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ARDC Director's Comments

Water Quality Update

by Daniel J Duncan, ARDC Director

Since I have been at the ARDC, there have been discussions relative to the quality of our potable water. I am sure everyone is familiar with the water quality issues related to the Department of Defense contaminants that are part of the EPA Superfund project. We have worked with the Army Corp of Engineers to move potable water wells out of these contaminant plumes. I was confident that we had adequate water quality and quantity until recently.

We are now experiencing high levels of nitrate in our potable water wells. We have our highest ground water nitrate levels on the north border of the ARDC. Nitrate levels decrease from north to south on the ARDC. Groundwater flows are to the south/southeast. Unfortunately all of our municipal wells are on the north side of the ARDC near the water mainline loop system and out of the DOD contaminant plumes.

As a result, we have entered into an agreement with the Nebraska Department of Health (consistent with their regulations) that allows us to operate our non-community water system at nitrate levels up to 20 ppm. Per regulation, the water in our municipal system should not be consumed by pregnant women and children under the age of 6 months. Bottled

water will be available for those who cannot drink the water. Appropriate notices have been sent to those on the system and posted at drinking locations. It is important that employees and visitors to the ARDC understand these restrictions.

On a positive note, I would like to welcome Mark Steele to the ARDC. Mark is our new Research Data Specialist - GIS. Welcome Mark! □

ARDC Feature Unit
Entomology

Switchgrass Insect Research

Article provided by Sandra Schaeffer, Dr. Fred Baxendale, and Dr. Tiffany Heng-Moss
UNL Department of Entomology

Switchgrass (*Panicum virgatum*) is native to the North American Great Plains. Historically, this prairie grass has been used primarily as a warm-season forage and as a component in prairie restoration plantings. In 2000, the Department of Energy's Bioenergy Feedstock Development Program identified switchgrass as a potential biofuel crop. While no switchgrass cultivars have yet been specifically developed for use as a biomass energy crop, research at the USDA Grain, Forage, and Bioenergy Research Unit in Lincoln, Nebraska is currently assessing the genetic potential and economics of growing switchgrass for biofuel production.

Essential to the goal of optimizing switchgrass as a biomass energy crop, is a comprehensive knowledge of potentially important arthropod pests. On-going entomological research efforts at the ARDC are working to identify the insects and mites associated with switchgrass, investigate their biology, seasonal abundance, and injury potential, and develop management alternatives for potential pests. Special



Soil, foliar, and airborne arthropods were collected every 2 weeks throughout the growing season from two switchgrass stands at the ARDC.

attention is being directed at identifying natural enemies which may play an important role in regulating pest populations, and on locating insect-resistant germplasm.

Beginning in 2007, soil, foliar, and airborne arthropods were collected every 2 weeks throughout the growing season from two switchgrass stands at the ARDC. The first stand, planted in 1998, provided established switchgrass plots, while the second, planted in 2006, offered a newly seeded stand for comparison. A third stand was sampled at Nine-Mile Prairie in Lancaster County, Nebraska to document the arthropod complex in switchgrass under minimal management conditions. Pitfall traps and soil cores were used to sample surface and soil dwelling insects, while sticky traps and vacuum samples collected leaf-feeding and flying insects. Preliminary findings indicate that weevils, leaf beetles, leafhoppers, and chinch bugs may be important pests, while ants, rove beetles, ground beetles, lady beetles, and spiders appear to be the primary beneficial arthropods associated with switchgrasses.

This research will provide important baseline information on the arthropods associated with switchgrass grown in intensive production systems. The ultimate goal is to develop effective and sustainable management approaches for key arthropod pests affecting switchgrass plantings in Nebraska. □



Upcoming Programs for Producers & Others

At the Saunders County Extension Office located at the ARDC August. N. Christenson Research & Education Building unless otherwise noted....

Winter is the time for producers to get updates and training for 2008....whether it be mandated training or just a way to get up to date and sharpen your skills. There are many training opportunities and workshops coming up. Several new workshops have been added to this winter's calendar - aimed at producers. Look for the "New in '08!" icon. Contact us at (800)529-8030 to register or for more details on any of the programs or training sessions listed in this article.

