Department of Plant Pathology
and Plant-Microbe Biology

George S. Abawi, APS vice-President

George W. Hudler, Cornell Weiss Fellow

2012 Alumni Newsletter
Volume 53

Cornell University
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Send feedback and suggestions for future newsletters to plantpathcornell@cornell.edu

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College of Agriculture and Life Sciences
Cornell University, 334 Plant Science
Ithaca, NY 14853
Dear Colleagues,

For many of the older department alumni, my letter is a bit of déjà vu “all over again”. I was chair of the Ithaca Department from 1981 through 1995. (I’m not yet retired, because I was only 15 when I became chair back in 1981.) Since June 2011, I have once again become chair of the department. I have to thank George Hudler for all he’s done as chair and to thank Wayne Wilcox who remains as associate chair. They both guided us through the initial stages of the Geneva-Ithaca merger. It’s a bit intimidating to follow George Hudler as chair of the merged department, but it’s also really fun. Thanks very much, George.

I know almost every alumna/us who is reading this letter and so this is a really personal communication for me. I’m delighted to have a reason for renewing these associations/friendships. For those of you who follow Cornell University happenings, you’ll know that I’m also still Dean of the University Faculty. However, the dual appointments end when a new Dean of the University Faculty assumes responsibility on 1 July 2012. My appointment as chair of PPPMB is through June 2014. It’s fun to be back.

It is with much enthusiasm and optimism that I write this opening letter. There is a lot happening. For me, one of the major happenings is that we are in our second year as a single unit at Cornell. I realize that some of you regard your academic home as Geneva and some of you regard your academic home as Ithaca. However, current members are evolving to a new reality; our academic home is “Cornell”, and we live in four locations in NY—Geneva, Ithaca, Hudson Valley and Long Island. We’re becoming better at using polycom technology for communication. (However, we have a ways to go in learning how to use it most effectively.)

We are a large department with about 170 members. There are typically 45–50 staff, 28 tenure track faculty, about 40 other faculty (Senior Research/Extension Associates; courtesy and adjunct faculty employed by BTI, USDA-ARS, and other academic institutions), 15–20 postdoctoral associates, 28–35 graduate students, and 6 local emeriti. Our total budget is about $13,000,000. With such human and financial resources we do a lot. We teach nearly 2000 credit hours in more than 20 courses on a diverse range of topics. Our accomplishment in extension/outreach is at the top of all departments in the college. Our accomplishment in research is also excellent: we are in the top quartile in the college in terms of publishing and grantmanship (with more than $20,000,000 in active grants).

Our accomplishment is recognized by the many awards received by department members (see pp. 10). In this letter I want to emphasize two awards that, “by George”, are really wonderful. George Abawi was recently elected Vice President of the American Phytopathological Society. He is now in the presidential succession, and will be president in 2013–2014. We’re taking bets on the theme for the APS meeting in 2014. What about soil health? George Hudler has been recognized as one of three Cornell faculty (all colleges) to be named a Weiss Presidential Fellow this year. Hudler’s course, “Magical Mushrooms, Mischievous Molds” is attracting 300–500 students each spring semester and it has become one of only two courses to make the list of “161 things every Cornellian should do” (http://cornellsun.com/section/news/content/2009/07/19/big-red-ambition-161-things-every-cornellian-should-do).

We are also a department in very significant transition. In addition to the merger, many of the early “boomers” are reaching retirement age, and there are many retirements already in place or planned. In fall 2011, Rosemary Loria “retired” from Cornell to assume the department head position in the department of Plant Pathology at the University of Florida. We miss Rose and thank her for her many contributions to Cornell. We wish her the very best. I need to remind Rose, that even though she’s department head at Gainesville, she’s still “emerita” at Cornell. Harvey Hoch retired in early 2012. Harvey retains research activity in Geneva, but he spends most of his time in warmer climes. I believe that Harvey’s emeritus activities will be more traditional. We wish him the best and look forward to his visits back to his lab.

Because of budget constraints, our college is scheduled to become smaller by about 10% in the next several years. Therefore, we expect that we will not be able to replace all retiring faculty. PPPMB at Cornell is already significantly
smaller now than it was 15 years ago. One indication is that 15 years ago, we had 36 tenure track faculty. We expect an additional 10 full or phased retirements in the next 2–4 years, so we are in the midst of planning how we will adjust to those departures. Part of that planning process has been to develop a new strategic plan for the Department. We realize that a strategic plan is a living and evolving document, so we shall continue to work on it as time progresses. See the right column of this page for the statements of our vision and mission presented in our May 2011 strategic plan.

Our transition provides many challenges and opportunities. One wonderful opportunity is to renew the faculty with new hires. This year we have a search in the area of “plant immunity”. Next year we are requesting a search in the area of soil-borne microbes/pathogens with extension responsibility in vegetable pathology. One of the challenges for us is graduate student funding. For the older alumni, you’ll probably remember being supported on a state line Graduate Research Assistantship. Those no longer exist, but we do have teaching, and extension/outreach assistantships that provide nine months of support. The difficulty is that our total internal graduate student support is less than 20% of what it was 30 years go. While we try to put graduate students on research grants, that’s a real challenge given our high tuition. I’ll be working hard to obtain more graduate student support from the college. But in addition I’ll also be soliciting philanthropy for this purpose. As a reminder, our “excellence fund” is always open for donations and has already been a significant source of help for some graduate students.

We love to hear from you. Please do write (we[@cornell.edu]) and let us know how and what you’re doing. It’s fun to see you at various meetings throughout the world. We are tremendously proud of your accomplishment.

Best,
Bill

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Our Vision:
“Cornell PPPMB will: generate new knowledge about pathogenesis and plant-associated microbes; devise innovative sustainable methods to suppress plant disease; educate undergraduate students, graduate students, and stakeholders (including policy makers, agricultural producers, and the general citizenry) for the benefit of humankind.”

Our Mission is to:
- Educate undergraduate and graduate students in the science and practice of our discipline.
- Prepare individuals for leadership roles in academia, in agribusinesses, in biotechnology, in non-profit organizations, in governmental research, outreach, and regulation, etc.
- Conduct research that will advance our understanding of interactions between plants and microbes and the cause and management of plant disease. This research will include:
  - Fundamental biology of plant-microbe interactions at the community/population level to better understand impacts on yield and quality of agricultural products, and impacts in urban/suburban and natural ecosystems
  - Development and implementation of effective and environmentally sound disease management strategies based upon the understanding of pathogen biology and crop production practices
  - Fundamental cellular, molecular, and evolutionary biology of pathogens and other plant-associated microbes, their pathogenesis, their impacts on human, animal, and plant health, and their roles in environmental processes
- Transfer research-based information and technology to stakeholders in the fields, landscapes, laboratories, and classrooms of New York State, the nation, and the world.
Beer Research Program Transitions from Blighted Apples to Rotten Onions

After more than 40 years researching aspects of fire blight ranging from control to genomics, the Beer program has transitioned to studies of bacterial pathogens of New York muck-grown onions. The program became involved with bacterial diseases of onion for several reasons. Firstly, Jim Lorbeer requested assistance early in 2007 in characterizing what seemed to be a new bacterial disease that was affecting New York onions following storage. The problem turned out to be center rot, caused by the bacterium Pantoea ananatis. Later, we found symptoms of center rot in onions growing in several New York onion-growing areas. More recently, we found and characterized another new disease for New York in onions, Enterobacter bulb decay, caused by Enterobacter cloacae. These two bacteria now join Burkholderia cepacia to comprise what appears to be the important bacteria responsible for the 10 to 40% that the State’s onion growers report losing to bacteria in typical years.

Obviously, growers were/are not happy with such severe losses, and they let it be known that they needed more work on bacterial disease problems. Thus, the Beer program has continued to delve into rotten onions. Based on the analysis of hundreds of cull onions received from growers following storage in 2011, several other pathogens are in the process of being documented and efforts are in the works to develop controls (non-existent at present!) based on attacking inoculum at its source and strategies to enhance the resistance of onions through altered cultural practices and sprays.

Program personnel include Jean Bonasera, career Research Support Specialist and mainstay of the program. Jean has made a seamless transition to onions. She now applies her crack organizational skills and keen research intellect and expertise to the bacterial problems of onions. She also has developed a neat molecular-based procedure to identify bacteria isolated from onions based on the sequence of a conserved gene.

About the time that we took up the onion problem in earnest, fortunately, Dr. Ali Zaid, from Giza, Egypt, joined the program as a Visiting Scholar. Ali has provided critical plant pathological expertise in developing a semi-selective medium for the isolation of onion pathogenic bacteria, and the development of several pathogenicity assays for onion pathogens. He also is seeking genes of Pantoea ananatis important to their virulence in onions.

The molecular aspects of the program have been enhanced by Dr. Jo Ann Asselin, who rejoined the Beer program after a 2-year assignment at The Ohio State University in Columbus, working with Drs. David Mackey and David Coplin. Jo Ann is investigating possible resistance genes of onion whose expression might be enhanced to increase resistance to bacteria that infect onions. Also, together with Jean, Jo Ann compiles the data on the hundreds of cull onions that the program has dealt with in the past year. Jo Ann also is in the running for the record as the photographer of the most rotten onions in the world.

Dr. Kubilay Bastas joined the Beer program as a Visiting Scholar for five months during the summer of 2011. Kube was on leave from his professorial duties at Selcuk University in Konya in central Turkey. In addition to helping out with studies of bacterial problems on onions in the lab and field, Kube spent several days in Geneva assisting Herb Aldwinckle with field experiments related to rootstock blight caused by Erwinia amylovora. Also, working together with Jo Ann, Kube initiated studies on the basis of virulence differences among strains of E. amylovora.

Steve Beer is one of several faculty in the department who has entered into phased retirement. He continues research and extension activity, but his teaching responsibilities have been reduced. He now serves as the Ithaca coordinator of the graduate student research seminar program.

Thomas Burr

Dusit Athinuwat recently left our lab where he was a postdoc working on Pierce’s Disease of grape to accept a faculty position at Thammasat University in Thailand. He received his Ph.D. from Kasetsart University in Bangkok and his current address is:

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Kameka Latoya Johnson recently joined our lab as a postdoc to work on Pierce’s disease and on grapevine crown gall. Kameka received her Ph.D. in 2010 from the University of
Georgia in Ron Walcott’s laboratory working on “Elucidation of the molecular host-pathogen interactions that influence seed-to-seeding transmission of Acidovorax citrulli”.

Supaporn Kaewnum left our lab in December 2010 to return to Thailand where she is interviewing for research positions. Supaporn’s research involved the biological control of grape crown gall.

