

Crop & Soil Update

C R O P S C I E N C E • S O I L S C I E N C E • T U R F G R A S S S C I E N C E

Department of Crop & Soil Sciences Newsletter

2003 Edition

Message from the Head

I have enjoyed my first year on the job with its attendant reintroduction to the seasons and traditions of the northeast. The switch from research/teaching responsibilities to administration has been a growing experience, and I wish to express thanks to all those who have helped ease the transition.



I invite you to learn more details about specific faculty programs in these areas by visiting us on the web at <http://cropsoil.psu.edu/deptfoci.htm>.

On the academic side, our department is now a major player in the university-wide Intercollege Graduate Degree Programs in

We are facing challenging times brought on by current budget constraints and pressures on production agriculture; nevertheless, I am optimistic about our future because we are addressing important issues regarding sustainability, environmental quality, and rural/urban concerns. The Department's teaching, research, and outreach programs are now focused around six thrust areas that have vital importance to Pennsylvanians:

- **Crop Ecology and Management** programs have nationally recognized applied research and extension impact,
- **Plant Breeding and Molecular Biology** faculty use new tools to track the structure and function of valuable genes,
- **Turfgrass Science** continues its strong industry collaboration and support,
- **Biogeochemical Processes** provide linkage to national research programs in C/N/P cycling,
- **Land Use** faculty have internationally recognized programs in remote sensing and applied GIS, and
- **Soil and Water Quality** programs are on the forefront of nutrient management issues.

Ecology, Environmental Pollution Control, Genetics, Materials, and Plant Physiology. This is a positive trend because it provides us increased visibility and credibility across campus; however, we need to also ensure the strength of our traditional programs in Agronomy and Soil Science.

Our two- and four-year resident turfgrass programs remain strong. Furthermore, the certificate program offered through the World Campus is highly successful, and a new online MAg program is being proposed. Our Environmental Soil Science and Agroecology (the Interdepartmental Program for students with interest in agronomy) undergraduate programs are facing enrollment challenges. We are working hard to increase the visibility of these programs and I would like to solicit your help in getting the word out – please see the **Recruitment Corner** to learn how to get involved.

The Department of Crop and Soil Sciences is poised to make important contributions to a high quality of life in Pennsylvania and beyond. I look forward to working closely with friends and alumni of the Department to further this goal. To enhance the

visibility of our alumni programs we have initiated an alumni-sponsored symposium. Our first symposium was held September 12, 2003, when we debated the Future of Agronomic Science and Practice. I hope to meet many of you at next fall's event - stay tuned for details.

Visit us at our new web address:
<http://cropsoil.psu.edu/>

An electronic version of this publication is available at <http://cropsoil.psu.edu/>.

In an effort to reduce costs, if you wish to view future publications electronically please send an email to Kathy Barr (ksb1@psu.edu). We will remove your address from our USPS mailing list and email you when we post the current issue to the website.

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Research Highlights

Pesticides are employed to protect a crop from pests and diseases to obtain full yield potential of a crop variety. The challenge that lies ahead is to genetically improve innate disease resistance in plants. Crop plants that can withstand disease pressure with the least usage of fungicides and insecticides will be needed to reduce the non-targeted affects of pesticides. The focus of the maize molecular genetics research program led by **Surinder Chopra** is to utilize natural plant chemicals that impart plant disease resistance. Our approach is to understand the genetic and molecular mechanisms regulating the synthesis of these compounds when a plant is challenged by adverse environmental conditions. We employ sorghum (*Sorghum bicolor*) as a model system to study its response to *Colletotrichum graminicola* (the anthracnose fungus), a pathogen of sorghum and maize (corn). Using whole plant, single cell and field based genetic screening approaches we are establishing

the basis for the expression of the biochemical pathway which is responsible for synthesis of induced plant flavonoids. A specific class of flavonoid compounds that act as toxins (phytoalexins) to the anthracnose fungus in sorghum has



