Paul United Methodist Church in Lincoln recently visited the ARDC to learn about agriculture. The ARDC hosts many different tour groups throughout the year - many of which are youth. During the tours, the parents, teachers and sponsors also tend to learn something they hadn’t known before visiting the ARDC.

Turfgrass Professionals Learn at Field Day

The 27th Annual Nebraska Turfgrass Field Day was held in June at the John Seaton Anderson Turfgrass and Ornamental Research Facility near Mead, Neb. Over 300 turfgrass managers from golf courses, sports turf facilities, sod farms, parks, cemeteries and commercial and private grounds came to the event. This year’s field day focused on hands-on demonstrations and talks. Topics included sports field painting, spreader and sprayer calibrations, fertilization benefits, traffic management, tree injections, and identification and control methods for landscape pests.
Crop Management Clinic Site Moved to New Area Near R & E Building

This summer, a few new crops sprouted up south of the ARDC Research and Education Building. To be more precise, a variety of field crops with various treatments and production methods were put into small plots for the Crop Management and Diagnostic Clinics. The clinics have been held at the ARDC since 1995, but this is the first year that they were held so close to the Research and Education Building.

In previous years, the clinics were held at a site several miles away near the old Load Line 2 location. Participants at the clinics utilized the old “minitheatre” in that building for non-field classes, lunch and breaks.

According to Walker Luedtke, Farm Research Projects Manager at the ARDC and site manager for the clinics, the minitheatre was in need of great repair if use of the facility were to continue. The changes were cost-prohibitive and the Research and Education Building was already equipped with all of the things that we needed, stated Lueckte.

By moving the clinic site to the new location, presenters now have greater access to computers, satellite system, and other technologies and facilities that were not available or nearly impossible to implement at the old location. This also enables the staff to utilize the site for other programs, such as the Crop Production Field Day.

Even restrooms are more accessible and considering most of the clinics take place during sweltering summer days, participants appreciate the opportunity to just step inside and cool off. And when participants are more comfortable, they tend to be better learners.

Dan Duncan, ARDC Director, also sees the move as a great improvement. From a facilitation perspective, clinic participants had to be “trammed” back and forth from locations and to the minitheatre. This took extra time, resources, and manpower. Now everything is within walking distance and there is no longer a need for shuttling people.

Duncan states an added benefit of utilizing the land at the new site is the variety of soil types. He says the soil ranges from very heavy, poorly drained clay soil to windblown sand. The soil is nonuniform, some has nutrient deficiencies and other variances. This mixed bag of soil types allows more diverse, real-life education opportunities.

We’re still pulling together results – so we will have more information on how the field days went in the next issue!

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September/October 2002

Magnet School UPDATES....

In the last issue of Extended Visions, a new column began that provides updates on some of the Mead Magnet School Projects. Two of the four Mead Magnet School students that participated in summer internships at the ARDC were featured. In this edition, we feature the other two students. Read the firsthand accounts of what Brendan Murray and Eric Deerson learned from their experience at the Horticulture and Turf Research Area at the ARDC.

Valuable Work Ethic

by Brendan Murray, Mead Magnet School Student

I have worked at the ARDC for the past two summers working at the Horticulture and Turf Research Area. My normal job duties include mowing, repairing and installing sprinkler systems, assisting researchers with their studies, and many other things that need to be done on a daily basis to ensure a smooth running department. I have learned many things about the turf and horticulture industries and have been able to apply this knowledge in many of my agricultural classes. The past two summers have instilled in me a work ethic that will be easy to apply to any situation or field. In conclusion, what started off as being a way to make money over my summer vacation has ended up being a learning experience that will never be forgotten.

Knowledge Gained Will Be Helpful in the Classroom

by Eric Deerson, Mead Magnet School Student

I have worked at the ARDC one summer at the Horticulture and Turf Research Area. The jobs I have done include mowing, building a California golf green, harvesting buffalo grass seed, repairing sprinkler heads, assisting researchers with their studies, and many other tasks. Last fall, I also participated in a fertilizer study at the Horticulture and Turf Research Area in one of my high school agriculture classes. I know that working at the ARDC has given me knowledge that will help me this school year in my high school agriculture classes.

In our next issue, we’ll tell you about some exciting developments in grant funding from the National 4-H Council and Cargill for the Ag Magnet School!