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PLP News

From the students of the Plant Pathology
Department to our community
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A Highly Effective, Virus-Based Biological Control for Tropical Soda Apple

by Drs. R. Charudattan and Ernest Hiebert



Tropical Soda Apple

Tropical soda apple (TSA) (*Solanum viarum* Dunal) is a “noxious weed” that is posing a serious threat to Florida’s cattle industry, agriculture, and natural areas. TSA is a native of southern Brazil, Paraguay, and northeastern Argentina. It has been aptly named the “Plant from Hell” due to its harmful, thorny nature and the capacity literally to “take over” infested lands within a short period of time. Left unchecked, it can form dense, thorny, impenetrable thickets. TSA occurs throughout Florida and parts of Alabama, Georgia, and Mississippi; in Florida, it infests over 750,000 acres. Calf, beef, and dairy industries are especially vulnerable to the economic and environmental damages from this weed. Pastures infested with TSA can cause the stocking rates to be lowered (fewer animals per acre) due to reduced pasturable area. Although the plant’s foliage is unpalatable because of the presence of

numerous sharp thorns, the fruit is consumed by livestock, wildlife, and birds.

In addition to these agents of seed dispersal, TSA is also spread by contaminated hay, grass seed, and sod produced in TSA-infested areas. TSA seed is highly viable even after passage through the animals’ digestive tracts and serves as the principal means of spread and increase in TSA populations. Since cattle shipped out of state can help disseminate the weed, the states neighboring Florida are demanding action to stop further spread this weed.

The current management practices include repeated mowing and application of chemical herbicides. Although these methods provide acceptable control of TSA on an interim basis, cheaper and safer methods are urgently needed for long-term management.

A Biological Control: During a routine examination of several fungal, bacterial, and viral pathogens as biological control agents for TSA, we discovered that *Tomato mild green mosaic tobamovirus* (TMGMV), a common, indigenous plant virus, evokes a systemic hypersen-

sitive response in TSA, completely killing the infected plant. **Matt Pettersen**, a former M.S. student, who worked on this project, demonstrated that TSA plants from seedling to mature stages could be killed following manual inoculation with TMGMV. Typically, the inoculated plants develop foliar local lesions, epinasty, systemic necrosis of leaves and petioles, and systemic wilting in rapid succession within 7-21 days after inoculation. In susceptible tobacco plants (*Nicotiana tabacum*, cultivar *nn* Samsun), TMGMV, true to its name, causes a mild systemic mosaic on the leaves. In resistant tobacco plants (cultivar *NN* Samsun), it causes hypersensitive local lesions on the foliage. Matt Pettersen showed that TSA is also susceptible to *Tomato mosaic tobamovirus* and *Tobacco mosaic tobamovirus* (TMV U1), which, unlike TMGMV, induced only mosaic and/or mottle symptoms on TSA. **Robert McGovern**, **Jane Polston**, and **Jeff Mullahey** have reported that TSA is a field host to at least six plant viruses, including *Tomato mottle begomovirus* and *Potato potyvirus* Y. TSA is also a host to *Alternaria solani* and Colo-

rado potato beetle. Thus, it is a potential reservoir of these economically important pathogens and insect. Unlike these pathogens and the beetle that do not necessarily kill TSA, TMGMV *kills* this plant rapidly and completely, thereby minimizing or precluding infected TSA from being a reservoir of TMGMV.

Highly Effective Results in the Field:

We have field-tested TMGMV in pastures at eight locations in central and south Florida. These trials, done at the invitation of cooperators, were intended to develop application methods and to gather preliminary efficacy data. Inoculum for these trials was produced in a greenhouse in systemically susceptible *N. tabacum* *nm* Samsun. It was prepared as an extract from infected leaves and stored frozen until use. Suitable dilutions of this inoculum were prepared on site in the field and applied.

Typically, TMGMV provided 80 to 99% control (weed-kill) in these trials. TSA plants of different sizes and ages were killed without regrowth. Fruit development and seed production were not affected if the fruits were fully mature at the time of virus inoculation. However, fruits that were immature at inoculation failed to develop further and shriveled or rotted away.

Among the field-application methods we have tested, the most effective were: 1) abrade-and-spray application done by dragging a section of chain-link fence or a piece of carpet and simultaneously spraying the inoculum with a tractor-mounted spray boom (Fig. 1); 2) high-pressure (>200 psi) spraying; and 3) application with a wiper applicator. **Jim DeValerio** (Senior Biologist), who manages and carries out the field trials, has customized the wiper application system for this work. With this applicator, we are able to use the virus at a rate of 1 gallon per acre compared to the 50-gallons-per-acre rate used for chemical herbicides.

An exciting feature of this viral bio-herbicide is that full foliar coverage is



Figure 1. Jim DeValerio, Mark Elliott, and two cooperators assembling and testing chain-link and carpet application devices at the Lykes Bros. ranch near Sebring.

not required to obtain high levels of weed kill; exposure of just a few leaves per plant is sufficient to kill the whole plant (Fig. 2). Full foliar coverage is a typical requirement for chemical herbicides. Furthermore, the efficacy of TMGMV is not constrained by temperature and moisture conditions in the field, but the plants must be growing and physiologically active at the time of virus application. These conditions are hardly



Figure 2. “Before-and-after” pictures of a TSA plant inoculated with TMGMV. The plant wilted ca. 14 days after inoculation with TMGMV and subsequently

difficult to obtain in the field.