Pesticide Applicator Training

Jan. 16 1:00-4:00 pm

Jan. 16 6:30-9:30 pm

Apr. 1 1:00-4:00 pm

* Certification as a private applicator allows farmers to purchase and use restricted use pesticides in their farming operations. Private pesticide applicators with expiring certification and those seeking first-time certification will need to attend a certification training session in 2008. UNL Extension provides the educational program, while the state ag department is responsible for certification. The training cost is \$30 per person.

Corn Disease Management Workshop

Febr. 7

New in '08!

* Presented by: Tamra Jackson, UNL Extension Plant Pathologist The workshop is aimed at producers and will focus on disease management issues for corn, including a review of diseases that have occurred in 2007 plus those projected to be a problem in '08. There is no fee for this workshop, but advance registration is requested.

Irrigation and Energy Conservation Workshop for Corn Growers

Febr. 11 - Clay Center

Febr. 12 - Holdrege

Febr. 13 - Ogallala

Febr. 14 - Neligh

* Nebraska corn growers are constantly challenged to grow corn responsibly using proven best-management practices. Surface and groundwater irrigation management is on the top of the list. The IRRIGATION AND ENERGY CONSERVATION WORKSHOP FOR CORN GROWERS is brought to you by the

UPCOMING PROGRAMS - Cont. on P. 3

ARDC Feature Unit Entomology

inflicting painful bites. Stable flies need one and sometimes two bloodmeals each day to develop their eggs. Unlike mosquitoes where only the females bloodfeed, both male and female stable flies require blood to reproduce. Stable fly maggots live in fermenting or decomposing vegetative material such as silage, spilled grain and hay or straw mixed with animal wastes. Historically, stable flies have been primarily associated with confined livestock in the barnyard environment. However, improved sanitation by the removal or covering of potential developmental sites has greatly reduced their numbers in confined livestock operations. Over the past 20 years, livestock producers have switched from feeding pastured cattle small square bales to large round bales during the winter. Cattle can waste up to 50% of the hay at large round bale feeding areas. This waste hay combined with manure and urine provides an ideal habitat for stable fly maggots. With the expansion of the stable fly habitat to pastures, their economic impact on livestock producers has increased to an estimated \$1 billion per year. This does not include their impact on companion animals and human recreation.

The USDA-Agricultural Research Service (ARS) Agroecosystem Management Research Unit, in collaboration with the Department of Entomology, has been conducting research on stable flies at the ARDC for nearly 30 years. This facility offers unique opportunities to study stable fly development, migration and feeding in a diverse agricultural environment. Current research focuses on characterizing winter hay feeding sites in the pastures, quantifying stable fly development in those sites and developing cultural, physical and chemical control technologies to eliminate stable fly larvae. Related research involves monitoring adult stable fly movement after emerging from developmental sites to search for blood meals. This information is important to determine how large an area must be included in a control program to reduce stable fly numbers. Weather parameters (temperature and precipitation) are used to develop models to predict stable fly population levels. Information from such models can be used to alert producers of the impending need to implement control procedures.

Researchers have estimated that as many as a million stable flies can develop and emerge from a winter hay feeding circle. Given that producers will frequently locate three to five feeders in a pasture, these sites can be tremendously productive. Most of the flies emerge from these sites from mid-June through early-July. Few flies emerge after this time. Generally, flies move an average of 1 kilometer (0.6 miles) in search of blood meals, but flies that develop in materials near livestock concentrations do not move any further than necessary to find hosts. Once adult stable flies locate a herd of cattle, they stay near the hosts, bloodfeeding daily until the female's eggs have matured and she begins to search for a suitable site to lay her eggs beginning the cycle over again. □



Beekeepers learn techniques for raising queen bees during a master beekeeping workshop.

About the People

Bill McCormick is the Unit Manager at the Entomology research area at the ARDC. He is a graduate of the University of Nebraska-Lincoln with a degree in agronomy and ag economics. He has been managing the research area at the ARDC since 1999 and makes his home with his wife, Natalie, in Lincoln. □



Bill McCormick

Stable Fly Research

Article provided by David B. Taylor and Dennis R. Berkebile, United States Department of Agriculture, Agricultural Research Service, Agroecosystem Management Research Unit

Adult stable flies feed on the blood of humans, pets and livestock,



Broce 'Sticky' Traps for monitoring adult stable fly movement/distribution



Emergence Traps for monitoring adult stable fly emergence from winter feeding sites

Understanding Life after Death

Article provided by Dr. David O. Carter, Assistant Professor of Forensic Science, UNL Department of Entomology

What happens after we die? Are we greeted by a bright light and angels? No one quite knows for sure. One thing we do know is that dead bodies are visited by insects, microbes, mammals and birds. This is probably not surprising. After all, most Nebraska have some concept of what occurs in nature.

