

Crop & Soil Update

CROP SCIENCE • SOIL SCIENCE • TURFGRASS SCIENCE

Department of Crop & Soil Sciences Newsletter

2009 Edition

Message from David Sylvia Professor and Head

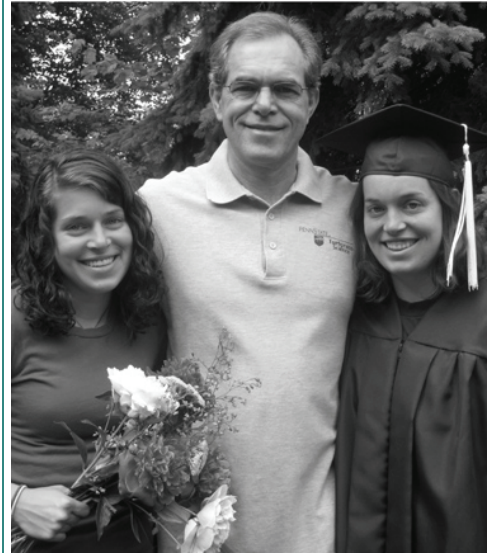
The Farm Foundation recently listed climate change, growing populations, increasing demand for energy feedstocks, and the depletion of natural resources among the challenges agriculture will face in providing food, fiber, and energy over the next 30 years. Furthermore, society is now asking agriculture to expand beyond the traditional role of commodity production, to provide an array of ecosystem services, such as nutrient cycling, genetic diversity, and aesthetic quality. I am pleased to report that the Department is in a strong position because our research, teaching, and extension activities address many of these issues and, indeed, much of our effort focuses on ways to achieve increased efficiencies in crop production without negatively impacting soil, water, and energy resources.

Each year brings numerous changes, both professionally and personally (one of my twin daughters graduated from Penn State and the other one was married in May). At the College level, many of you know that Dean Steele is stepping down after 12 years of service and Bruce McPheron will assume that role on July 1. At the Department level, we have updated our strategic plan (downloadable from our homepage) and are now focused on the following research priorities: (i) increasing capacity for integrated, multifunctional landscape/system analysis, (ii) improving food and feed

grain, biomass energy crop, and turfgrass production systems, (iii) achieving a balance between production and resource conservation, (iv) expanding understanding of invasive species, (v) assessing the ecosystem services provided by agroecosystems, (vi) informing stakeholders and policy makers, (vii) contributing to international engagement, and (viii) enhancing recruitment and retention of our students.

An important change to the soil science academic program was initiated this year when the faculty voted to consolidate the soil science curriculum as an option within the Environmental Resource Management (ERM) major. We believe this will allow more effective offering of the subject matter within a broader environmental context and provide exposure of the subject to a larger cohort of students within the ERM major. Be assured that this change will not reduce the quality of undergraduate soil science education at Penn State because students within the option are required to take the same rigorous soil science course load as in the former Environmental Soil Science major.

I wish you and your family well for the coming year and trust you enjoy learning about some of our activities and accomplishments on the following pages. And, please, if you have any comments or concerns about our programs, do not hesitate to contact me.



Best regards,

David M. Sylvia

Visit us on the web where an electronic version of this publication is available:

<http://cropsoil.psu.edu/>

Inside this issue . . .

Highlights	2
Activities	4
News briefs	5
Excellence Fund	6

PENNSTATE



College of Agricultural Sciences

HIGHLIGHTS

Research

Dr. Jason Kaye, assistant professor of soil biogeochemistry, conducts research to understand how nitrogen (N) cycles through soils. He hopes to develop the ability to predict when soils will be good filters for nutrient pollution, effectively retaining nutrients and preventing nutrient leaching to streams and gaseous emissions to the atmosphere.



Most forests are efficient filters for nutrient pollution. Jason's research group studies forest N cycling to understand what soil and ecosystem characteristics enable forests to retain N. They compare young and old forests, forests under climate change (experimentally warming and wetting soils in the field), and a gradient of soil textures. The texture experiment has the potential to be widely applicable because there are already maps of soil texture that cover the US, so if they gain an understanding of when and whether soil types differ in their N retention capacity they could use these maps to locate hotspots of nutrient pollution. Jason hopes to translate this basic science knowledge on biological filters into applications in agroecosystems.