TMGMV is a mechanically transmitted virus that spreads through physical contact between infected and healthy plants, often aided by contaminated agricultural tools. TMGMV is not known to be seed-borne and the members of the *Tobamovirus* group are not insect-transmitted in that they do not depend on a specific insect-vector relationship for transmission.

Nonetheless, as part of risk-analysis, **Sarah Clark**, a Ph.D. student, will be examining the potential for mechanical dissemination of TMGMV by three ar-

thropod species. One of the insects she will study is a chrysomelid, *Gratiana boliviana* from South America that has been released in Florida to control TSA. Sarah Clark will also study the impact of the use of TMGMV on this beetle's effectiveness as a biocontrol.

Host-range of TMGMV: From published literature, it is known that TMGMV infects at least 15 plant species in four families, Solanaceae, Apiaceae, Chenopodiaceae, and Lamiaceae. Studies done by **Bill Zettler** and **Julie Nagel (Julie Ploetz)** established that the virus is quite prevalent in nursery-grown plants of the Gesneriaceae family.

As part of risk-analysis, we have undertaken the most extensive host-range study to date of TMGMV. The results from this study, which has been managed and carried out by **Mark Elliott** (Senior Biologist), indicate that TMGMV is a pathogen primarily of plants in the Solanaceae family. Among the plants screened (376 in 155 genera and 53 plant families), the majority of susceptibles were solanaceous plants. Twenty one plants in 12 other families were also systemically infected. Only *Capsicum* spp. and *Nicotiana tabacum* developed hypersensitive systemic necrosis comparable to that seen on TSA. Tomato, eggplant, and several other plants in Solanaceae were immune or resistant to TMGMV.

Characterization of TSA's Response to TMGMV:

Localized foliar necrosis is the most common virus-induced hypersensitive response in plants; hypersensitive plant death, as seen in the TSA-TMGMV system, is a rare phenomenon. Therefore, we are interested in characterizing the genetic and physiological basis of this hypersensitive plant death. As a first step, **Jonathan Horrell**, an M.S. student, is attempting to identify the viral gene that elicits the wilting response in TSA. This information may then be used to characterize the physiological mode of action that triggers plant

death.

We now plan to petition the U.S. Environmental Protection Agency for an Experimental Use Permit (EUP) to test and gather data needed to register the virus as a bioherbicide. The EUP will allow us to do larger field trials using realistic, commercial conditions.

This work would not be possible without the excellent cooperation from ranchers and county extension personnel, especially **Mr. Ed Jennings** (Sumter County), **Mr. Joe Walter** (Brevard County), and others. Funding for this work is provided by the Florida Department of Agriculture and Consumer Services and UF/IFAS Center for Aquatic and Invasive Plants. **Dr. Richard Gaskalla**, DPI, and the Tropical Soda Apple Taskforce are acknowledged here for their interest and support.

Faculty, staff, students, alumni, and colleagues in our department



Congratulations to **Fabricio Rodrigues** (left) and **Ronald French** (right) who won, respectively,

the first and third place in the Student Paper competition during the Pan American Plant Disease Meeting held in South Padre Island, Texas on April 2003.



After 15 years of conducting research on the epidemiology and control of foliar and soilborne diseases of rice, turf and vegetables at the Everglades Research and Education Center, **Dr. Lawrence E. Datnoff** is transferring to the Department of Plant Pathology in Gainesville in January 2004. In his new position, Dr. Datnoff will be focusing

on soilborne diseases and will continue with his silicon nutritional studies for suppressing plant diseases. Dr. Datnoff will be involved with the departmental



teaching program. Welcome Dr. Datnoff!

Carrie La-paire, a New England native transplanted to Indiana, spent the last year as a USDA-ARS laboratory technician in the Corn and Sorghum Pathology Laboratory at Purdue University. Her primary focus on research included analysis of genes involved in the biosynthesis of a phytotoxin produced by *Cercospora zeae-maydis*. She obtained her MS degree under the guidance of Dr. Larry Dunkle, focusing on microcycle conidiation of *C. zeae-maydis* on maize. During her time at Purdue, she also worked in the Plant and Pest Diagnostic Laboratory. She anticipated an exciting career shift as the Plant Pathology Coordinator for the Southern Plant Diagnostic Network in our Department.

Dr. Jeffrey Jones gave lectures to a group of students interested in plant breeding at the Universidade Estadual do Norte Fluminense (UENF) in Campos dos Goytacazes, Rio de Janeiro, Brazil. His lectures focused on pathogenic variation within *Xanthomonas campestris* pv. *vesicatoria* and the implications in developing breeding programs. Dr. Jones was invited by **Dr. Rosana Rodrigues** who is an associate professor at that University.



Dr. Phil Harmon is a native Hoosier (person from Indiana). He attended Purdue University where he earned a Ph.D while studying Plant Pathology. His Ph.D project focused on the gray leaf spot disease

of perennial ryegrass and involved applied plant pathology, molecular biology, and participation in extension education activities with turfgrass managers. Dr. Phil Harmon started as an assistant professor in our department to address extension and research objectives in the areas of turfgrass, ornamentals, and small fruit pathology. He said that he looks forward to the change from a Boilermaker to a Gator. Welcome Dr. Phil!