been the focus of our research. Since sorghum and maize are closely related cereal species, research findings learned from sorghum will be applied to the on-going maize improvement projects. Our long-term goal is to engineer the flavonoid and phytoalexin pathway in diverse plant species. To achieve our goals, the research

is done in collaboration with on- and off-campus research groups. Graduate students from the Department of Crop & Soil Sciences and Inter-college programs as well as interns in summer programs participate in thesis and independent research projects. Sources of research funding include College of Agricultural Sciences, Department of Crop & Soil Sciences, The Huck Institute of Life Sciences, and USDA-NRI. For additional information, please contact Dr. Surinder Chopra at (814) 865-1159 or email sic3@psu.edu.

Teaching Highlights

Dan Fritton is infusing “Emotional Intelligence” into Soils 101, including cross-cultural sensitivity and expertise in building and leading teams. During a year-long initiative, a group of volunteer faculty were challenged to infuse multiculturalism into their courses. At first, Dan found it difficult to even recognize a cultural component in the introductory soils course; however, a student commented that you could always tell the “aggies” from the “townies” in an Ag classroom. Dan immediately recognized the truth of that statement for Soils 101 and also recognized that other cliques existed in the classroom. During the summer of 2002, Soils 101 was reorganized to take advantage of the diverse, multicultural nature of the students by assigning them to groups based on geography. Students were selected with as many different majors as possible as a second criterion. These groups worked together for the entire course and during many class periods, groups were required to produce a report or solve a problem using soils information. Through this process, students improved their expertise in building and leading teams. In addition, students were encouraged to develop a professional relationship with individuals who were culturally different from themselves— “aggies” got to know “townies,” “environmentalists” got to know “production types,” and

“minorities” got to know “other minorities” among the many diverse individuals in the course. And finally, we think the students learned as much about soils as they did under the traditional lecture/lab approach.

Extension Highlights

Several of our extension faculty, **Doug Beegle, Bill Curran, Sjoerd Duiker, Marvin Hall, Les Lanyon** and **Greg Roth** provide leadership for a multidisciplinary Crop Management Extension Group that works with extension agents, agribusiness professionals, and commodity groups on many of the current issues facing our clientele. We are currently addressing issues on a range of topics including the management of new transgenic crops, innovative grass evaluation trials for grazing, the phosphorous index for nutrient management and understanding the new organic crop production standards. We’ve recently expanded our on-farm research trial programs by hiring **Ron Hoover** and now have research efforts with over 50 producers across the state. Our extension effort is more than just traditional crops and soils, though. We’ve got a great turf extension program managed by **Pete Landschoot** that is a real team effort including all of the other turf faculty and the Pennsylvania Turfgrass Council working together to develop some top-notch conferences and fact sheets. Our environmental soils extension program is managed by **Rick Stehouwer** and deals with a number of current issues. We also have a very strong Geographic Information Systems extension program that is managed by **Rick Day**. Rick and his group have a number of training and database development projects underway, including Ag Map, a system that helps consumers, farmers, and businesses find local producers and sellers of various agricultural products. You can get more details by visiting <http://cropsoil.psu.edu/Extension/Extension.html>.

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Farm Activities

Many research activities are taking place at the Agronomy Research Farm for 2003. Much of the field research is focused on the major crops grown in Pennsylvania, including corn, soybeans, alfalfa, wheat, and forage grasses. For each of these crops, research is being conducted to evaluate the impact of various cultural practices, nutrient management issues, IPM strategies, and varietal performance. A new research effort begun last fall focuses on the potential for hard red winter wheat production in Pennsylvania.

In addition, weed scientists are studying weed population dynamics based on landscape and cropping systems as well as studying weed biology, ecology, and control in various crops. Several long term experiments are continuing at the farm. One of these, a tillage experiment, is examining the long-term effects of several different types of tillage on crop yield and soil quality. Another, a long-term crop rotation experiment, is designed to measure differences in crop yield and soil quality due to various crop rotations and various fertilizer and manure inputs.