Most agricultural ecosystems are "leaky" with respect to N. So, a large portion of Jason's research is focused on considering which management practices enable agroecosystems to retain more N. He has used the Hunter Long-Term Rotation Experiment at Rock Springs to understand how crop rotations and fertility sources (manure vs. inorganic N) affect ammonia and greenhouse gas emissions from soils to the atmosphere. His group is experimenting with organic cropping systems that use a combination of periodic tillage in combination with perennial crops to manage weeds. These systems have less tillage than a traditional organic field, and he expects their soils will accumulate organic matter that will enable greater N retention.

Jason's group monitors surface soil N concentrations to understand how organic N inputs become available to plants and how susceptible they are to leaching. They also monitor N concentrations in soils below the rooting zone because they expect this to be a good indicator of how much N may pollute ground or surface waters under different management practices. Eventually, he hopes to understand how the timing, quantity, and type of organic N inputs leads to variation in the N that leaches below the rooting zone.

Teaching

Soil is the foundation of all life, but soil is neither well understood nor appreciated outside of the natural sciences. As lab instructor and coordinator of Soils 101 (Introductory Soils) and instructor of Soils 489 (Supervised Experience in College Teaching), **Katharine Butler**, Sr. Lecturer of Soil Science, sees hundreds of students a year. Few of these students, however, come from majors outside of the College of Agricultural Sciences. She asked, how can we reach the many students of our University who have never given much thought to soils? Can we offer a "soil appreciation" course to a broad, non-ag/non-science audience that will appeal to students from many different majors? An effort to address these questions resulted in the development of "Soils, Civilizations, and Societies," a new discussion-based course in the Department.

The objective of this course is to provide students from a wide variety of majors with a learning experience that will enhance their understanding of the intricately interconnected relationships between soils and the civiliza-



Soils class in Cappadocia, Turkey

tions and societies that develop upon them. In class students explore the impacts that native soils have had on how, when, and where civilizations developed and prospered, and further, how the management of soils by these civilizations over time affected this valuable, non-renewable resource. Class discussion begins with the very earliest societies of the Fertile Crescent region and continues through all regions of the world looking at environmental and agricultural issues across diverse landscapes, climate and soil regimes, and cultures over time.

In addition to the regular spring semester offering, Soils, Civilizations, and Societies has a six credit option that includes a student study tour. In May of 2007 six undergraduate students participated in a three-week trip to Turkey and Jordan; in May 2008 nine undergraduates and one graduate student participated in a three-week study tour to Jordan planned in part by Jordan's Ministry of Agriculture and the

Royal Society for the Conservation of Nature.

In both countries students visited sites of ancient civilizations, modern conservation projects, and old and new agricultural practices. They walked through fields where agriculture had once flourished, but that now stand barren and they visited successful farms where advanced soil conservation methods are preserving the still fertile soils.

Student feedback indicates that Soils, Civilizations, and Societies is meeting the course objectives. Students from diverse majors such as English, Political Science, Mechanical and Civil Engineering, Archaeology, and Science have participated in both the semester course and the study tour.

Extension

Dr. Rick Day, associate professor of soil science and environmental information systems, focuses his Extension program on uses of geospatial technologies, such as geographic information systems (GIS), for agriculture, land and environmental assessment, and local government. Traditional GIS systems allow users to view, overlay, and analyze mapping of an abundance of surface features describing soils, topography, hydrology, land cover, imagery, and more. Combining GIS capabilities with online web-based technologies opens the door to innovative applications. Dr. Day and his team, have developed several online tools taking advantage of these technologies. AgMap (<http://agmap.psu.edu>), for example, is an online direct-marketing system designed to promote agricultural businesses within the state and currently serves nearly 3,200 businesses in Pennsylvania and will be launched nationally in the near future. AgMap represents the only web presence for nearly 50% of the enrolled businesses and has helped support agribusiness. FarmMap (<http://farmmap.psu.edu>), another online tool, allows landowners to advertise farmland for sale or lease. An improved version of FarmMap will be launched in summer 2009 that will enable landowners to better describe their land by outlining fields, mapping other features of interest such as water wells, buildings and silos, and upload photographs. Users searching for lands will see everything provided by the farmer overlaid onto color aerial photographs and additional information automatically extracted by FarmMap such as soils within the fields. Additionally, FarmMap will enable farmers to post needs for services such as custom harvesting or spraying.



