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The layout work for this year’s issue of the Alumni Newsletter was done by Dawn Dailey O’Brien. Thanks to Dawn also for pursuing and organizing contributions from alumni, faculty and staff and for compiling information regarding past and present graduate students. Thanks to Alicia Caswell for assisting Dawn in the pursuit.

Thanks to Rachel McCarthy and Justin Buechel for proofreading. Send feedback and suggestions for future newsletters to plantpathcornell@cornell.edu

The Alumni Newsletter is published annually by the

Department of Plant Pathology and Plant-Microbe Biology
College of Agriculture and Life Sciences
Cornell University
Greetings from the Chair

William Fry
Chair, Department of Plant Pathology and Plant-Microbe Biology

Dear Friends,

Greetings from Cornell. This has been a significant year for the department. Much has been accomplished in many different arenas—teaching, research and extension. There is really a lot happening. We’ve chronicled part of that accomplishment in this newsletter. The merger initiated in 2010 has made us one of the larger units in the world dealing with plant diseases and their associated microbes. The merger is proceeding and has identified some fascinating cultural idiosyncrasies. We’re having fun.

There have been significant comings and goings and celebrations this year. In terms of “comings”, we’re delighted that Adam Bogdanove (PhD 1997, with Steve Beer, and postdoc with Greg Martin 1997–2000) has returned as a full professor. Adam has played a major role in the developing story of TAL effectors and he was willing to continue that activity at Cornell. We welcomed a new cohort of 9 graduate students this year. They are a really good group—probably almost as good a group as was your cohort. Two faculty have retired this year. Harvey Hoch retired in February and Herb Aldwinckle retired in August. Harvey now lives in Georgia and Herb splits his time between California and Geneva. After 30+ years in the department, Dave Kalb is retiring this year. Dave will work part time during this transition year. After 10 years in the department, Jackie Armstrong is also retiring this year. She is also working part time in transition. We have much to celebrate. Several faculty have received very nice recognition including some nice awards to Margery Daughtrey, Chris Smart, and George Hudler. Amy Andersen was recognized with the 2012 CALS Core Values award. Read more about all of these folks in this newsletter.

However, a major celebration concerns graduate training at Cornell. In 2007, we celebrated 100 years of graduate education in plant pathology. Hans VanEtten was the inspiration, the energy and the mastermind of the celebration. Hans spent much effort in gathering data, interviewing many of you, and compiling a wonderful history. He presided over the celebration in November 2007. For those of you who were not present, Hans has prepared a wonderful DVD that chronicles the history and the celebration. Please read about it and obtain a copy. Details are provided in this newsletter.

The College of Agriculture and Life Sciences is also evolving and that evolution may have an impact on the department. There is currently a “Plant Science Reorganization Committee” to visualize the organization of the plant sciences in the future at Cornell. It’s premature to predict the eventual organization, but we expect some organizational changes.

I wish you all the very best, and please do let us know how things are going with you. Please also visit whenever you can.

Best,

Cornell University
Department of Plant Pathology and Plant-Microbe Biology
Cover Stories

Harvey Hoch Retires
Wayne Wilcox

Professor Harvey Hoch retired in February 2012, after an illustrious 38-year career in the department. Over most of this time, Harvey’s research program emphasized various aspects of cell biology in (primarily) plant pathogenic fungi, often focusing on mechanisms by which these organisms use leaf surface characteristics to sense the right time and place to infect their host. A keen microscopist and tinkering wizard, Harvey utilized micro- and nanotechnology to fabricate devices and surfaces that mimic plant features to visualize and otherwise investigate fungal cell function. For example, he and his group showed that germlings of the bean rust pathogen (*Uromyces appendiculatus*) use topographical leaf surface features to orient their growth towards the stomates that constitute the infection court, and that upon reaching the surrounding guard cells additional topographical features provide the stimulus for the germlings to differentiate appressoria and begin the infection process. In recent years, Harvey branched out to apply his talents to bacterial diseases as well, with a particularly active collaborative program on the xylem-inhabiting bacterium *Xylella fastidiosa*, causal agent of the dreaded Pierce’s Disease of grapes. Because the xylem vessel environment within a living plant cannot be readily viewed, he once again used fabrication technologies to create microfluidic chambers that mimicked these vessels, in which the bacteria could be studied temporally and spatially, allowing him to determine that the bacteria “swim” against the flow of xylem sap through the extension and retraction of hair-like pili.

Harvey’s intellect, unique talents, and rigorous experimental techniques made him a sought-after collaborator with many colleagues, whose research foci were both “applied” and “basic”. His skills and professional accomplishments were recognized by his peers through several prestigious awards, including the Ruth Allen Award from the American Phytopathological Society, designation as Fellow by the same organization, and the Distinguished Mycologist Award from the Mycological Society of America. In addition to maintaining an active research program, from 2005–2010 he served as Chair of the then-autonomous Geneva branch of the department, where he spent virtually his entire career, while simultaneously serving as Co-Director of Cornell’s Nanobiotechnology Center in Ithaca. A native of San Antonio, TX, Harvey has relocated to the warmer climes of coastal Georgia near Savannah, where the weather and his emeritus status allow him to play a lot more golf than he did while working at Cornell.

A keen microscopist and tinkering wizard, Harvey utilized micro- and nanotechnology to fabricate devices and surfaces that mimic plant features.
Margery Daughtrey Honored as Fellow of the American Phytopathological Society at National Meeting in Providence, Rhode Island

Margery L. Daughtrey was selected as a Fellow of the American Phytopathological Society (APS) at their annual meeting in Providence, Rhode Island in August. This is a distinct honor reserved for a small percentage of the nearly 5,000 members of APS. Margery was nominated for her exceptional contributions to her stakeholders, her professional society, and to the science and practice of plant pathology.

Margery is internationally recognized as a leader in prevention and mitigation of disease losses in nursery and floriculture production. Her department chair, (and former APS president) W.E. Fry said: “Margie is easily the most famous plant pathologist at Cornell University”. By stakeholder consensus, she is also the most prominent and influential ornamentals pathologist in the US. She is one of the most effective producers of practical information on disease management, and is absolutely passionate about producing educational materials for ornamental growers. And Margery’s presentations are always full of exceptional photographic images. She has published over 600 research reports and magazine articles that are distributed directly to stakeholders and scholars across the US and Canada. Several colleagues contacted expressed the view that students would profit more from a week spent with Margery in the field than any amount of time in a lecture hall.

Margery’s skills as an enthusiastic and unfailingly positive mentor are well-known and widely respected, particularly as a role model for young women entering our discipline. She is an excellent diagnostican and is often the first to report a disease new to floriculture. Her knowledge has made her a valuable advisor to industry groups as well as to the USDA. Her contributions to the floriculture industry have been recognized through prestigious regional and national awards. As an impartial and informed advocate for the floricultural industry, Margery has been a critical source of expert information for regulatory agencies. Her logical and scientifically based testimony on issues such as Southern wilt on Pelargonium (Ralstonia solanacearum) and chrysanthemum white rust (Puccinia horiana) was essential to balance politically-driven actions that would have otherwise harmed stakeholders. When Southern wilt hit the geranium industry in 2003, Margery was called upon by USDA-APHIS to help design a workable response. It was Margery who worked with the four major geranium breeders, for several years, to develop and deploy the basic sanitation principles to keep geranium crops free of Ralstonia and Xanthomonas. Those early efforts are the foundation of the current certification program that allows geranium cuttings to enter the U.S. from offshore, and without it the geranium industry in the U.S. could literally have been ruined.

Margery has also served APS in numerous capacities: as a member of APS Council, as editor in chief of Phytopathology News, and as senior editor and editor in chief of APS Press. She was instrumental in re-organizing the editorial board to improve function and efficiency. During Margery’s tenure as editor in chief, APS Press explored new ways to publish, and the first electronic products became available in 2012. Testimonials from APS headquarters’ staff, as well as numerous authors who worked with her, universally acknowledge her editorial skills, effectiveness, boundless energy, timely encouragement, and dedication to move projects forward. She has an extraordinary gift for inspiring weary authors to breathe life into ambitious but moribund writing projects.

Despite a 100% appointment in Extension, Margery has compiled an impressive record in research. She collaborated with colleagues in the first descriptions of two Carlaviruses: Coleus vein necrosis virus, and Hydrangea chlorotic mottle virus (HdCMV). Margery was the first to find a new powdery mildew (Oidium longipes) on petunia in the U.S., and determined the threat it posed to other solanaceous crops. She has written two prestigious reviews in Annual Review of Phytopathology. Margery has published 14 scholarly book chapters, and co-authored four books, including the recent Diseases of Herbaceous Perennials. In the increasingly specialized research world, Margery is an invaluable rarity who truly bridges the divide between research and its practical application. She is thoroughly deserving of recognition as a Fellow of the American Phytopathological Society.
Dr. Herb Aldwinckle Retires
George Abawi, Amy Andersen, Ewa Borejsza-Wysocka

Dr. Herb Aldwinckle retired on August 31, 2012 after a long and distinguished career in Plant Pathology at Cornell University. However, Herb is continuing his several ongoing projects with the support of his entire staff as an Emeritus Professor in the department.

Dr. Aldwinckle obtained his BA from Cambridge University, Cambridge, UK in 1963 and his PhD from London University, London, UK in 1967. He was an Assistant Research Plant Pathologist at the University of California-Davis from 1967–1969 and in UC-Berkeley from 1969–1970. He was appointed Assistant Professor of Plant Pathology at Cornell University on the Geneva campus in 1970, promoted to Associate Professor in 1976, and Full Professor in 1984. Herb has been a member of the American Association for the Advancement of Science, the American Phytopathological Society, American Society of Horticultural Science, International Society for Molecular Plant-Microbe Interactions, and the Society for In Vitro Biology.

Herb developed an outstanding, nationally and internationally recognized research and outreach program in fruit pathology with special focus on apple diseases and particularly fire blight, apple scab, rust and other diseases. Herb’s projects spanned the entire breadth of plant pathology research from the very applied (disease epidemiological studies and evaluations of biological and chemical control products) to the very basic and mechanistic level (tissue culture, genomics, functional genomics, plant transformation, genetic engineering, etc.). He also participated in the collection and characterization of apple germplasm from China, Turkey and other regions.

Dr. Aldwinckle has been a highly successful scientist in his numerous collaborations with several plant breeders, pathologists and other scientists at Cornell and several other institutions nationally and internationally. In addition, he has trained and mentored many graduate students, visiting scholars, postdocs, and other colleagues throughout his illustrious career.

Herb has been a highly productive scientist and has over 153 articles in refereed scientific journals, 16 book chapters, 93 conference proceeding papers, and a total of 155 additional publications in various media.

Dr. Aldwinckle has received many awards in recognition for his numerous contributions to plant pathology, fruit diseases, and apple rootstock breeding, only to mention a few. Among the awards he has received are the Life in Apple Research Award, Rosaceae Research Community, RGCC, San Michele all ‘Adige in 2012; Career Accomplishment Award, CALS, Cornell University in 2009; Lifetime Achievement Award, International Society of Horticultural Sciences in 2008; Distinguished Research Award, International Dwarf Fruit Association in 2003; Fellow of APS in 1992; and others.

Dr. Aldwinckle has truly been a good citizen and served the department, the Experiment Station, the College and Cornell, as well as several professional societies in various capacities throughout his career. He served as Chair of the Department of Plant Pathology at Cornell-Geneva from 1982–1997; Chairperson, Apple & Pear Disease Workers; Chairperson, Apple Breeders Cooperative; Chairperson, Apple Crop Germplasm Committee, USDA National Germplasm Committee; Chairperson, US Executive Committee for Rosaceae Genomics, Genetics, and Breeding; APS Editorial Review Board, Plant Disease; Steering Committee for the Workshop on Deregulation of Genetically Engineered Trees and Woody Perennials; Steering Committee, Technology Road Map for Tree Fruits; Faculty Senate, Cornell University; Faculty Advisory Committee for the Ag. Tech. Park, CALS, Cornell; GMO Advisory Group and Working Group, Cornell; and many others.

Helene Dillard, Herb Aldwinckle, Tom Bur and Bill Fry at Herb’s retirement party.
Residents of PPPMB expressed a collective gasp as they learned that Dave Kalb is retiring from the department to start a second career. Dave has touched the lives of virtually all of the faculty and graduate students on the Ithaca campus since he joined our group as a research technician with Prof. Roy Millar’s program in 1980. When Roy retired, Dave moved to Gary Bergstrom’s program where he continued to provide outstanding support that was well above and beyond what might be expected from someone with his job title.

In 1996, Dave became both the department Teaching Lab Coordinator and the Plant Science Building Facilities Manager. In the former role, he maintained virtually all of the cultures and plants that were used in the teaching program and ensured that each lab section started with all that was needed by the teaching faculty and students to conduct meaningful laboratory experiences. With the rapid growth and application of new diagnostic technology (Biolog, ELISA, PCR, etc.) and on-line teaching software, new challenges to make the new tools work were rapidly accepted and mastered by Dave. And through his efforts, Cornell students could continue to get state-of-the-art instructional support.

One of the many things that distinguished Dave throughout his term was his sincere dedication to the educational mission. Time and time again, he leaped at the chance to present classes not only within the confines of our traditional labs, but also when we took the show on the road as happened in the late 1990s when we developed and presented a program for grade school students in the Ithaca area. And his contributions weren’t just OK; they were outstanding and very well received by his audiences.

On the Building Facilities side of the ledger, Dave oversaw (and actually directed) some major transitions in the department including numerous research laboratory renovations, purchase and installation of improvements to the teaching lab space, and the relocation of Bradfield research programs back to the Plant Science Building. One reliable measure of Dave’s critical role in all of these (and seemingly hundreds of other building-related fixes) was the rate at which his cell phone rang during the course of any conversation one tried to have with Dave. It was as if he were wearing a musical belt with the relentless mix of ringtones constantly going off as he tried to have a bit of “quiet” conversation.

In addition to the many hats that he wore on the job, Dave is also VERY busy in his “spare” time. He travels extensively in service to his church, he is a competitive tri-athlete — occasionally in Ironman-style competitions but also biking or running competitions — and he is ever there as a dedicated husband, father and grandfather for a family that obviously got the “keep me busy” gene from their father.

Although there aren’t many awards available to honor the best of Cornell staff members, we jumped at the chance to nominate Dave for one and were thrilled when he did, indeed, win the George Peter Award for Dedicated Service to Cornell in 2007.

About three years ago, with a B.S. in biology already in his hip pocket, Dave enrolled in the nursing curriculum at the local community college and began taking classes soon thereafter. This spring, he’ll complete his last clinical rotation and with an R.N. degree to his credit, whoever is the beneficiary of his service will be getting the absolute best.