Club Activities

The Agronomy Club is the student activities organization of the American Society of Agronomy. One of the ongoing and popular club activities is the production and sale of blue and white corn. Club members plant and harvest the corn at Penn State's Agronomy Farm at Rock Springs, then in the fall they bundle the corn and sell to Penn State fans on home football weekends. Five club members traveled to the ASA national meetings in Indianapolis last year where they presented a poster on the blue and white corn project. At those meetings one club member, **Gwendolyn Crews**, prepared a presentation for the meetings on her research project with grazing chickens. Gwendolyn won third place for her work.

The Turfgrass Club continues to be very active within the Crop and Soil Sciences Department. This past year there were over 75 active members from the 2- and 4-yr turfgrass science programs. Fourteen

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meetings were held during the academic year that included guest speakers and social activities. The Cutter Cup was defended and retained again by Penn State in our annual golf match against Michigan State. Michigan State hosted the event at Inverness Club in Inverness, Ohio. The 5-team match play event was closely contested and ended in a tie. Penn State retained the cup having been the possessor of the cup prior to the match. The club was well represented at the Golf Course Superintendent's Association of America conference held in Atlanta during the second week of February. Over 20 students made the trek to Atlanta to attend the international conference and trade show. Three teams competed in the 7th Annual Turf Bowl, finishing 3rd, 8th, and 13th in the competition of over 60 teams. Many students spent time viewing the newest advancements in turfgrass management on the 4+ acre trade show floor.

The Penn State Soil Judging Team placed third in the Northeast Regional Collegiate Soil Judging Contest. This past spring, Penn State joined 21 other teams at Texas A&M University for the 43rd annual contest. Although awards are used to motivate students to work to the best of their ability, the real award of such a competition is the chance to interact with students and professors with similar interests, as well as gain invaluable experience studying soil properties unique to the contest area. Additional information can be obtained by visiting the team's webpage at: http://www.courses.psu.edu/soils/soils100_mpc150/website/private/soiljudge.htm

The Penn State Weed Science Team will begin soon to prepare for the upcoming Northeastern Weed Science Society – Collegiate Weed Science Contest. This year's contest will be held July 29, at the Syngenta Crop Protection Eastern Region Technical Center in Hudson, NY. This year's team includes: **Brian Dillehay, Joe Dauer, Matt Booher, and Melanie Labaido**. Most of the students who have been involved in the contest find it most

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challenging, humbling, rewarding and enjoyable. It provides a lot of helpful experiences for future use. As in the past, **Dwight Lingenfelter** and **Dr. Bill Curran** will coach the team and get its members ready for the exciting event. For more information and photos of some past contests, please visit our websites at www.cas.psu.edu/docs/casdept/agronomy/weedteam/weedteam.html.

Symposium Notes:

The first Alumni-Sponsored Symposium was held Sept. 12, 2003 at University Park on the topic of the Future of Agronomic Science & Practice. **Al Bilzi** moderated the session where **Ray Bryant** (USDA Pasture and Watershed Research Lab), **Chuck Krueger** (Professor of Agronomy), **Bill Palkovics** (DelVal Soil & Environmental Consultants), **Walt Peechatka** (PennAg Industries Association), and **Gary Petersen** (Professor of Soil Science), provided perspectives from the academy, government, and industry. We concluded the afternoon with a panel discussion, Outstanding Alumni Award, and reception.

Outstanding Alumni Award:

George May (BS, 1971; MS, 1973; PhD, 1976) received this honor in recognition of his national reputation for applying agricultural remote sensing at the farm level. He accomplished this by creating commercial spin-off companies from his applied research programs that are currently servicing corn, wheat, soybean, and cotton farmers across the U.S. Dr. May has been a national leader in providing Congress, NASA, USDA, and commodity associations with the necessary information to identify problems, to recommend solutions through remote sensing technologies, and to implement programs that support the needs of farmers and agribusiness. In recent years George has used his expertise in sensing technology to assess stress and disease in humans.