However, most might not know that the activity of these organisms can be used to solve crime.

"Decomposers, particularly insects, can be very helpful in death investigations," says Dr. David O. Carter, Assistant Professor of Forensic Science in the Department of Entomology.

Current research in the Department of Entomology is aimed at developing better ways to estimate time since death (post-mortem interval) and locate hidden graves. This is most often done by decomposing swine carcasses and monitoring above-ground and belowground processes associated with their decomposition.

Dr. Carter is currently focusing on the use of ninhydrin to detect graves that are meant to be hidden. The results thus far, which will be published in the May issue of the Journal of Forensic Sciences, have caused a great deal of interest in crime labs around the world.

"I have been contacted by forensic scientists in the USA, Canada, England, Australia, and Thailand." Says Dr. Carter, "They are all very interested in this method because it is rapid, inexpensive and ninhydrin is already being used by most investigative agencies around the world."

Ninhydrin is regularly used to detect fingerprints on paper.

"Although we primarily use ninhydrin to presumptively test for the presence of gravesoil, we are researching its potential for estimating postmortem interval," says Carter. "If that turns into a viable approach, it would be a great help to investigators in Nebraska. We live in a state where bodies can go undiscovered for months and years. There is currently no method to determine how long those bodies have been dead with a great deal of accuracy." □



Monitoring decomposition processes in swine carcasses help develop better ways to estimate time since death.

Apiculture Lab Provides Beekeeping Research and Programs

Article provided by Dr. Marion Ellis, UNL Department of Entomology

The Apiculture Laboratory located at the Agricultural Research and Development Center provides a unique setting for beekeeping educational programs and applied apiculture research. Educational programs have the

advantage of a fully equipped auditorium for classroom presentations and nearby apiaries for hands-on activities. Educational programs offered at the ARDC include beginning beekeeping classes, master beekeeping workshops, value-added products workshops and field days. The laboratory also provides a site for UNL students to gain experience working with honey bees and hive products.

Apiculture research at the ARDC focuses on solving applied apicultural problems.

During the last 20 years 5 important bee diseases and pests have been accidentally introduced to the U.S., and the apiaries located on the ARDC have been used to develop and evaluate techniques to detect bee pests, to determine when intervention is needed, and to develop and evaluate pest suppression techniques. The extensive honey bee colony losses that occurred in the spring of 2007 across the U.S. demand a strong effort to provide sustainable solutions to introduced bee diseases and pests. The Apiculture Laboratory's ongoing programs will allow the University of Nebraska to make important contributions to providing beekeepers the tools and knowledge to successfully manage their colonies. □



Hands on beekeeping is an important part of the master beekeeping workshop.



Graduate student, Jeremy Wagnitz demonstrates how to secure bee hives to a truck bed during a beginning beekeeping workshop.

ARDC Feature Unit
Entomology

Corn Rootworm Research

Article provided by Dr. Lance J. Meinke,
UNL Department of Entomology

Corn rootworms are one of the leading insect pests of field corn in the Midwest, especially in situations where corn is planted in the same field for two or more consecutive years. Corn rootworm larvae feed on corn roots which can cause substantial damage to corn plants and reduce grain yield. Research on the biology, ecology, and management of corn rootworms has been conducted at the ARDC Insect Field Laboratory since the mid-1960's. The main goals of ongoing research are 1) to increase our understanding of the biology and behavior of rootworm species, and 2) develop and evaluate alternative corn rootworm management techniques and strategies. Many recent experiments have been conducted to evaluate new rootworm management technologies (e.g., seed treatments, and Bt corn hybrids) that are being developed by industry. Results of ARDC efficacy and yield trials are annually made available to the public through the Department of Entomology website (<http://entomology.unl.edu>) and are used to develop and support insect management recommendations in field corn.