Congratulations to Dave for 33 years of spectacular service to Cornell and for having the ambition and courage to make such a profound lifestyle change. While for some of us, the new challenge isn’t surprising; it’s typical Kalb. But no matter what, we’re still amazed and just glad that we were able to work with Dave for as long as we have. BEST WISHES.
Nancy Keller

Well, I am now editor in chief of *Fungal Genetics and Biology*. This is interesting time to be editor in chief with all the changes in publication (open access, etc). So we are trying a few experimental actions with this journal from semi-open access to special video sections and ‘hot topic’ submissions. In our lab, we are still work with *A. flavus*/maize/peanut interactions and drug discovery with fungal metabolites. We are heading towards an ecological approach of fungal development. It is fun (when not worrying about funding).

Personally, my daughter and I are well. Nina is 12, an active and forceful tween. Soccer and acting are her two favorite fun things. Academics, at this point, have little call to her!

Bamidele (Dele )Fawole

Thank you for sending this year’s *Plant Pathology Newsletter*. It is always a pleasure to be updated on happenings in Cornell. I was in the department until October 1976 and worked with late Prof. Bill Mai, along with Bob Dunn, Jim Starr, Rodrigo Tarte, etc.

Xiaoling (Ling) Xuei

I am from Olen Yoder/Dick Staples’ labs back in the late 1980s. I’m now working at Indiana University School of Medicine as full research professor. I have been following the newsletter every year, hearing many changes, and occasionally communicating with Annemiek Schilder, Nancy Keller, and Dan Legard, folks back from the 80s and 90s. I had some email chats with Olen when San Diego had the wildfire, and Hans when he was preparing for the Plant Path 100th anniversary a few years ago. It’s always nice to hear from or about Cornell. Say hi to everyone in the dept. and best wishes to you.
George Bird

Michigan State University has a truly outstanding system of “working retirement”. You retire from your tenure-stream position and work on multi-year fixed term contracts. I took advantage of this at the end of 2005 and currently work full-time plus on teaching, research and Extension responsibilities. My nematology laboratory had two M.S. students finish this year and I currently have one Ph.D. student.

The past ten years as been in the international arena. This involves a research-teaching-outreach project in Central Asia. It has mandated that I learn both Soviet-times and Post-Soviet times in Tajikistan, Uzbekistan and Kyrgyzstan. In Central Asia, we are currently knee-deep in Golden Nematode, late blight of potato (the second bread) and Colorado potato beetle. Root-knot infested tomato plants are considered the norm and yellow rust is a major challenge on wheat, especially on land that suffers from 3,000 years of extensive over grazing and over-cultivation. In Bishkek, Tajikistan, the National Agrarian University was founded by K. I. Skryabin, a nematologist (see photo on right). At the height of the Soviet Union, there were twelve Ph.D. phytonematologists at the Zoology and Parasitology Institute in Dushanbe, Tajikistan. The current undergraduates in Central Asia are especially interested in virology. And yes, I even think I know what RNAi is after auditing a graduate-level molecular biology course last fall.

K. Alice Fox

K. Alice Fox (formerly Kelly Bulkeley) recently accepted a position as Laboratory Technician II to the Althoff and Segraves’ laboratories in the Department of Biology at Syracuse University. Fox began working in the Department of Plant Pathology as Administrative Assistant III in October 2001, serving both the department and Dr. Rebecca Nelson and her many exciting endeavors. In 2004, Fox began her long journey through the Employee Degree Program to earn a Master of Science Degree in horticultural biology in 2011. Fox specialized in plant propagation and greenhouse management under the guidance of Kenneth Mudge and Bill Miller. In May 2012, Fox moved to Syracuse, New York after marrying her now husband, Christopher. Her current position at Syracuse University involves not only horticultural crop management, but she is learning molecular techniques as well! Fox is currently assisting Dr. David Althoff and Dr. Kari Segraves in several of their projects involving species interaction and speciation. Fox is working on micro satellite arrays for Prodoxus, a species of yucca moth; examining parasitoid-pea aphid interactions, observing mutualism in yeast colonies, as well as managing a greenhouse full of plants used for insect rearings! More information about these projects can be found on the Althoff Laboratory website: http://althofflab.syr.edu/.
Alumni Survey
By Julia Crane, Ellen Crocker and Carly Summers

A committee of the Plant Pathology Graduate Student Association conducted a survey in 2012 of Cornell Plant Pathology grad student alumni from the past 20 years in order to gather information about where alumni ended up and hear their reflections on their time at Cornell. Specific questions on the survey ranged from information on career track and salary, to inquiries about courses alums felt were most useful or had the largest room for improvement.

44 alumni responded, spanning experiences in Plant Pathology grad school from 1986–2011. Of these, the majority (84%) completed their PhD at Cornell. Most (70%) took time off before coming to graduate school at Cornell, such as to do research or to complete a Master’s at another institution.

The most common career for graduates was as a tenured faculty (31%). The next most common careers were industry jobs (16%, split evenly between plant pathology related and non-plant pathology related), jobs in the government (16%, split evenly between US Department of Agriculture (USDA) and non-USDA), and non-tenured faculty positions (14% split evenly between those that were tenure-track and non-tenure track). The most common salary range was $50,000–100,000 (Figure 1). Approximately half of the participants said their current career matched their expectations in graduate school.

Participants were asked to choose which aspects of their graduate school experience were most useful, or had the greatest potential for improvement. The most commonly chosen positive aspects were those that dealt with either the advisor-mentee relationship and with training/experience (Fig. 2). Fewer responses were recorded for the most common negative aspect of graduate school, but of those recorded the most popular choice was career preparation (Fig. 3).

In terms of classwork, survey respondents chose general plant pathology as the most helpful course for their career. Other commonly chosen useful courses included molecular biology, mycology, and statistics. Statistics was also chosen most frequently by alumni as the course which they wished they had gotten more out of, followed by experimental design.

When asked what, if anything, they would change about their Cornell graduate school experience, the majority of survey participants (approximately 50%) either answered ‘nothing’ or did not respond. Of those who did respond, greater grant writing or real world/field experience were popular answers.

Finally, survey takers were asked to predict major future trends in plant pathology that current students should be aware of. The most common answer was a greater importance for teamwork and collaboration across disciplines. Other popular answers involved a tough job market and the need for more applied researchers. When asked for advice for current students, participants had much to say, and most of it was positive and encouraging. Answers included: “Finish! Don’t give up!”; “Enjoy (and network with) your peers!”; “Take a couple of months off between degree and next position”; “Be aggressive with going after money. Don’t forget non-traditional sources”; “Focus on your tasks and do them well”; “Be aggressive with going after money. Don’t forget non-traditional sources”; “Focus on your tasks and do them well”; “Understand your advisor is human”; “Consider meditation”; and finally, “Good luck to you all!!!”. In addition, many alums gave contact information for those with additional questions.

Thank you to everyone who participated in this survey! We appreciate all your thoughtful responses and advice. Detailed responses to questions, including advice to current students, will be presented at the next graduate student association meeting.
An Opportunity to Contribute to Graduate Education in Plant Pathology & Plant-Microbe Biology by Gillian Turgeon

You can help further graduate education in our Department. Please consider making a 'once in a century' donation to our Graduate Student Fund and you will receive the Oscar-winning DVD, 'A Century of Excellence in Graduate Education' produced and directed by Hans VanEtten, former graduate student and faculty member, and starring all of you. Details below.

The Department of Plant Pathology celebrated 100 Years of Excellence in graduate student education with a centennial seminar series in the Fall of 2007. Distinguished graduate student alumni, representing the diverse specialties within our discipline, returned to Ithaca to share their scientific achievements, as well as their memories, with our faculty, staff, and students, and to reflect on how Cornell experiences shaped their careers. The seminar series was kicked off by our own Bill Fry who obtained his PhD in the department in 1970, then was followed by graduate returnees Jane Rissler (1977), Amy Charkowski (1998), Nancy Keller (1990), Bob Zeigler (1982), Sheng Yang He (1991), Corby Kistler (1983), Linda Kohn (1979), Paul Vincelli (1988), and Hans VanEtten (1971).

Hans VanEtten, now a Professor at the University of Arizona, not only presented his groundbreaking scientific research in the seminar series, but also delivered a very special capstone lecture entitled ‘A Century of Excellence in Graduate Education’. The lecture, which followed a celebratory reception and banquet attended by current and previous Cornellians, including 98-year-old former head George Kent, was a labor of love. For six months prior to his talk, Hans tracked down information on our students, contacted and interviewed many of you, haunted the libraries for the very first theses, ferreted out early movie clips, and compiled a truly memorable chronicle of our superb history in graduate student training.

(Pop quiz: what student became a professor in our department before he obtained his PhD? Who coined the phrase “Don’t get caught with your plants down”? Where did H. H. Whetzel get his PhD?). Kent Loeffler, our department photographer and Dave Bogner, Tech Analysis Support, at the University of Arizona were instrumental in imaging, visual effects, and editing the DVD.

To build on this legacy, Hans has donated a DVD of his lecture, which traces our beginnings as one of the first departments of plant pathology in the country until now, as a fund-raising activity to benefit future graduate student education. The DVD, which begins with an introduction by Bill Fry and a request from Hans to make a donation that will go to the Graduate Student Fund in the Department, captures Hans’ lecture and all the materials he so devotedly put together—images from the archives, front pages from theses, graduate student photos, personal stories, recollections of student-faculty baseball challenges, interviews with alums and much more.

Hans suggests a donation of $100 or more, however any and all amounts are appreciated. To receive a Centennial DVD, send a request to Alicia Caswell: amd33@cornell.edu.

Donate to the PPPMB Graduate Student fund by clicking on this link or following the steps below:
1. Go to www.giving.cornell.edu/give/
2. In the “Gift amount”, enter the value of your gift.
3. Select “College of Agriculture and Life Sciences”.
4. For “Designation”, select: “other”.
5. In the “Other designations or special instructions” field, write: “Department of Plant Pathology and Plant-Microbe Biology Graduate Student Fund.”
6. Identify the gift type (i.e. one-time gift).
7. Proceed to checkout.
‘A Century of Excellence in Graduate Education’

Highlights from the DVD

The history of the department was thoroughly discussed.

A movie clip featuring H. H. Whetzel.

A movie clip featuring John Niederhauser, The World Food Prize Winner.

Cynthia Wetscott, a pioneer leader in plant pathology.
Alan Collmer

The Collmer Lab continues to work on the type III effector repertoire of *Pseudomonas syringae* pv. *tomato* DC3000. The big event this year was the successful PhD thesis defense by Jay Worley in December 2012. Jay’s primary field is microbiology, but he has been an active participant in the life of our department and attracted many department members to the Friday morning coffee breaks with clever ads individualized to the hosting lab for the week. Jay is also a jazz saxophonist and avid soccer player and fan. He made a number of significant discoveries in his thesis research, a notable example being his demonstration, in collaboration with USDA/ARS scientist and faculty member Donna Gibson, that a DC3000 gene with mysteriously strong effects on pathogenesis directs the first step in the synthesis of the phytotoxin coronatine. Jay will be missed by many in the Plant Sciences Building, but fortunately for the next several months he will remain close by, pursuing postdoctoral work with Greg Martin at the Boyce Thompson Institute for Plant Research.

Kerik Cox

2012 was a productive year for the Cox Lab. Kerik became a permanent member of the Faculty after receiving tenure in July of 2012. One of my graduate students Zachary Frederick has made some interesting discoveries linking fungicide management practices for apples scab and practical fungicide resistance. His presentations have been well-received at applied research and stakeholder meetings throughout NY and New England. Sara Villani joined the department as a employee degree PhD student working on genetic aspects of practical resistance to the apple scab pathogen *V. inaequalis*. She mentored a William Smith student Juliana Freier and together they began to further unravel the story behind the relationship between demethylation inhibitor fungicide resistance in *V. inaequalis*, and target gene expression and upstream insertion deletion events. Sara also mentored Shawn Lyons, a Summer Scholar from UGA who investigated the influence of modern fungicides and growth regulators on the development of biological-based fruit russetting in ‘SweeTango’ apples. In regards to our apple scab and brown rot resistance monitoring efforts, we have just completed our 6th year of offering these free services to NY stakeholders. In collaboration with NYS IPM and the program of Aldwinckle et al. we have secured considerable specialty crop funding and have completed the first year of investigations on latent fire blight infections in asymptomatic nursery stock, and have established the presence of antibiotic resistance in populations of the fire blight pathogen *Erwinia amylovora* in NY.

Magdalen Lindenberg

In addition to ongoing collaboration with the Collmer and Martin labs on *Pseudomonas syringae* biology and genomic analysis, Magdalen Lindeberg continues work on the genomics of citrus greening disease funded by the Florida Citrus Research and Development Foundation. Magdalen and Surya Saha, the research associate supported by the project grant, are involved in bioinformatic analyses of various aspects of citrus greening biology including genome analysis of the bacterial pathogen as well as the psyllid vector and its endosymbionts. Recent accomplishments include assembly and analysis of a draft genome sequence for the *Wolbachia* endosymbiont, of interest owing to its potential manipulation for insect control. During the course of this work, computational pipelines for phylogenetic sorting of metagenome data, genome assembly, and motif identification have been developed that are adaptable to collaborative work on other projects in the PPPMB department. The project additionally involves maintenance of the CG-HLB Genome Resources Website which hosts a genome viewer for strains of the Liberibacter pathogen and other bacterial pathogens of citrus, as well as for the *Wolbachia* endosymbiont.
Tom Zitter presented the Keynote address at the 21st International Pepper Conference held in Naples, FL from Nov 4–6, 2012. This was a special occasion for him, as it was an opportunity to reconnect with many early colleagues and pepper breeders from his earlier days spent in Florida. Forty years ago Tom and Ben Villalon, a plant pathologist stationed then at Homestead, FL, discussed the need for a national/international conference on pepper production, meeting in McAllen, TX (1973) and Tom the second in Lake Worth, FL (1975). Pictured below with Tom are Ben Villalon and Ted Winsberg, a Cornell Graduate and pepper grower for many years in Boynton Beach, where many of Tom’s trials for virus resistant peppers were conducted. Interestingly, much of the land used for Ted’s pepper production was sold to Palm Beach County for developing a wildlife refuge (re-flooded and returned to nature), and much of the surrounding farm land was sold off for now existing gated communities.

Rebecca Nelson was invited to join the Executive Committee of the Leadership Council of the Sustainable Development Solutions Network (SDSN). The SDSN is a global initiative led by Dr. Jeffrey Sachs and reporting to the secretary general of the United Nations. It has the objectives of (1) providing expert advice and support to various international processes, including the UN panel charged with defining the post-2015 development agenda; (2) organizing thematic groups to mobilize global expertise to identify pathways towards sustainable development; (3) identifying, vetting and promoting solutions to development challenges; and (4) building a global knowledge center network involving universities, businesses and other key entities. Rebecca was asked to serve as co-chair of the thematic group on Sustainable Agriculture and Food Production. She would greatly appreciate your ideas and collaborative contributions for the SDSN’s work on agricultural sustainability.