Nominations for our 2004 Outstanding Alumni Award are due Jan. 5, 2004. Nomination forms are available at <http://cropsoil.psu.edu/OutstandingAlumniForm.pdf>.

New Faculty

David H. Johnson is the new Plant Scientist/Scientist-in-Charge at the Southeast Agricultural Research and Extension Center in Landisville. Dave has experience in laboratory and field research and product development in the agricultural products industry. Before coming to Landisville he was a research chemist and soil scientist at Princeton and a senior field biologist in product development with BASF Corporation. He earned a B.S. degree in agronomy from Penn State and an M.S. and Ph.D. in agronomy/weed science from the University of Arkansas.

Carmen Enid Martinez joined the department in July, 2002, as an assistant professor of environmental soil chemistry. Before joining the University, she was a research associate in environmental biogeochemistry at Cornell University. Her research interests include the occurrence, distribution, and transformations of trace elements in the environment and their interactions with soil surfaces. She will be involved in teaching courses in environmental aspects of the chemistry of soils. She earned a B.S. in Chemistry from the University of Puerto Rico and an M.S. in Environmental Chemistry and Ph.D. in Environmental and Soil Chemistry from Rutgers University. Martinez can be reached at (814) 863-5394 or by e-mail at cem17@psu.edu.

Maxim Schlossberg joined the department in August, 2002, as an assistant professor of turfgrass/soil science. His area of study centers on appraising current soil testing protocol, interpretation, and fertilizer/lime recommendation practices for turfgrass systems throughout Pennsylvania. His research objectives include evaluation of soil amendments for improved nutrient use efficiency, and nutrient-temperature-root physiological interactions in intensively managed sand root zones. Schlossberg will be involved in teaching in the Golf Course Management Program. He earned a B.S. in Agronomy from Texas A&M University and an M.S. and Ph.D. in Agronomy from

the University of Georgia. Schlossberg can be reached at (814) 863-1015 or by e-mail at mjs38@psu.edu.

David M. Sylvia joined the department in June, 2002, as department head. His research has examined the microbial ecology of the rhizosphere—particularly mycorrhizal fungi—with the goal of incorporating mycorrhizal technology into sustainable agricultural practice. He is an award-winning educator who has contributed to the development of Web-based distance education. He earned a B.S. in forestry and an M.S. in plant pathology from the University of Massachusetts, and a Ph.D. in plant pathology from Cornell. Sylvia can be reached at (814) 865-2025 or by e-mail dmsylvia@psu.edu.

Honors/Awards

Faculty

Mary Ann Bruns, assistant professor of soil science/microbial ecology, served as President of the Allegheny Branch of the American Society for Microbiology. **Kate Butler**, senior lecturer, received the Outstanding Young Alumni Award from Penn State, DuBois. **Marvin H. Hall**, professor of agronomy, was named a Fellow of the American Society of Agronomy. **Sridhar Komarneni**, professor of clay mineralogy, was named a Fellow of The Royal Society of Chemistry. Received the Marion L. and Chrystie M. Jackson Mid-Career Clay Scientist Award and was named as an Elected Member of the European Academy of Sciences. Komarneni was recognized as a Highly Cited Researcher by the Institute for Scientific Information (ISI). **Charles R. Krueger**, professor of agronomy, was recognized for his contributions by the Executive Committee of the NE Pasture Consortium. **Peter Landschoot**, associate professor of turfgrass science, was promoted to professor. **David A. Mortensen**, associate professor of weed ecology/biology, received the Outstanding Teacher Award from the Weed Science Society of America. **Gary W. Petersen**, distinguished professor of soil and land resources and co-director of

ORSER, was named Vice-President of International Union of Soil Sciences. **Greg Roth**, associate professor of agronomy, was promoted to professor.