HIGHLIGHTS

Dr. Day is also developing PaOneStop, a suite of online tools designed for nutrient management and conservation planning. The initial tool within PaOneStop will enable farmers to create maps required for the completion of Nutrient Balance Sheets for imported manure, as required by Pennsylvania's Nutrient Management Act. Further work is ongoing in developing online soil conservation planning tools that will allow farmers to effectively develop or update their own Conservation Plans. PaOneStop is a joint effort between Penn State, PA Departments of Agriculture and Environmental Protection, State Conservation Commission, and USDA-NRCS. Another project underway is the development of a statewide drought vulnerability index that will evaluate historical climatic conditions, field soils, and crop management to assess drought vulnerability at the field scale. The purpose is to provide additional guidance to farmers in understanding risks associated with drought.

Dr. Day and his team also provide extensive training throughout the state in use of geospatial technologies. Custom classes are conducted at various regional locations where attendees from a range of disciplines can be trained in new technologies. Educational outreach extends to K-12 students as well. Penn State is a partner in the FFA SAFE program which engages FFA students and schools in the development of Farm Emergency Response Maps. The maps, located on the farm and used by first responders, identify potential farm hazards, such as fuel tank locations, that enable first responders to more effectively deal with farm emergencies, and hopefully, save lives and money. To date, over 26 schools have been training in the program.

Student Profiles



As a graduate student in Soil Science and Biogeochemistry, **Morgan Minyard** enjoys being part of a department that promotes interdisciplinary research and has an amicable atmosphere in which to develop as a professional. She has worked closely with her soil science advisor **Dr. Mary Ann Bruns** and with **Dr. Susan Brantley** in Geosciences on a long-term ecological project located in the Luquillo Experimental Forest, Puerto Rico. Her research focuses on the role of microbes in promoting bedrock weathering and soil formation, specifically measuring microbe-mineral interactions in the soil/saprolite. Morgan has had the opportunity to present at several professional

conferences and student symposiums sharing her research ideas and networking with prominent scientists in her field. She recently represented the Department by co-chairing an interdisciplinary student symposium that promoted the exchange of research and ideas between students from 11 different departments across Penn State and several other universities. When not conducting research, Morgan enjoys participating in outreach programs such as the College of Agriculture's Governor's school and the Women in Science and Engineering summer camps.



As an undergraduate student in Environmental Soil Science, **Hunter Stambaugh** values the small class sizes that allow him to know the teacher and offer the opportunity to ask questions during class to gain further understanding. The smaller classes also allow Hunter to know his fellow classmates so they are able to help each other study for tests or work out problems. He enjoys being a member of the Agronomy Club as it offers the ability for students with similar interests to meet outside of class and discuss current issues within agriculture. The club went on several trips to various farms for club members to see what actual farmers are doing to make their farms more productive. The club also provides social opportunities such as bowling or having a picnic at the agronomy farm. When Hunter was looking for a summer job he wanted to work with some aspect of agriculture. The professors that he knew from class were very helpful in providing him with various opportunities even though there has been a decreased demand for summer workers. He states that professors sent him e-mails about opportunities they heard of or talked with him about his interests in order to assist him in his job search. With faculty recommendations and the knowledge he received in class, he can readily see the value of his education as he works as a crop scout this summer. Hunter attributes his success in school as well as the workplace to the individual support offered by professors at Penn State.

The Agronomy Club

The Agronomy Club was busy again this year with trips to conferences, competitions, and farms. In November, nine members of the club attended the American Society of Agronomy

Meetings in Houston, TX to compete in the Quiz Bowl Competition, Poster Contest, and attend sessions on Career Development. **Bryan Harnish** and **Ginger Spangler** won 1st place in the Quiz Bowl Multi-University Team. In April, **Alicia Spangler**, **Bryan Harnish**, and **Curtis Frederick** competed in the NACTA (North American Colleges and Teachers of Agriculture) Crops Competition held at Ohio State University. This was a rigorous test of all their agricultural knowledge against schools from all over the country. In mid-April, the club took their annual farm trip to visit the Heidel Hollow Farm, which is owned and operated by **David Fink** and family. While attending, the group learned about hay marketing, hay processing (including his bale compression system), and new advancements in his farming operation. Along with studying for classes and competitions, the Agronomy Club has maintained their social events including the annual fall hayride and line dance as well as the end of spring semester barbecue held at the Agronomy Farm. Fundraising activities included Indian Corn Sales, Blue and White Popcorn, and Agronomy Club Apparel. The



Agronomy Club wishes to thank their advisors **Kate Butler**, **Scott Harkcom**, and **Justin Dillon**. The Agronomy Club Members and Advisors wish the best to our graduating seniors **Bryan Harnish**, **Clare Wagner**, **Corey Grove**, **Curtis Frederick**, **Ginger Spangler**, **Sara Oyler**, and **Tiffany Dean**.