**Rebecca Nelson**

**Tom Zitter**
### Outreach Activities

#### K-12 Outreach Activities Summary

**Alan Collmer:**
- Since 2000 the Pseudomonas-Plant Interaction (PPI) group in the department has developed an extensive series of activities and laboratory modules for high school teachers including PPI High School Connect, a website intended to give high school teachers a resource to familiarize their students with research on plant-microbe interactions and illustrate the importance of genomics in modern biology. See [http://www.pseudomonas-syringae.org/Outreach/HSC-newhome.htm](http://www.pseudomonas-syringae.org/Outreach/HSC-newhome.htm)
- Developed Plants vs. Pathogens: Vegevaders™, board game is designed to be used with appropriate introductory and follow-up materials in a 40-minute classroom session at the high school biology to graduate level. (See more information on page 15.)

**Margaret McGrath:**
- Gave presentations to science classes about plant pathology and science careers.
- Organized and lead class science experiments on plant pathology.
- Provided plant material for student projects.
- Mentored students conducting independent research projects. Many have entered their projects in school science fairs, the Siemens competition, the Intel Science Talent Search, and the Science and Engineering Fairs.
- Hosted high school teachers participating in a summer enrichment workshop on ozone and its Impact on plants.

**David Gadoury:**
- Hosts annual visits to the department from local elementary schools, as well as from the Summer Science Camp program where students are given an overview of microscopy, some hands-on demonstrations, and get to see several examples of diseased plants and common plant pathogens.
- Became Internal Communications Officer for the American Phytopathological Society which involves overseeing outreach efforts of the Society, which maintains an extensive collection of K12-relevant educational materials (see: [http://www.apsnet.org/edcenter/K-12/Pages/default.aspx](http://www.apsnet.org/edcenter/K-12/Pages/default.aspx)).

**Chris Smart:**
- 1,000 contact hours with elementary school kids and their teachers as part of the outreach program with the Geneva City School district.
- On planning board for the Geneva Community Center/Boys and Girls Club gardening project involving at-risk youth in after school gardening programs.
- Collaborator on an NSF grant submitted by the Rondout Valley school district (in the Hudson Valley) to increase awareness of STEM opportunities for the 8–12 grade students in the district.

**Kathie Hodge:**
- Classroom talk and mushroom cultivation experiment, 2nd grade, Caroline Elementary
- “Meet the Scientist” lecture for the Trumansburg High School
- Lecture on mushrooms for the Young Naturalists Club of Ithaca (home schoolers’ group)
- Cornell Institute for Biology Teachers, training: lichens and oyster mushroom exercises
- Classroom talk, mushroom growing in Junior Level classroom at E.A.C. Montessori School of Ithaca
- Consulting help with mushroom cultivation at the Lehman Alternative School in Ithaca
- Articles on outreach website, the Cornell Mushroom Blog, are used in schools around the US.
Nature’s Game Brought to the Classroom in Vegevaders™: Plants vs. Pathogens
Candace Collmer

The challenge:

• How to get high school/college students to experience the ongoing battle between plants and their pathogens, perfected over millions of years of evolutionary playtime and responsible for “Boom and Bust” cycles in agricultural fields...

• How to show the recognition between molecules underlying the two levels of plant immunity, where plant molecules work to detect and pathogens in turn evade, disable, and infiltrate...

• How to add something fun involving plants to the high school curriculum...

• How to highlight the continuing challenges for plant pathologists, as evolutionary change in pathogens dooms newly released cultivars to finite field time...i.e. evolution in action right before our eyes.

• And, for high schools, to do all this within a 40-minute time slot and match topics within the NY State Biology Curriculum Standards.

Enter the computer game Vegevaders™: Plants vs. Pathogens, currently being tested for playability as a 2-person (Plant vs. Pathogen) board game. This form of the game includes a play mat (see below), four sets of playing cards, and an accompanying PowerPoint presentation that ties together the underlying biology with the components of the game. Playing cards for the Plant represent detectors or defense molecules involved in plant immunity, while cards for the Pathogen represent features that can allow detection and/or disablers that thwart plant defense pathways. After a season of battle, whichever player is the loser mutates before another engagement in season 2. The game developers (Alan Collmer and Magdalen Lindeberg, of PPPMB, Ithaca; Candace Collmer, of PPPMB, Ithaca, and recently retired from Wells College; and Bryant Adams, Assistant Professor of Computer Sciences, Wells College), after two and a half years of work on multiple versions targeted to multiple levels, are ready to take the board game into high school classrooms in 2013 to see how close it is to meeting the stated challenges. Supported by funding from the National Science Foundation for the outreach component of a multi-institutional grant, “Leveraging genomics resources and wild species of tomato to identify new sources of disease resistance” (Alan Collmer, PI), they have so far play-tested the game with grad students (Alan Collmer’s Microbial Pathogens versus Plants course at Cornell), college students (Holly Lange’s Plant Pathology course at Finger Lakes Community College), high school teachers coming to Cornell for training workshops (Cornell Institute for Biology Teachers; Boyce Thompson Institute), and middle school students attending Career Day (Ithaca school district). The results of the larger scale play-testing with high school students at multiple locations should determine which form(s) will be most useful for teachers and how to best meet their needs. Also under development is an accompanying website and a full-fledged, multi-level video game (B. Adams). Who knows, the latter might even get some players hooked on trying to find new solutions for a million-year-old challenge...

For further information, or to volunteer a possible play-testing site, contact Candace Collmer (cwc6@cornell.edu).
Summer Scholars Program
David Gadoury

Cornell University’s New York State Agricultural Experiment Station in Geneva, New York offers undergraduate students the opportunity to work with faculty, their graduate students and postdocs, and staff on research projects that can be laboratory or field-based. Many of the basic research projects have a translational alignment with practical problem solving applications for the agricultural community. The goal of the program is to provide undergraduates with the opportunity to plan and conduct experiments, evaluate data, communicate results, and learn about opportunities in agricultural and food research. The following undergraduate students completed the program in 2012. Many have since enrolled in graduate studies in plant pathology at Cornell and at other leading departments around the country. Applications for the 2013 Summer Scholars Research Experience for Undergraduates program opened in December 2012. See: http://www.scholars.pppmb.cals.cornell.edu/.

Shawn Lyons (University of Georgia) worked with Dr. Kerik Cox on the influence of modern fungicides and growth regulators in the development of fruit russet caused by *Aureobasidium pullulans* in NY plantings of ‘SweeTango’ apples.

Heather Cronin (Colby College) worked with Dr. Thomas Burr on a project entitled “Understanding Grape Crown Gall (*Agrobacterium vitis*): Distribution in Grape and Biocontrol Potentials”.

Tyler McCann (University of Florida) worked with Drs. David M. Gadoury and Robert C. Seem on the ontogeny of sporulation in *Erysiphe necator*.

Kristie Goughenour (Ohio Wesleyan University) worked with Dr. Herb Aldwinckle on a project entitled “Infection of Apple Rootstocks by *Erwinia amylovora*”.

Megan Daniels (SUNY Binghamton) worked with Dr. Christine Smart on a project entitled “*Phytophthora capsici*, an oomycete pathogen in NY surface irrigation water: biological threshold and results of ultraviolet treatment”.

Deborah LeGendre (University of Cincinnati) worked with Dr. Herb Aldwinckle on a project entitled “Transformation of Greensleeves Using the MYB10 Gene”.

Anjali Merchant (Middlebury College) worked with Dr. Christine Smart on a project entitled “The Fight Against Blight: A Q-PCR-based assay to detect the arrival of *Phytophthora infestans*”.

Larissa Osterbaan (Calvin College) with Dr. Marc Fuchs on a project entitled “Investigations into eIF4E as a recessive resistance gene for grapevine fanleaf virus”.

Renate Loomis (Appalachian State University) worked with Dr. George Abawi on a project entitled “Root-Galling Severity Incited by the Northern and Southern Root-Knot Nematodes on Cucumbers, Peas and Soybeans Under Greenhouse Conditions”.

Elizabeth Cieniewicz (Lebanon Valley College) worked with Dr. Marc Fuchs on a project entitled “Identification of the *Grapevine fanleaf virus* silencing suppressor”.

Amanda Hastings (Armstrong Atlantic State University) worked with Dr. Helene Dillard on a project entitled “Efficacy of Biochar Amended Soil for Suppression of Alternaria Leaf Spot on *Brassica oleracea*”.

Ashley Williams (Southern University) worked with Drs. David M. Gadoury and R.C. Seem on a project entitled “Effects of pre-inoculation host stress on infection and establishment of the grapevine powdery mildew pathogen *Erysiphe necator*”.

http://www.scholars.pppmb.cals.cornell.edu/
We are proud to announce publication of Branching Out: Features from the Past for the Future. We’ve consolidated and organized the 150 updated feature articles previously published in the Branching Out newsletter for Trees and Shrubs into a 300 page book that we’re hoping will enable plant health care professionals, educators, Master Gardeners, etc. to have ready access to up-to-date tree and shrub pest management information. Branching Out features contain information on a wide array of the most important pest management issues that plant health care professionals are likely to face in any given year. We’ve had only positive responses from several NPDN diagnosticians from various states who have already purchased the book.

Many of the feature articles deal with pests and pathogens that have similar symptoms (e.g. conifer twig problems, witches’ brooms, leaf scorch) but for purposes of this book, an alternative organizational scheme that leads IPM practitioners more directly to relevant information was employed. Each feature, complete with topnotch color illustrations, describes in some detail either an individual pest/pathogen, a group of closely related (by symptoms or hosts) pests/pathogens, plant problems caused by non-infectious agents, or some other important issue.

The feature articles are different from traditional industry or academic generated fact sheets in that writers do more than illustrate pests/pathogens and detail life cycles; they use the opportunity to develop IPM concepts that justify recommended management strategies.

Practitioners can use this resource to hone their diagnostic skills and to put a conceptual framework behind whatever management strategy they are proposing to implement. They will also have a bit of an historic record of some unusual outbreaks or epidemics, inasmuch as those would have been worthy of extended treatment in a feature article. Together, the collection provides end-users with ready answers to vexing questions and enables them to make informed decisions about pest management strategies. We hope you are as pleased with the result as we are!

Additional thanks for the significant feature article contributions from Daniel Gilrein (CCE-Suffolk County) and occasional entries from other colleagues who contributed feature articles. Publication of the book was made possible, in part, with funding from the New York State IPM program.

You can find more information about the book at http://www.nysipm.cornell.edu/press_rel/branching_out.asp

Branching Out: Features from the Past for the Future is available from Branching Out, Department of Plant Pathology, Cornell University, 334 Plant Science Building, Ithaca, NY 14853. Cost $30 (includes postage and handling); checks made out to Cornell University or order online at http://branchingout.cornell.edu/FeatureBookInfo.html
This past summer was a memorable one for me. Not only did I attend a very interesting MPMI conference in Kyoto, Japan, prior to the conference I had the privilege of being invited to spend two weeks at the Tokyo University of Agriculture and Technology (TUAT). Although I met many wonderful people and learned a lot about TUAT research, the highlight of my time there was when I had the opportunity to lead a workshop for Japanese high school students.

The workshop was hosted by TUAT’s Innovation Advancement Organization. This organization runs a workshop each year on different topics. They are designed to engage high school students in critical thinking and serve as a forum for the students to practice their leadership and presentation skills. As the workshops are conducted in English, students have the added challenge of practicing their English.

Together with TUAT staff and students, we decided this year’s topic should be “Japanese food innovation”. I was given a lot of autonomy in how to run the workshop and I led several discussions with 10 graduate students to design it. We decided to structure the workshop around challenging the students to develop a Japanese food product which could be marketed to the rest of the world. This idea was partially inspired by Japan’s famous export, Mr. Noodle. The product came to mind partly because it is graduate student staple, and partly because we had recently been to the Instant Ramen Noodle Museum (see box).

Following two introductory seminars by our own Dr. Gillian Turgeon and Dr. Takao Nitani from TUAT, workshop participants were divided into groups of five to brainstorm ideas. The students had to identify potential markets and come up with a final product proposal under the guidance of the TUAT graduate students. Each high school student had a role to play; two students presented their group’s idea, while three others gave feedback to other groups. All of the groups did a great job of developing both feasible and interesting ideas. The organizers voted on their favorite product and the top group won a prize for their product, Daigakuimo, a Japanese snack made from sweet potato.

All in all, it was a successful workshop thanks to the hard work of the organizers, the graduate students and the high school students themselves. While I really enjoyed the experience myself, I think that both the high school and graduate students got a lot out of it. Down the road, this could be an effective way for our own department to engage with potential future graduate students.
The idea is to foster an unforgettable learning experience for Cornell undergraduates. Role playing... Interactive group case studies... Reading groups... Critical thinking exercises. These are just a few of the techniques that Eric Nelson and Marshall Hayes have been implementing in undergraduate plant pathology course offerings to enhance student learning and create more engaging classroom atmospheres. One particularly innovative approach involves the use of elaborate, science-based role-playing games, formally known as “Reacting to the Past” (RTTP) pedagogy. RTTP was originally developed by Professor Mark Carnes at Barnard College with the intents of immersing students in pivotal historical debates, exposing them to classic works of literature and challenging them with interactive case studies that require a mastery of underlying concepts and ideas. Marshall and Eric are currently collaborating with Prof. Carnes, Prof. David Henderson at Trinity College and Prof. Tony Crider at Elon University to develop RTTP modules for use in science, technology, engineering and mathematics (STEM) classrooms. This effort is part of a multi-year project funded by the National Science Foundation’s Course Curriculum and Laboratory Improvement program.

Over the past two years, students of Biology of Infectious Disease: From Molecules to Ecosystems (PLPA 2950) and Disease Ecology (PLPA 4330) have been “teleported” back to London on the evening of September 7, 1854, the site of a local administrative meeting to debate options for responding to the deadly outbreak of Cholera that claimed the lives of more than 500 parish residents over the preceding eight days. Historically, the result of this meeting was a decision to remove the pump handle from the pump at Broad Street, a contaminated local water supply, effectively cutting off further transmission of Vibrio cholera, the deadly waterborne, disease-causing bacterium. This event is regarded as a significant advance toward the universal acceptance of germ theory and is an ideal case study for examining cause and effect in epidemiology, as well as understanding modern achievements in the design of municipal water systems and the management of waterborne diseases. Even more interesting is the fact that it gives Marshall and Eric an opportunity to take students out of the traditional classroom and hold their class sessions in an unusual location, the Crypt of Sage Chapel. The idea is to foster an unforgettable learning experience for Cornell undergraduates.