Amanda Hodges has both a B.S. degree (in Biology) and a Ph.D. from the University of Georgia. Her Ph.D. in Entomology, "The Life History of *Polistes metricus*

Say: Study of Behavior and Parasitic Natural Enemies", was completed in December 2002. As a graduate student, she held various teaching assistant positions including courses in agricultural entomology, integrated pest management, pesticide management and utilization, general entomology, insect natural history, medical entomology, and an introductory biology course. She also had numerous leadership and organizational activity opportunities. She served as the Vice President/Outreach Coordinator (1998-1999) for the student entomology club and as a representative for the University of Georgia, Southeastern Branch of the Entomological Society of America Student Affairs Committee (1999-2001). Prior to completion of her degree, she participated in life history research involving the plum curculio in middle Georgia peaches and host preference research on the noxious bamboo mealybug. During February of 2003, she began writing a book on the insect galls of Florida in collaboration with Dr. Russ Mizell and Dr. Eileen Buss of the University of Florida. This book is in the editing process for publication and sale through the University of Florida's Insti-

tute of Food and Agricultural Sciences. During the summer of 2003, she also had the opportunity to teach an undergraduate/graduate level course in field invertebrate biology in the University of Florida's Entomology and Nematology Department. She is now working with the SPDN and NPDN in order to provide better protection for our nation's agriculture from exotic pests.

Dr. D. P. "Pete" Weingartner was recognized as an Honorary Life Member of the Potato Association of America during the 87th Annual Meeting in August 2003 for his extensive research and extension program in potato disease and nematode management. Congratulations Dr. Weingartner.



Dr. Jane Polston is a plant virologist and has been with the University of Florida since 1991. She established a research program at the Gulf Coast Research and Education Center in Bradenton, FL (on the West Coast of Florida) on viruses of vegetables and ornamentals. In late September 2003 she relocated from Bradenton to our Department in Gainesville.

Her research program is spread among several areas right now; one area is the development of transgenes that can generate broad-spectrum resistance to begomoviruses in tomato, another is characterizing the gene silencing which is elicited by transgenes which have a begomovirus *Rep* gene. Another area of research is the identification of new begomoviruses; we have found several new begomoviruses in Florida, the Caribbean, and South America and are in the process of identifying their genomic sequences and host ranges. Her lab is also working on identifying the sequence of a hammerhead viroid that was identified as the cause of grassy tuber of caladium. As for her teaching program, she

will be responsible for Plant Virology beginning next fall semester.

Dr. Polston will be leaving the second week of December to begin a 3 month sabbatical at Hebrew University in Tel Aviv, Israel with Dr. Hanokh Czosnek. There she will be learning about whitefly genomics, working with Dr. Moshe Lapidot on TYLCV resistance in tomato, and teaching a 6 week class in begomoviruses.



Dr. Rosana Rodrigues associate professor and geneticist (center) at the Universidade Estadual do Norte Fluminense (UENF) in Campos dos Goytacazes, Rio de Janeiro, Brazil is doing a sabbatical with **Dr. C. Eduardo Vallejos** (right) in the Horticultural Sciences Department and with **Drs. Jeff Jones** (left) and **Bob Stall** in the Plant Pathology Department. While at UF, she is working on bacterial spot resistance in pepper and also plans to be involved in similar work on tomato. Her research at UENF focuses on vegetable crops and bean breeding with emphasis on disease resistance; genetic resources in vegetable crops with emphasis on morphoagronomic characterization, genetic divergence studies and evaluation for disease resistance; and maintenance of a vegetable germplasm bank. Dr. Rodrigues has also been quite extensively involved in administration at UENF.

Many students joined the Plant Pathology Department during the Fall of 2003. **Sarah Clark** is working with Dr. Charudattan. **Moyi Li**, from China, is working with Dr. Rollins. **Jeff Kaesberg** is under the guidance of Drs. Strandberg, Polston and Hiebert. **Jason Hong** is Dr. Tim Momol and Jones' student. **Amandeep Kahlon** is working with Dr. Brlansky. **Chris Rasmann** is working with Dr. Chellemi Graham. **Francis Tsigbey** is Dr. Marois's student. Wel-



come to our Department !

Dr. Fanny Iriarte has recently joined our department as a postdoctoral associate with Drs. Tim Momol and Jeff B. Jones. Dr. Iriarte, who is originally from Bolivia, recently completed her Ph.D. at Kansas State University under the guidance of Dr. Ned Tiserat. Her dissertation was titled "Genetic diversity and aggressiveness of *Ophiophaerella korrae*, one of the casual agents of spring dead spot of Bermuda Grass". Dr. Iriarte will be working on IPM strategies for control of bacterial spot of tomato.



Graduate and undergraduate students from the course Fundamentals of Plant Pathology got extra credit by showing up at **Jennifer Gillett's** house in costume during Halloween. Jennifer is a TA in PLP3002/5005 this year and teaches all the labs with the help of **Jennifer Cook**, **Sarah Clark** and **Whitney Elmore**.



Adriana Castañeda, **Matt Brecht** and **Yolanda Petersen** during the Halloween party at Aaron and Matt's house. Several students from the Plant Pathology Department and the Plant Medicine Program attended this exotic party.

Congratulations to **Alba Nava**, **Jennifer Gillett** and **Yolanda Petersen** who recently received their Ph.D. from our department. Congratulations also to **Penny Robinson**, **Misty Nielsen** and **Hamed Al-Aqeel** who earned their M.S. this Fall too.



Dr. Natalia Peres is a new assistant professor in our department. She will be located at the Gulf

Coast Research and Education Center in Dover, FL and will address research on strawberry diseases. Dr. Natalia is from Santos, São Paulo, Brazil. She received her B.S., M.S. and Ph.D. from the Universidade Estadual Paulista in Botucatu. During her M.S., she worked on the characterization of isolates of *Colletotrichum* that causes post-harvest anthracnose in avocado, banana, guava, papaya and passion fruit. Her Ph.D. focused on the epidemiology and control of post bloom fruit drop in citrus caused by the fungus *Colletotrichum acutatum*.

