PLANT DISEASE SPOTLIGHT

DISEASE
Tomato Yellow Leaf Curl Virus

CAUSAL AGENT
Tomato Yellow Leaf Curl Virus (TYLCV)
Genus: Begomovirus
Family: Geminiviridae

INSECT VECTOR
Silverleaf whitefly
Bemisia tabaci Biotype B
(Bemisia argentifolii)

TRANSMISSION
Circulative

PLANT HOSTS
Tomato, common bean, pepper, lisianthus

SYMPTOMS
Stunted growth, chlorotic leaf margins, leaf cupping, reduced leaf size, flower drop
INSIDE THIS ISSUE

4 Welcoming Remarks
5 GRACE Grows
7 Program Exhibits, Activities, and Student Recruiting
8 New Student Profiles
10 Congratulations to our Graduates
12 Student Accomplishments
13 Alumni Spotlight: Dr. Chris Ferguson
Dear Alumni and Friends:

2018 was an exciting year for the interdisciplinary Doctor of Plant Medicine (DPM) program! Some of our outstanding student internships were completed with ArborJet, USDA-APHIS-PPQ, Driscoll’s, and Syngenta. Six exemplary students graduated and are pursuing careers as professional Plant Doctors! Fall 2018 was particularly busy as four new students joined the program-welcome Heather Kalamari, Brianna Whitman, Keir Hamilton, and Clayton Bania! DPM students received many awards, presented their research at conferences, and attended meetings with industry stakeholders. The DPM program also furthered our partnership with La Escuela Superior Politécnica del Litoral (ESPOL) through teaching an Integrated Pest Management Workshop in Ecuador, and DPM students will travel to Ecuador in 2019 for a professional development field trip. Our students continue to learn leadership through service in the DPM student organization (DPMSO) and with leadership roles in the USDA-APHIS-PPQ funded plant biosecurity youth outreach or Florida First Detector Program. In this edition, you will also learn about the DPM programmatic educational partnership that began with GRACE Grows during 2018. DPM students have developed or redesigned most of the educational curriculum for this new community service program. The DPM program intends to continue with the GRACE Grows partnership for delivery of educational content at upcoming courses.

Thank you for your continued support of the University of Florida, Doctor of Plant Medicine (DPM) Program! Our students have many opportunities due to internship and network opportunities, and faculty instruction at one of the top agricultural land grant institutions in the world. As we begin 2019, I am pleased to announce that all three of our spring 2019 graduates have already accepted job offers. The diversity of opportunities is only possible through supportive faculty, industry stakeholders, and state or federal partnerships. Go Gators!

Sincerely,

Dr. Amanda Hodges
Director, Doctor of Plant Medicine Program
RACE Marketplace, a 30-acre, low-barrier, one-stop service center and shelter for homelessness, opened its doors in 2014 in Gainesville, Florida. Since then it has provided housing, food, and medical service to people experiencing homelessness in Alachua county. There are approximately 115 people sheltered at GRACE Marketplace and 150 people living around the perimeter who also receive services. The facility is run by staff and volunteers who are passionate about helping people improve their lives.

One of these volunteers, Abigail Perret-Gentil, started gardening at GRACE Marketplace to share her love of growing plants. “I wanted to share something with people who are struggling that has given me peace and purpose. It was meant to be a gift, where even if people did not have shelter, at least they could have a tiny piece of earth that was all their own.”

The garden was named GRACE Grows Garden. As more guests joined Abigail in the garden and expressed interest in learning about plants, an opportunity arose to offer valuable education to people in need. “We added the Vocational Program to GRACE Grows at the advice of Helen Strain, GRACE Marketplace’s former Director of Community Engagement. The goal was to contribute to GRACE Marketplace’s evidence-based approach to ending homelessness. We wanted to provide something that also had measurable and tangible outcomes for the guests of GRACE. With an industry-backed credential in horticulture and the support system we provide, people there can seek better opportunities for themselves.”

The first vocational program was offered at GRACE Marketplace in 2018. DPM student Alicia Kelley joined the volunteer team and worked with Abigail to develop an agriculture curriculum. The program consisted of hour-long lessons on an agricultural topic once a week for two months. After the lesson, instructors joined the students in the garden for hands-on learning and demonstration. Each participant managed their own raised bed and grew any plants they wanted. Participants were paid a weekly stipend for attendance at each lesson and their work in the garden. At the end of the course, guests expressed an improvement in their sense of community and mental health. The time spent gardening provided a place of relaxation, exercise, and bonding.