Students get the unusual chance to visit the crypt of Sage Chapel.

Marshall and Eric’s game, entitled London 1854: Cesspits, Cholera and Conflict over the Broad Street Pump, has been designated as one of the featured games to be showcased at the Thirteenth Annual Reacting to the Past Faculty Institute at Barnard College (Thursday, June 6–Sunday, June 9, 2013 in New York City). With the help of techniques such as RTTP role playing, PLPA 2950 and PLPA 4330 join a growing list of undergraduate course offerings in PPPMB—including Kathie Hodge’s Mushrooms of Field and Forest (PLPA 3190), George Hudler’s Magical Mushrooms, Mischievous Molds (PLPA 2010), and Steve Beer’s Microbes and Food: Contemporary Issues Affecting Humanity (PLPA 4090)—that play a central role helping to generate a scientifically minded student body and, hopefully, inspire future generations of plant pathologists as well. For further information on the “Reacting to the Past” pedagogy, please visit:

http://cornellsun.com/section/science/content/2012/09/05/scientist-marshall-hayes-and-eric-nelson-bring-role-playing-scienc

http://reacting.barnard.edu/2013-institute
Samuel Mutiga Selected as Fellow for LEAP
Rebecca Nelson

PPMB graduate student Samuel Mutiga was selected as a Fellow for the Leadership Enhancement in Agriculture Program (LEAP) of the Norman E. Borlaug International Agricultural Science and Technology Fellows Program. Samuel is a PhD student in Rebecca Nelson's lab, and is currently conducting his dissertation research at the Biosciences eastern and central Africa Hub in Nairobi, Kenya. He has been selected as outstanding graduate student showing promise as a leader in the field of agriculture, and his research on aflatoxin has been recognized as having the potential to make an impact in developing countries. The Borlaug LEAP Fellowship honors Nobel Laureate Dr. Norman E. Borlaug who has been hailed as the father of the Green Revolution.

Congratulations

Graduate Students Participate in Graduate Teaching Assistant Fellowship Program

Two graduate students, Ellen Crocker and Bradford Condon, were accepted to the Cornell Center for Teaching Excellence’s Graduate Teaching Assistant Fellowship Program. Through this program, both Ellen and Bradford will be leading a series of university-wide workshops designed to improve the teaching of Graduate TAs, on topics ranging from understanding undergraduate learning styles to developing teaching ePortfolios. Bradford, who was also selected for this program last year, has TAed four years for PLPA 2015, the discussion section for George Hudler’s Magical Mushrooms and Mischievous Molds course with his advisor Gillian Turgeon. Ellen has twice been the TA for Kathie Hodge’s course, Medical and Veterinary Mycology.

Ellen Crocker
Bradford Condon

John W. Gottula Receives a USDA-NIFA Pre-doctoral Fellowship
Marc Fuchs

John W. Gottula, graduate student, received a USDA-NIFA pre-doctoral fellowship and a scholarship from the US Grape Research Coordination Network. John is working in Marc Fuchs’ program. His research interest is agriculture biotechnology with a special interest on Grapevine fanleaf virus. John is engineering this virus as a vector for grapevine functional genomics. He is anticipated to graduate in spring 2014.

Ellen Crocker
Bradford Condon
John Gottula

Chris Smart Recognized
Smart Lab

Our plant pathology family can be very proud to congratulate Christine Smart for a much deserved honor this summer: she was one of the three recipients of the first annual Award for Excellence in the Teaching, Advising and Mentoring of Graduate and Professional Students. The award was created by the Graduate and Professional Student Assembly in order to recognize the incredible impact our mentors have in shaping our graduate careers and future. Nominations for this award were solicited from graduate students throughout the university. In their nomination letters, Chris’ current and former advisees praised her thoughtful and energetic mentorship. She always has time to listen deeply to our thoughts with the purpose of helping us to reach our goals. In addition to mentoring graduate students, she leads an elementary school outreach program and a summer undergraduate research program, supporting young scientists of all ages. Thank you, Chris, from all of us you have positively impacted with your dedication and time.
Hudler Chosen as Menschel Distinguished Teaching Fellow for 2012–13 by Kimberly P. Kenyon, Associate Director, Center for Teaching Excellence

Dr. George Hudler, Professor in Plant Pathology and Plant-Microbe Biology and Stephen H. Weiss Presidential Fellow, has received numerous teaching awards including the Innovative Teaching Award and the Professor of Merit Award from Cornell’s College of Agriculture and Life Sciences, the Excellence in Teaching Award from the American Phytopathological Society, the SUNY Chancellor’s Award for Excellence in Teaching, the College of Agriculture and Life Sciences Edgerton Career Teaching Award and the USDA Northeast Region Award for Teaching Excellence. George has also been widely recognized for his creativity and innovation in teaching, as well as his use of humor in his very popular undergraduate class “Magical Mushrooms, Mischievous Molds, an Introduction into the World of Fungi.”

This year the Provost selected George to represent Cornell faculty as the Center’s Menschel Distinguished Teaching Fellow for 2012-13. This one-year fellowship is funded by the Office of the Vice Provost for Undergraduate Education in conjunction with the CTE and awarded annually to a distinguished faculty member to promote the teaching mission of Cornell University. As the Menschel Distinguished Teaching Fellow, George acts as a liaison between the CTE and faculty, offers insights from his extensive Cornell teaching experience, collaborates with the CTE on many aspects of planning and programming, and serves as a sounding board for Center staff.

Menschel Distinguished Teaching Fellows also develop a project to enhance campus-wide engagement with teaching during their year with the Center. George is currently working on an interdisciplinary teaching model that involves a number of faculty members from diverse fields working together on a course that will cover multiple topics (e.g. evolution, biology, and astronomy) under a unifying theme. George also anticipates engaging additional faculty in the Humanities to offer perspectives from literature and folklore surrounding certain topics.

As the Center’s resident Menschel Distinguished Teaching Fellow, George succeeds David Feldshuh (Menschel Distinguished Teaching Fellow 2011–2012, Professor, Performance and Media Arts) and Ron Harris-Warrick (Menschel Distinguished Teaching Fellow 2010–2011, Professor, Neurobiology and Behavior). The former fellows’ projects, Feldshuh’s “Bringing Joy to Your Teaching” (part of this year’s New Faculty Institute, http://www.cte.cornell.edu/programs-services/faculty/new-faculty-institute.html) and Harris-Warrick’s Faculty Partnership Program (http://www.cte.cornell.edu/programs-services/faculty/faculty-partnership-program.html) have engaged numerous faculty since their creation.

George recently started blogging about his experience working with the CTE via his “Menschel Musings” postings. Follow George’s thoughts on teaching at: http://blogs.cornell.edu/cte/.

More Teaching Awards…

When it rains, it pours! In addition to unexpected receipt of the Weiss and Menschel teaching awards described elsewhere in this newsletter, George Hudler was flattered to learn last spring that he had been selected by Cornell’s Class of 1972 as their “Outstanding Professor”—an award that the class gives every five years to a faculty member who has been unusually influential in the lives of undergraduate students. The award, given at a gala reception during Reunion Weekend, included a plaque and a super-sized check for $10,000 — the money to be used in support of Hudler’s teaching program. Much later, George learned that each dean is invited to nominate one faculty member from their college/school to be considered for the award, and a Class of ’72 committee then chooses from the pool of 11 candidates.

Cornell’s President Skorton congratulates George Hudler.

At about the same time that George learned of the Class of 1972 award, he also received an ultra-secret e-mail informing him that he had been chosen by the Princeton Review and ratemyprofessor.com as one of the nation’s top 300 professors. The genesis of the nomination still remains a mystery, but Hudler had to swear to secrecy for about six months until a national change of hands in this event except that George was paid $100 bucks. He did.

By the way, rumors to the effect that George’s wife has hired a carpenter to enlarge all the doors in their house to accommodate his now grossly inflated head and ego are not true. He just ducks and turns sideways as he moves from room to room!
Congratulations to Teresa Pawlowska, who was granted tenure by the Cornell University Board of Trustees at its October 2012 meeting, Teresa’s work focuses on fungi broadly, but with significant emphasis on the biology of the arbuscular mycorrhizal fungi – a group of fungi that live in an obligately commensal association with roots of their plant hosts. Because these fungi essentially cannot be cultivated away from their hosts, they are a very difficult group to study. Thus her studies, which have clarified the organization genetic variation in individuals of arbuscular mycorrhizal fungi, have been very visible. In 2007 she received the C. J. Alexopoulos Early Career Award from the Mycological Society of America. Teresa has been a driving force in the “Symbiosis & Cooperation Study Group” at Cornell. Recently, Teresa has developed a program concerning the role of bacterial endosymbionts with fungi. While bacterial endosymbionts are well known and well-studied in other systems, rather little is known concerning their interaction with fungi. Bacterial endosymbionts have important roles in the biology of at least some fungi.

Wayne Wilcox

We are pleased to announce that Dr. Kerik Cox was promoted to Associate Professor with tenure, effective July 1, 2012. Kerik joined the Department as an Assistant Professor in August 2006, after receiving his MS and PhD degrees at the University of Georgia and gaining further postdoctoral experience at Clemson University. As one of our Geneva-based faculty, Kerik’s appointment has been 50% research/50% extension, leading the department’s extension program on tree fruit and berry crop pathology while conducting basic and applied research on a broad range of related topics that include practical disease management, the dynamics and molecular characterization of fungicide resistance, and molecular mechanisms for the improvement of transgenic disease resistant crops. While continuing to utilize traditional delivery techniques, his extension program has also reflected a sophisticated expertise in the effective use of modern electronic communications technologies, and has been richly praised by various stakeholder groups. Young faculty such as Kerik bode well for the future of our department, as this promotion duly attests.

Amy Andersen Receives Core Value Award

Wayne Wilcox

Amy Andersen, Administrative Assistant IV housed in the Geneva administrative office, was one of three staff members across the College of Agriculture and Life Sciences to receive a 2012 Core Values Award. Amy, who began her career with the department in 1998, was recognized for her selfless attitude, unwavering dedication to our department and College, and high quality of her work; her compassionate and empathetic nature towards students and visitors, particularly those who may be having a hard time of things for one reason or another; her work in the local community to help others in need; and her overwhelmingly positive contribution to the general work atmosphere and esprit de corps within the department’s unit at Geneva. Amy had been recognized previously as the 2010 Employee of the Year by the staff at the NY State Agricultural Experiment Station in Geneva, for many of the same reasons. We are proud that Amy is no longer one of the “unsung” staff heroes whose contributions are so critical to the excellence for which Cornell is recognized.
Crocker Wins Golden Apple Award

Ellen Crocker won a Golden Apple in 2012. This is the coveted prize for an Outstanding Teaching Assistant, awarded by our college over a nice lunch interrupted by grateful speeches. Ellen, who is working on her PhD in Eric Nelson’s lab, has been the excellent and reliable TA for my class, Medical and Veterinary Mycology, for two years. This year she developed an exercise in which (yikes!) students responded to fungal biowarfare. She also helped students develop gruesome posters on fungi affecting animals, and gave a fine lecture on mycotoxins in which a pig was seen throwing up and a horse drooled surprisingly copiously. That’s the kind of class it is—students always ask for MORE disturbing images. I appreciate Ellen’s great help in developing this course.

Harrison and Klessig—AAAS Fellows

The American Association for the Advancement of Science (AAAS) awarded honors of distinction to Dr. Maria Harrison and Dr. Daniel Klessig, BTI scientists and adjunct professors in the PPPMB department. Each year, the Council elects members whose “efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished.” Harrison was recognized for her discoveries on arbuscular mycorrhizal (AM) symbiosis and associated aspects of phosphate transport and nutrition in plants. Klessig was recognized for his major contributions to the understanding of how plants protect themselves against microbial pathogens and particularly the role of salicylic acid in plant immunity.

Carly Summers Awarded an NSF Graduate Research Fellowship

Carly Summers, a PhD student with Chris Smart, had a banner year. She was awarded an NSF Graduate Research Fellowship, a travel grant from the Mario Einaudi Center for International Studies, and a grant from the Towards Sustainability Foundation. Carly completed a mixed-species cover crop study in her first 2.5 years here at Cornell, and has begun population studies on two devastating oomycete pathogens (Phytophthora capsici and Pseudoperonospora cubensis). Her work on P. capsici will focus on the pathogen population in Colombia, in collaboration with a former lab member Silvia Restrepo (Professor and Dean of Faculty at Universidad de los Andes). The Ps. cubensis work will focus on strains of the pathogen attacking cucurbits here in NY. Congratulations Carly!

Amara Dunn Awarded USDA Land Grant Graduate Fellowship and More!

Amara Dunn, PhD student with Chris Smart, continues to excel at grant writing! Having written and been awarded grants from the Storkan-Hanes-McCaslin Foundation Award (2010), and the CALS Land Grant Graduate Fellowship (2011), she outdid herself in 2012 with a USDA AFRI competitive pre-doctoral fellowship. Amara has completed studies on the Phytophthora capsici pathogen population here in New York, and is now focusing on understanding differences in the host-pathogen interaction among susceptible, tolerant and non-host solanaceous vegetables using confocal microscopy and green fluorescent protein-tagged P. capsici isolates. She collaborates closely with vegetable breeders and is very active with the vegetable extension team. Congratulations Amara!
Dr. Lance Cadle-Davidson is Selected for the 2012 T.W. Edminster Research Associate Award  
(Excerpt from article by the National Grape and Wine Initiative)

A grape genomics project proposed by plant pathologist Dr. Lance Cadle-Davidson of the Agricultural Research Service (ARS) Grape Genetics Research Unit at Geneva, NY, has been selected to receive ARS’ prestigious T.W. Edminster Research Associate Award. ARS is the chief intramural scientific research agency of the U.S. Department of Agriculture.

Dr. Cadle-Davidson’s proposal was rated the best among the 50 proposals selected for funding through the agency’s 2012 Postdoctoral Research Associate program. Dr. Cadle-Davidson’s project will focus on isolating the Ren4 gene to control powdery mildew resistance in grapes. The T. W. Edminster Research Associate Award provides funding for a postdoctoral researcher to work on the project for two years. This program gives postdocs the opportunity to work closely with an experienced researcher in their field of interest, and also perform valuable research to help solve agricultural problems.