Comments...

Crop & Soil Update is published by the Department of Crop & Soil Sciences, The Pennsylvania State University, University Park, PA 16802 (814-865-6541).

Editorial comments and opinions expressed in *Crop & Soil Update* do not necessarily reflect the views of The Pennsylvania State University or the Department of Crop & Soil Sciences. Use of trade names implies no endorsement by Penn State.

DEPARTMENT HEAD: David Sylvia
EDITOR: Linda Spangler

ACTIVITIES

Soil Judging Team

The Soil Judging Team participated in the North East Regional Collegiate Soil Judging Contest this past fall, hosted by Delaware Valley College. The team consisted of returning team member **Collin Olie** and new comers **Austin Young** and **Nicole Heeter** coached by **Patrick Drohan**. The students gained valuable hands-on experience and had the opportunity to study soils of Southwestern Pennsylvania comprised of igneous, metamorphic, loess and old terrace deposits. They enjoyed interactions with NRCS professionals and students from other northeastern universities while improving their field skills. Highlights included seeing several aeolian affected soils with local loess from the Delaware River, the very red diabase soils, community scale-on-site wastewater treatment systems, and a local chocolate factory tour. This fall the team will be traveling to Ohio for the regional competition.



Weed Science Team

The 2008 Northeastern Weed Science Society – Collegiate Weed Science Contest was held at University of Delaware on July 30 where a total of 37 graduate and undergraduate students participated from five universities. Penn State's team included six students. The graduate team included: **Ryan Bates**, **Nelson DeBarros**, **Ruth Mick**, and **Matt Ryan**; and the undergrad team included: **Cory Chelko** and **Alicia Spangler**. **Dwight Lingenfelter** again coached the team in preparation for this practical and exciting challenge.

The universities represented at the contest were North Carolina State, Virginia Tech, Penn State, Cornell, and Guelph. Students participated in four contest segments including: 1) weed identification; 2) sprayer application technology; 3) diagnosis and identification of herbicides by symptoms; and 4) problem solving and recommendations in a field

setting (role-play event). The goal of the contest is to include “real-world” scenarios for experiential learning with a twist of fun. The weed science contest is open to graduate and undergraduate students interested in weed management in agroecology (agronomy), horticulture, turf, and natural areas.



The results of the contest include: Of the seven graduate teams in the contest, Penn State claimed 1st place and individually, **Matt Ryan** took 1st place with the overall highest point total of all contestants across the four events. Of the five undergraduate teams competing, Penn State was awarded 2nd place and individually, **Cory Chelko** tied for 2nd place among the undergraduate contestants.

The 2009 collegiate weed science contest will be a joint venture between the NEWSS and NCWSS (North Central). For the first time, it will bring together the two societies to compete in a combined challenge. The contest will be hosted by ABG Ag Services near Indianapolis, IN on July 23. The contest organizers expect between 80-90 participants from the combined societies; and it promises to be a great learning opportunity for all involved. This event could bring together people from as far west as Colorado, south to Oklahoma, east to North Carolina, north to Nova Scotia and Ontario, and points in between. The Penn State Weed Team is looking forward to this challenge and the experience of interacting with students and other agricultural specialists from Midwest universities and industries.

Turfgrass Club

These have been memorable years for the 40+ students comprising the Turfgrass Club membership. Student members participate in a minimum of four annual activities each academic year; the PSU Homecoming Parade, the Cutter Cup, the Sports Turf Managers' Association (STMA) National Conference, and the Golf Industry Show (GIS).

Turfgrass Club students burned the midnight oil putting finishing touches on their float, centered on a Beaver Stadium theme. The Cutter Cup, a trophy that returns to either the PSU or Michigan State campus each fall, acknowledges the superior play of students in five 18-hole matches hosted by a prestigious course in Ohio. The PSU Turf Club team fielded in 2008 defeated MSU 3-2 at the Inverness Club to bring home the Cup for the first time since 2002!