Gary Bergstrom

The Bergstrom Lab, aka Field Crops Pathology Lab, had another busy year. We said a fond farewell in November to Katie Waxman, our superb research support specialist of the past 4+ years, as she moved to California with her husband Andrew to pursue new opportunities in the Golden State. We started the new year by welcoming Jaime Cummings from Missouri as our new research support specialist; Jaime and her husband Aaron are returning to their roots in New York State. Continuing in the lab are research associate Marshall Hayes, Ph.D. students Christine Layton and Julia Crane, research specialist Stan Kawamoto (part time), and senior undergraduate researchers Hannah Baughmann and Liz Burrichter—each associated with the lab since their freshman year. Marshall Hayes continues his research funded by Northeast Sun Grant on directed evolution of fungi to select strains with increased capacity for enzymatic conversion of lignocellulose for biofuel production, while also pursuing new research frontiers in the landscape ecology and transmission of field crop diseases in association with the AFIDD (Analytical Frameworks for Infectious Disease Dynamics) group on campus. Cornell signed a contract with Novozymes BioAg in 2011 that provides for partial support of Julia Crane’s Ph.D. studies on mechanisms of biological control by Bacillus amyloliquefaciens against Fusarium graminearum. Christine Layton’s Ph.D. work on switchgrass smut is currently supported by a grant from the New York Farm Viability Institute. Gary and Katie continued their collaborative, farm-scale epidemiology studies on Fusarium head blight of wheat with experimental sites in Illinois, Kentucky, Michigan, Missouri, Nebraska, New York, and Vermont. Gary completed his service as director of the APS Auxiliary Meetings Board and as vice-chair of the Disease Management Committee of the US Wheat and Barley Scab Research Initiative. Gary was recognized in 2011 with the Excellence in IPM Award from the New York State IPM Program, and was named a faculty fellow by Cornell’s Atkinson Center for a Sustainable Future.

Alan Collmer

The Collmer Lab continues to work on the type III effector repertoire of Pseudomonas syringae pv. tomato DC3000. In a nutshell, we are trying to understand the rules of the molecular game that is played between pathogens and plants so that we can improve the ability of plants to more consistently win the game. This is a tough challenge because the game involves so many pieces, for example, the 28 effector proteins that DC3000 injects into plant cells. A highlight of this year was the 6-month sabbatical visit of Professor Pablo Rodriguez-Palenzuela from Centro de Biotecnología y Genómica de Plantas (CBGP) and Universidad Politécnica de Madrid. This was also a year of triumph, as Jay Worley (with Ellen Crocker) won the 7th Annual Cornell Plant Sciences Chili Cook-off – Meat Entry Award. And finally, former lab members were very busy in 2011 producing a new crop of potential future students:

- Lisa Schechter and Richard Bierman: son Gabriel Ross Bierman born on February 26
- Sébastien Cunna and Aurélie Angot: son Samuel Cunna Angot born on November 12
- Duck Hwan and Nam Kyung Park: son Hyun-Seo Park born on December 1
- Adela Ramos and Peter Choi: son Francisco Javier Jae-Hun Choi born on December 3

Kerik Cox

2011 was a productive year for the Cox Lab. We welcomed a new graduate student Zachary Frederick, who hit the ground running with a side project investigating the breakdown of white pine blister rust immunity in currants in NY and RI that led to a note in Plant Disease. Sara Villani mentored a William Smith student Juliana Freier and together they unraveled the story behind the Monilinia shoot blight and brown fruit epidemics that swept across NY and New England in the late spring and early summer, which also led to a note in Plant Disease. Sara also mentored Summer Scholar and Cornell undergraduate Kathryn Abbott who investigated the influence of late season apple fungicide applications on the selection of site-specific fungicide resistance in the apple scab fungus Venturia inaequalis. Her project was well received at the applied research conferences in the fall and was requested at upcoming winter grower Fruit schools. In regards to our apple scab and brown rot resistance monitoring efforts, we have just completed our 5th year of offering these free services to NY stakeholders.

I continued to work with former post-doc Stacy Singer and together we further elucidated the phenomena of enhancer-blocking insulators in transgenic plant systems, which led to several papers in Plant Cell Reports and related journals. In collaboration with the Aldwinckle Lab, we regenerated several
transgenic citrus lines that contain RNAi constructs targeting gut proteins in *Diaporina citri*, the vector of citrus greening. Finally, the Aldwinckle program and I have secured specialty crop funding to investigate latent fire blight infections in nursery stock, and are starting new initiatives to investigate antibiotic resistance in populations of the fire blight pathogen *Erwinia amylovaria*.

Anne Johnson rose to the occasion and the semester ran to completion in fine form. On the research front, post-doc Shawn Kenaley continued to make progress toward answering puzzling questions about occurrence and distribution of lethal Phytophthora-caused bleeding cankers on European beech. An unusual site in Brooklyn (actually, a 500 acre cemetery with nearly 200 mature beech trees) with all vegetation under management by one individual has proven to be an ideal place to conduct spatial analyses on disease occurrence as well as tree ring analyses to identify potentially predisposing weather events. Our other main project, one to document the diversity of *Melampsora* spp. on willows grown for biofuels feedstock, continues to surprise us with new awareness of the variability in what we first thought was a single species. A third project, in conjunction with Marge Daughtrey and of lesser magnitude but perhaps equal practical importance led us to make a first record of *Gymnosporangium sabinae* (cause of pear trellis rust) in New York on Callery pear, no less. Callery pear is an extremely reliable tree because of its pleasing growth habits, tolerance of marginal sites, and freedom from insects and diseases. However, discovery of this occasionally serious leaf disease could be a game-changer. Some personal accomplishments include an addition to the Kenaley family—a baby girl, Mairenn—and Hudler’s receipt of the Edgerton Career Teaching Award; the former obviously expected *(this) year*, the latter a complete and much appreciated surprise.

**Helene Dillard**

I would like to welcome a new visitor to my laboratory. Dr. Nana Bitsadze is a Fulbright Scholar from the Republic of Georgia. She completed her Ph.D. at the Kanchaveli Institute of Plant Protection and has had visiting scientist scholarships in Holland, Germany, and Israel. She will be working in my lab on biological control of *Sclerotinia sclerotiorum* with combinations of *Coniothyrium minitans* and *Beauveria bassiana*. Nana arrived in October and will be with us until July 10, 2012. I would also like to welcome a new graduate student to the lab, Susan Scheufele, who will be working on Alternaria leaf spot of crucifers. She is particularly interested in developing effective control strategies for organic farming systems. This summer, many hands made for fun and invigorating work on *Sclerotinia sclerotiorum*, *Phytophthora capsici*, and *Alternaria brassicicola*, thanks to Joi Strauss (technician), Alissa Carissimi (temporary technician), and Rachel Kreis (summer scholar from Iowa State University).

**George Hudler**

The New Year started out with a bang for Hudler and Company as a little over 500 students showed up for the first day of Magical Mushrooms, Mischievous Molds. Call Auditorium was nearly full to overflowing, in part because the course (with an added discussion section) now fulfills a science course requirement for students in Arts and Sciences and in CALS. Exams became exclusively multiple-choice and half the class had to go to another auditorium on exam days just to enable us to have one empty seat between each test-taker. Every new class day brought its own challenges but Dave Kalb and TAs Allison Jack, Christine Layton, and...
Lab members who left in 2011 for positions elsewhere:
Kathy Munkvold was selected as the American Society of Plant Biologists (ASPB) Plant Science Policy Fellow. Her work will support the Plant Science Research Summit, a gathering of representatives from all aspects of the plant science community designed to identify critical areas for future plant research. Kathy will be working at ASPB headquarters in Rockville, MD beginning in mid-July.

Jesse Munkvold accepted the position of Trait Bioinformatician in the Applied Systems Biology group at Keygene Inc., Rockville, MD. He will be working on integrating diverse omics data and applying novel computational methods for trait gene selection.

Rob Abramovitch, a former PPPMB graduate student in the Martin lab and now postdoc with David Russell in the Cornell Vet School, has accepted a position as Assistant Professor in the Department of Microbiology and Molecular Genetics at Michigan State University. Rob will join MSU and officially become a Spartan in January 2012.

Chang Sik Oh, former PPPMB student with Steve Beer and postdoc with Greg Martin recently departed BTI to become Assistant Professor, Department of Horticultural Biotechnology, at Kyung Hee University in Korea. He is busy juggling dual roles: as researcher (fruit tree pathology—mechanisms of disease resistance in fruit trees and pathogenesis of pathogens in fruit trees) and faculty member, teaching a “General Plant Pathology” course this semester.

Gillian Turgeon

O

ver the last few years, the Turgeon lab has worked with the Joint Genome Institute (JGI) and its Community Sequencing Program (http://www.jgi.doe.gov/; http://proposals.jgi-psf.org/) to sequence the genomes of several key cereal pathogens in the genus Cochliobolus. Cochliobolus is a species-rich genus of taxa that have caused devastating losses to US agriculture. The superpathogens, C. heterostrophus (host:corn), C. carbonum (corn), C. victoriae (oats), C. sativus (cereals), and C. miyabeanus (rice), form a tight phylogenetic group, distinguished by unique pathogenic capability to particular plants. Genome resources for all of these species are now available (http://genome.jgi-psf.org/programs/fungi/index.jsf; http://genome.jgi-psf.org/CocheC5_3/CocheC5_3_home.html) under the auspices of the JGI Fungal Genomics Program. In addition, the Turgeon lab worked with the JGI in sequencing the causal agent of Northern Leaf Blight, Setosphaeria turcica, which is a close hemibiotrophic relative of necrotrophic C. heterostrophus, causal agent of Southern Corn Leaf Blight, in order to compare pathogen lifestyle requirements on the same host.

Turgeon is also part of a team (http://1000.fungalgenomes.org/home/participants), spearheaded by Joey Spatafora (Oregon State), to sequence 1000 fungal genomes that will provide ‘broad coverage of the Kingdom Fungi and inform all areas of fungal biology’ (http://1000.fungalgenomes.org/home/category/announcements/).