Congratulations to **Fabricio Rodrigues** and **Glenn Colburn** who received, respectively, the Caribbean Division Award and The Zahir Eyal Award to attend the APS 2003 Annual Meeting in Charlotte, NC.

Congratulations to **Jonathan Horrell** for getting his picture and write-up accepted for as the APSnet Image of the week in November.



Color break symptoms on flowers of flowering tobacco (*Nicotiana glauca* cv. Avalon), caused by Tobacco mild green mosaic virus (TMGMV; genus *Tobamovirus*). Inset shows a flower from a noninfected plant of the same color.

T. E. Freeman (1930-2003)

Dr. Thomas Edward (Ed) Freeman, plant pathologist and turf grass specialist, died on Tuesday, September 16, 2003 in Gainesville, Florida, at the age of 73.

Ed was a native of Mississippi, where he attended primary and secondary schools. He received his Bachelor of Science Degree in Biology from Mill-

sap College in 1952. Ed earned his MS and Ph.D. degree in Plant Pathology in 1954 and 1956, respectively, after which he joined the faculty of the University of Florida's Plant Pathology Department. Ed served the University in the capacities of Assistant, Associate and Professor of Plant Pathology, Acting Department Chairman, and Acting Assistant Dean for Research.

Although holding teaching and extension assignments at various times, his primary efforts have been in basic and applied research in two areas, 1) Elucidation of the etiology, occurrence, and control of turfgrass diseases and 2) Biological control of weeds (primarily aquatic) with plant pathogens.

From 1980-1992, Ed coordinated the UF/IFAS turfgrass program. In that capacity, he worked closely with the turfgrass industry through the Florida Turfgrass Association. In 1985, this group honored him with their highest award, the coveted "Wreath of Grass." In 1992 they further honored him with a special achievement award "To honor a career of distinguished service to Florida's turf industry through his contributions of research and education." After he retired, he built a cactus-growing hobby into a "beer money" enterprise. He also was an avid saltwater fisherman spending much of his time in Cedar Key, Florida.

Dr. Freeman was a positive influence on the lives of his students. In noting those influences, former graduate students Drs. Michael T. Olexa, Director of the Agricultural Law Center at the University of Florida and Raymond D. Martyn, Jr., Chair of the Botany and Plant Pathology Department at Purdue University stated that he allowed them the freedom to explore many avenues of research, which helped nurture the creative spirit of good scientists and educators. Both agreed that one of the most important lessons they learned from their mentor was that you're never too old to learn. He always expected his students to do more and learn more than

he did. Ed Freeman was never ashamed to admit that he didn't know something and was eager to learn about a new technique or result.

Both aforementioned students have applied his philosophy of learning to their own students and career development. To these and other former students, he was a quiet man, a great man, and a good friend and mentor. Dr. Freeman is survived by his wife of 50 years, Ruth Imogene (Gene); son Thomas Harrell; daughter Roxane Ethel McGinnis; brother, Barry Freeman; grandchildren, Whitney and Mason McGinnis.

Things to think about

God gave us two ears but only one mouth. Some people say that's because He wanted us to spend twice as much time listening as talking. Others claim it's because He knew that listening was twice as hard.

During my second year of graduate school our professor gave us a pop quiz. I breezed through the questions until I read the last one. "What is the first name of the woman who cleans the school?" Surely this was some kind of joke. I had seen the cleaning woman several times, but how would I know her name? I handed in the paper, leaving the last question blank. Before the class ended, one student asked if the last question would count toward our grade. "Absolutely", the professor said. "In your careers you will meet many people. All are significant. They deserve your attention and care, even if all you do is smile and say hello." I've never forgotten that lesson.

One of the most lasting pleasures you can experience is the feeling that comes over you when you genuinely forgive an enemy – whether he or she knows about it or not.

If opportunity does not knock, build a door.

The best way to forget your own problems is to help someone else solve theirs.

Drs. Zettler and Berger Retire

At “high noon”, June 24, 2003, the Plant Pathology Department “paid tribute” to two retiring faculty that had become departmental legends in terms of service, research and teaching. There is no truth to the rumor that their colleagues really felt they had become legends in their own mind. **Richard “Dick” Berger** and **Francis “Bill” Zettler** officially retired at the end of June. Their colleagues honored them with a potluck lunch and a roast that featured highlights of their careers including photos of their successful exploits and comments from former and current students, colleagues, and USPS employees.

Dick Berger was honored for his contributions to epidemiology, including teaching, research and mentoring students. Dick was a “follower” in the sense of being a “true believer”. He followed epidemics of plant disease, students to Brazil, and, of course, golf balls played over some of the most scenic and interesting golf courses around the world.



Dr. Richard D. Berger (center), wife Joyce (right) and long-time biological scientist Terry Davoli (left).

His service as an interim department chair and editor of many scientific journals was lauded. As an editor for journals and for his colleagues, Dick developed a reputation for trimming the fat from verbose text. His efforts were affectionately, and sometimes not so affectionately, known as to “bergerize” as in my manuscript has just been ber-

gerized. As one who has had many manuscripts “bergerized”, I simply say to Dick “thanks” followed by “sorry if I didn’t always express appreciation for your help”.

Bill Zettler, a current teaching icon, has morphed from a virologist and water weed control specialist to become an inspirational salesman for the science of Plant Pathology.