Charles, a guest of GRACE Marketplace and a participant in the spring program last year, described the mental health benefits he experienced. “I use to love to garden with my father growing roses, but several years ago I got encephalitis from a mosquito. Because of that I lost a lot of my memory. This program has brought those memories back to me.”

GRACE Grows Garden has expanded substantially in the past year thanks to several fundraising efforts, generous donations, and hard-working volunteers. There are now 21 raised beds, two flower beds, two herb boxes, seven fruit trees, and several flower gardens. Recently, volunteers added wheelchair accessible garden beds and irrigated, tilled rows.

“For individuals that have experienced trauma, gardening can provide a valuable way to heal, connect with others, and practice self-care.” - Sienna Turner
Sienna Turner, who graduated from UF with a Bachelor’s in Plant Science, began directing GRACE Grows Garden in Fall of 2018. She has brought incredible leadership to the program and worked to improve the vocational program.

“I believe that many people often feel powerless to help individuals experiencing homelessness,” Sienna writes. “We want to provide support, but may be uncertain of how to do this in the most beneficial way. When I began volunteering with GRACE Grows, I saw an opportunity to have a meaningful impact on the lives of others. Gardening has long been a therapeutic activity that calms the mind and allows people to connect with nature. For individuals that have experienced trauma, gardening can provide a valuable way to heal, connect with others, and practice self-care. As part of a holistic approach, I loved that GRACE Grows’ mission was rooted in providing education and improving employment opportunities. Collaborating with Abigail, all of our amazing volunteers, and GRACE Marketplace guests to develop GRACE Grows into a long-term, robust, and effective program continues to be incredibly rewarding.”

As the next Spring semester approaches, volunteers at GRACE are preparing for the next Spring Vocational Training Program. This spring, we expect to teach 12 guests basic horticultural and agricultural skills and knowledge to prepare them for the FNGLA Certified Horticulture Professional exam. DPM students Sage Thompson and Keir Hamilton joined the volunteer team and led the effort to restructure the course for this new goal. Our hope is to improve the employability of the participants with an official certification.

As the GRACE Grows vocational program begins its second semester, the excitement of learning and the joy of gardening continues to inspire volunteers and participants. In the future, volunteers hope to offer the vocational program twice a year, with weekly demonstrations from agronomy and horticulture professionals.

“What I love about GRACE Grows is the fact that it gives people hope, myself included,” Abigail writes. “The people of GRACE and all the volunteers who have come together to help one another remind me that there is a lot of good in the world. I believe that because gardening is such an ancient universal tradition, that it has the power to bring people together over shared stories of culture, family, and food. This work has taught me to listen. The guests of GRACE are some of the strongest people I know and their stories have changed my life.”
PROGRAM EXHIBITS, ACTIVITIES, AND STUDENT RECRUITING

AUGUST
• Clayton Bania, Matt Borden, and Ploy Kurdmongkoltham helped at the entomology outreach table for the honey bee lab opening.

SEPTEMBER
• Dr. Hodges and Ploy Kurdmongkoltham attended the Florida Fruit and Vegetable Association Annual Convention in Naples, FL.

OCTOBER
• Alex Gannon, Ariane McCorquodale, Nick Goltz, Ben Waldo, Craig Frey, and Matt Borden attended FNGLA.
• Dr. Hodges, Clay Bania, Ploy Kurdmongkoltham, and Ariane McCorquodale promoted entomology and DPM at TailGator!
• Dr. Hodges and Ploy Kurdmongkoltham presented a Florida First Detector seminar to Hernando County community gardeners.
• Clayton Bania represented entomology and DPM at the Tallahassee Science Festival.

NOVEMBER
• Arjun Khadka, Sage Thompson, Cory Penca, Morgan Pinkerton, and Eleanor Phillips attended ESA in Vancouver.
• Clayton represented the DPM program at Career Connections event at Abraham Baldwin Agricultural College.
HEATHER KALAMAN

Academic Credentials:
- B.S. in Biology – University of Central Florida, 2014
- Co-enrolled M.S. in Environmental Horticulture and DPM

Why DPM?
I was born and raised here in the state of Florida, and my love for plant science began during my undergraduate studies. During this time, I participated in a study abroad trip to Guyana, South America to study the ethnobotanical use of plants by the Macushi Amerindians, with Professor Steve Myers. Exposure to this indigenous culture, and respect for the plants around them in terms of both use and conservation, left me captivated.

My interests in plant identification, propagation, and diagnostics are all encompassing and continuously evolving. This has coincided well with the objectives and opportunities provided within the DPM program, and I look forward to my future experiences in applied practice and research in such a multifaceted environment.