Tom Zitter

Tom Zitter convened the 26th annual Tomato Disease Workshop from October 11–13, 2011 at the downtown Holiday Inn in Ithaca, NY. It provided a greater opportunity to showcase ongoing research and extension programs relating to tomatoes—from genomes to farming operations at Cornell and in New York State. A total of 109 registrants and others participated (nine countries represented), and the attendance was swelled by attendees to the Tomato Breeders Roundtable meeting held the same week, as well as the SolCAP Workshop held on campus at Mann Library. Representing the tomato industry in New York was an excellent presentation by Amy Hepworth, of Hepworth Farms in Milton, NY, near the banks of the Hudson River. She described the intricacies of growing 55 acres of tomatoes organically, and providing many heirloom tomatoes to Whole Foods and the Park Slope Food Coop in Brooklyn, NY, a CSA with over 17,000 members. The next TDW will be held in fall 2012 in Wooster, OH.
New Graduate Students—Fall 2011

Giovanna Danies
Research Experience: Molecular and histological interaction between Phytophthora infestans and Physalis peruviana.
Interests: The genetic structure of populations of P. infestans in the United States and elucidating the genetic basis for host specificity and sensitivity to mefenoxam in populations of P. infestans.
Chairperson: Dr. William Fry

Zack Frederick
Research Experience: Distribution of fungicide resistance in spatially separated trees within an orchard, and how sampling schemes reflect the distribution.
Interests: Dynamics of the G143A point mutation that confers resistance to QoI fungicide chemistries in Venturia inaequalis.
Chairperson: Dr. Kerik Cox

Erin Garanneau
Research Experience: Biogenesis of a chloroplast protein in Arabidopsis; population genetics of wild rice species (Zizania palustris and Zizania aquatica)
Interests: Effect of biotic and abiotic influences on the interaction of grape powdery mildew (Erysiphe necator) and grape (Vitis vinifera).
Chairperson: Dr. Robert Seem

Christine Kras
Research Experience: Plant biotechnology and genetics, Pseudomonas syringae pv. tomato type II effectors
Interests: Plant-microbe interactions and plant immunity
Chairperson: Dr. Gregory Martin

Susanne Scheufele
Research Experience: Biogeochemistry, invasive pest biocontrol and population biology
Interests: Population dynamics and field management of soil-borne pathogens in organic cropping systems
Chairperson: Dr. Helene Dillard

Matt Tancos
Research Experience: Xylella fastidiosa detection via nanomechanical resonator arrays; cortical structuring in Oxytricha fallax; and the microbiological treatment of municipal drinking water.
Interests: Identifying the movement of Clavibacter michiganensis subsp. michiganensis in the xylem of tomatoes, and the development of novel plant pathogenic detection tools.
Chairpersons: Dr. Christine Smart & Dr. Marc Fuchs

Timothy Westlake
Interests: Understanding the molecular and genetic components behind plant-microbe interactions.
Chairpersons: TBD

Barbara McClintock Award Winners
Gillian Turgeon and Greg Martin

Each year, two to three graduate students in the Plant Sciences at Cornell are awarded the Barbara McClintock Award. This year two graduate students, Bradford Condon and Andre Velasquez, in the Department of Plant Pathology & Plant-Microbe Biology received the award. The award honors Dr. McClintock, a geneticist, who won the Nobel Prize in Physiology or Medicine in 1983 for her work with mobile genetic elements (transposons). McClintock began her scientific career at Cornell where she received her BS, MS, and PhD in the 1920s. The time she spent as a student and young researcher and her association with George Beadle and Marcus Rhoades at Cornell were, in her words, “by far, the most influential [events] in directing my scientific life.” The Barbara McClintock Award was established by an endowment from Dr. Robert Rabson and provides $1,650 to the recipients for supporting research and travel.

Bradford’s advisor is Gillian Turgeon. Bradford’s work is on genetic and functional analyses of mechanisms by which fungi obtain iron and manage oxidative stress on their hosts. For this, he uses the necrotroph Cochliobolus heterostrophus, and the hemibiotrophic close relative, Setosphaeria turcica, to compare mechanisms used by related taxa differing in pathogenic lifestyle on their common host, maize. In addition, Bradford, who has a minor in genomics and bioinformatics, spearheads the Turgeon lab’s Cochliobolus comparative genomics effort aimed at identifying genomic signatures associated with pathogen specialization on different cereal hosts.

Andre’s advisor is Greg Martin and his committee members are Alan Collmer and Dan Klessig. Andre studies the interaction of tomato with Pseudomonas syringae pv. tomato to gain insight into the molecular basis of plant immunity. He developed a method for determining the possible involvement of individual plant genes in the immune response and then used this method to examine over 3,000 genes. This work, which was a collaboration with Dr. Soma Chakravartthy in the Martin lab, resulted in the discovery of 14 novel plant immunity genes. Andre is currently studying one tomato gene, Bti9, to understand how it acts to inhibit bacterial infection. He is an author on five papers deriving from this work and plans to finish his studies in May 2012.
Amara R. Dunn Receives the Robert Gilmer Graduate Student Award
David Gadoury

Amara R. Dunn was the 2011 recipient of the Robert Gilmer Graduate Student Award. The award is named in honor of Dr. Robert M. Gilmer, a member of Cornell University’s Department of Plant Pathology at the Geneva Experiment Station from 1950 to 1975. Dr. Gilmer is remembered as an outstanding plant pathologist, colleague, and mentor, internationally respected for his contributions to our knowledge of virus diseases of fruit crops. His generous gift created the endowment that bears his name. Dunn received the award in recognition of her excellence in academics, research, and service to the Department of Plant Pathology and Plant-Microbe Biology. Her MS research on Phytophthora blight caused by the oomycete Phytophthora capsici was conducted at Cornell University’s Department of Plant Pathology and Plant-Microbe Biology under the direction of Dr. Christine Smart. More about Dunn’s work can be seen at: http://www.cals.cornell.edu/cals/plpath/directory/camp-a.cfm.

Dunn Wins “Art in Phytopathology” Contest
For the third consecutive year, the Graduate Student Committee of the American Phytopathological Society sponsored the “Art in Phytopathology” contest. Entries were judged in four categories: Digitally Altered, Arts and Crafts, Wacky/Humor, and Microscopic. This year, Amara Dunn (Ph.D. student working with Chris Smart) won Best in Show and first place in the Arts and Crafts category for her submission “Which came first: the sporangium or the zoospore?”. The piece is a Ukrainian egg, decorated by dipping the egg in a series of dyes and applying wax to portions of the egg after each dye in order to maintain the underlying color when the egg is moved to a new dye. After the last color has been applied, the wax is removed from the egg. Traditionally, eggs are decorated with some combination of geometric patterns, free-form shapes, and images from nature. The pattern on this egg features the asexual spores of the oomycete Phytophthora capsici (sporangia and zoospores). All contest entries, as well as winners in the other three categories can be viewed online: http://www.apsnet.org/members/apsleadership/comm/Pages/ArtinPhytopathology.aspx

Amara Dunn receiving the award from Dr. Wayne F. Wilcox, associate chair of the Department of Plant Pathology and Plant-Microbe Biology.

“Which came first: the sporangium or the zoospore?” Amara Dunn’s Ukrainian egg decorated with spores of Phytophthora capsici won Best in Show and first place in the Arts and Crafts category in the 2011 APS Art in Phytopathology contest.

Congratulations to Those Students Who Have Passed Their ‘A’ Exam 2011

Amara Dunn May Christine Smart
Tiffany Jamann June Rebecca Nelson
Lisa Jones November Christine Smart
Tien Tran November Xiaohong Wang

Congratulations to Our Newest Alumni 2011

Michelle Moyer Ph.D. January
Marin Brewer Ph.D. August
Santiago Mideros Ph.D. August
Jonathan Oliver Ph.D. August
A. Paola Zuluaga Ph.D. August

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CONGRATULATIONS

Two Teaching Awards for George Hudler!

Kathie Hodge

It’s no secret that George Hudler is among Cornell’s best teachers. In the last year he’s won two different undergraduate teaching awards: First, the 2011 Louis and Edith Edgerton Career Teaching Award of CALS. And second, the Stephen H. Weiss Presidential Fellowship, which confers a permanent title, “Weiss Presidential Fellow,” and even a bit of cash. We nominated him for these elite honors based on his creative and exemplary career as a teacher, including student advising, mentoring, service, outreach, and especially his exceptional class Magical Mushrooms, Mischievous Molds. In 2011 enrollment in this course topped 520; over 6000 students have taken it since 1991. His course has been widely emulated in North America and beyond—one of our recent grads was specifically asked to develop a similar course in her new faculty job. Given George’s popularity and dedication to teaching, we were not at all surprised to hear that he’d swept the awards this year.

The best part of the nomination process was finding past and present students who jumped at the chance to write a letter. Their letters converged on a few points: Caring; Funny; Inspiring. Here are some telling quotes from the supporting letters.

▶ The type of excellence that has the greatest positive impact on us undergraduates is the uncommon excellence which George Hudler exudes: special thoughtfulness and adaptability in instruction and the desire to form meaningful relationships with undergraduate students for their successful education.
▶ I had never before been so captivated by a class. My eyes were opened to a new and fantastic field that is all too often overlooked.
▶ Every lecture…was filled with the same wit, charisma, and intellect that is George Hudler.
▶ His impact on me, in turn, impacts my students and the people that I work with as a science educator, and I am sure the same is true for countless other Cornellians.
▶ I graduated from Cornell nine years ago, but my interactions and experiences with Dr. Hudler in class and through the faculty fellow program continue to impact what I do today.
▶ Since arriving at Cornell in 1942 as an undergraduate student, I have only encountered two professors whose lectures were in the same class of excellence.
▶ You have never seen such an astonishing collection of mushroom neckties in your life!

George Abawi Elected APS President

Wayne Wilcox

In June 2011, George Abawi was elected to begin a 4-year term in the presidential lineage of the American Phytopathological Society (Vice President in 2011, President-Elect in 2012, President in 2013, Immediate Past President in 2014). George received his Ph.D. in Plant Pathology from Cornell in 1970 under the direction of the late Bill Mai, and joined the faculty at the Geneva campus in 1972, where he has remained active ever since.

George’s career has focused on the biology and ecology of soilborne diseases of vegetable crops caused by fungi and nematodes and their integrated management. George is well known to vegetable growers and advisors throughout New York, the Northeast, and the world, where he has traveled extensively. His recent research projects have emphasized microbial interactions, identification of resistant germplasm sources, and the development of soil-IPM programs for vegetable production systems. He is a charter member of the interdisciplinary CALS Soil Health team, which received the Dean’s award for outstanding achievements in extension/outreach in 2008. George has received several awards from APS, including the Northeast Division Award of Merit and recognition as a Fellow. He has a long history of service to the Society, including Chair of the APS Foundation, Director of the Office of International Programs, APS representative to the International Society of Plant Pathology, associate editor of Plant Disease and Phytopathology, and President of the Northeast Division. Way to go George!
Congratulations

Dan Klessig: APS 2011 Noel T. Keen Awardee for Excellence in Research

For the third time since its inception in 2003, a PPMB faculty member has received the Noel T. Keen Award for Research Excellence in Molecular Plant Pathology from The American Phytopathological Society. The latest recipient is Dan Klessig, who received the award at the annual APS Meeting in Honolulu on August 7, 2011.

Dan Klessig was honored for his groundbreaking work on plant immunity. Klessig’s work over the past 30 years has established how plants protect themselves against microbial pathogens. He has also uncovered links between plant and animal immunity that have significant implications for both plant and animal health.

Klessig’s laboratory was first to demonstrate that salicylic acid is a critical signaling molecule for activation of the plants’ immune system. His lab was also the first to establish a defense-related function for nitric oxide in plants. In recent break-through studies, his group demonstrated that methyl salicylate is a mobile signal that triggers heightened resistance to a secondary infection in the distal uninfected tissue of the plant; they also identified a key factor that is involved at four distinct levels of plant immunity.