Roast master, Dr. Jerry A. Bartz (left) and Dr. Francis “Bill” Zettler.

As one current graduate student brightly remarked, “I want to be Bill Zettler when I grow up”! People who have crossed paths with Bill throughout the years contributed insights into his career which began as a rather envious and little known graduate student at Cornell (“Kimbrough always got invited to the better parties”), to a virologist at the “plant virus complex” (a rather shabby collection of wooden, temporary buildings located on the wrong side of Lake Alice), to international virus consultant in tropical wet lands where he became affectionately known by Rambo Zettler as a “boss” that sent USPS employees on collecting trips to places where slithery, creepy crawly things lived, to his current status as teacher extraordinaire and departmental sex symbol. Bill used to say that he regularly received “anonymous” comments on course evaluation forms such as “It’s really hard for me to sit in this class without having sexual fantasies about Dr. Zettler. His passion for Plants, Plagues, and even people makes my body tingle all over”.

After comments from the assembled “roasters,” the “roastees” had their chance to set the record straight. Dick

Berger, as is his gentlemanly fashion, declined. Interestingly, during the roast, Dick did direct a telling salvo that questioned the intelligence of the roast master. On the other hand, Bill Zettler assembled a list of comments. He accused colleague **Jim Kimbrough** of being from a line of Mississippians who were responsible for the Civil War-related amputation of the most important digit for a New Jersey citizen. After the battle, the wounded Zettler could no longer gesture his displeasure or otherwise communicate and, subsequently, passed away a broken spirit. There is no truth to the rumor that the New Jersey Zettler was gesturing his opinion of the Mississippian's marksmanship when the telling shot ripped off part of his hand including the middle finger. Bill Zettler then related his view of the rest of the assembled colleagues, students, USPS workers, and APS workers. No one was spared!!! **Daryl Pring**, whose office was next to Bill's for so many years, best summoned up the feelings in the room by shouting "free at last".

SPDN Update: What have we accomplished in 2003?

The National Plant Diagnostic Network (NPDN) consists of 5 regional diagnostic network centers including the Northeast (NEPDN), North Central (NCPDN), Great Plains (GPDN), Western (WPDN), and Southern (SPDN) regions. The University of Florida, Department of Plant Pathology, coordinates the SPDN, which includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and Puerto Rico. Funding for this program was provided as a result of recent terrorist attacks on the United States to: (1) establish a secure, regional network for the detection and diagnosis of plant health problems, (2) provide sound public policies and response strategies, (3) provide leadership and training to "first detectors" on na-

tional and regional levels, and (4) strengthen our diagnostic and response capabilities. Although many plant pathologists would agree that we are already doing this as part of our routine responsibilities, as our National Program Leader for CSREES, Kitty Cardwell has said "**this is not business as usual**".

Although the funding was provided by CSREES (\$900,000 per region), the national coordinators (UF, Cornell, U Michigan, Kansas State University, and UC-Davis) were given the responsibility to decide how to fulfill our responsibilities. Although the land mass, number of states, and cultural practices may vary between regions, we all are working in concert to protect our nation's agriculture. In the SPDN, each state was given subcontracts of \$44,000 for their plan of work.

The network: The first step is for our diagnostic clinics in each region to be networked, the "N" of the NPDN. Dr. Howard Beck, our co-PI in Ag and Bio Engineering at UF, has done a fantastic job of linking all the clinics into the SPDN database. Our goal is for all clinic data to be transmitted to the National Agricultural Plant Information System (NAPIS) at Purdue. **Howard** along with his colleague, **Dr. J. Xin** and our graduate student **Min Zhong** worked together to accomplish this feat. This was extremely challenging since 8 of 12 states were already using unique database programs that they were using. Additionally, Puerto Rico did not have digital diagnostic capabilities or a workable database. The Ag and Bio Engineering collaborators at UF along with all of the Information Technologists in each state worked together to solve these problems for the SPDN. Currently, all southern states are connected and able to transmit information to the regional center. Soon, we expect to have Puerto Rico networked as well.

Education of "First Detectors": **Dr. Gail Wisler**, the southern regional co-

ordinator, was designated as the national subcommittee chair for NPDN training and education of "first detectors", i.e., our county agricultural agents and private crop consultants. **Dr. Tim Momol**, as well as numerous collaborators in all the regions have been instrumental in these developments. This too was a daunting task, as most plant pathologists are not well versed in the current educational technologies and program design. We decided that our goals for first detectors were to: (1) have an increased awareness of NPDN mission (2) be able to recognize something new (3) respond properly to a new introduction, (4) submit a quality and secure sample, (5) demonstrate proper use of digital imaging for diagnosis, and (6) be able to train others (>25,000 extension educators nationally). As a result, we have coordinated the following training modules based on these objectives:

- NPDN Mission and Biosecurity
- The Art and Science of Diagnosis
- Quality and Secure Sample Submission
- Monitoring for High Risk/Unknown pests
- Digitally Assisted Diagnosis

Our plan is to "roll out" our training modules this spring to at least 2,500 extension educators nationally.