The 2009 GIS conference was great fun in the Crescent City, with the highlight being the Collegiate Turfgrass Student Competition. The top PSU Turfgrass Club teams placed 5th and 8th on the comprehensive team examination out of the 83-team field. One year earlier in Orlando, the top PSU Turfgrass Club team placed 6th out of 92 participating teams.

The 2009 STMA National Conference provided many PSU Turf Club members their first in-person view of the Pacific Ocean. While in San Jose, CA, turf club members participated in the STMA Student Competition. This year, our top teams placed 1st and 3rd out of 20 in the four-year programs division and 2nd place out of 10 teams in the two-year programs division. One year earlier in Phoenix, the top teams took 1st place out of 21 teams in the four-year programs division and 1st place out of 8 teams in the two-year programs division.

This year, students were excited to have Dr. John Kaminski join Dr. Max Schlossberg as a co-advisor of the PSU Turfgrass Club. Regularly updated PSU Turfgrass Club developments are available at: <http://www.personal.psu.edu/asm4/blogs/pennstateturf/>

2009 STMA Student Team



NEWSBRIEF

Alumni Symposium Notes

The 2008 Alumni Symposium was held on Oct. 24 on the University Park Campus. Our outstanding alumnus and guest speaker was **Nancy Jo Ehlke**, Professor and Head, Agronomy and



Plant Breeding, University of Minnesota. Dr. Ehlke received her Ph.D. in Agronomy from Penn State in

1987. Her research responsibilities are to (i) conduct research on the genetics and breeding methodologies of forage legumes, turf grasses, and native legumes, (ii) conduct a germplasm enhancement and varietal development program for important forage crops and turf grasses, and (iii) develop management strategies which maximize the profitability and sustainability of grass and legume seed production. In addition, she has administrative responsibility for a department with 24 faculty and 9 adjunct faculty in St. Paul and 5 faculty and 4 adjunct faculty located at four Research and Outreach Centers across the state.

The 2009 Outstanding Alumni Award recipient is **Joel Myers** (BS, 1965; MS, 1967). Joel is recognized regionally and nationally for his accomplishments related to the promotion and implementation of no till planting systems. He is also respected widely for his deep practical and theoretical knowledge of soil conservation plan development. He was among the first in Pennsylvania to support the Certified Crop Advisors program, recognizing the need for minimum professional standards among the agricultural service community. He has served as a speaker for state, regional and national meetings. Joel has always been aware of the need to work closely with Penn State colleagues to maintain a sound science base for all the recommendations that he gives.

Mark your calendar for the next Symposium
The Life and Times of a Practicing Agronomist

October 30, 2009

Nominations for the 2010 Outstanding Alumni Award are due January 5, 2010. Nomination forms are available at <http://cropsoil.psu.edu/OutstandingAlumniForm.pdf>.

Faculty Updates

John Kaminski joined the Department in 2009



as an Assistant Professor in Turfgrass Management. He also serves as the Director of the Golf Course Turfgrass Management Program.

Carmen Enid Martinez and **Max Schlossberg** were granted tenure and promoted to the rank of Associate Professor.

Curtis Dell and **Sarah Goslee** were promoted to adjunct associate professors.

Sridhar Komarneni was awarded the title of Distinguished Professor.

Andy McNitt and **Marvin Hall** received College of Agricultural Sciences Community of Teaching Excellence Awards.

Greg Roth received the Extension Faculty Award from Gamma Sigma Delta. Greg has also been appointed as State Program Leader for Renewable and Alternative Energy.

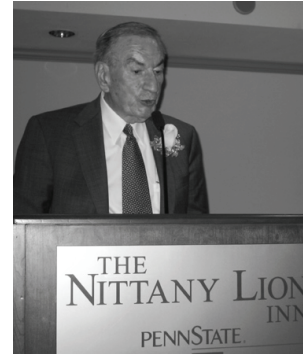
Mary Ann Bruns received the WISE (Women in Science and Engineering) Outstanding Service Award

Dan Fritton, retired in June 2008. He was recognized for 37 years of dedicated service to the Department. Dan received his undergraduate degree from Colorado State University and graduate degrees from Iowa State University. He began his academic career at Cornell University before joining Penn State in 1971. Over the years Dan taught Soils 101 to more than 6000 students, Soil 401/507 to nearly 2000 students, and received teaching awards from NEBASA (1993) and Gamma Sigma Delta (1996). Dan also served as Coordinator of the Soil Science/ Environmental Soil Science major since its inception and received the College Advising Award in 2007. We wish Dan a long and rewarding retirement.