As a student studying gene regulation in human viruses, Klessig helped uncover the phenomenon of split genes and RNA splicing, including alternative splicing. These discoveries helped explain the development of human diseases such as cancer and how the relatively small number of genes in the human genome can encode an organism as complex as humans.

Greg Martin was recipient of the Noel T. Keen Award in 2010 and Alan Collmer in 2003. Greg was recognized for his pioneering work in the tomato, *Pseudomonas syringae* pv. *tomato* (*Pst*) pathosystem. This work included i) cloning of the first recognition resistance (*R*) gene, *Pto*, when a post-doctoral fellow with Steve Tanksley; ii) the first demonstration of the physical interactions between an avirulence (*Avr*) factor and its cognate *R* protein (i.e. *AvrPto* and *Pto*) that provided a molecular explanation for gene-for-gene specificity; and iii) identification of a second type III effector of *Pst* recognized by *Pto, AvrPtoB*. An elegant series of studies by Martin and his students on *AvrPtoB* revealed that it contains two functionally distinct domains and that evolution of gene-for-gene interaction can occur at the level of domains within a single protein.

Work with Jen Sheen at Harvard and former post-doctoral fellows Jian-Min Zhou at National Institute of Biological Sciences, Beijing, revealed that *AvrPto* and *AvrPtoB* inhibit pathogen-associated molecular pattern (PAMP)-triggered immunity (previously called basal resistance) and support their model that *Pto* acts as a decoy. Martin and his many collaborators have provided key components in a new conceptual framework for plant-bacterium interactions that involves type III effectors interacting with two levels of plant defense, and their studies have revealed a remarkable degree of molecular subterfuge by both host and pathogen in the evolution of gene-for-gene interaction systems.

Alan Collmer was the first recipient of the Noel T. Keen Award in 2003. Alan has made major contributions to the understanding of pathogen virulence factors (effectors) and their transport/secretion into host cells or tissue. Alan’s early studies on *Erwinia chrysanthemi* demonstrated the multifunctional nature of virulence and how several pectate lyases contributed incrementally to bacterial soft rot disease. Subsequent major contributions include i) cloning a functional cluster of “out” genes from *E. chrysanthemi*, which enabled *Escherichia coli* to secrete pectate lyases and other related virulence proteins which are part of the type III secretion system; ii) cloning and characterization of *P. syringae*’s hrp (hypersensitive response and pathogenicity) genes, which encode the type III secretion system (TTSS) shared with animal pathogens; iii) demonstrating that *Avr* factors (and other effectors) are delivered into the host cell by the TTSS; and iv) proposing in 1996 with J.R. Alfano a new model for bacterial plant pathogenesis, in which the central event in pathogenesis is the TTSS-mediated injection of *Avr*-like effector proteins into plant cells, such that inside plant cells these proteins collectively promote virulence unless the presence of any one of them is recognized by R proteins that trigger plant defenses. Perhaps Alan’s largest impact on molecular plant pathology was sequencing of *Pst* DC3000 genome (completed in 2003) and subsequent bioinformatic and experimental analysis, which identified one of the largest inventories of effectors from plant or animal pathogens secreted by the TTSS.

Alan, Greg, and Dan are Fellows of the American Academy of Microbiology in recognition of their important contributions to the general field of microbiology.
Amy Andersen Named Employee of the Year

Amy Andersen, administrative assistant in the Department’s Geneva office, was named Employee of the Year at the New York State Agricultural Experiment Station in a ceremony early last year. Amy, who began her job in 1998, was enthusiastically supported by current and past department chairs, faculty, and staff from different units across Geneva. Multiple letters in support of her nomination focused on several recurrent themes: the quality of her work, her dedication to her job, her volunteer efforts in the workplace and the community, her helpfulness to others (“She is one of the most kind, generous people I know. She always thinks of others and works hard to assist them and make them happy.”), and her enrichment of the work atmosphere (“The day is just brighter seeing her smiling face.”).

People like Amy are the glue that hold our department, college, and university together, and it’s great to see them get recognized for what they do. Congratulations, Amy.

Bergstrom Awarded “Excellence in IPM”

Gary Bergstrom receiving the Excellence in IPM Award from Don Rutz, Director of NYS IPM program, at the Soybean and Small Grains Congress in Waterloo, NY on February 10, 2011. (Photo by Curt Petzoldt)

Additional Noteworthy Items

- Dr. David Gadoury, Laura Wakefield, Dr. Lance Cadle-Davidson, Dr. Ian Dry, and Dr. Robert Seem’s paper “Effects of Prior Vegetative Growth, Inoculum Density, Light, and Mating on Conidiation of Erysiphe necator” chosen to be used for the cover of Phytopathology and was also the editor’s pick for January 2012
- Dr. Tom Burr awarded an Honorary Doctorate Degree from Hobart and William Smith Colleges
- Dr. Lance Cadle-Davidson named the USDA-ARS-NAA Early Career Scientist of the Year
- Amara Dunn received the CALS Land Grant Graduate Fellowship
- Dr. David Gadoury appointed American Phytopathological Society Internal Communications Officer
- Jonathan Oliver won the American Phytopathological Society Foundation Stephen A. Johnston Student Travel Award
- John Gottula won the American Phytopathological Society Foundation Robert Fulton Student Travel Award

Birth Announcement

Santiago Mideros and Tiffany Jamann would like to announce the birth of their son Lucas Xavier, born Oct 30, 2011 at 5:37 pm. He weighed 6 lbs 6 ounces and measured 19.5 inches.
Congratulations

Cornell Faculty and Staff Receive National Plant Diagnostic Network (NPDN) Outstanding Service Awards

Karen Snover-Clift

Department of Plant Pathology & Plant-Microbe Biology Faculty and Staff recently received recognition for their outstanding service to the National Plant Diagnostic Network (NPDN). Awards were presented at the NPDN National Meeting Awards ceremony which was held during the 3rd NPDN National Meeting on November 7, 2011.

The NPDN Outstanding Team Service Award was presented to Karen Scott for her efforts as part of the NPDN Portal Team and for the development of the new portal used for the NPDN national and regional websites.

Karen Snover-Clift was presented her Outstanding Team Service Award for her efforts as part of the NPDN National Database Program Area Committee. The committee has reviewed, corrected, updated, and/or verified the information within the database for over 22,041 host and pest codes used by all NPDN National Repository clients.

Rachel McCarthy was recognized a second time for her efforts as the editor of the NPDN newsletter. The NPDN News is a monthly publication that incorporates articles on announcements of new identifications, diagnostcs tools and tips, regional news, committee updates, upcoming meeting announcements and reviews of past meetings, and much, much more. To learn more about the NPDN and Cornell’s role as the Northeast Regional Center, please go to: www.NPDN.org and www.NEPDN.org.

George Hudler and Rachel McCarthy also received an Outstanding Team Service Award for their efforts as part of the Sentinel Plant Network (SPN) Development Team. The SPN was created in 2010 and was designed to engage public garden professionals, volunteers and visitors in the detection of high-consequence pests and pathogens.

The NPDN Portal Team: Karen Scott, Andrew Coggeshall & Eileen Luke

The Sentinel Plant Network Team: George Hudler, Rachel McCarthy & Amanda Hodges

The NPDN National Database Committee: Carla Thomas, Eileen Luke (for Mike Hill & Virginia Russell), Nancy Gregory, Marty Draper, Karen Rane, Linnea Skoglund, Anne Vitoreli, Andrew Coggeshall, Karen Snover-Clift & Nancy Taylor

Rachel McCarthy was recognized for her efforts as the editor of the NPDN newsletter.
Expanding Our Outreach

Elementary Science Education Gets a Boost from Geneva’s Experiment Station
Wayne Wilcox

For the seventh consecutive year, Chris Smart and other scientists from the Geneva campus partnered with the Geneva City School District to enhance elementary science education and bring agricultural science to local 3rd and 4th grade students. During the three-phase program kids learn about soil, plants, insects, plant diseases, sustainability and food production through an inquiry-based, hands-on program. Typical of other school districts across New York, there is less than one hour of elementary school science education scheduled per week in the Geneva City School District. Helping to fill this void, the program has sparked an interest in science, resulting in expansion of the 4-H program in the district and improvements in standardized science test scores.

During the first phase, Chris and horticulturalist Steve Reiners visit each 3rd grade class in the district (approximately 180 children). There are hands-on activities and each student plants seeds that are then moved to a greenhouse on the Geneva campus. In May, each of the classes visits the campus and learns about the research performed there. The Seem/Gadoury lab becomes a major outreach center for a week, with all students checking out powdery mildew under the microscope.

The students also love to see how well their plants grew in the greenhouse. Finally in the first week of June, Chris, Steve and their lab groups bring the plants to the elementary school and help the students plant their garden.

The second phase of the project is a 5-week summer science camp that is open to any interested students who have just completed the 3rd grade. While not all students choose to attend, about 20 students generally enroll. The camp is coordinated and directed by Chris and two school faculty, with guest appearances by other Geneva campus faculty. The focus of the camp is on inquiry-based learning, where students are given a subject and they help develop hypotheses, collect data and draw conclusions. Each week has a scientific ‘theme’ such as soil science, horticulture, microbes (where we study plant pathogens), entomology, and cooking with veggies. Students also take field trips to the local farmer’s market and Bejo Seeds, and beekeepers come for a visit too!

The final phase of the program is a fall harvest festival which is a true celebration, with students cooking nutritious treats, and presenting some of the scientific knowledge gained through working in the gardens. The entire school is invited to attend, as well as parents and community members.

Summer Research Scholars Program
Wayne Wilcox

Twenty four scholars participated in a summer Research Experience for Undergraduates program based at Cornell University’s New York State Agricultural Experiment Station at Geneva. The Summer Research Scholars Program recruits nationally. Admission is competitive, and students admitted to the program are provided support for travel, a stipend, and are housed at nearby Hobart and William Smith College. Accepted students can choose from a variety of research projects and are mentored by faculty, postdoctoral and visiting scientists, and graduate students. They are also encouraged to participate in a field-oriented course in Agricultural Diseases and Pests, where they visit berry crop, tree fruit, vegetable, grain and forage crop production fields; golf courses; forest, shade tree and ornamental plantings; and vineyard and winery operations. The summer session culminates in a conference where the scholars present posters on their research.

Pictured are the 2011 Summer Research Scholars Program participants.
Game Night
Allison Jack

The PPPMB Graduate Student Association sponsored a department-wide game night organized by Jay Worley and Allison Jack. Faculty, staff, students and their families battled the Ithaca winter blues with Scrabble, Sjoelbak (Danish table top shuffleboard), jigsaw puzzles, card games and vintage video games on the big screen in the Whetzel seminar room. The event was well attended and got everyone’s competitive spirit going in preparation for the spring bowling night, so there are plans to make the winter game night an annual event!