Diagnostics and Drills: Based on the list of 10 high risk pathogens published by the USDA, the NPDN started the process of establishing "expert labs" throughout the United States. These labs are certified to diagnose a particular pathogen according to the methods used by USDA-APHIS in Beltsville, MD. **Dr. Pam Roberts** was one of several extension specialists nationwide who was trained in the morphological characteristics and molecular diagnostics for *Phakopsora pachyrhizi*, the causal agent of soybean rust, at the quarantine facility at Ft. Detrich, MD. Soybean rust (SBR)

was chosen as the first pathogen to study because of its high probability of introduction into the U.S. Our clinic staff in Gainesville will purchase a real-time PCR and will be trained to perform the SBR diagnostics. On a local level, **Dr. Bob McGovern** has worked with SPDN diagnosticians to establish a list of pests and pathogens that are representative of concerns in the southern region.

In addition to the diagnostics, dry-runs, drills or “scenarios” have been conducted among several states nationwide for SBR. This begins with an extension agent bringing in a suspect SBR sample to a diagnostic clinic. This process sets off a chain of communications, and the sample is FEDEX’ed or driven to the USDA-APHIS diagnostic lab in Beltsville, MD. In this case, **Dr. Mary Palm**, the USDA mycologist, and **Dr. Laurene Levy**, in charge of biochemical and molecular analyses, are responsible for SBR diagnosis. This sets up a series of phone calls between state and federal regulatory agencies. In many instances, some of the land grant, state, and federal groups have not previously communicated. Initiating these lines of communication is an essential component of addressing a potential agricultural emergency. This was an eye-opening process for many of those individuals involved, and provided us with an excellent preparatory exercise.

More than just plant pathology: Although plant pathogens have been the focus of the network, we must remember that insects, nematodes and weeds are also significant threats to our agriculture, whether by accidental or intentional introduction. As a result, we have made presentations at APS and the ESA (Entomological Society of America) to “raise awareness” and generate interest from our colleagues. In addition, to support the huge effort that this program requires, the SPDN has hired two extension assistant faculty to work with us and support the efforts of this pro-

gram. They are **Ms. Carrie Harmon** (Plant Pathologist) and **Dr. Amanda Hodges** (Entomologist). We are thrilled to have them join us and appreciate the enthusiasm, contributions and knowledge they have to offer. Welcome Carrie and Amanda!

Future opportunities: We are hopeful that the 2004 and 2005 budgets will be approved. In addition, each state has received some funding for education and training of first responders and we hope that a portion of this money will go to agriculture. We have had the opportunity to interact with animal and human health programs with the same goal of security from exotic pests and pathogens, and we are coordinating with these groups. The Department of Homeland Security will also provide opportunities to compete for funding. Please note the recent request for proposals (RFP) through the National Research Initiative FY 2004 at http://www.reeusda.gov/1700/funding/04/rfa_nri_04.htm.

There are some viable opportunities for our pathologists to compete for these funds in a variety of areas.



Great gills! What a sale! As with previous years, one of the staple fundraisers to fatten the coffers of the Plant Pathology Graduate Student Association was the mushroom sale this March. After a bit of bargaining with our Monterey Mushroom Farm benefactor, donations for the portabello mushrooms were doubled this year. This increase was much appreciated as the sale met with great success. These relentlessly sought after mushrooms sold in only three hours. The pre-ordered portabello’s accounted for 71 of the 100 pounds obtained. The button mushrooms also proved to be an in-demand culinary delight. Of the 200 pounds donated, 56 pounds were pre-ordered giving more than 120 pounds sold overall. Over the course of the day, more than 220

pounds of mushrooms were sold. Although not all the button mushrooms sold, they were still put to good use. The remaining 80 pounds were donated after the sale to St. Francis House on Main Street.

Thank you to all the graduate students who picked-up, packaged, and sold the mushrooms for the sale. Without your help, this process would have been alarmingly difficult. Thank you also to all who pre-ordered and purchased all the mushrooms. The Plant Pathology Graduate Student Association thanks you.

Jonathan Horrell also deserves some recognition for his contribution of t-shirts featuring some of the more well-known mushrooms. The proceeds from shirts purchased at the mushroom sale were donated to the PLP Graduate Student Association.

Folks from Plant Pathology Department visit Citrus Nurseries in Brazil

A 2-day citrus nursery course "Healthy Trees in a New Era" was held at CREC, Lake Alfred in April 2003 and was organized by **Pete Timmer**, **Jim Graham** and **Richard Lee**.

Following the course, a group of 11 Florida citrus nurserymen and their spouses plus several IFAS research and extension faculty took a trip to visit São Paulo, Brazil led by **Drs. Natalia Peres** and **Pete Timmer**.



Natalia Peres and Pete Timmer examining some orange trees in a nursery

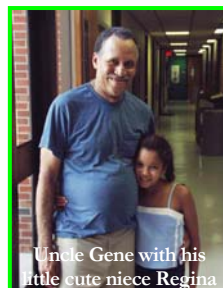
The group visited several state-of-the-art greenhouse nurseries where trees are produced in containers. Sanitary measures are strict requiring use of special uniforms to enter the nursery area.



The group from Florida used special uniforms to enter the state-of-the-art greenhouse nurseries containing citrus trees

The groups also had the opportunity to visit farms with exotic diseases such as sudden death, citrus variegated chlorosis, leprosis, and black spot.

Talking to People in our Department



From now on, PLP News will interview staff and faculty in our department with the mission to bring up interesting facts about them that we would never know. In this issue of the PLP News, we are glad to present some facts about **Mr. Eugene Crawford**. Who does not know this character? In Fifield Hall everybody has exchanged at least a few words with our dear friend Eugene Crawford. He has been working in Plant Pathology since 1969. Gene has worked with many professors such as Dr. Zettler, Dr. Hiebert, Dr. Purcifull and Dr. Kimbrough. Gene often visits our labs filling them with harmony and friendliness especially when we are going through hard times getting the expected results from our pathological experiments. Although we tried hard to get

deep dark secrets about the department from Uncle Gene, he was unwilling to provide details.