Andrew Sharpley, adjunct professor of agronomy, **Douglas Beegle**, professor of agronomy, **Bill Gburek**, hydrologist, **Peter Kleinman**, adjunct assistant professor of soil science, and **Jennifer Weld**, adjunct instructor of agronomy, received the Honor Award from the Secretary of Agriculture. **Richard C. Stehouwer**, assistant professor of environmental soil science, received tenure at Penn State and was promoted to associate professor. Rick headed Penn State's Cooperative Extension's Backyard Composting Program which received the 2002 Governor's Award for Environmental Excellence. The program is a cooperative effort between Penn State and the Pennsylvania Department of Environmental Protection. **A. J. Turgeon**, professor of turfgrass management, received the Fred V. Grau Turfgrass Science Award from the Crop Science Society of America and the Outstanding Teaching Award from Penn State World Campus. **Thomas Watschke**, professor of turfgrass science, received the Distinguished Member Award from the Northeastern Weed Science Society.

Emeritus Faculty

Nathan L. Hartwig, professor emeritus of weed science, received the Distinguished Member Award from the Northeastern Weed Science Society. **Donald V. Waddington**, professor emeritus of soil science, received the ASTM International 2003 Award of Merit and the accompanying title of Fellow.

Students

Art Gover, M.S. candidate in agronomy, received the Outstanding Researcher Award from the Northeastern Weed Science Society. **Keith Goynes**, Ph.D. candidate in soil sciences, won the Student Paper Competition for the Third Annual International Conference on Remediation of Chlorinated and Recalcitrant Compounds, sponsored by Battelle. **Jeremy Menna** and **Matthew Slingerland**,

turfgrass undergraduate students, were presented scholarship awards at the Sports Turf Managers Association's 14th Annual Conference and Exhibition Awards Banquet in San Antonio.

Retirements:

Jean-Marc Bollag, Professor of Soil Biochemistry – March 31, 2002

O. Elwood Hatley, Professor of Agronomy – August 1, 2002

John O. Yocum, Sr. Research Associate – October 1, 2002

Deaths:

Clarence S. "Rusty" Bryner, professor of animal science extension from 1956 until retiring in 1978, died April 18 at age 91.

William L. Stout, agronomy research assistant from 1972 to 1976 and again as USDA research soil scientist, adjunct assistant professor of soil science in crop and soil sciences from 1981, died March 1 at age 56.

This publication is available in alternative media on request.

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Comments...

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DEPARTMENT HEAD: David Sylvia

EDITORS: Kathy Barr and Gretchen Rebarchak

Staff Updates

New faces. A number of new staff have joined the Department in the past few months. **Eileen Thomas**, bookkeeper, has joined the administrative staff working with Mrs. Cheryl Keller. **Kristina Cowan**, senior research technologist, working with Dr. Carmen Martinez. **Brad Georgic**, senior research technologist, working with Dr. Henry Lin. **Leah Wasser**, extension assistant, working with Dr. Rick Day. **Jennifer Sporre Moeny**, research technologist, working with Dr. Sjoerd Duiker. **Kathleen Arrington**, senior research technologist, working with Dr. Les Lanyon. **Robert Raley**, research technologist, working with Dr. George Hamilton. **Joshua Cook**, research technologist, working with Dr. Peter Landschoot.

Partings. **Brad Park**, research support technician working with Dr. Peter Landschoot, has accepted a position with Rutgers University.

Promotions. **Rob Stout** was recently promoted to research support assistant working with Drs. Marvin Hall and Heather Karsten. **Dianne Petrunak** was promoted to research support technician working with Dr. Andy McNitt.