Department of Entomology faculty are also actively working with grower, industry, and regulatory organizations to develop effective but practical resistance management strategies that are required by the U.S. Environmental Protection Agency (EPA) when new transgenic corn hybrids are registered. Growers are currently required to plant a refuge (i.e., corn hybrid that does not express the rootworm-resistant Bt protein) adjacent to rootworm-protected Bt corn. The refuge is part of the required resistance management plan which has been designed to produce beetles that have not been exposed to Bt. Beetles emerging from the refuge can then be available to mate with beetles that survive from Bt corn to slow the potential evolution of resistance to the Bt event. To develop an effective refuge system, new information on rootworm biology is needed in relation to Bt hybrids and other management technologies. Therefore, field experiments are being conducted at the ARDC to increase our understanding of rootworm age specific mortality, mating behavior, late season ecology, and female ability to reproduce after feeding on various Bt transgenic events. The long-term goal is to work with industry and the EPA to provide growers with a suite of viable rootworm management tactics (growers can then adopt the tactics that best fit their needs) and to facilitate their use within an IPM framework in combinations that are sustainable over time. □



Dan Duncan, ARDC Director, presented Bryon with a certificate of appreciation at the reception on behalf of the ARDC.

Chvatal Recognized at Farewell Reception

Bryon Chvatal was recently honored at a farewell reception held at the ARDC. Bryon started with the ARDC in 2004. He served as an Ag Research Technician and was instrumental in the field preparations and behind the scenes work that led to the success of field days such as the Soybean Management Field Days, Solution Days and the Crop Management Diagnostic Clinics. During his employment at the ARDC, Bryon completed his Bachelor's degree and will now go on to operate the family farm. We wish Bryon the very best! □



Calendar of Events

4-H Beef Weigh In
Jan. 19 & Mar. 15
1:00 - 3:00 p.m.
at the
Wahoo Sale Barn

January

14	Saunders County Ext. Board Meeting	7:00-9:30pm
14-15	NSFGPP Consultations	8:00-5:00
16	Private Pesticide Applicator Training	1:00-9:30pm

February

4-5	NSFGPP Consultations	8:00-5:00
7	Corn Disease Management	9:30-1:00
13	Unit Managers Meeting	1:00-3:00
15	Farmland Lease Arrangements for Tenants and Landlords	
18	NSFGPP Consultations	8:00-5:00
20	Nebraska No-Till Conference	
29	Alfalfa Management for Farmers	10:00-2:00

March

6	Sprayer Technology for Growers	8:00-5:00
12	Unit Managers Meeting	1:00-3:00
17	Field Scout Training for Pest Managers	8:00-5:00
20	Nitrogen Management Training	7:00-9:00
26	All Facilities Safety Training	12:00-2:00

April

1	Private Pesticide Applicator Training	1:00-4:00
9	Unit Managers Meeting	1:00-3:00

UPCOMING PROGRAMS - Cont. from P. 1

Nebraska Corn Board and the Nebraska Corn Growers Association in partnership with University of Nebraska-Lincoln Extension. This special training session will provide you with valuable information on irrigation management that will help you save water and money.

The workshop will focus on the Fundamentals of Agriculture Water Management and Irrigation System Management. By participating in the training, irrigated corn growers will learn how to:

- Apply less water and maximize the value of water.
- Reduce irrigation pumping costs.
- Further protect and enhance the environment.
- Be aware of new technological advances in water management.
- Use information relative to your farming operation that when implemented will enhance profitability.

Certified Crop Advisor credits are available.
Advance registration required.

Farmland Lease Arrangements for Tenants and Landlords

Febr. 15

* UNL Extension is offering a workshop to assist landowners, tenants and other agri-business professionals with issues related to farmland ownership management, and leasing arrangements. This program will also be held on February 8 in Scribner.

New in '08!

Nebraska No-Till Conference

Febr. 20 - ARDC and Febr. 21 - Holdrege

* UNL Extension will give corn and soybean producers information on how to be successful with minimum and no-till at the Nebraska No-Till Conference.

The conference will be held from 9:30 a.m.-3:30 p.m. and producers will learn the benefits of no-till and how it can work for them. Speakers include no-till farmers, university specialists and industry representatives.