Stewart Gray Selected the 2012 North Atlantic Area Scientist of the Year

Congratulations to Stewart for being selected the 2012 North Atlantic Area Scientist of the Year by the USDA Agriculture Research Service (ARS). This was in recognition of Stewart’s outstanding research on the insect transmission of plant viruses, plant virus epidemiology and plant virus disease management. As an interesting side note, Lance Cadle-Davidson, whom Stewart advised while he was at Cornell, was chosen in 2011 as the USDA-ARS-NAA Early Career Scientist of the Year. ARS recognizes “early career scientists” who have been with the agency for seven years or less. Lance was recognized for partnering with the grape industry to identify genetic resistance to powdery mildew and forming research collaborations to advance grape pathology, genetics and genomics.

Grad Student Awarded Sustainable Biodiversity Fund Grant

Ellen Crocker, a graduate student in Eric Nelson’s program, recently received a Sustainable Biodiversity Fund Small Grant award for $6,000 to fund her research focused on the role of soil pathogens in wetland plant community dynamics. The Sustainable Biodiversity Fund, in its first year, is a new program from Cornell’s Atkinson Center for a Sustainable Future which supports multidisciplinary research relating to sustainability in the environment, energy and economic development.

Ellen’s dissertation research focuses on the role of soil fungal and oomycete pathogens in plant species invasions. In particular, she is looking at how the invasive marsh wetland plant species Phragmites australis changes soil pathogen communities and how these changes feed-back to facilitate invasive success of P. australis in diverse native wetland plant communities. With the funds she received from this grant, Ellen will quantify changes in the abundance of several key Pythium species in soils colonized by a range of invasive and native wetland plant species. This research will inform understanding of the mechanisms that drive plant invasions and plant community dynamics.

Fry Receives Award for Excellence in Faculty Service

Chair and Professor William E. Fry was awarded the SUNY Chancellor’s Award for Excellence in Faculty Service in 2012. More about the SUNY Chancellor’s Awards can be found at http://www.suny.edu/ provost/academic_affairs/ChancellorsAwards.cfm.
Andrea Ficke, Lisa Hoffman, and Megan Kennelly Receive the Prestigious
Lee M. Hutchins Award based upon their Graduate Studies at Cornell

Drs. Andrea Ficke, Lisa Hoffman, and Megan Kennelly were recognized at the annual meeting of the American Phytopathological Society (APS) in Providence, Rhode Island in August as recipients of the prestigious Lee M. Hutchins Award. All received their PhDs from Cornell as students in what was then the Department of Plant Pathology at the New York State Agricultural Experiment Station in Geneva, and worked with Cornell faculty members Bob Seem, David Gadoury and Wayne Wilcox. The award is presented based upon the best paper or series of papers on diseases of fruit crops published in an APS journal within the previous 10-year period. In the 32-year history of the L.M. Hutchins Award, this was the first time a series of graduate student research projects was selected by the award and nominations committee of the society as worthy of recognition.

Drs. Ficke, Hoffman and Kennelly worked together as PhD students within a research team at Cornell University’s New York State Agricultural Experiment Station at Geneva between 1998 and 2005, and published a series of 13 papers in *Phytopathology*, *Plant Disease* and *Plant Health Progress* between 2001 and 2007 that profoundly affected management of three of the most destructive diseases of grapevine: powdery mildew (*Erysiphe necator*), black rot (*Guignardia bidwellii*) and downy mildew (*Plasmopara viticola*). They worked together within the same vineyards, shared techniques and protocols, discussed, critiqued, and refined each other’s research, and cooperated in the complex studies required to simultaneously investigate ontogenic resistance to multiple diseases at the field level. Their combined work contributed new knowledge on three fronts that markedly improved management programs worldwide.

**Andrea Ficke**

Andrea Ficke explored the onset of ontogenic resistance to powdery mildew in developing grape berries. Pioneering work in which Ficke played a major role (*Phytopathology* 91:948-955 and 93:547-555) had shown that berries became highly resistant to infection far earlier than previously thought. Later work lead by Ficke (*Phytopathology* 93:556-563 and 94:438-445) produced a number of important findings: (a) it showed that ontogenic resistance stopped pathogen ingress at the interface of the cuticle and epidermis, (b) precisely delimited the time of pathogen death, (c) elucidated the anatomical and biochemical mechanisms involved in ontogenic resistance, and (d) ultimately showed that the response was sufficiently consistent and predictable to serve as the basis for a revision of management programs for grapevine powdery mildew worldwide (*Phytopathology* 92:671-675). Ficke’s elegant experiments demonstrated the irrelevance of several pathogenesis related proteins and secondary metabolites to ontogenic resistance, as they were produced too late or in the wrong tissues to effect an epidermal pathogen (*Phytopathology* 94:438-445), and thereby redirected and refocused fundamental studies searching for the mechanism of ontogenic resistance. In the most recent work, the above authors demonstrated how cryptic mildew colonies established just before the complete development of ontogenic resistance can produce a cascade of effects that can substantially degrade wine quality (*Phytopathology* 97:1356-1365).

**Lisa Hoffman**

Lisa Hoffman’s contributions were made in a series of parallel studies of ontogenic resistance and inoculum dose in the epidemiology of black rot. As in the case of grapevine powdery mildew, little was known about the period of fruit susceptibility to black rot, and this often resulted in substantial and seemingly unexplainable losses. Work lead by Hoffman clearly delineated not only the period of berry susceptibility (*Phytopathology* 92:1068-1076), but also the period of inoculum availability and how sanitation and spray timing could be optimized based upon her discoveries (*Phytopathology* 94:641-650 and *Plant Disease* 87:273-281). Her comprehensive work has been of great value to growers throughout the eastern US where the disease is both endemic and severe, and also in several European countries where the disease has more recently become destructive.

continued on next page...
As a fellow PhD student with Ficke and Hoffman, Megan Kennelly embarked on a multifaceted investigation of grapevine downy mildew. The overarching goal of her work was to provide the biological basis for an improved forecasting model for advisory systems. This necessitated exploring the development of ontogenic resistance in grape berries to *P. viticola* (*Phytopathology* 95:1445-1452). As in the case of powdery mildew and black rot, this process was poorly understood before Kennelly’s study. The seasonal dynamics, mechanisms involved, and differential response of berry as compared to rachis tissue proved to be substantially different from either powdery mildew or black rot. Kennelly's work clearly demonstrated a very brief period of extreme berry susceptibility, hence a critical and narrow window of opportunity to suppress fruit infection. Her additional findings related to multi-season survival of oospores, the relationship between sporulation and the cyclical decline of lesion productivity, and host phenology and early-season disease development (*Phytopathology* 97:1356-1365) all resulted in improvements to downy mildew forecasting systems (*Plant Heath Progress* doi:10.1094/PHP-2007-0726-03-RV).

The impact of the collective work of Ficke, Kennelly, and Hoffman has been felt worldwide. Indeed, there are few disease management programs today that do not incorporate their findings. It is significant to note that all three former students were selected to present their work to APS as distinguished speakers in the I.E. Melhus Graduate Student Symposia (*Phytopathology* 92:671-675, 676-680, and *Plant Heath Progress* doi:10.1094/PHP-2007-0726-03-RV). The high quality and importance of their research was thus appreciated even before it was published in APS journals.

Andrea Ficke is presently a cereal pathologist at the Norwegian Institute for Agricultural and Environmental Research. Lisa Hoffman is a research scientist with DuPont Crop Protection, and Megan Kennelly is an associate professor of plant pathology at Kansas State University. Lisa was the only one of the awardees able to attend the meeting in Providence, and accepted the award on behalf of the group. Both Andrea and Megan were at home on maternity leave, caring for newborn sons Carl-Eric and Nathaniel, respectively.

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**Congratulations**

**Congratulations to Those Students Who Have Passed Their ‘A’ Exams**

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<th>Year</th>
<th>Name</th>
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<td>Ewa Borejsza-Wysocka</td>
<td>April</td>
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<td>Aldwinkle</td>
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<td></td>
<td>Ellen Crocker</td>
<td>February</td>
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<td>E. Nelson</td>
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<td></td>
<td>Alexa Schmitz</td>
<td>August</td>
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<td>Harrison</td>
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<td>Elizabeth Brauer</td>
<td>November</td>
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<td></td>
<td>Simon Schwizer</td>
<td>September</td>
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<td>Martin</td>
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<tr>
<td>2013</td>
<td>Carly Summers</td>
<td>January</td>
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<td>Smart</td>
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**Congratulations to Our Newest Alumni**

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<td>May</td>
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<td></td>
<td>Andre Velasquez</td>
<td>Ph.D.</td>
<td>August</td>
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<td>Allison Jack</td>
<td>Ph.D.</td>
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<td>Daniel Moebius-Clune</td>
<td>Ph.D.</td>
<td>August</td>
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<tr>
<td>2013</td>
<td>Jay Worley</td>
<td>Ph.D.</td>
<td>January</td>
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**Megan Kennelly**

**Ficke, Hoffman and Kennelly continued...**
Departmental Bowling Tournament
Ellen Crocker and Bradford Condon

The annual department bowling tournament was held at Helen Newman Lanes on May 3, 2012. As in previous years, students, faculty, staff and their families enjoyed a pizza dinner and some friendly competition. The Graduate Student association would like to thank the department for financial support, and all those who participated and made the event a success. Again this year, the Faculty and Staff handily defeated the Students and Post-docs. Best team uniform went to the team “Hungry Hungy Haustoria”.

Game Nights 2012
Julia Crane

PPPMB members were treated to not one, but two game nights in 2012! One was in March and the other was in December, and both were sponsored by the Graduate Student Association. The game nights were attended by faculty, staff, graduate students, and their friends and family. Games included board games such as Settlers of Catan, action games such as Bill Fry’s Dutch game Sjoelin, and virtual games like Wii Mario Kart.
Department Picnic on June 25, 2012

Carol Fisher’s Going Away Party on March 7, 2012
H. David Thurston’s 85th Birthday Celebration on March 30, 2012

Milt Zaitlin’s 85th Birthday Celebration on April 6, 2012
Casino night

Liz Brauer

On March 30, the Graduate Student Association ran its first casino night. Eric Carr and Liz Brauer organized an evening of roulette, poker, and blackjack with so many prizes that it was difficult to walk away from the event without at least a potted plant or a bag of prize potatoes. The more than 50 attendees paid a $5 entrance fee which bought a stack of Eric’s Plant Pathology Funny Money as well as access to a delectable spread of pizza and hors d’oeuvres. Over several hours, the gamers did their best to beat the odds but in the end, the top three prize winners were Giovanna Davies, Christine Kraus and Sonam Sherpa from Horticulture who walked away with gift certificates to local restaurants. Eric and Liz would like to thank the many volunteers and dashing bowtied dealers who helped to make the night such a success.
Greetings from the Plant Path Photo Lab. 2012 was a busy and interesting year here, as I hope it was for you. Thousands of petri plates, tobacco leaves, Arabidopsis plants, corn leaves, invasive insects etc. and their bacterial, fungal and viral hitchhikers passed through the lab and were digitally immortalized. A few even found their way onto Journal covers!

The year started out on a high note when the photo lab’s redesigned web site went live (...at 10:15 AM, February 6, 2012 the Cornell Plant Path Photo Lab web site became self-aware...). The site was completely re-designed (and beautifully too, I must say) by Molly Swartwood, who works in the Diagnostic Lab and loans her considerable graphics skills to numerous projects around the department. If you get a chance, please check it out: http://www.plantpath.cornell.edu/PhotoLab/

One of the most interesting projects I worked on in 2012 was a series of portraits of graduating seniors taken for the CALS Communications magazine "periodiCALS". For this project, CALS Communications chose 12 outstanding students to feature and we made a series of photographs of them using an old-fashioned 8x10” film view camera. These portraits were made in the style of the famous fashion photographer Richard Avedon (http://www.richardavedon.com/). It was a treat to work with film again (it’s been about eight years since the lab went completely digital) and especially the exquisite quality you get from the huge 8x10” negatives. Julia Crane, a graduate student in the department, graciously and patiently sat for several practice portraits allowing me to work out all the details of lighting, exposure, development, scanning and printing the images. The final images of the graduating seniors were published in the periodiCALS magazine (http://calsnews.cornell.edu/2012-spring/features/senior-portraits.html) and were also made into 30x40” prints and exhibited at Roberts Hall and Mann Library throughout the summer.

In June, Claire Smith, a senior in the Biomedical Photography Dept. of the Rochester Institute of Technology, began a summer internship in the photo lab. Claire is a fantastic photographer and is a whiz with any graphics program she uses. Throughout the summer, Claire worked on numerous projects, including setting up time-lapse movies, taking field photos of fungi on weekly field trips with Kathie Hodge and other mycologists, creating panoramic images of the Cornell campus, photographing hundreds of specimens in the studio and, most amazingly, she re-edited over 50 time-lapse movies and uploaded them to YouTube (http://www.youtube.com/user/cuplantpathphotolab). In February of 2013, Claire and I will be having an exhibit in Mann Library entitled “Planet Cornell”. The images we will be exhibiting are landscape “planets” created from panoramas of the Cornell campus. A gallery of the planets can be seen on the lab’s web site: http://www.plantpath.cornell.edu/PhotoLab/panoplanets.html.

Claire Smith worked as the summer intern in the photo lab.

Julia Crane sat for several practice portraits allowing Kent to work out all the details of lighting, exposure, development, etc.
Herbarium Notes
Scott LaGreca

This review highlights activities of the Plant Pathology Herbarium (CUP) from January 2012–December 2012.

Staff News

Dr. Scott LaGreca, Curator, enjoyed a busy year of publishing and traveling in addition to his curatorial work. Scott published a new discomycete species from Bermuda, based on historic collections at CUP; a lichen checklist for Windsor Jambs gorge in Massachusetts, including a new lichen species for New England; and (with Robert Dirig) a complete lichen checklist for Berkshire County, Massachusetts. He attended meetings in Columbus, Ohio (BSA) and New York City (Macrofungi Workshop at NY Botanical Gardens). In addition, Scott led botanical fieldtrips to the Adirondacks, the Berkshires and Hoxie Gorge (near Cortland); and he participated in two BioBlitzes (one in Vermont, the other in the Berkshires).

Torben Russo, Assistant Curator, is finishing up the Atkinson NSF project with the help of our skillful squadron of student interns. This is Torben’s final year with us at CUP, and we are grateful to him for his conscientious work on this important curatorial project.

Robert Dirig, Anna E. Jenkins Honorary Curator of Lichens, took over the editorship of Solidago (the newsletter of the Finger Lakes Native Plant Society), where he published a paper on Chemung Pine Barrens cryptogams, as well as an update of his 2002 McLean Bogs lichen survey. In addition, Bob finished re-packing our New York and New England lichen specimens (1826 specimens total) with the help of long-time CUP volunteer Doug Murray. The two also kept our front garden looking beautiful despite near-drought conditions this past year.