Bowling Tournament
Bradford Condon

The annual department bowling tournament was held at Helen Newman Lanes on Friday, April 8, 2011. As in previous years, the event was well attended by students, faculty, staff, and their families. After much beer, pizza, and soda, “The Buzzards” took home the best team average of 133, with “The Gilberts” close behind at 130. “The Buzzards” were also voted best team uniform. The best individual scores went to Nick Gilbert (197), Mike Kwiatkowski (180), and Eric Carr (168). For the third year in a row, the Faculty/Staff averaged (114) above the Students/Postdocs (112). The graduate student association would like to thank the department for their generous funding support for this event, as well as all participants for a fun night out.
Greetings alumni sports fans! This summer, two motivated PPPMB graduate students, Liz Brauer and Eric Carr, were determined to revive the annual departmental softball game. The Bill Mai Spring Classic Student-Staff-Faculty department softball game dates back to 1956 and had continued annually until 1994. After a 17-year hiatus, the game was renewed on May 21, 2011. The game was held at Buttermilk Falls, prior to the annual Plant Sciences BBQ. Participants and observers could not have asked for better weather, the day was sunny and humid. Players were able to stay refreshed thanks to plentiful amounts of beer and homemade treats, a long tradition for this event. Teams were divided into students-post-docs versus faculty-staff.

Stewart Gray was selected captain of the faculty-staff team while Liz and Eric co-captained the students and post docs. Both teams were well attended. Spirits were high and much heckling could be heard from both sides. Dr. Jim Lorbeer, a veteran of the Bill Mai Spring Classic, kept score over a very tight game. Though close, the long experience of the faculty-staff team could not tame very enthusiastic students and post-docs who won 11 to 9. Their enthusiasm boiled over a few times during the game. Most memorably, an excited Shawn Kenaley accidentally launched his bat towards third-baseman, Giovanna Danies, after swinging past a pitch. The student-post-doc team’s victory has been commemorated with a new plaque that has been added to the Bill Mai Spring Classic memorial hanging in the copier room. The revival of the department softball game has stimulated fond memories and many individuals would like to see the game continue. Next year, the faculty and staff are hoping to avenge their narrow defeat! Hiring younger staff and faculty has been advised to compete with the youth of the students and post-docs.

Back by popular demand, ‘Cheers with your Peers’ returns for the third straight year to the Plant Science Building. Throughout 2011, faculty, staff and students have been occupying Plant Science in protest of grading tests, writing grant reports, and arduous lab work. Their goal, though unclear and clouded by fermented beverages, has been roughly defined as ending the thirst caused by the tenured 1% and seeing that the 99% receive a cold beverage and light snacks.

‘Cheers with your Peers’ has been a semi-weekly peaceful protest, or social event, that gathers faculty, staff, and students from all departments within Plant Science. What’s more, the Department of Plant Breeding and Genetics has joined the movement. This year the event was co-hosted by Bryan Sobel of Horticulture and Eric Carr of Plant Pathology & Plant-Microbe Biology.

When the weather was fair, ‘Cheers’ occupied the Susan A. Henry Terrace, adjacent to the Plant Science Building, while during the chilly months the third floor atrium of Plant Science provided the encampment. From 4–6 pm on Thursday afternoons, the usual suspects and curious members of the departments lined up to receive drinks and light snacks.

Socializing is critical for financial equality and research development. Weekly events such as ‘Cheers’ and PPPMB’s Friday coffee break provide an atmosphere where colleagues can share laughs and their thoughts, research related or not. For many individuals it’s an entertaining mini-vacation to their work week.

Special thanks go out to Rachel McCarthy (PPPMB) for providing flyer and email advertisement, the members of the Northeast Plant Diagnostic Network for frequently providing snacks, and Dave Kalb (PPPMB) for providing his fine homebrew on occasion.

‘Cheers’ will continue to support the 99% in the coming months and provide refreshments for all those who attend. Keep your eyes open for an email or flyer announcing the next ‘Cheers’ event. And do not be alarmed if you hear a human microphone delivering the slogan, “we are the 99% and we are thirsty”, you are encouraged to belly-up to the bar and see that your glass gets filled.
Department Doings

Chili Cook-off
Liz Brauer

This year’s 7th annual chili cook-off was a great success. On the afternoon of November 18, aspiring chefs from Plant Pathology mixed their courage with their spices, cooking off against Plant Breeding, Horticulture, Plant Biology and Soil Science departments. Plant Pathology was well represented with seven delectable submissions prepared by (among others) George Hudler, Kevin Myers, Sandra Jensen, Jay Worley, Ellen Crocker, Alice Bulkeley and Ian Small. Bowls were filled, appetites were satisfied and tongues were (occasionally) burnt as students, faculty and staff enjoyed this delicious event. When the dust and stomachs settled, Plant Path’s own Jay Worley and Ellen Crocker reigned supreme. Their “Colorado Dreaming Chili Verde” took home the much coveted “Best Meat Chili Award.” This marks the first time in years that a Plant Path submission won a cook-off award. The Department is hoping to build on this triumph next year, repeating as champions in the meat category, as well as taking the “Wild Card” and “Vegetarian” awards. In other words, a chili triple crown.

Rose Loria Retires

Professor Rose Loria accepted the position as Chair of the Department of Plant Pathology at the University of Florida. During her 31 years at Cornell she became a full professor, served as Chair for the Department and Associate Dean for CALS. The position at Gainesville will allow her to utilize the research, extension, teaching and administration skills and knowledge that she acquired here.

Rose with a giant size tub of gatertone sunscreen
A photo of Minns garden was one of Rose’s parting gifts.

Alan Collmer and Gillian Turgeon present Rose with a blueprint of Plant Science building depicting all the renovations made during her time here.

Rose standing in front of the gift of plywood for hurricane protection for her new home in Florida while Stewart Gray presents another gift.

The annual chili cook off is a great way to enjoy delicious food while meeting plant researchers from other departments.

Jay and Ellen showing off their trophy for best meat chili.
Herbarium Notes
Scott LaGreca (Curator)

This review highlights activities of the PLANT PATHOLOGY HERBARIUM (CUP) from December, 2010 through December, 2011.

Staff
► Dr. Scott LaGreca, a professional lichenologist and CALS alumnus (B.S. ‘91), assumed the role of Curator in April. Scott specializes in chemotaxonomy (especially of the genera Ramalina and Lecanora), the lichens of Bermuda, and the lichen flora of the northeastern United States. Scott has authored over 30 papers on lichens and bryophytes. He comes to us most recently from the Berkshire Museum in western Massachusetts, where he worked for three years as Natural Science Coordinator. Scott is also a research associate at the Farlow Herbarium of Harvard University (where he worked for many years) and the New York State Museum in Albany, and is a former Curator of Lichens at the Natural History Museum, London, UK.

► Robert Dirig, Curator for the past three years, retired from the position in December, 2010. Bob has stayed on at CUP as the Anna E. Jenkins Honorary Curator of Lichens, an official title dating from 1990 that was restored by former Department Chair George Hudler in May. In this capacity, Bob is re-packeting and curating CUP’s historic lichen specimens as well as continuing his research on the lichen flora of New York State. He also maintains our beautiful Front Gardens. Long-time CUP volunteer Doug Murray assists Bob in all of these efforts on a weekly basis.

► New volunteer Betsy Crispell, a recent graduate of the Cornell Plantations Natural Areas Academy, began working at CUP in September. A former bookkeeper, Betsy’s first project was to help bring our herbarium loan and gift records up-to-date, for the purpose of incorporating them into our new herbarium computer database called Specify. She is currently putting the finishing touches on a computerized list of all the fungal families and genera represented in the Atkinson General Collection, which comprises over half of the holdings of the historic Atkinson Herbarium.

► Assistant Curator Torben Russo continues in his skillful stewardship of our current NSF grant (Atkinson’s Fungi: Curation and Databasing at the Cornell Plant Pathology Herbarium). Over the past year, Torben has hired over a dozen new student interns, who were responsible for databasing and repairing our Atkinson Herbarium specimens, photographs, and negatives. To date, over 20,000 Atkinson specimens have been databased.

Herbarium Happenings
► Summary of statistics: Eight loans (comprising 127 specimens) were sent from CUP in 2011 and three gifts and/or exchanges (comprising 113 specimens) were received from other institutions.

Outreach & Visibility
► On March 22, Cornell Physics Professor Paul McEuen released a novel entitled “SPIRAL.” The book, a scientific thriller set (in part) in the Plant Pathology Herbarium, features a torture-resistant heroine based on Herbarium Director Kathie Hodge! The novel has already been sold in 16 countries, and plans are in the works for a film adaptation.

► On May 25, CUP hosted its second Open House, which was a fantastic opportunity for our new Curator to put the “welcome mat” out! As part of the Open House, a new exhibit on “Slime Molds” was installed in the herbarium display case; the exhibit, which is ongoing, interprets these fascinating, fungal-like organisms using photographs, specimens and reprints from CUP collections. Also at the Open House, Ann and Allan Witteman (the latter of Ben-Gurion University of the Negev, Beer-Sheva, Israel) presented CUP with a set of eight original wood engravings by celebrated botanical illustrator Elfriede Abbe, who once worked at Cornell. The prints, which were made in 1967, illustrate different species of mushrooms, and are one of only fifty sets in existence.

► A total of 104 visitors, including students, other academics, and tour groups, crossed our threshold in 2011.

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.
Facilities

Plant Pathology Photo Lab
Kent Loeffler

2011 was a “buggy” year in the Plant Path Photo Lab. Working with Rick Hoebeke of the Entomology Department, over 250 species of invasive weevils and bark beetles were photographed for a forthcoming book on these little critters. I used a “deep focus” technique to photograph dorsal and lateral aspects of pinned specimens that Rick had gleaned from insect collections all over North America. This technique involves taking up to 20 images of each specimen at slightly different focal depths and then using specialized software to create one “deep focus” image. Most of these insects are very small (2–5 mm), which necessitates a pretty complex camera set-up (see picture).

The process became streamlined when a Cognisys StackShot system was purchased and put to use. This system provides a motorized, programmable micro-focusing rail that automatically moves the camera through its series of exposures. After the stack of images is made they are processed and cropped in Photoshop and then run through Helicon Focus Pro software to create the final image.

The weevil images were so visually arresting that the Mann Library agreed to show them in their 2nd Floor Gallery (see picture). For the show, I printed 27 large images (2 x 3") which we hung with Rick’s informative captions detailing each specimen’s range and economic importance. We kicked around several names for the exhibit, including “Deliver Us From Weevil” and “Speak No Weevil”, but settled on “Fear No Weevil” (see picture). The show was very well received and stayed up from June to October. CALS Communication even decided to use one of the images as the cover for its fall CALS News magazine (see picture). In September Rick moved to the University of Georgia where he has arranged to show the prints at the Georgia Museum of Natural History sometime in 2012.