The agenda for the ARDC conference includes: "Three Farmers, Three No-Tillers, Three Different Stories."...No-Tiller # 1 - Story #1 - Duane Lange; No-Tiller # 2 - Story #2 - Keith Thompson; " No-Tiller #3 - Story #3 - Jerry Crew; Controlling Trees in No-Till - Lowell Sandell; and What I heard Today and What I learned in 2007! - Paul Jasa.

The Holdrege agenda includes: Do You "C" What I "C" - Dwayne Beck; No-Tiller # 1 - Story #1 - Keith Thompson; Rainfall Simulator Demonstration on Conventional and No-Till Soils - Dan Gillespie; No-Tiller # 2 - Story #2 - Duane Lange; and Residue Management - Achieving Uniform Emergence - Paul Jasa.

Pre-registration is due February 13. For more information or to register at the ARDC location, call (800)529-8030 or e-mail at kglewen1@unl.edu. For more information or to register at the Holdrege location, call (308)995-4222 or email cburr1@unl.edu. Online registration available at <http://ardc.unl.edu/no-till.shtml>.

The free event is sponsored by UNL Extension in the university's Institute of Agriculture and Natural Resources, Nebraska Soybean Board, Lower Platte North Natural Resources District, Tri-Basin Natural Resources District, Central Nebraska Public Power and Irrigation District, USDA Natural Resources Conservation Service, Farm Credit Services of America. John Deere Risk Protection and Ag Service Associates.

Alfalfa Management for Farmers

Febr. 29

* Presented by Bruce Anderson, UNL Extension Forage Specialist and Keith Jarvi, UNL Integrated Pest Management Extension Assistant. Determine the best strategies for your alfalfa operation. This session also includes insect problems in alfalfa, including identification of insects, scouting techniques, economic thresholds, and management options.

New in '08!

Sprayer Technology for Growers

March 6

* Presented by: Robert Klein, UNL Extension Cropping Systems Specialist. The performance of a pesticide is highly dependent on the quality of the application. Many new developments have occurred in pesticide application equipment with post application pesticides and the development of herbicide resistant and tolerant crops. How the sprayer should be set up along with nozzle selection to maximize efficacy while managing spray drift, will be covered in this workshop.

New in '08!

NSFGPP On-Farm Research Update

March 11

* Corn and soybean growers are invited to attend the Nebraska Soybean and Feed Grains Profitability Project on-farm research update March 11 at the ARDC.

The 9 a.m.-3 p.m. program will be at the August N. Christenson Research and Education Building.

Producers will obtain valuable crop production-related information from on-farm research projects conducted on Nebraska farms by Nebraska farmers.

The Nebraska Soybean and Feed Grains Profitability Project is an on-farm research project designed to provide farm operators with an understanding of how to conduct crop research on their farms using their own machinery. Comparisons are scientifically designed, statistically analyzed and conducted for three years to assure reliable, useful information.

UPCOMING PROGRAMS - Cont. on P. 4

UPCOMING PROGRAMS - Cont. from P. 3

Registration is \$25 for non-NSFGPP members and includes a copy of the annual on-farm research report, refreshments and noon luncheon. Pre-registration is encouraged by March 6. To register or for more information about the Nebraska Soybean and Feed Grains Profitability Project or how to conduct crop-related research on your farm, call (800) 529-8030 or visit <http://on-farmresearch.unl.edu/>.

Crop Scout Training for Pest Managers
March 17

* UNL Extension’s Crop Scout Training for Pest Managers is targeted at agribusinesses and producers. The expertise of university and industry agricultural specialists is drawn upon to provide the latest, up-to-date, research-based information in crop production. Topics include growth staging, recognizing fertilizer deficiencies, major pest identification, understanding insect economic thresholds, handling soybean cyst nematode, and weed and disease identification and management. Continuing education credits for the Certified Crop Advisor program are available.

Those who register one week in advance of programs will receive a discount. Fees include lunch (unless otherwise noted), refreshment breaks and workshop materials. Fee for this workshop is \$70 for those registering up to one week in advance and \$80 there after.

Nitrogen Management Training
March 20

* All producers using fertilizer in the LPN-NRD must attend nitrogen certification at least once every four years. Training will be held at the ARDC on March 20. □

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EXTENSION

Know how. Know now.

UNL Extension offers a variety of programs that are of great value to Nebraskans. This information is now being shared through the theme of “Know how. Know now.” We will share some of that information with you from time to time. Here is this week’s UNL Extension “Know how. Know now.” quick fact...