Family Matters

Sravya R. Keremane, daughter of **Manjunath** and **Chandrika**, won top honors in Spring 2003 at the Florida State Science and Engineering Fair.

Her project was titled "Cloning a cold tolerant gene in *Agrobacterium* for citrus transformation". Sravya's project received the grand award in the junior division. She also received first place in the microbiology category. Sravya's project earned her an opportunity to submit research in the Discovery Young Scientist Challenge competition.

The Biannual Meeting of the Florida Phytopathological Society 2003

Students, staff, and faculty of the Plant Pathology Department converged upon Fort Pierce, Florida this May to present and share the latest research on



Graduate students attending the Florida Phytopathological Society Meeting in Fort Pierce. Back row left to right: Robin, Whitney, Gina, Jennifer, Lisa and Myrian. Front row left to right: Aaron, Andy, Fabricio, Botond, Ronald and Jonathan.

Phytopathology in the US and the state of Florida at the 8th Biennial Meeting of the Florida Phytopathological Society.

The event, held May 5th to May 7th at the USDA Horticultural Research Laboratory, kicked off with an "Old

Florida" tour of Adam's Ranch in Ft. Pierce for those who arrived early.

The main event began the 6th, with **Dr. Harald Scherm**, from the University of Georgia, giving the keynote speech: "Global Change and Global Challenges for Plant Pathology and Pest Management," which he used to highlight his presentation on mummy disease of blueberry and wild relatives. Thereafter, **Dr. Gail Wisler**, Chair of the Department of Plant Pathology at UF, discussed the new developments in agricultural security in her talk, "The role of UF in the Southern Plant Diagnostic Network".

The first item on the agenda, after the opening speeches, was a graduate student paper competition, with several students from our department presenting their research as following: **Whitney Elmore** (Cross-pathogenicity tests to determine susceptibility to *Gaeumannomyces graminis* var. *graminis* in cultivars of warm-season turfgrasses); **Fabricio Rodrigues** (Ultrastructural and cytochemical aspects of silicon-mediated rice blast resistance); **Ronald French** (Oospores and weeds: Potential sources of initial inoculum of *Phytophthora capsici* in commercial vegetable fields in Florida); **Botond Balogh** (Efficacy of bacteriophage formulations for control of bacterial spot of tomato); **Steven MacKenzie** (Sexual recombination and pathogenic variability among *Colletotrichum gloeosporioides* on naturally inoculated strawberry petioles); **Robin Oliver** (Transformation of three molecularly different *Xylella fastidiosa* isolates with one of two autofluorescent protein genes for simultaneous visualization within xylem vessels of *Vitis vinifera*) and **Aaron Hert** (Relative Importance of Bacteriocin-like genes in antagonism of T3 Strains to T1 Strains of *Xanthomonas campestris* pv. *vesicatoria*).

Congratulations to students **Fabricio Rodrigues**, **Ronald French** and **Steven MacKenzie** who won, respectively, the first, second and third prize

during the Graduate Student Paper competition.

After the competition, the meeting was dispersed into several simultaneous and interesting conferences about bacterial, fungal and viral diseases; biological and chemical control of plant diseases; molecular plant pathology; and plant disease epidemiology.

Pan American Plant Disease Conference 2003

The Pan American Plant Disease Conference was held in South Padre Island, Texas, from April 5-10, 2003.

This meeting was held in conjunction with the 82nd Annual Meeting of the American Phytopathological Society (APS)-Southern Division, 42nd Annual Meeting of the APS-Caribbean Division, XII Congress of the Latin American Phytopathological Society (ALF), and the XXX Congress of the Mexican Society of Plant Pathology.

Our graduate student body was well represented by **Fabricio Rodrigues** and **Ronald French**. Fabricio won first place in the APS-Southern Division Graduate Student Paper competition. Ronald also took first place in the APS-Caribbean Division Graduate Student Competition.

A recent alumnus from our department who attended the meeting was **Juliana Freitas-Astua**, former editor of the PPL News. Juliana was invited to give a talk on Citrus Sudden Death (CSD), which has been causing severe losses in the Brazilian citrus production areas of the southwest and northern parts of Minas Gerais and São Paulo states, respectively. The cause of CSD is still unknown.

Florida was well represented by our Plant Pathology community from UF-IFAS, USDA, DPI, as well as folks from the Doctor of Plant Medicine (DPM) Program. **Adam Silagyi** (recent graduate of the DPM program) and **Bob McGovern** (Professor of Plant Pathology and Director of the DPM program)

presented a poster on the DPM program. Bob is also Secretary-Treasurer of the APS-Southern Division.

Recent Publications

Rodrigues, F.A., Benhamou, N., Datnoff, L.E., Jones, J.B. and Bélanger, R.R. 2003. Ultrastructural and cytochemical aspects of silicon-mediated rice blast resistance. *Phytopathology* 93:535-546.

Brunings, A.M. and D.W. Gabriel. 2003. *Xanthomonas citri*: breaking the surface. *Molecular Plant Pathology* 4(3):141-157.

MacKenzie, S.J., Xiao, C.L., Mertely, J.C., Chandler, C.K., Martin, F.G. and Legard, D.E. 2003. Uniformity of strawberry yield and incidence of *Botrytis* fruit rot in an annual production system. *Plant Disease* 87:991-998.