David Mortensen received the Edward Bellis Award from the Ecology Graduate Program in recognition of his service as coordinator.

Jason Kaye received the Honored Ecology Alumni Award from Colorado State University.



Joe Duich, emeritus professor of turfgrass science, received a Distinguished Alumni Award, the university's highest award for an individual.

Joe Harrington, emeritus professor of agronomy, died Oct. 17, 2008 at the age of 82. He received his M.S. (1955) and Ph.D. (1959) from Penn State. Joe taught crop management and production courses and received numerous awards for teaching excellence. Joe managed the Penn State Ag Progress Days, growing it into Pennsylvania's largest outdoor agricultural exposition.



a Century of SOLUTIONS

Staff Updates

Kathy Barr retired from the University and **Linda Spangler** accepted the position of Office Manager for the Department.

Wayne Hass retired from the Corn Testing Program and **James Breining** was hired to continue the program.

Darlene Berry, **Stan Fitch**, and **Greg Roth** received their 25-yr service awards from the University in 2009.

Paul Craig, Extension Educator in Dauphin County, received the Merit Award from the American Forage and Grassland Council.

David Livingston, Manager of the turfgrass facilities, received the Department Outstanding Staff Award in 2008.

NEWSBRIEF

Student Updates

Sara Oyler, senior in Agroecology, received the Penn State Outstanding Senior Award sponsored by SASES (Students in Agronomy, Soils, and Environmental Sciences).

Clare Wagner, senior in Agroecology, was the Student Marshall at the Spring 2009 commencement.

Hunter Stambaugh, senior in Environmental Soil Science, received a Golden Opportunity Scholar Award from the Crop Science Society of America.

Jing Dai, Ph.D. in Agronomy, received the NACTA Graduate Teaching Award as well as second place in the C5 graduate student poster session of the Crop Science Society of America.

Kulbhushan Grover, Ph.D. in Agronomy, received the Outstanding Graduate Student Award from NEBCSA (NE Branch of CSSA, SSSA, and ASA).

Ashlee Dere, M.S. in Soil Science received the Outstanding Student Oral Presentation Award from NEBCSA and the Department Outstanding Student Service Award.

EXCELLENCE FUND

Public support for land-grant programs continues to erode at an alarming rate. To maintain the quality of our programs we depend on the support of our alumni and friends. The Department maintains the **Excellence Fund** to facilitate important projects that would otherwise be impossible. Examples of uses for gift monies include: helping deserving students present research results at professional meetings, facilitating development of teaching materials, and aiding graduate students in conducting research in unfunded areas by providing funding for research supplies and equipment.

If you wish to donate to this cause please make your check payable to Penn State (with a notation in the memo section of the check "Crop and Soil Sciences Excellence Fund") and send to: Office of Development, College of Agricultural Sciences, The Pennsylvania State University, 233 Agricultural Administration Bldg., University Park, PA 16802, or you may donate online at: <https://secure.ddar.psu.edu/GiveTo/> All donations are tax deductible.

Thank you for your support!



This publication is available in alternative media on request. The Pennsylvania State University is committed to the policy that all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by state or federal authorities. It is the policy of the university to maintain an academic and work environment free of discrimination, including harassment. The Pennsylvania State University prohibits discrimination and harassment against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, sex, sexual orientation, or veteran status. Discrimination or harassment against faculty, staff, or students will not be tolerated at The Pennsylvania State University. Direct all inquiries regarding the nondiscrimination policy to the Affirmative Action Director, The Pennsylvania State University, 328 Boucke Bldg, University Park, PA 16802-5901, Tel 814-865-4700/V, 814-863-1550/TTY.

UED#U.Ed. AGR 09-137

<http://cropsoil.psu.edu>

Non-Profit Org.
U.S. Postage
PAID
State College, PA
Permit No. 1

CROP & SOIL UPDATE
DEPARTMENT OF CROP & SOIL SCIENCES
THE PENNSYLVANIA STATE UNIVERSITY
116 AGRICULTURAL SCIENCES AND INDUSTRIES BUILDING
UNIVERSITY PARK, PA 16802-3504

Change of address notices should be sent to
Crop & Soil Update
116 Agricultural Sciences and Industries Building
University Park, PA 16802