Betsy Crispell, volunteer, continued working on specimen repairs for the Atkinson NSF project. She also provided critical help preparing our index cards for digitization (see Herbarium Happenings, below).

Herbarium Happenings

In August, CUP staff met with Cornell Facilities staff to find a solution to ongoing temperature and humidity problems in the herbarium—a dangerous situation that potentially threatens the integrity and conservation of our priceless, historic mycological collections. As a result, our HVAC system has been reprogrammed, and structural improvements to the building will be made beginning in Spring 2013. Fingers crossed!

November was a momentous month at CUP! Torben Russo and his crew of student interns finished databasing the entire Atkinson Herbarium (about 50,000 specimens total), which is the primary component of one of our NSF grants (Atkinson’s Fungi: Curation and Databasing at the Cornell Plant Pathology Herbarium), now in its final year. We also finished scanning all of Atkinson’s photographs and notes—only Atkinson’s collection of negatives remain to be databased.

In November, we also hosted H. Thorsten Lumbsch, Chair of the Botany Department at the Field Museum, Chicago. Thorsten gave a talk on lichens as part of the Fall 2012 PPPMB seminar series, then spent a few days in the herbarium finishing a project on systematics of the genus Lecanora with Scott LaGreca.

November was also when we sent our first shipment of index cards for digitization as part of another of our NSF-funded projects, The Macrofungi Collection Consortium: Unlocking a Biodiversity Resource for Understanding Biotic Interactions, Nutrient Cycling and Human Affairs. As part of this collaborative project (involving 64 institutions in 34 states), all of CUP’s index cards (c. 120,000 cards total) are slated to be scanned and read with OCR (Optical Character Recognition) software by Silver Biology, a company based in Denver. Our index card file is our most important finding aid for locating specimens in CUP—which makes this task the equivalent to having a library’s index card files converted to a computer database. We’re very excited about completing this in early 2013.

Summary of 2012 statistics:

Eleven loans (comprising 115 specimens) and nine gifts (comprising 76 specimens) were sent from CUP in 2012, and six gifts (comprising 123 specimens) were received from other institutions. A total of 708 new accessions (gifts plus staff collections) were incorporated this year. Five loans from other institutions were received for study by PPPMB researchers. About 78 inquiries were answered by CUP staff. In addition, Bob contributed 242 hours, Doug contributed 120 hours and Betsy contributed 105 hours during 2012.

continued on next page...
Herbarium continued...

Outreach & Visibility

Director Kathie Hodge led our 2012 outreach efforts with three presentations: “Pretty Rotten—the fungi that eat our food” (for SUNY Cortland in February and Trumansburg High School), a WICB Science Cabaret interview on September 28. Kathie and George Hudler also helped organize the fungus photo exhibition “The Other Side of What? Adventures in Fungal Wonderland” at Mann Library during the Spring semester. Both attended the Peck Fungus Foray in Pennsylvania in mid-September. Additionally, Kathie and Scott LaGreca taught high school biology teachers about fungi and lichens as part of the 2012 Cornell Institute for Biology Teachers in August.

The CUP Front Garden, July 2012 (photo by Robert Dirig).

In the spring, CUP hosted two classes: an Introduction to Print-Making class (College of Arts & Sciences) and a Landscape Architecture class (CALS). In the fall, students from the Print-Making class presented a portfolio of beautiful, original lithographs to us, all based on CUP specimens.

In October, Scott LaGreca ran a New York Flora Association workshop on crustose lichen identification, with the help of NYFA President David Werier and Robert Dirig. Five botanists participated. The workshop included a field trip to the Lake Cliffs along the railroad track near East Shore Drive, where calcareous seeps support a diversity of lime-loving lichen species.

NYFA crustose lichen workshop participants, from left: Chris Mengels, David Werier, Tom Phillips, Anne Johnson, Bob Dirig.


Visitors Welcome

The Cornell Plant Pathology Herbarium is located at 214 Gallus Road, off Game Farm Road, about two miles from central campus. Parking is free. All are welcome to visit our museum and see the collection. Volunteer opportunities are also available. Please send a message to our email address (cup-herbarium@cornell.edu) to schedule a visit.

A total of 128 visitors, including students, other academics, and tour groups, darkened our door in 2012.
As in most years, 2012 brought a wide variety of samples from a variety of green industry and home gardens into the Cornell Plant Disease Diagnostic Clinic (PDDC). We also continued to process samples for New York State Department of Agriculture and Markets (NYSDAM) personnel on a wide variety of plant problems. These included some pathogens that are currently regulated in nurseries, greenhouses, and landscapes in New York State (NYS).

Although the PDDC receives most of our routine lab samples from New York State, we also receive samples from other states. In 2012, we received 383 (65%) of our samples from New York sites. Other states submitting 20 or more samples per state included: NC (56!), GA, ME, PA, and VT. Fifteen additional states and the District of Colombia submitted samples to the PDDC as well.

Sample processing started out slow in 2012, but picked up drastically about mid-year ending with 590 routine lab samples submitted as of December 14, with 82 (14%) of those samples being submitted in just five months. June through October samples peaked with 121 samples submitted in September. That made for a busy time in the PDDC!

Once again, woody ornamentals topped the list of submissions with more than half of the samples submitted collected from trees or shrubs including 193 deciduous and 136 evergreen woody ornamentals.

Vegetable crops were also high on the list with 97 samples. One vegetable seemed to elicit more diagnostic requests than any other. Tomatoes accounted for 46 of the 97 vegetable sample submissions. Unlike the three preceding years however, most samples were not submitted for analysis for late blight (Phytophthora infestans).

Samples submitted through the NYSDAM were way up with 82 for 2012 compared to just 46 in 2011. Keep in mind, those are just routine sample submissions and do not include samples submitted as part of ongoing surveys.

Processing of some significant pathogens also occurred with several cases of boxwood blight, caused by Calonectria pseudonaviculata, from northeastern sites and increasing numbers of impatiens samples infected with the impatiens-downy mildew pathogen: Plasmopara obducens. As of this writing, both pathogens are still managed by state officials when found in any greenhouse or nursery setting. Destruction of infected plants (do not compost) is still the recommended option until effective fungicide treatments can be found. Late in the season, we received a serviceberry (Amelanchier sp.) sample with unusual symptoms. Tissue was selected and tested via ELISA for the bacterial leaf scorch (BLS) pathogen Xylella fastidiosa. The sample gave a positive (weak) result—but symptoms looked good.

We also had the opportunity this year to see a few unusual fungi that do not cause plant diseases but rather attack specific plant pathogens. In June we found an Ampelomyces sp.—a mycoparasite on Oidium developing on Rhus copallinum from the NYC area. This fungus was identified by Dr. George Hudler.

In July, we received a shallot sample with Fusarium basal rot. This sample also showed evidence of a second fungus with conspicuous dark spores. This second fungus was identified by Dr. Kathie Hodge as a Sphaerodes sp., a potential mycoparasite of some Fusarium spp. Although some Sphaerodes spp. are reported to be specific to certain fungal species, at least one species is reported to parasitize the fungus Fusarium oxysporum, the fungus found to be infecting the shallots.

Occasionally, our clients ask for analysis to try to confirm or rule out a specific issue. Specific problems

continued on next page...
Disease Clinic continued...

we were commonly asked to evaluate samples for in 2012 included: Phytophthora root rot, boxwood blight, impatiens downy mildew, bacterial leaf scorch, dogwood anthracnose, Dutch elm disease, bloat nematode (garlic), chrysanthemum white rust, *Hibiscus chlorotic ringspot virus*, and late blight.

In addition to plant disease diagnosis, the PDDC offers some fungus or mushroom ID and plant or weed ID services. Both of the latter methods are performed using macro and microscopic characteristics, so it is important to have a high quality and intact sample for best results. For partially digested mushroom samples, we seek help from mycologist Dr. Kathie Hodge. Fortunately, such samples are still few and far between, although we do typically receive a few samples every year for mushroom or plant ID that involve an animal health issue. In most cases, a dog, horse or other animal has become ill or died following ingestion of a fungus or a potentially poisonous plant.

To encourage more 4H entries, we have developed a new project in collaboration with Dr. Kathie Hodge for the 2013 NYS Fair. We are offering a “Mushroom Collector’s Journal” to allow students to get a more in-depth experience regarding identification of the mushrooms they collect. Students will be required to keep notes on all aspects of the fungi they collect, take measurements, make spore prints, etc. In addition, we hope that some students may continue to add to the journal in subsequent years, developing better skills and adding to their overall knowledge about mushrooms!

We had two Cornell students take the course PLPA 6610 “Diagnostic Lab Experience” through the PDDC during the fall 2012 semester. They received hands-on experience examining plant tissue sample submissions to try to determine what may be wrong with the plants. Many of the samples received at the Clinic exhibited no evidence of a pathogenic infection; this can make it quite a challenge for students to try to diagnose a problem when there is limited tissue and information regarding the plant’s history, care, etc.

Members of the PDDC are currently working on a couple of other significant projects. First, we are in the process of wrapping up a three-year, Agriculture and Food Research Initiative (AFRI) grant focusing on designing and evaluating molecular techniques that would increase early and accurate detection of high-consequence plant pathogens. This project is a collaborative effort lead by the University of Florida and including the diagnostic laboratories at Louisiana State University, Texas A & M, and Purdue University. Second, we have increased the number of samples we process for *Phytophthora ramorum* (sudden oak death, ramorum blight) this year due to an additional discovery of the pathogen. Back in 2010, the pathogen was detected in an inactive, irrigation pond at a nursery on Long Island. Additional material providing positive results from that original site and at a second location, over 100 miles away, were sent to NYSDSAM, for the United States Forest Service and nationally as a back-up to the USDA-APHIS-PPQ regional laboratories. To date, no samples collected from natural environments nor garden plants have produced positive results for *P. ramorum* in New York State.

We completely revised the PDDC’s website. See the new updated site at [http://plantclinic.cornell.edu](http://plantclinic.cornell.edu)
The BogLab Comes to Ithaca
Sara Carpenter

During the Summer of 2012, our department got a new member—Dr. Adam Bogdanove! Dr. Bogdanove, formerly of Iowa State University (ISU), moved from Ames to Ithaca in July, bringing with him his crack team of researchers, who now occupy the Loria Lab’s former digs.

Dr. Bogdanove is a departmental alumnus, having completed his PhD in Dr. Steven Beer’s lab in 1997. He also did Post-Doctoral research with Dr. Greg Martin, of the Boyce Thompson Institute (BTI) (when BTI was at Purdue University), before becoming faculty at ISU in 2000.

The Bogdanove research program revolves around understanding the molecular interactions between *Xanthomonas oryzae* and rice, with particular focus on transcription activator-like (TAL) effectors, type-III secreted proteins injected by the pathogen into host cells. TAL effectors specifically bind host DNA and can activate genes to the pathogen’s advantage. The Bogdanove lab has helped to solve the structure that underlies this DNA-binding and defined pairs of amino acids in repeating regions of the effector which bind specific nucleotides. The discovery that the effector structure is modular and predictable means that these proteins can be designed to bind specific DNA targets and has huge applications in Biotechnology and Plant Pathology.

The members of the Bogdanove Lab (or BogLab, for short) work on a variety of fascinating projects. Li Wang, originally from China, completed her PhD with Adam at ISU in 2007 and is now a Research Support Specialist working to engineer TAL-based nucleases. Andrés Cernadas, a post-doctoral associate born in Argentina (PhD in Plant Pathology, Campinas University, Brazil, 2008) has worked with Adam since 2009 to characterize that lead to susceptibility. Fabio Rinaldi, a post-doctoral associate from Brazil (PhD in Structural Biology, Campinas University, Brazil), is newly recruited to the lab, and will be studying the biochemical interactions between TAL effectors and DNA. The computational biology aspect of the program is supported by Iowa native and computer whiz Nick Booher, who manages the TALE-NT website (https://tale-nt.cac.cornell.edu/), a site with tools that allow design of TAL effectors for particular DNA sequences. Graduate students Katie Wilkins and Shan Qi have come to Ithaca from ISU to continue their work with Adam. Katie is a Computational Biology student who seeks rice resistance and susceptibility genes by bioinformatic means. Shan is the black sheep of the BogLab, and uses TAL effectors as a tool to identify not *Xanthomonas*, but *Blumeria graminis* effectors. I (Sara Carpenter, formerly of Dr. Steve Beer’s, Dr. Rose Loria’s, and Dr. Jim Lorbeer’s research programs) will be managing the lab and assisting with research and outreach.

We of the BogLab thank the department for their welcome to us, and invite folks to drop by and visit the lab! 🙏

BogLab members at the ribbon cutting for the newly renovated lab space, September 2012. From left to right: Li Wang, Nick Booher, Shan Qi, Raman Sundaram (visiting scientist), Adam Bogdanove, Andrés Cernadas, and Sara Carpenter. BogLab Members Not Pictured: Fabio Rinaldi, Katie Wilkins. Photo by Kent Loeffler.
$9 Million VitisGen Project
VitisGen Team

What is the VitisGen Project?
In September 2011, Cornell initiated a $9 million project to revolutionize how grape varieties are developed. This project, known as VitisGen (www.vitisgen.org), is co-led by Bruce Reisch (Cornell’s Grape Breeder) and Lance Cadle-Davidson. VitisGen brings together all public U.S. Bunch grape breeders to develop the world’s largest unified grape breeding effort. Centralized phenotyping and genotyping are provided to the breeders for the quantitative measurement of key traits and for the construction of high-resolution genetic maps.

What is our role within the VitisGen Project?
The PPPMB department houses the national grape phenotyping center for fungal disease resistance, drawing on the expertise of David Gadoury, Bob Seem, Wayne Wilcox, and Cadle-Davidson. The primary target is powdery mildew, the most costly disease in grape production. Operated out of the Seem Lab, the powdery mildew phenotyping center (VitisGenPM) maintains the world’s most genetically diverse collection of grape powdery mildew (Erysiphe necator), including important isolates originally collected and characterized by Michael Milgroom’s lab. These diverse isolates are inoculated onto breeding resistance sources to test the race-specificity, efficacy, and mechanisms of resistance.

VitisGenPM uses the above data to develop strategies for measuring resistance segregation among breeding progeny. In its first year of operation, VitisGenPM has processed over 3000 samples for powdery mildew resistance, led by Anna Nowogrodzki, Michelle Schaub, and Jackie Lillis [pic1]. Replicated detached leaves of up to 200 full-sibling vines are received from grape breeders for detailed analysis of marker-trait associations. Single isolates are inoculated onto leaf discs in agar-lined baking dishes—a VitisGenPM innovation that enables the evaluation of hundreds of progeny in a uniform environment [pic2]. Early fungal development is quantified by microscopy in a detailed analysis that results in 50,000 observations per population. The outcome is a wealth of information on the genetic inheritance and detailed mechanisms of powdery mildew resistance.