Mertely, J.C., MacKenzie, S.J., and Legard, D.E. 2002. Timing of fungicide applications for *Botrytis cinerea* based on development stage of strawberry flowers and fruit. *Plant Disease* 86:1019-1024.

Urena-Padilla, A.R., MacKenzie, S.J., Bowen, B.W. and Legard, D.E. 2002. Etiology and population genetics of *Colletotrichum* spp. causing crown and fruit rot of strawberry. *Phytopathology* 92:1245-1252.

The American Phytopathological Meeting 2003

The American Phytopathological Society (APS) held its annual meeting in Charlotte, North Carolina, from August 9-13, 2003. The theme for this meeting was "Plant Health and Security in the Age of Genomics".

There were plenty of sessions to choose from, depending on your interest. Some sessions were organized by members of our state's plant pathology community. "Science and the Legal System: When Worlds Collide" was organized by **Tim Gottwald** (USDA-

Ft.Pierce) and **Randy Ploetz** (IREC-Homestead). "Emerging and Re-emerging Threats to USA Agriculture" was co-organized by **Scott Adkins** (USDA-Ft.Pierce). "Integrated Pest Management of Tospoviruses and Their Thrip Vectors" was co-organized by **Timur Momol** (NFREC-Quincy). Of interest to all, especially our graduate student body, was the session titled "The Role of Teaching Assistants in Higher Education" which was co-organized by **Carol Stiles** (UF-Gainesville).

Many of our graduate students presented posters and oral talks or simply attended the meeting as a way to be active in the society.

Once again, Florida Plant Pathology had one of the highest attendances by any state, as is customary year after year. That could easily be noticed just by visiting the Alumni social sponsored by our department on Monday night. Many of our current Florida Plant Pathology family were present to socialize and mingle with alumni and colleagues who had been members of our family in the recent past.

APS Meetings 2004

The Annual Meeting of the American Phytopathological Society will be held in the beautiful city of Anaheim, California from July 31-August 4, 2004. This meeting is expected to attract a large number of participants and for those of us Floridians planning to attend, start making plans as soon as possible (Anaheim is home to Disneyland as its major attraction). If you need more information, please visit the APS website at www.apsnet.org.

The Annual Meeting of the APS-Southern Division will be held in Tulsa, OK, February 15-17, 2004. Please, visit this site http://www.cals.ncsu.edu/plantpath/SD_APS/SouthernAPS.html for more

information regarding this exciting meeting.

Facts on California



Admission to Statehood: September 9, 1850

Bird: California Valley Quail

Flower: California Poppy

Tree: Coast redwood

Area: 163707 square miles

Border States: Arizona, Nevada and Oregon

Agriculture: Vegetables, fruits and nuts, dairy products, cattle, nursery stock, grapes

Industry: Electronic components and equipment, aerospace, film production, food processing, petroleum, computers and computer software, tourism

Lowest point: Death Valley

Motto: Eureka

Nickname: Golden State

Origin of State's Name: Named by Spanish after Califia, a mythical paradise in a Spanish romance written by Montalvo in 1510

Population: 33,871,648

Topography: Long mountainous coastline, central valley, Sierra Nevada on the east, southern desert basins, rugged mountains in the north

Flag: raised at Sonoma on June 14, 1846, by a group of American settlers in revolt against Mexican rule. The flag was designed by William Todd on a piece of new unbleached cotton. The star imitated the lone star of Texas. A grizzly bear represented the many bears seen in the state. The word, "California Republic" was placed beneath the star and

bear. It was adopted by the 1911 State Legislature as the State Flag



This year the International lunch took place on November 5th. Once again our colleagues cooked up a storm. Dishes representative of the cuisine from Brazil, Egypt, Colombia, Costa Rica, Germany, Ghana, Hungary, India, Mediterranean region, Scotland, Panama, Peru, South Africa, Suriname, Thailand, USA, Venezuela were served.



People enjoying the international food

The International Lunch was well attended by students and faculty from a number of different Departments. The cultural atmosphere was enhanced by a wonderful selection of music from around the world. This event not only exposed people to dishes worldwide, but also provided an opportunity to interact with international people. The International Lunch committee would like to thank everyone who participated and made this event a great success.

Friday Coffee Break Schedule Winter 2003-2004

December

5 Gabriel and Hiebert/Polston
12 Charudattan and Jones
19 Bartz, Stiles, Plant Dis. Clinic and Harmon

26 Christmas Break

January

2 New Year's Break
9 Office Staff and DPM
16 Kimbrough and Rollins
23 Chourey, Virology Lab and Pring
30 Kucharek and Song



February

6 Gabriel and Hiebert/Polston
13 Charudattan and Jones
20 Bartz, Stiles, Plant Dis. Clinic and Harmon
27 Office Staff and DPM

If you would like to contribute with an article, a short piece, or a suggestion, please mail us at:

PLP News
1453 Fifield Hall
P.O. Box 110680, Gainesville, FL 32611

News Team and Collaborators
for Spring, Summer and Fall 2003

Fabrício Ávila Rodrigues (Editor)
Collaborators:

Dr. Gail Wisler, Dr. Jerry Bartz, Dr. Pete Timmer, Dr. Jeff Jones, Dr. R. Charudattan, Dr. Ernest Hiebert, Ronald French, Whitney Elmore, Penny Robison, Abby Guerra, Jonathan Horrell, Aaron Hert, Yolanda Petersen and Adriana Castañeda.

The opinions expressed in this newsletter are not necessarily those of the PLPNews Staff.

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