Student Profiles

Matthew Myers began his Masters Degree Program in Agronomy in January 2001. The Crop and Soil Sciences Department at Penn State attracted him because of the strong commitment of the faculty and staff to teaching, research, and outreach programs. In the past couple of years, many positive experiences have helped him further his education as well as grow professionally. From networking opportunities at international and regional conferences to competing in intercollegiate weed science contests, Penn State has provided him with the foundation needed to achieve future goals. As Matt finishes his graduate studies at Penn State and begins a career with the USDA-Agricultural Research Service on

campus, he says he "feels fortunate to have received a quality education and made friendships that will last a lifetime."

Polly Leonhard was attracted to the AGESS undergraduate program at Penn State because she was interested in learning about agronomic research in Pennsylvania. She had an interest in cotton breeding genetics due to a science fair project she had completed in high school. Polly wanted to gain some broad agronomic knowledge before focusing on plant breeding. Polly says being involved in the Agronomy Club and working in Dr. Surinder Chopra's research lab were two good experiences in the Crop and Soil Sciences Department. The Agronomy Club was a great way for her to meet other students with similar interests, to socialize, and share experiences. As an undergraduate researcher in Dr. Chopra's lab, Polly was involved in a project co-advised by Dr. David Gustine. This was a valuable experience for Polly leading to her pursuit of a master's degree.

Polly arrived in Texas and has officially become a Texas A & M Aggie. She says she is looking forward to her work with Dr. C. Wayne Smith, a cotton breeder at TX A&M, but will always be a Nittany Lion.

Recruitment Corner

In a time of changing priorities and proliferating majors, getting our message out to prospective students is becoming increasingly important. We have developed new recruiting materials for our Environmental Soil Science major. We invite you to go to <http://esoils.psu.edu/downloads.html> where you can download a PDF version of our recruitment flier and a brief PowerPoint show that introduces the major. Please use these materials as you interact with various groups that should know about this major. Similar recruitment materials are being developed for the Agroecology major and our graduate programs.

**Alumni Update – By Jackie Stonfer,
President, Agronomy Program Group**

The Pennsylvania Farm Show is a great place to meet people. This past January I met with Dr. David Sylvia while he was attending his first PA Farm Show. We discussed ways in which the Crop and Soil Sciences Department and the Alumni Program Group (APG) can work together. Several exciting items were discussed, which Dr. Sylvia later discussed with the APG board members at the March 28, 2003, meeting.

Discussion at the March 28 meeting included the following:

- *Name Change* - The question as to whether the APG should change its name from Agronomy to Crops and Soils (like the Department) or another name or acronym was discussed. No comments were received regarding the name change as a result of the last newsletter. However, Mary Smith advised that the graduating students that she has talked to did not want the name of the APG to change.

- *Mentoring* - The fact that we would like to get the mentors more involved with the students was discussed. Jillian Stevenson, Director of Alumni Relations for the College, advised that Ag Alumni Society has a pilot mentoring program where students are matched with mentors. The mentors help with resumes and interviewing skills. Some students shadow their mentors on the job. This takes initiative from the students and needs Departmental support. The response from the students and the mentors has been very positive.
- *Student Recruitment* - Dr. Sylvia advised that he would like to use the individuals on the mentoring list to aid in recruitment for the Department.
- *Membership Recruitment* - The need to involve more people in the APG was emphasized. It was agreed upon that we need to meet with the undergrads prior to graduation to get them involved.
- *Symposium* - Dr. Sylvia advised that we could arrange to have a symposium in place of the Departmental Seminar. This is planned as an annual event to address

critical issues facing our profession and to provide an opportunity for alumni to stay connected to the department. To learn how you can become involved send an email to alumni@cropsoil.cas.win.psu.edu

Agronomy APG mission Statement: The agronomy APG is an alumni group formed specifically for the benefit of the Penn State's Department of Crop and Soil Sciences, its alumni, and students. The APG will focus on its efforts in the development of a system that will facilitate internships, mentors, and career resources for the mutual benefit of students, alumni, and interested industries/businesses. Our organization will establish channels of communication between faculty, alumni, and industry/business for the exchange of ideas and the rapid identification of industrial and academic trends.

<http://cropsoil.psu.edu>