As if this wasn’t already enough, Wilcox and Reisch are collaborating to evaluate resistance to black rot [pic3] and Phomopsis, important diseases that become major problems in organic production.

How do we identify marker-trait associations?
Cadle-Davidson and the genotyping center then analyze the vines’ DNA using a next-generation technology called genotyping-by-sequencing (GBS). At $25 per sample, GBS assays up to 300,000 loci across the grape genome [pic 4]. In Year 1, the genotyping center processed 7,200 DNA samples across 13 Vitis species and 37 mapping populations using the GBS technology, generating more than one billion data points. From this impressive database, markers are being identified that are predictive of disease resistance and other traits, such as fruit quality (measured in the Dept. of Food Science) and low temperature responses (measured at South Dakota State University). In addition, over 30,000 SSR markers (to assay single genetic loci) have been processed in Year 1 to select for desirable alleles. These markers are being used to pyramid multiple resistance genes and select for fruit traits in young seedlings, years before fruit would be produced.

What does it all mean?
Through VitisGen, grape breeders now have access to rigorous, quantitative trait data and cutting-edge DNA analyses at a level only imaginable through extensive collaboration. Breeders wanting to combine three genes in one vine can discard 90% of their progeny based on marker data, before investing years of resources into vineyard establishment and vine evaluation.
Cornell University and the Department of Plant Pathology & Plant-Microbe Biology, in collaboration with the University of Georgia and the University of Maine, established a node thanks to two consecutive IPM grants. Our goal is to ensure valuable images are made available to a broad audience that focuses on educators and plant diagnosticians and that those images are not lost to the agricultural and green industry community when faculty or staff retire. The Bugwood database is mainly an image library where photographers post their best images for use by others in presentations and other educational materials. The use of images for educational purposes is automatically allowed and users are only asked to cite the images properly. If images are to be used for commercial purposes, permission and possibly compensation must be granted prior to use.

In 2007, the Bugwood Image Database, which is the largest database system of plant related images with a focus on pathogens and pests, expanded to allow editing and project maintenance capabilities by trained collaborators housed at other locations, hence, serving as a node is mainly that this allows us to work independently to add images, perform data entry according to the system standards, and to manage our project directly. All of the data and images remain at the University of Georgia, but the nodes have the ability to control the system through web-based data entry forms.

Beginning in January of 2012, the Plant Disease Diagnostic Clinic and NEPDN staff have been submitting images, reviewing the inactive PDIS image library collection and coordinating with Bruce Watt, University of Maine and fellow NEPDN member, to determine what images would be useful for others to use. Bruce is known among the diagnostic community as an exceptional photographer with an outstanding collection of pathogen images. He often shares these images with his NEPDN colleagues and, because of this project, he can share some of his finest with a larger audience. Since the establishment of the node, 1,307 images were submitted through the Bugwood-Cornell node to the network. These images cover 175 subjects and include significant diseases such as chrysanthemum white rust, Japanese apple rust, thousand cankers disease and boxwood blight. Many of the images are microscopic views of plant pathogens that may aid diagnosticians in their identifications. The images have been viewed 98,336 times, 463 were directly downloaded. 136 images received use requests (87 for educational purposes, 13 for commercial purposes and 5 for personal use.)

**Cornell Node Numbers**

Images were viewed 98,336 times, 463 were directly downloaded. 136 images received use requests (87 for educational purposes, 13 for commercial purposes and 5 for personal use.)

If you have some images or know of a collection that is worth preserving, please contact Karen Snover-Clift. Visit the Bugwood-Cornell Node at http://www.forestryimages.org/nodes.cfm

An example of an image detail and download page on Bugwood.
Department of Plant Pathology and Plant Microbe-Biology (PPPMB) has invigorated the project which has resulted in significant progress in the development of the STAR-D program. Karen Snover-Clift is filling the role as the NPDN STAR-D National Quality Manager (NQM) and Dawn Dailey O’Brien has been serving as the National Quality Coordinator since 2010.

Through leadership of the NQM and NQC and the activities of the NPDN laboratory accreditation working group, the core implementation documentation requirements of the STAR-D quality management system have been developed and are continually reviewed and improved as they are used in STAR-D trainings and with input from NPDN members. The primary goal of this effort is to develop a valuable quality management system that can be established in each of the NPDN laboratories with minimal duplication of effort. Snover-Clift and O’Brien have built a framework that includes a significant number of document templates (including System Documents, Quality Procedures, Work Instructions, and Forms) to facilitate use by NPDN laboratories.

In April, 2011, 26 NPDN members representing each of the five NPDN regions attended a 3-day QMS training program. The interactive training program included lectures and training on quality system requirements, the accreditation process, document control, internal auditing, and root cause analysis. In addition, participants had the opportunity to conduct an on-site audit. This introductory workshop was followed by a flurry of activities that included a Gap Audit/Document Review at Cornell University in May, 2011, a 4-day auditor training at the University of Florida in September, 2011, as well as a checklist development workshop and a return to the University of Florida by the core development team members in June 2012.

Farm Bill funding allowed for continued development of the program and the team moved to the next phase by conducting auditing exercises for members of the STAR-D auditor pool which provided an opportunity to practice their auditing skills. The first auditing exercise was held in Ithaca, NY at Cornell’s Plant Disease Diagnostic Clinic in September 2012 and the second in Sparks, NV at the Nevada Department of Agriculture Laboratory in November 2012. This spring, the third exercise is planned for the Plant Diagnostic Clinic at the University of Florida in Gainesville, FL and the fourth at the Kansas State University Diagnostic Laboratory in Manhattan, KS. Another Farm Bill suggestion has been submitted for the next funding cycle and, if approved, will allow the PPPMB staff to continue in their leadership role and will provide resources for another QMS training workshop, the establishment of a STAR-D Accreditation Board, an ISO-17025 workshop to train additional auditors, auditing exercises at five NPDN laboratories, and official external accreditation audits of five laboratories. The PPPMB department is honored to have the roles of STAR-D National Quality Manager and National Quality Coordinator performed with the energy to bring this project to fruition.

This year, the NEPDN staff also provided leadership on NPDN advanced diagnostician workshops and the Sentinel Plant Network (SPN). The advanced diagnostician workshops were held at the USDA-APHIS-PPQ-CPHST facility in Beltsville, Maryland. The NPDN staff have worked with CPHST staff since 2003 to provide instruction that includes classroom lectures and
laboratory hands-on activities including morphological characteristic identification, ELISA techniques and, if available, molecular procedures and protocols. Topics covered this past year included bioinformatics, *Phytophthora ramorum* and *Phytophthora kernoviae*, potato wart, citrus leprosis, citrus black spot, sweet orange scab and citrus greening. Since 2003, this collaborative effort has provided 45 workshops, covering 12 topics for 304 participants.

George Hudler and Rachel McCarthy continue to collaborate with the American Public Gardens Association on the Sentinel Plant Network (SPN) project. Funded through the Farm Bill, the SPN curriculum and supporting materials raise awareness about high-consequence pests and pathogens that threaten our agricultural, natural and urban ecosystems. By participating in the Sentinel Plant Network, members agree to regularly scout their gardens and natural areas for significant pests and pathogens and to submit samples to their state’s NPDN laboratory if they find something significant or new and unusual.

In 2011–12, five regional SPN workshops were held for individuals working in either horticulture or IPM. Collectively, these five workshops served 132 professionals from 74 different public gardens. The second round of workshops, scheduled to begin this spring, will focus on training education and outreach staff on how they might use SPN materials to build curriculums for garden volunteers, visitors and youth groups at their gardens.

**Remembrance**


The Beer Research Program recently lost a critical member of its team of accomplished research scientists. Ali Zaid succumbed to liver cancer on November 21, 2012 in Cairo, Egypt after battling his illness for almost two years.

Ali joined the Beer Program as a Visiting Scholar in March 2009, supported on an Egyptian Government Scholarship for nine months, followed by appointment as a Post-doctoral Associate, at which point his wife Maha and four children joined him in Ithaca. Ali trained in Egypt, receiving a B. Sc. degree in Botany and Chemistry from Zagazig University in Cairo and a M. Sc. from Mansoura University, before returning to Zagazig University for a Ph. D. in Microbiology. Ali worked on diseases of crops in the Nile delta at the Plant Pathology Research Institute of the Egyptian Agricultural Research Center in Giza. He also taught and did research at King Saud University in Saudi Arabia for some years.

Ali joined the Beer Lab as its focus shifted towards studying bacterial decay of onion bulbs, an emerging problem in New York. Ali’s experience with diseased plants was ideal preparation for contributions to this problem. Ali participated in the identification of two pathogens of onion new to New York. With Lorbeer Lab Technician Eric Carr, *Pantoea ananatis* (Center Bonasera, the Enterobacter Bulb Decay pathogen, *Enterobacter cloacae* was identified. Ali spearheaded the development of Onion Extract Medium, which has proven highly useful for isolation of bacteria associated with onions and onion-related materials. With Jean and Post-doctoral Associate Jo Ann Asselin, Ali developed assays for testing the pathogenicity of bacteria to onions, and molecular means of identifying onion bacterial pathogens.

Ali worked extremely hard on his projects in spite of his declining health. He continued working until the day he departed Ithaca to return to Egypt in the hope of obtaining a partial liver transplant from his brother. Unfortunately, medical complications precluded the operation.

Many in the Department recall the generous contributions of Egyptian delectables that Ali (and Maha) provided during Beer Lab-sponsored Friday Coffee Breaks. Ali will be remembered as a kind, generous man and dedicated researcher. He is sorely missed.
Hodge Wows Radio Audience

On August 14, 2012, Kathie Hodge was interviewed on Ithaca College’s WICB’s radio show Science Cabaret on the Air, which is described as “an eclectic mix of science, art and entertainment.” The interview is titled “Putting the ‘Fun’ in Fungi”. You can listen to the podcast at http://sciencecabaret.podomatic.com.


Zitter’s Septoria Presentation Online

In May 2012, Plant Management Network’s Focus on Tomato talk featured the presentation, titled “Septoria Leaf Spot of Tomato” by Tom Zitter. Tom helps researchers and practitioners in tomato-growing regions better understand Septoria leaf spot (SLS) and how to manage this economically important disease. It is available at http://www.plantmanagementnetwork.org/edcenter/seminars/Tomato/SeptoriaLeafSpot/. The presentation is just over 11 minutes.

5 of ‘Best 300’

Five Cornell professors have been named to “The Best 300 Professors.” The book takes data from RateMyProfessors.com, a website on which students rank professors on helpfulness, clarity, easiness and “hotness.”

“The professors in the book are not ranked (nor are their colleges ranked in this book) but each professor profiled received high ratings from their most important audiences, beneficiaries and critics: the students they teach and inspire,” writes the publisher.

Cornell winners are Gerald Feigenson, professor of molecular biology and genetics; Karl J. Niklas, the Liberty Hyde Bailey Professor of Plant Biology; Cindy Van Es, senior lecturer in the Dyson School of Applied Economics and Management; George Hudler, professor of plant pathology and plant-microbe biology; and Shalom Shoer, senior lecturer in Near Eastern studies.
A team of international researchers is working to tackle the global problem of plant viral diseases that are spread by insects, thanks to close to $1 million from the National Science Foundation (NSF) and the Bill & Melinda Gates Foundation.

The team, headed by Stewart Gray, a U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS) research plant pathologist and Cornell professor of plant pathology, and Michelle Cilia, a USDA-ARS research molecular biologist, received a three-year, Basic Research to Enable Agricultural Development (BREAD) grant of $868,896 to develop protein biomarkers that distinguish insect populations capable of transmitting disease from those that do not.

“One problem with managing viral diseases is there is no cure,” said Gray, of the plant diseases that cause an estimated $60 billion in damages worldwide each year. “To control them, you have to develop a resistant crop, or you have to prevent the vector from feeding on and infecting the plant.”

Another challenge is that within insect species, such as aphids and whiteflies, that spread these viruses, researchers find populations vary widely in how efficiently they spread a virus. That’s because mutations or changes in genes alter specific proteins that viruses use to move through an insect. Slight changes in a gene can drastically alter the way a protein functions, Cilia said.

The researchers have identified protein biomarkers that allow them to determine whether an aphid will efficiently transmit disease or not.

“Finding these biomarkers for virus transmission is an exciting major breakthrough,” said Cilia. In medicine, for example, biomarkers for breast cancer and prostate cancer are rare success stories, Cilia added. The researchers are now trying to validate the aphid biomarkers in a range of vector insects.

If successful, the researchers hope to develop a test kit that can be used in the field to identify if an insect population is likely to be a virus vector. Once identified, growers can then target particular insects with pesticides at a certain time in their lifecycle. Currently, growers must spray crops indiscriminately to prevent disease outbreaks.

“Prophylactic spraying of crops to eliminate all potential vectors is not efficient from an economical or environmental standpoint,” said Gray.

Common disease-causing viruses include the barley yellow dwarf viruses spread by aphids and Geminiviruses transmitted by white flies. In Africa, viruses commonly destroy entire fields of such staple crops as bananas, cassava, maize and sweet potatoes. In the United States, barley yellow dwarf viruses reduce annual wheat yields by about 5 percent. Last year in Kansas, a severe outbreak of barley yellow dwarf virus caused the highest economic loss from any wheat disease.

The international team also includes researchers from the University of Washington in Seattle, the USDA-ARS U.S. Vegetable Laboratory in Charleston, S.C., and the International Institute of Tropical Agriculture in Nigeria and Cameroon.

BREAD seeks to partner advanced research expertise with the developing world and is jointly funded by the NSF and the Bill & Melinda Gates Foundation.
For more than 125 years, Cornell’s New York State Agricultural Experiment Station (NYSAES) in Geneva has been addressing the needs of New York consumers, food businesses and farm families via research. This summer and fall, NYSAES is responding directly to another pressing community concern: hunger, by donating about 40 bushels of produce to the food pantry at the Geneva Center of Concern.

“We often share produce from our student garden and research trials with NYSAES faculty and staff,” said Carly Summers, a graduate student and member of the Student Association of the Geneva Experiment Station (SAGES). “But we were eager to share the harvest beyond campus.”

For guidance in how to get started, graduate student John Gottula, SAGES garden coordinator, reached out to the Community Partnership Board, a student organization of the Public Service Center at Cornell, which provided a start-up grant for the project. “They were integral to our success,” Gottula said. “Before we knew it, we were transforming a student hobby garden into a full-fledged food donation program.”

Many faculty members stepped in to supplement the students’ donations with produce from their own field experiments. Thomas Björkman, Ph.D. ’87, and Stephen Reiners, associate professors of horticultural sciences, provided sweet corn and green beans, respectively. Terence Robinson, professor of horticultural sciences, contributed peaches; Chris Smart, associate professor of plant pathology, contributed tomatoes.