2011 also saw the Photo Lab involved in making numerous time-lapse movies as Kathie Hodge and Dave Kalb never seem to run out of ideas. A few of the year’s classics involve paperback novels sprouting oyster mushrooms, coffee (both with and without cream) molding, pumpkins rotting and bioluminescent fungi glowing in the dark. Many of the movies can be viewed on the Cornell Mushroom Blog (http://blog.mycology.cornell.edu/) and the Photo Lab web site (http://www.plantpath.cornell.edu/PhotoLab/Default.htm). Speaking of the lab’s web site, Molly Swartwood of the Diagnostic Lab is doing a complete makeover of the site. We’re hoping to have the new, slicker site up and running later this spring so be sure to check back regularly.

In October I gave a seminar in the Technical Photography Department of the Rochester Institute of Technology entitled: “The Cornell Plant Pathology Photo Lab—100+ Years and Still Clicking” (see picture). As proof that everyone loves time-lapse movies I was approached afterwards by three students in the Biomedical Photography Department about doing internships in the lab to learn time-lapse techniques. As a result, Claire Smith, a junior at RIT will spend next summer in the Photo Lab setting up, processing and editing time-lapse movies. One of her responsibilities will be to prepare the best ones for posting on YouTube so be sure to check them out next fall.
Facilities

The Uihlein Farm—Record Production and in the Black by Keith Perry

The Uihlein Farm of Cornell University, the foundation seed potato farm for New York State, is at capacity! We operate on a three year rotation, and in any given year there are ~35 acres available for production. In 2011, we planted and harvested 34.4 acres, so we are near capacity. For the past four years we have had higher than average yields, with 275 cwt (hundred weight) per acre in 2011; this is thought to be due in part to improved soil management practices. We harvested 9457 cwt of seed potatoes; that’s almost 1 million pounds and a record in recent memory! The seed is stored on site until spring delivery, and at this production level, we are at capacity for our storage facilities.

One of the recent great success stories for the Cornell potato program has been the development of two new processing potato varieties ‘Waneta’ (NY138) and ‘Lamoka’ (NY139). New York growers have first access to new varieties, and with increased yields and quality, they provide a competitive advantage. These varieties have been a huge success for the Uihlein Farm in particular, as approximately half our acreage is now planted to Waneta and Lamoka. The availability of these new varieties has ensured the relatively high levels of orders the Farm has received and helps to ensure financial security for the operation. The financial climate continues to be quite challenging, but in 2011 Farm income has exceeded expenditures for the first time in the past decade. We are in the black! Continuing this trend will be essential in that we have necessary capital expenditures that have been deferred and are upcoming. With decreasing or uncertain revenues from State and Federal sources, the Farm is increasingly dependent on income from sales and services. Fortunately, there has been demand for Cornell’s new potato varieties from other potato seed producers in the midwest and northeastern states. In 2011, only seven remaining NY seed producers ordered seed, thus the interest in seed from other states helps to sustain the Uihlein Farm. More importantly, it addresses one of the missions of the Uihlein Farm, to contribute to the management of the golden nematode (GN). Cornell potato varieties have resistance to this cyst nematode and their planting in other states helps to limit the possibility of the GN spreading to other potato production areas.

One of the biggest highlights of 2011 was the acquisition of a new (used) potato harvester that saved on labor and allowed a record harvest to be completed in near record time. We also recently acquired a used grain harvester that allows us to harvest seed from winter rye, our rotational crop. This saves the Farm the cost of purchasing new seed every year and provides additional revenue from the sale of surplus rye. These purchases were facilitated by the Farm manager, Chris Nobles who has an aptitude for and interest in farmmachinery; he is a Cornell alumnus from Agricultural Engineering. The Farm is very fortunate to have a committed staff. We are optimistic that 2012 will be another good year at the Uihlein Farm!

New State-of-the-Art Inoculation Chamber for Plant Path! by David Kalb

Long, long ago when the college tore down the old Plant Science greenhouses we also lost one of our mist/inoculation chambers as it was too big and too old to move. The college helped us by replacing that old unit, constructed of rusting metal, rotting wood and asbestos containing transite. The new mist chamber is made with 100% stainless steel. It has sliding glass doors on the front, fixed glass doors on the back and glass on the top. There are no additional lights other than what comes in through the glass. The unit has refrigeration coils inside to adjust temperatures to an optimum range and two commercial humidifiers. It works very well, primarily for producing disease plants for the teaching program and some research use.

Dimmock greenhouse has been the home to an older, rusty, transite unit for many decades. With department funding another new and improved stainless steel unit has just been completed. It is similar to the stainless unit at Plant Science but improved in many ways. The humidifiers are now mounted outside the unit conserving space inside the chamber. The best improvement was the removal of the refrigeration coils from inside the chamber. These were replaced with small, thin, fin-type coils that circulate chilled (or warmed) water from an external water bath. Digital controls now allow for automatic on/off for humidity at almost any set point and more accurate and tight temperature controls. We hope it will get many decades of use.

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Plant Disease Diagnostic Clinic
Sandra Jensen

The Plant Disease Diagnostic Clinic received some very interesting samples in 2011. The fungus *Derma balsamea* was found on hemlock and made our list of most interesting because it was the first time we have identified this fungus, which causes a twig blight on this host. As you can see in Figure 1, the fruiting body can produce rather extensive spore tendrils with one of the more exotic ones being pictured here.

We have identified the fungus that causes Japanese apple rust in New York a few times since its recent introduction into the United States in 2004. However, we have not seen the teliospore stage until this year, as shown in Figure 2. These *Gymnosporangium yamadae* teliospores were collected from a gall on juniper. The detail in this photo is another interesting aspect of this sample. It has been edited or “Photo-shopped” if you will. We took several photos at different levels of focus and layered them to produce better depth perception.

The same technique was used to create the image of the wood decay fungus, *Inonotus dryadeus* in Figure 3. Old fungal conks like this one are often lacking spores that are needed for identification. In this case however, we found setae characteristic of *Inonotus dryadeus* within the pores of the fungus. We were so enamored by these setae that we wanted to capture a good photo, but could not focus our camera on more than a few setae at a time. In this case, the overlapping technique provided the ability to create the feeling of peaking into the pore of this fungus!

The Clinic has received many garlic samples exhibiting symptoms of an infestation by the garlic bloat nematode, *Ditylenchus dipsaci*, over the past two seasons. In fact, analyses for this pest have become our most common requested service. As seen in Figure 4, symptoms include exhibiting yellow skins, loss of roots, and roughened tissue at the basal plate.

In 2011 we also redesigned our entire web site, so please take a moment to check out the new version at: [http://plantclinic.cornell.edu/](http://plantclinic.cornell.edu/).
Students Flock to ‘Magical Mushrooms’ Course
Cornell Chronicle, Joyce Wu, February 2011

No. 69 on the unofficial list of “161 Things Every Cornellian Should Do” is to take the Magical Mushrooms, Mischievous Molds class, something that more than 5,500 students have checked off their Big Red to do list.

Now in its 19th year, the course has itself mushroomed into a universitywide phenomenon.

The first time it was offered, plant pathologist George Hudler expected perhaps two dozen students. “That first day I walked in there, and there were 225 people in the classroom. [Since] then, it’s just taken off. It’s crazy, but it’s been a lot of fun,” said Hudler, professor and chair of the Department of Plant Pathology and Plant-Microbe Biology. The course, normally taken by 250–300 students annually, boasts an enrollment of 520 students this spring.

The large class size, however, doesn’t appear to deter the students’ appreciation of the material. Says Connie Hsia ‘11: “Professor Hudler lectures in a very eloquent style that engages students. Coming to class is almost like storytelling time. What would seem like a boring, even disgusting, topic is made extremely enthralling.”

Hudler was first inspired by the world of fungi when he first peered at a fungus under a microscope as an undergraduate.

To provide such opportunities for his students, despite the large class size, Hudler offers, for example, a three-day open lab demo, where walk-ins can observe giant puffballs, grow oyster mushrooms and even take home their own slime mold.

“An unexpected benefit of the open lab,” says Hudler, “is meeting students. As the course has gotten bigger, I look out at the auditorium and see a sea of faces in the dark. But when you come for these demonstrations, we can take this vast group of people, spread them out and have some of that really important one-on-one interaction.”

Other special class events include an annual mushroom feast, a buffet of delicacies from mushroom quiche to mushroom bread, and a fungus hunt.

Despite the lack of a biology background among many of his students, Hudler says part of his goal is to “try and reach those people who have an aversion to scientific courses. I purposely leave out a lot of the terminology because I think you just don’t need that to develop an appreciation for the natural world.”

He is evidently successful: “I’m not even enrolled in this class, but I still attend every lecture because I’ve always wanted to take a fungi class and find them really amazing,” says Natasha Shylo ’11. “The professor is a great lecturer, and I enjoy his jokes and personal stories.”

To better tailor the course readings with his lectures, Hudler penned the book “Magical Mushrooms, Mischievous Molds,” as the course text in 1998. The book is now used by universities across the country.

“One of the things I’m proudest of,” says Hudler, “is that there are a number of other universities that have taken up similar courses. I’m proud that they saw what happened here at Cornell and used it as an impetus to get themselves going.”

After almost two decades, the Magical Mushrooms, Mischievous Molds course keeps evolving, partly due to the feedback Hudler receives.

“When people leave the course, there’s a fairly large number that don’t forget about it,” Hudler says. “They send me articles; they send me experiences they’ve had. That kind of feedback just lets me know that what I’m doing is making [a] difference.”

What’s so magical or mischievous about mycology?

Medicinal molds, yeasts for baking and brewing and hallucinogenic mushrooms are just some of the topics sprouted in the course and book of the same title, “Magical Mushrooms, Mischievous Molds.”

From the edible and the hallucinogenic to the pathogenic varieties of fungi, Hudler spins stories about the possibility that the “bewitched” in Salem, Mass., may have had fungus-induced hallucinations; the discovery of penicillin—and how British scientists smeared its spores on their clothes in case Germany invaded; and cites other intriguing facts about fungi and ‘shrooms: aflatoxin could be the perfect murder weapon, that perhaps the oldest and biggest living thing on Earth is a 1,500-yr-old mushroom in Michigan that spans some 37 acres, and that the cause of the 1960 mass death of 100,000 turkeys in England was due to a common storage mold.

Hudler notes that while some fungi are good to eat, others can cause death. Yet many others enhance our everyday lives by serving as a natural pesticide or as an ingredient in a perfume.

-- Susan Lang and Blaine Friedlander
Scientists Tackle Threat to New York’s Garlic Industry
Cornell Chronicle, Kara Lynn Dunn, November 2, 2011

Cornell nematologist George S. Abawi, Ph.D. ’70, is on a mission to help save one of New York’s burgeoning agricultural commodities: garlic.

Once filling just 11 acres of land in 1992, garlic production has grown exponentially, to 306 acres in 2007, up from 153 acres in 1997. New York is now the fifth largest garlic producing state in the nation. But an outbreak of a new crop pest is threatening the $24.5 million industry.