*** 4-H is a well-known Extension program. Did you know that Nebraska has the highest per-capita involvement of children in 4-H with more than 118,000 members? One in three eligible children in Nebraska are involved in 4-H! □**

Master Gardener Training for Local Gardeners

Do you love working in the garden? Would you like to learn more about plant culture, insect and disease problems? Then why not consider becoming a Master Gardener? Anyone with an interest in plants or gardening is welcome. Master Gardener volunteers pass along their horticulture knowledge to beginning gardeners and help them learn more about all aspects of horticulture, including growing flowers, vegetables, managing a lawn, water gardening or choosing the right landscaping tree or shrub. They also have the opportunity to meet and learn from other Master Gardeners in the community, who share their love of gardening. Master Gardener Training for Saunders and surrounding counties will be on the following Thursdays from 9:00 a.m.-4:00 p.m.: 2/28, 3/6, 3/13, 3/20 and 3/27. All sessions will be held at the UNL Extension office in Dodge County at 1206 W. 23rd Street in Fremont. The fee for Master Gardener training is \$150. Request more information below. Or apply online at the following website: <http://extensionhorticulture.unl.edu/MG.shtml>. For more information, contact Sarah Browning at (800) 830-4855. □



Send me information about becoming a Master Gardener!

Return to: University of Nebraska- Lincoln Extension
1206 West 23rd Street, Fremont, NE 68025 or call (800) 830-4855

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

E-mail Address _____



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adjust the temperature and has a watering system, it was the students who took care of the daily needs of the plants. The conditions in the greenhouse are controlled electronically by a environmental monitor, which adjusted the temperature as the plants developed and grew. Each student was responsible for the daily care of twenty plants.

Upon arrival, the incoming plants were treated with fungicides by the students, who were dressed in protective safety gear. Integrated pest management was used and pesticides were applied thereafter only as needed. Sticky traps were set up to catch any wayward insects, and to give the class an early warning of any serious insect problems. The class members handwatered the poinsettias so they could better control watering. Over watering can lead to plant diseases such as root rot.

The students were also responsible to do the advertising for the sale of the plants. They designed posters and placed advertisements in the school newsletter. The class will host an evening open house to kick off the sale, which will be manned by the students. The sale will continue for two weeks thereafter. Customers who wish to purchase Poinsettias after the open house can purchase plants during the school day.

The plant colors ranged from red to pink to white and various mixed colors. Proceeds from the sale benefit horticulture and landscape projects and sustain the greenhouse maintenance fund. □

Plant Science Students Apply Skills By Growing Holiday Plants

by Students of the Mead Public High School Plant Science Class

The Mead High School's Plant and Soil Science class grew Poinsettias during most of the fall semester. The students enrolled in this agriculture class monitored the plants closely for diseases or insects that might have crippled or killed them. The class members are happy to say that "none were lost."

The students were responsible for taking care of almost all phases of the poinsettia management, applying the plant science skills they learned in the class. Even though the school greenhouse is monitored to automatically



MPS Plant Science students were each responsible for the daily care of twenty poinsettia plants, as well as the marketing of the plants.

Get Your Green Thumb Ready!

Creating a Horticulture Paradise Series

Feb. 19 - Container Gardening With Hypertufa, Kelly Feehan

Feb. 26- Effective Control of Backyard Wildlife, Stephen Vantassel

March 4- Earthkind Roses, LoAnne Langbee


March 11- Diseases of Trees, Laurie Stepanek

March 18- Small Fruit Selections for Eastern Nebraska, Vaughn Hammond

Time: 7-9 p.m.

Location: UNL Extension, 1206 W. 23rd Street, Fremont.

Pre-registration requested for these free programs, but is not required. For more information contact Sarah Browning, (800) 830-4855.



Horticulture-Related Pesticide Safety Education Program

Horticulture-related Pesticide Safety Education Program will be held at the Extension Office in Dodge County (1206 W. 23rd Street, Fremont) starting at 9:00 a.m. *Initial training* will be held on **February 5**. Categories trained include: General, Ornamental & Turf, R-O-W, Fumigation, and Wildlife Damage. *Recertification* will be held on **February 7**. Preregistration required at <http://pested.unl.edu>. For more information contact Sarah Browning, (800) 830-4855. □