SAGES has since delivered 13 pickup-truck loads of vegetables and melons. Cheryl Toor, director of the Geneva Center of Concern, said more than 90 percent of those donations have already been distributed to families, and the surplus sent to the Seneca House of Concern in Seneca Falls, N.Y.

“Summer is our busiest time of year as families struggle to replace the meals their children receive at school during the rest of the year,” said Toor. “We’ve simply never had this abundance—or this quality—of produce to offer them.”

According to the U.S. Department of Agriculture, 13 percent of New York households were considered “food insecure” during 2009–11, a 2 percent increase over the three years prior. The SAGES project joins several others at Cornell helping to meet this growing need. The Cornell University Agricultural Experiment Station has donated more than 1 million tons of produce from its Homer C. Thompson Vegetable Research Farm in Freeville, N.Y., since 2004, and both stations collaborated with Cornell Cooperative Extension in 2011 to launch the Cornell Gleaning Project, which connects area farmers to local food banks.

“I’m so proud that students and faculty in Geneva are part of this effort to get food directly from those who grow it to those who need it most,” said Thomas Burr, associate dean of the College of Agriculture and Life Sciences and director of NYSAES. “We grow a tremendous amount of healthy and delicious food at NYSAES, and the entrepreneurial spirit of these students is making sure none of it goes to waste.”

Kate Frazer is the agricultural experiment stations communications officer at the College of Agriculture and Life Sciences.
Creative Marriage Proposal

Posted by ajl34@cornell.edu
This article was originally placed on the Station News blog on May 10, 2012 at http://blogs.cornell.edu/stationnews/2012/05/10/creative-marriage-proposal-on-research-north/

There are many ways to propose marriage—a ring dropped in champagne, a beach at sunset, a short and sweet Tweet—but graduate student John Gottula found a creative way to let a bed of tulips speak for him.

Back in October, he planted a message on the vegetable crops plot on Research North using only red tulips.

“I thought it would be an appropriately horticultural approach,” said Gottula, a graduate student working on Grapevine fanleaf virus with Marc Fuchs.

Winter was kind to the bulbs—he didn’t lose any letters to deer or squirrels—but when he took his girlfriend Kelly Voll to check on the SAGES garden plot one Saturday morning in April, she had good reasons to refuse the ruse. It was 45 degrees with driving rain.

“It took a lot of convincing to get her out of the pickup,” said Gottula. “I had to really insist.”

However, standing on the bed of the pickup with Gottula on bended knee, she could see the real reason for their visit. His marriage proposal—“Marry me, Kelly”—was spelled out in tulips. She said yes to living happily and horticulturally ever after.

ID Report

Kathie Hodge

Every year, I receive many requests for fungus identifications by email and phone: at least one every day. In 2012, for example, five dog poisoning requests came in (two fatalities), and a smattering of human poisonings, none fatal. Then, many other requests in varying shades of quirkiness: There was the moldy cat poop, the stinkhorns from outer space, the Bahamian Doomsday fungus, a moldy book printed in 1585, and Pachyella clypeata (a cup fungus I’ve dubbed Pachyella clypeata aka cup fungus I’ve dubbed Gloeophyllum cheekily ate my roof. Perhaps the best submission was this curious thing (pictured below), which arrived by FedEx after being discovered in the woods by a dog.

It has a tough consistency, a virulent pink color, and a very many blurry cell phone photos of fungi in lawns, erupting from motor homes, and eating people’s scones. There were crust fungi that mimic skin grafts, requests for methods of annihilation, and orange, rust-infested grasses. One man wrote to report he has Dutch elm disease; another claimed chicken-of-the-woods mushrooms have invaded his bloodstream, such that if he spits on a stump, mushrooms will grow (if only it was truffles! exclaimed Ken Mudge). Also, Gloeophyllum cheekily ate my roof. Perhaps the best submission was this curious thing (pictured below), which arrived by FedEx after being discovered in the woods by a dog.

It has a tough consistency, a virulent pink color, and a fishy smell. The finders had consulted botanists who said it must be a fungus, because it is weird. Molly Swartwood Towne, laboratory technician in the Plant Disease Diagnostic Clinic, figured it out via Google: it’s a barfed-up, rainied-on dog treat, specifically a Ranch Rewards Pink Flower Crushed Natural Rawhide Lollipop Dog Chew. Poor dog lost her treat to science!

A marriage proposal spelled out in tulips.

Object submitted for identification.
People

Active PPPMB Employees

Abawi, George Samuel
Abbott, Marguerite
Andersen, Amy Darlene
Armstrong, Jacqueline R
Asselin, Jessica E
Asselin, Jo Ann Elizabeth
Bao, Zhongmeng
Beer, Steven Vincent
Bergstrom, Gary Carlton
Bogdanove, Adam Joseph
Bonasera, Jean M
Booher, Nicholas James
Borejsza-Wysocka, Ewa
Brodie, Bill Burr
Bronikowski, Agathe
Bruening, Stephen R
Burr, Judith Ann
Burr, Thomas J
Butcher, Bronwyn G
Cadle-Davidson, Lance E
Carpenter, Sara
Carroll, Juliet Evelyn
Cartinhour, Samuel
Caswell, Alicia Mae
Cernadas, Raul Andres
Chakravarty, Soma
Chalkowski, Kayleigh
Chen, Shiyan
Chen, Ying
Cheung, Yen Mei
Churchill, Alice C.L.
Cilia, Michelle L.
Clarke, Sarah
Collins-DeHaven, Barbara
Collmer, Alan Raymond
Collmer, Candace Whitmer
Cox, Kerik D.
Craft, Cheryl Marie
Cummings, Jaime
Dailey O’Brien, Dawn
Daughtrey, Margery L
Dillard, Helene R
Donzelli, Bruno
Filiatrault, Melanie J.
Fry, William Earl
Fuchs, Marc F.
Gadoury, David M
Gardner, Amanda L
Gibson, Donna Marie
Gilbert, Andrea
Gray, Stewart
Hammond, Thomas A
Harrison, Maria J
Hayes, Marshall L.
Hodge, Kathie Therese
Holdridge, Tracy Lou
Hudler, George William
Jensen, Sandra Lorraine
Johnson, Kameka Latoya
Kalb, David
Kawamoto, Stanley O
Kenaley, Shawn C.
Klessig, Daniel F.
Kolkmann, Judith M
Komorowska-Jedrys, Jadwiga
Krenz, Bjorn
Kuehne, Shirley A
LaGreca, Scott Anthony
Lamarsh, Karen
Lang, Ping
Lange, Holly W.
Lawrence Jr, Dennis F.
Lawrence, Dennis F.
Lazarowitz, Sondra Gale
Lehman, Charlotte E.
Levy, Armit
Lin, Yu-hsuan
Lindeberg, Magdalen
Liu, Qian
Loeffler, Kent Edward
Macumber, David C.
Marsella-Herrick, Patricia
Martin, Gregory B
McCarthy, Rachel LaMorte
McGrath, Margaret T
McLane, Heather Lynne
Meyer III, Frederick William
Mideros Mora, Santiago
Milgroom, Michael Gordon
Miller, Laura
Moktan, Kundan
Mowery, Patricia
Myers, Kevin L.
Nelson, Angela Holt
Nelson, Eric Bronson
Nelson, Rebecca J.
Nobles, Christopher
Nosir, Walid Sabry
Nowogrodzki, Anna
Oman, Robert L.
Palukaitis, Peter F.
Pawlowska, Teresa E.
Perry, Keith Lloyd
Petell, Ashlee H.
Plank, Christopher
Potter, Jamie L.
Reid, Cheryl Lynn
Rinaldi, Fabio Cupri
Rosenberger, David A
Rugh, Anne L.
Russo, Torben Rocco
Ryan, Shauna G
Saha, Surya
Schaub, Michelle L.
Schneider, David J
Seem, Robert Charles
Shi, Qiaojuan
Smart, Christine Durbahn
Smith, Dawn M
Snover-Clift, Karen Lynn
Spolti, Pierri
Stahl, Donna Marie
Staples, Richard C
Strack Jr, Larry E
Strauss, Joi-Anne
Swartwood, Molly A
Swingle, Bryan M.
Thompson, Jeremy R
Thurston, David Mark
Turgeon, Barbara Gillian
Uchiyama, Asako
Villani, Sara M.
Wang, Li
Wang, Wei Wei
Wang, Xiaohong
Wei, Hailei
Welser, Mary Jean C
Whitlock, Kevin G.
Wilcox, Wayne Frank
Wu, Dongliang
Zheng, Desen
Zheng, Judy Yue
Zitter, Thomas A

Emeritus Professors
Aldwinckle, Herb
Gonsalves, Dennis
Hoch, Harvey
Horst, R. Kenneth
Hunter, James
Korf, Richard P.
Lorbeer, James
Provvidenti, Rosario
Sinclair, Wayne
Thurston, H. David
Zaitlin, Milton

Returning Graduate Students
Jacqueline Marie Benson
Borejsza-Wysocka, Ewa
Brauer, Elizabeth
Condon, Bradford
Cran, Julia
Crocke, Ellen
Danes Turano, Giovanna
Dunn, Amara
Frederick, Zachary
Gottula, John
Gregory Chandler Ray
Jamann, Tiffany
Jones, Lisa
Kraus, Christine
Lam, Hahn
Lastovsky, Olga
Layton, Christine
Mondo, Stephen
Morales, Laura
Mutiga, Samuel
Naito, Muzue (Micro)
Qi, Shan
Schuefele, Susan
Schmitz, Alexa
Schwizer, Simon
Summers, Carly
Tancos, Matthew
Tran, Tien
Westlake, Timothy

New students on next page...
New Graduate Students—Fall 2012

**KIERSTEN BEKOSCKE**

BS – St. John Fisher College; major – Biology  
**Research Experience:** Impact of cold stress on *Vitis vinifera* and its susceptibility to grape powdery mildew (*Erysiphe necator*), fungicide efficacy and resistance in fire blight (*Erwinia amylovora*) infested apple orchards.  
**Interests:** Impact of environmental stress on the susceptibility of grapevine to grape powdery mildew, impact of environmental stress on grape powdery mildew disease progress, and mechanisms of stress-induced resistance in grapevine.  
**Chairperson:** Robert Seem

**Mickey Drott**

BA – Franklin and Marshall College; major – Biology  
**Research Experience:** Role and regulation of alftaoxin in the ecology of *Aspergillus flavus*.  
**Interests:** Ecological roles of mycotoxins.  
**Chairperson:** Michael Milgroom

**Max Fishman**

BS – University of California, Berkeley; major – Chemical biology  
**Research Experience:** Synthetic modification of proteins, single cell genomics and transcriptomics.  
**Interests:** Gene regulation of *Pseudomonas syringae*.  
**Chairperson:** Melanie Filiauert

**Zach Hansen**

MS – Clemson University; major – Plant and Environmental Science  
**Research Experience:** Using biofumigation cover crops to suppress soilborne fungal pathogens of peppers; resistance of *Didymella bryoniae* to DMI fungicides.  
**Interests:** Late blight resistance in tomato, field detection of *Phytophthora infestans* sporangia.  
**Chairperson:** Christine Smart

**Sean Patev**

BS – University of Massachusetts Amherst; major – Microbiology  
**Research Experience:** ComA regulation in *B. subtilis*, basil downy mildew diagnostics and disease cycle characterization, Apple IPM, analysis of *P. infestans* and *ramorum* population distribution.  
**Interests:** Oomycete plant pathogens and their host interactions at both macro and cellular/molecular levels. Disease cycle progression and population distribution in the field.  
**Chairperson:** William Fry

**Ian Small**

MS – Stellenbosch University, South Africa; major – Plant Pathology  
**Research Experience:** Investigation of host resistance in maize to Fusarium ear rot and mycotoxin accumulation.  
**Interests:** Epidemiology and management of plant diseases, with a focus on the development of models and online tools to improve the efficiency of late blight management.  
**Chairperson:** William Fry

**Jose Vargas**

MS – University of Costa Rica; major – Genetics and Molecular Biology  
**Research Experience:** Plant viruses and their whitefly vectors affecting tomato and sweet pepper grown under greenhouse conditions.  
**Chairperson:** Keith Perry

**Sara Villani**

BS – SUNY Geneseo; major – Chemistry  
**Research Experience:** Investigating the prevalence of demethylation inhibitor and quinone outside inhibitor fungicide resistance in Northeastern U.S. populations of *Venturia inaequalis* and *Monilinia* spp.  
**Interests:** Investigating the relationships between molecular mechanisms of fungicide resistance and the development of practical resistance to fungicides in field populations of *Venturia inaequalis*. More specifically, I am interested in understanding the role of mitochondrial heteroplasmy in QoI fungicide resistance in populations of *V. inaequalis*, and identifying genes involved in *V. inaequalis* resistance to multiple fungicide classes.  
**Chairperson:** Kerik Cox

**Katie Wilkins**

BS in Biochemistry and BS in Computer Science, both at Case Western Reserve University  
**Research Experience:** Population genetics, machine learning, rna-seq analysis.  
**Interests:** The evolution of the TAL effector complement of bacterial populations in response to the deployment of resistance genes.  
**Chairperson:** Adam Bogdanove
The Future for Plant Pathology and Plant-Microbe Biology

We are building several endowment funds to support future activities. Your contributions to any of these funds will be greatly valued. You can donate directly at www.giving.cornell.edu/give/ or contact Bill Fry (wef1@cornell.edu)

**Graduate Student Fund**
The Department of Plant Pathology and Plant-Microbe Biology and society in general have benefited immeasurably from previous support for graduate education. Continued excellence of the graduate program in Plant Pathology and Plant-Microbe Biology at Cornell will be greatly assisted through the Graduate Student Fund. Gifts of any size are appreciated and enable the brightest minds and most dedicated individuals to work and study in plant pathology and plant-microbe biology.

**Plant Pathology Excellence Fund**
Income from this endowment fund will be used to facilitate important projects which otherwise would be impossible. For example, the fund will help deserving students present their thesis results at a scientific meeting; it will facilitate the development of teaching aids; and it will aid graduate student research in unfunded areas by augmenting funding for supplies and small equipment items.

<table>
<thead>
<tr>
<th>Named Gift Opportunities</th>
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<td>Endowed Professorship</td>
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<td>Graduate Award</td>
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**NEWS FOR FUTURE NEWSLETTERS**

We want to hear from you...

Send an e-mail to plantpathcornell@cornell.edu or write to us at:

Newsletter Committee  
Department of Plant Pathology and Plant-Microbe Biology  
Cornell University  
334 Plant Science Building  
Ithaca, NY 14853