First spotted by Cornell Cooperative Extension vegetable specialist Christy Hoepting in Orleans County in June 2010, the microscopic stem and bulb (bloat) nematode (Ditylenchus dipsaci) has now been identified in garlic seed and soil samples from 17 New York counties.

Abawi, professor of plant pathology and international agriculture, analyzes the samples at his lab at the New York State Agricultural Experiment Station in Geneva, N.Y.

He recently received a $69,122 grant from the New York State Department of Agriculture and Markets to extend diagnostic expertise to growers statewide in 2012. A portion of the funds will subsidize nematode analysis of garlic and soil samples submitted by growers.

“Stem and bulb nematode has become widely distributed across New York state primarily through infected seed and will worsen if we do not identify the infected seed and soil,” Abawi said.

Garlic Seed Foundation Director David Stern says the help will be invaluable to fighting “a real problem that starts slow but grows exponentially, and the next year can decimate your crop.”

Some growers have suffered up to 80 percent crop loss, costing them several thousand dollars, as garlic can retail for more than $10 a pound. The parasite also affects onions, leeks, chives, celery, some varieties of peas and lettuce and other plants; more than 120 plants can serve as a host.

“Ten percent of all New York vegetable farms report growing garlic. Its high value per acre makes garlic a financially important aspect of our vegetable industry,” said extension specialist Crystal Stewart.

Bloat nematode-infected plants are stunted, with yellow, limp leaves and suffer premature defoliation. Bulbs gradually discolor to dark brown, and become soft, lightweight and cracked.

Young nematodes feed on leaves, stems and bulbs, and adults move into the soil once plant tissues become too degraded. They can then spread to new sites through planting material, on contaminated equipment and by irrigation and surface water runoff.

Abawi said farmers can limit the pest’s distribution and damage through crop rotation, debris removal, hot water washing of field equipment and moist soils, as the nematode likes dry conditions.

“Garlic growers must take a holistic approach to production, from site selection and pest control to proper harvesting and storage, and must not transport infected seed or planting material,” Abawi said.

Hoepting warned that even “perfect-looking” bulbs can have low levels of nematode that eventually cause problems during production, so it is important to use clean seed. Abawi said clean soil is equally important, so both should be tested.

“Growers do not help themselves by planting clean seed in infested ground,” he added.

For more information about how to submit soil and seed samples for testing, contact Abawi at gsa1@cornell.edu.
A Forthcoming Book Aims to Help Researchers Identify Non-native Weevils in Glorious Detail.
CALS News, Fall 2011

Celebrated in song, folklore, and statuary, the boll weevil—scourge of the American cotton industry—is perhaps the best known agricultural pest in the United States. But not so for its weevil cousins, a lacuna that E. Richard Hoebeke, a taxonomic and survey entomologist recently retired from the Department of Entomology, is looking to remedy with the help of Kent Loeffler, photographic specialist in the Department of Plant Pathology, in the forthcoming book An Illustrated Identification Guide to the Adventive (Non-Native) Weevils (Curculionoidea) of North America.

Specifically, Hoebeke and co-author James LaBonte, a taxonomic entomologist with the Oregon Department of Agriculture, hope to enable specialists and others to accurately recognize North American non-native weevils.

Like the boll weevil, which emigrated from Mexico to Brownsville, Texas, and beyond, many of the 3,200 North American species of weevil are not native to our fauna, either unintentionally introduced via commerce and a traveling public, or deliberately released for weed biocontrol.

Because of their great diversity, ability to thrive in any climate, association with virtually all plants, and a burgeoning global marketplace, weevils are especially successful hitchhikers to all of the world’s continents. The accidental introduction of exotic weevils into North America has occurred since early colonial days. And although a large number of weevils introduced into North America, or soon to be on the continent’s shores, are innocuous and apparently cause no measurable damage to plants, many are serious plant pests, such as the feared Japanese Pear Weevil (below).

The number of described weevil species on the planet is calculated to be about 62,000, with the total number of existing species likely approaching 220,000, meaning that entomologists have described just over a quarter of the diverse population of this important and largest group of herbivorous beetles.

For more information and amazing images of various weevils photographed for the book see http://calsnews.cornell.edu/2011-fall/features/weevil.html

Researchers Discover How Pathogen Causes Speck Disease in Tomatoes
Cornell Chronicle, December 14, 2011

Researchers have discovered how the structure of a protein allows a certain bacteria to interfere with the tomato plant’s immune system, causing bacterial speck disease.

The work helps explain how Pseudomonas syringae, a bacterial pathogen, has evolved to cause disease and may open the door to breeding tomato varieties that are resistant to speck disease, which can prompt costly losses in tomato crops.

The research—conducted at the Boyce Thompson Institute for Plant Science (BTI) at Cornell in conjunction with scientists at Tsinghua University in Beijing—is published in the December issue of the Cell Host and Microbe.

“Our work presents clear evidence of a molecular arms race and co-evolution between a host plant and a pathogen,” said Greg Martin, an expert on tomato disease resistance at the Cornell-affiliated BTI, a Cornell professor of plant pathology and plant-microbe biology, and lead author of the paper.

The paper describes the crystal structure of AvrPtoB—a protein injected into plant cells by Pseudomonas syringae that interferes with the plant immune response and allows the bacteria to multiply. The paper also provides an understanding of how AvrPtoB binds and interferes with the plant protein BAK1, which acts with immune receptors to activate plant defenses.

Some tomato varieties are able to resist infection by Pseudomonas syringae because they express proteins Fen and Pto, which detect AvrPtoB and mount a defense.

The structures characterized in Martin’s research revealed that two domains of AvrPtoB have a structural similarity, suggesting they arose from an ancestral avrPtoB gene. The paper also identifies part of BAK1 that is structurally similar to the defense protein Pto.

Martin’s research is supported by the National Institutes of Health and the National Science Foundation.
Strep-resistant Fire Blight Found in New York Orchards
Stacey Shackford, Cornell Chronicle, January 6, 2012

Cornell plant pathologists have issued a warning to New York apple and pear growers after discovering a strain of fire blight that is resistant to such traditional treatments as the antibiotic streptomycin.

For 50 years, the disease has been kept at bay using the antibiotic, but streptomycin-resistant strains of the disease were recently found in four locations in Wayne and Ontario counties.

“This is a serious situation that we need to manage effectively. The rapid identification of this outbreak positions us to implement a coordinated plan leading up to next year’s growing season,” said Herb Aldwinckle, professor of plant pathology and plant-microbe biology at Cornell’s New York State Agricultural Experiment Station (NYSAES) in Geneva.

In coordination with colleagues at NYSAES and Cornell Cooperative Extension, Aldwinckle is developing guidelines growers can follow to reduce the threat. Upcoming sessions at the Fruit and Vegetable Expo and CCE Fruit Schools in several counties will also provide growers with opportunities to learn more about the outbreak and possible solutions.

Fire blight is caused by the bacterium Erwinia amylovora, earning its name from the scorched appearance of infected leaves and branches. Its symptoms include blackening of flowers and young leaves, resulting in crop loss and even death of trees.

Strep-resistant fire blight was first identified in California in 1971, and since then it has been found in Washington, Oregon, Missouri and southwest Michigan. Diseased nursery trees from Michigan were the source of a limited outbreak in New York in 2002. At that time, Aldwinckle and colleagues, in close collaboration with growers, ensured that all infected trees were destroyed and surrounding farms were checked.

That eradication appears to have been effective. “For the past 10 years, extension staff have sent in samples for routine surveillance, and we hadn’t found it again,” Aldwinckle said.

This current infection was first spotted in Wolcott, N.Y., where a persistent suspected fire blight infection evaded a streptomycin spray regime. Samples were immediately brought to Aldwinckle’s lab.

Sampling was necessarily limited in late fall, so the full extent of the outbreak will be unclear until additional samples are studied, but the latest results indicate there are several outbreaks of strep-resistant fire blight in Wayne and Ontario counties.

Aldwinckle said the fact that one of the sites is a nursery does complicate the management plan. Fortunately, that nursery has a strict rogueing program—in which infected plants are removed from the soil and destroyed—that should minimize the chance of spread, he added.

However, Aldwinckle noted that some infections might not be immediately visible, so there’s a possibility that a small number of trees with the strain were inadvertently shipped to growers.

He advises all growers to examine their trees carefully for any symptoms of fire blight that may develop after planting. These recommendations apply to all trees purchased, with particular attention for those from New York and Michigan nurseries, where strep-resistant fire blight is known to occur.

He is also exploring other ways to eradicate the blight. “The antibiotic kasugamycin is as effective as streptomycin, and in some ways it is a more appropriate antibiotic because it is not used in human or veterinary medicine,” said Aldwinckle.

“Kerik Cox, an assistant professor of plant pathology at Cornell, is leading an application for a Section 18 emergency registration from the EPA [Environmental Protection Agency] for growers to use Kasumin [commercial kasugamycin] next spring.”
Cornell University College of Agriculture and Life Sciences Plant Pathologists Put the Squeeze on Citrus Disease
*CALS Chronicle, Amanda Garris, January 16, 2012*

With Florida’s $9 billion citrus industry threatened by a deadly bacterial disease, Rick Kress ’73 asked scientists at Cornell’s New York State Agricultural Experiment Station in Geneva for help. Three years later, the researchers have delivered several genetically engineered orange trees that could provide a long-term solution.

The trees were engineered to provide a natural resistance to the Asian citrus psyllid, the insect responsible for spreading the deadly bacterial disease huanglongbing -- also known as citrus greening because it causes perpetually immature green fruit that tastes bitter, medicinal and sour. First confirmed in Florida in 2005, the disease has spread to all citrus growing counties, and growers face a costly regime of cutting out dying trees and spraying insecticides to reduce the psyllid populations.

Far from the citrus growing climate and the federally quarantined psyllid pest, Cornell scientists turned to a model system instead: tomatoes.

Plant pathology and plant-microbe biology faculty members Kerik Cox and Herb Aldwinckle first identified a handful of naturally occurring insecticides produced by bacteria, fungi and plants known to fend off other types of insects.

Research support specialist Ewa Borejsza-Wysocka and technicians Peggy Abbott and Shirley Kuehne then used genetic engineering to insert candidate genes individually and in groups into tomato plants. They found some transgenic lines were very effective in making the tomato leaves unappealing to tomato psyllid insects and inserted the most promising genes into the Hamlin orange variety.

The diminutive transgenic orange plants await the opportunity to prove themselves against the Asian citrus psyllid on its home turf in Florida while the required permits and approvals are being secured. Aldwinckle said that he hopes to have some results of the trials within a year.

Kress, president of Southern Gardens Citrus Inc., one of the largest citrus growers and processors of not-from-concentrate orange juice in Florida, is in the process of continuing the overall research in Florida through evaluation of disease resistance on a commercial basis. He is optimistic that the work will have tremendous economic benefits. “It would also have a positive environmental impact by reducing insecticide sprays, because in Florida, trying to eliminate the Asian citrus psyllid is as daunting as trying to get rid of mosquitoes,” Kress said.
Disease Updates

New Ornamental Pear Rust in the Neighborhood
Margery L. Daughtrey

The pear trellis rust, caused by Gymnosporangium sabinae, has previously been known in Europe and the Pacific Northwest as well as Canada. Michigan reported the disease for the first time in 2009. Beginning in 2009, unusually colorful (yellow to red) leaf lesions have been noted on some ornamental street-side callery pears in scattered locations in southeastern New York; symptoms were also found in a nursery in 2011. The lesions often show spermagonia at the center that aid in their identification as a rust, but identification and rust development can both be thwarted by the secondary development of large brown lesions caused by an anthracnose fungus, Glomerella acutata. The appearance of leaf symptoms in the spring is typical of a Gymnosporangium rust, but the aecia of pear-trellis rust with their intriguing acorn-shaped peridia develop unusually late: the spores are released from October to December (until the leaves drop). In 2011 the range expansion of this rust into New York was formally documented by members of the Department, using sequence analysis of the D1/D2 domain of the 28s rDNA to show that G. sabinae has been found on Pyrus calleryana ‘Bradford’ and/or ‘Chanticleer’ in Hempstead, Moriches, Riverhead, and Staten Island, NY. Further information on susceptible and resistant host cultivars, alternate hosts, and effective control measures will be pursued, because this species’ value as an ornamental has been associated with its ease of maintenance.
Disease Updates

Impatiens Downy Mildew
Margery L. Daughtrey

The favorite annual flower of everyone with a shady yard, Impatiens walleriana, was dramatically attacked by a downy mildew in several areas across the country last summer. The result: extensive defoliation. Plasmopora obducens was first recorded in 1897 in Vermont on a native impatiens species, and has been seen repeatedly since around the country on Impatiens capensis (syn. I. biflora and I. noli-tangere) and I. pallida. However, the disease on the cultivated ornamental I. walleriana was curiously first seen in the United Kingdom in 2003, where the pathogen had not previously been recorded. Impatiens downy mildew was found in a few greenhouses in New York and a few other states for the first time in 2004, but was not noted in any American gardens until 2009 in Saratoga County, NY. The disease has continued to harm impatiens in Saratoga County in 2010 and 2011, suggesting that P. obducens may have the ability to overwinter.

We have observed oospores in the stems of infected plants—these could, alas, provide a mechanism for survival in flowerbeds from one growing season to the next. In 2011, catering to by the stormy weather of hurricanes Irene and Lee, this downy mildew caused dramatic symptoms in gardens on Cape Cod and eastern Long Island. But the disease was also confirmed for the first time in parts of California, Illinois, Indiana and Minnesota, indicating that diseased plants might have been distributed unwittingly by the greenhouse industry. Although most impatiens are produced from seed, some vegetatively-propagated types are available, so seed transmission is not the only possible scenario.

Much research is needed to answer the important questions about this disease. A trial of fungicide effectiveness at Cornell’s Long Island Horticultural Research & Extension Center in Riverhead, NY showed protection from mandipropamid, mefenoxam, azoxystrobin and dimethomorph on impatiens. Although fungicide treatment may be helpful for protecting plants during greenhouse production, disease-free or resistant plants will be needed for the landscape. Fortunately the New Guinea impatiens, Impatiens hawkeri, has very low susceptibility to this downy mildew—good news for plant breeders and for gardeners who would like to use some sort of impatiens in beds that were stricken with downy mildew last year. Only Impatiens walleriana is a host for this disease, but it is such an important bedding plant that the ornamentals industry is focusing intently on solutions for this new problem.
New and Ferocious: Boxwood Blight
Margery L. Daughtrey

Gardeneres are especially devoted to boxwood (*Buxus* spp.) for their stately, historic aura and their reputation for being relatively deer-proof. Suddenly an invasive exotic disease has arisen to challenge the production and landscape utilization of *Buxus* species in the United States. *Cylindrocladium bxicola* (syn. *C. pseudonaviculatum*) was recognized as an exotic new pathogen in the United Kingdom in 1994; its origin is still not known. Since the initial detection it has become a devastating problem in much of Europe and has also traveled to New Zealand and Australia. This disease begins with round brown leaf spots or leaf tip necrosis, followed by blighting and leaf drop. The bare twigs show black cankers. The fungus fruits abundantly on both leaves and twigs under moist conditions and the disease progresses very rapidly: the disease cycle requires only seven days.

Boxwood blight was first reported in the United States in October 2011. As of this writing, the disease has been officially noted in Connecticut, Maryland, Massachusetts, New York, North Carolina, Oregon, Rhode Island and Virginia, as well as British Columbia. Within New York, horticultural inspectors have found single instances of the disease in Nassau, Suffolk, Westchester, and Dutchess counties thus far, none of them in the landscape. The list of states includes those where many boxwoods are produced in field or container nurseries; plant material is frequently shipped from state to state. Spreading the understanding of this aggressive new disease prior to the spring is critical: New York State Nursery & Landscape Association and the Long Island Nursery and Landscape Association are helping to distribute information on boxwood blight. The Department diagnostic laboratories in Ithaca and on Long Island are working to help nurserymen, garden center retailers, landscapers and gardeners determine the extent of the problem. The disease cannot be accurately identified in the field because there are similar symptoms caused by *Phytophthora* spp. and fungi such as *Volutella* and *Macrophoma* spp. that could easily be confused with the new box blight.

Once a laboratory diagnosis of *C. naviculatum* has been received, diseased plants should be bagged and sent to a landfill rather than composted, as the fungus has been shown to survive in dead leaves for at least five years. Because of the threat posed by the dead leaves, these should be carefully gathered and destroyed along with the diseased plants and their containers. Replanting any *Buxus* spp. into a landscape where the disease has appeared will be risky; using alternative plant genera is advised in these situations. Only *Buxus* spp. have been found naturally infected; *Sarcococca* (sweet box) was found to be susceptible by inoculation.

Gardeners with the charge of protecting valuable old historic boxwoods should avoid bringing in any new boxwood material—it will be far safer to propagate cuttings on site. Thus far all of the cases of this disease described in CT or MA landscapes have been associated with boxwoods newly planted in 2011. The disease is expected to move easily over short distances via handling, pruners, wind-driven rain or overhead irrigation. Long distance spread will be largely through the movement of diseased plant material. There is no quarantine on this disease: the nursery industry will need to self-impose very high sanitation standards to preserve the successful use of boxwoods. The ornamental extension program in the Department is working hard to educate the production, maintenance and retail aspects of the green industry on the threat that this new disease poses to a very valuable ornamental.
Necrology

Rodrigo Tarté Ponce (1936-2011)
Rodrigo Tarté Ponce died on April 10, 2011 in Reno, Nevada, after a struggle with cancer. Tarté obtained a Ph.D. in Phytopathology at Cornell University under Bill Mai.

Muriel Dickey, (1922-2011)
Muriel F. Dickey, 89, wife of Robert Dickey, Professor Emeritus of Plant Pathology, Cornell University, passed away on October 18, 2011.

Miscellany

Korf Suggests Sharing Your Wisdom
Emeritus Professor Dick Korf (now 86) suggests that those of you 60 and older may, as he does, enjoy sharing your wisdom with young advice seekers around the world. The premier such organization is the Elder Wisdom Circle. You share from your home computer, at your leisure. And you can make a real contribution to someone else, without spending a penny. Sometimes the advice receiver is willing to write back to your self-selected moniker to thank you profusely for your suggestions. It’s as simple as pie: just go to www.ElderWisdomCircle.org and then click on Offer Advice for details. It can make your day, week, or year.

Loeffler’s Video on Science Friday
A couple of Kent Loeffler’s time lapse videos of mushrooms were featured on NPR’s Science Friday’s web site for a video story entitled “Rainfall Brings Bumper Crop of Fungi” on Friday September 9, 2011. For more information see http://www.sciencefriday.com/program/archives/20110909

Visitors

Dr. Andrea Ficke, of the National Agricultural Research Service of Norway (Bioforsk) was recently a visiting fellow at Cornell University’s New York State Agricultural Experiment Station in Geneva. Dr. Ficke was at Cornell as part of a collaborative project with D.M. Gadoury and R.C. Seem (Department of Plant Pathology and Plant-Microbe Biology), C. Linn (Department of Entomology) and T. Acree (Food Science and Technology) to study volatile organic compounds as diagnostic and detection tools for cereal pathogens.

Dr. Zvezdomir Jelev, assistant professor in the Department of Plant Pathology, Agricultural University of Plovdiv, Bulgaria; was recently a USDA Borlaug Fellow at Cornell University’s New York State Agricultural Experiment Station in Geneva with D.M. Gadoury and R.C. Seem (Department of Plant Pathology and Plant-Microbe Biology) to initiate a collaborative project on the epidemiology and management of grapevine powdery mildew (Erysiphe necator) and grapevine downy mildew (Plasmopara viticola).

Dr. Jahn Davik is presently a visiting fellow from the National Agricultural Research Service of Norway (Bioforsk) working with David Gadoury, Robert Seem, and Lance Cadle-Davidson at Cornell University’s New York State Agricultural Experiment Station in Geneva. Dr. Davik’s work focuses on mlo resistance to powdery mildew in strawberry (Podosphaera aphanis).

Dr. Aruppillai Suthaparan is presently a visiting fellow from the Norwegian University of Life Sciences (UMB) working with David Gadoury, Robert Seem, and Lance Cadle-Davidson at Cornell University’s New York State Agricultural Experiment Station in Geneva on the use of high-energy LEDs and UVB to suppress powdery mildews in greenhouse crops, and phytochrome systems in powdery mildews.
We want to hear from you...

Send an e-mail to plantpathcornell@cornell.edu or complete the form below and send to:

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Feel free to attach additional sheets
Opportunities in Plant Pathology

The College of Agriculture and Life Sciences has evolved from being a state-supported institution to being state-assisted. Because less and less of our financial support now comes from New York State, private support has become even more important. The Department of Plant Pathology and Plant-Microbe Biology in Ithaca is building several endowment funds to support its future activities. Your contributions to any of these funds will be greatly valued.

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. Early in the history of the Department, the agriculture industry provided graduate assistantships to support investigations important to agriculture in New York. Later, major responsibility for this support came from New York State. Reduced funding from New York State has severely affected the departmental support for graduate students. 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.

Named Gift Opportunities

Graduate Fellowships
Full support $300,000
Partial support $50,000

Cornell Plant Pathology Pledge/Contribution Form

Name
Address

Telephone

Please send form to:
Dept. of Plant Pathology & Plant-Microbe Biology
334 Plant Science Bldg
Cornell University
Ithaca, NY 14853

Plant Pathology Excellence Fund
Pledge $_________/yr
Contribution $_________

Plant Pathology Graduate Student Fund
Pledge $_________/yr
Contribution $_________
Other gift $_________