Additionally, I am pursuing my Master’s in Environmental Horticulture under the advisory of Dr. Knox, Dr. Wilson, and Dr. Mallinger. My thesis work will focus on pollinator plant interactions, evaluating the efficacy and resource value of ornamental plants for native bees. My goal is to generate the necessary research to support the assumptions that certain ornamentals marketed as pollinator friendly provide beneficial floral resources to our native bee populations.

BRIANNA WHITMAN

Academic Credentials:
- B.S. in Entomology and Horticulture, minor in Crop Science - University of Idaho

Why DPM?
I decided to enroll in DPM because it was interdisciplinary. I was originally planning on doing a Master’s in horticulture and a PhD in entomology so that I could be well rounded and use that to take a multi-faceted approach to problems. While trying to figure out how to fit plant pathology into this plan, I found the DPM program. It was an easier way to accomplish what I wanted.
**KEIR HAMILTON**

**Academic Credentials:**
- B.S in Environmental Science and Policy - University of South Florida
- M.S. in Environmental Horticulture - University of Florida

**Why DPM?**
After graduating with an interdisciplinary B.S. degree in Environmental Science and Policy from the University of South Florida and a M.S. degree in Environmental Horticulture from the University of Florida, I was convinced that I should pursue a multidisciplinary doctoral degree. The Doctor of Plant Medicine program piqued my interest because it assesses plants from a host-centric perspective. Furthermore, I was attracted to the DPM’s target to incorporate integrated plant medicine into their curriculum. Objectively, the DPM program aligns with my goals because it is committed to facilitating students to become applied plant doctors, scientists, researchers, educators, entomologists, nematologists, and plant pathologists.

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**CLAYTON BANIA**

**Academic Credentials:**
- B.S. in Biology with concentration in Plant Biology – University of South Florida

**Why DPM?**
After spending some time in the workforce managing a hydroponic farm, I found the main shortcoming of my knowledge to be identification of pests and diseases. With dreams of owning my own farm one day, I constantly look to gain as much knowledge and experience as I can about farming plants. I looked to find suitable academic fits that would offer me the best opportunity to learn what I needed and found the DPM program to be exactly what I was looking for!
CONGRATULATIONS
to our graduates

DR. JAMIE BETTS

Although I certainly know the years and work put into completing the DPM program, it seems like the time has flown by! As a full-time employee in the Ag Industry, this program was an absolute perfect fit for me and allowed me to keep my job. Being a student while working in the Ag Industry, there were many times where I felt overwhelmed but kept pushing through it all because I knew how important the end result would be. The interdisciplinary nature and applied training that is offered in this program is why I chose to further my education at the University of Florida. Dr. Hodges and the staff truly care about this program along with going above and beyond to assist each individual when needed. All the knowledge, experiences and training that I have gained from this program is not only used each day in my current role but will continue to be extremely important in my future endeavors. I have truly enjoyed furthering my education at the University of Florida and will forever be proud to call myself a graduate from the Doctor of Plant Medicine program.

DR. LANETTE SOBEL

The DPM program afforded me the opportunity to explore all areas of plant health. I truly enjoyed delving into entomology, nematology, weed science, and all areas of plant pathology. But my expertise going into graduate school was in composting (especially with earthworms) and soil health is what I still feel most drawn to.

After graduation, I decided to focus on expanding my business in south Florida. While in graduate school, we focused on diverting food waste to feed farm animals such as chickens and pigs. But due to the limited number of animal farms in the area, we are in the process of developing south Florida’s first soil farm, complete with large scale commercial composting, an earthworm farm and a research plot focusing on bioassays. We will also be developing organic soil mixes and organic liquid fertilizers for commercial and residential use as well as custom soil blends for the cannabis industry.

I believe my time spent in the DPM program has prepared me far beyond what I expected to take on this endeavor. And I look forward to putting my knowledge to good use for the betterment of the environment and society.
Dr. Bruce Stripling

When I look back when I entered the program to where I am today, I think the biggest enjoyment is developing relationships and understanding the dynamics and opportunities that come about in agriculture in Florida. Those relationships helped shape my career path. Not only did I earn a valuable education, but the relationships I built with my peers and the faculty are immeasurable.

The DPM program has benefited me immensely. There is only one other institution globally that I am aware of that can prepare you for working in agriculture or agribusiness, and the Doctor of Plant Medicine program from UF is in a class to itself. No other program can provide you with the skill sets, knowledge, and resources to walk out of classroom and make an immediate impact in your career on day one. The day you graduate you have developed a network of relationships with some of the most decorated researchers in the country, and you have the skill sets to tackle agronomic opportunities and challenges with an understanding of the largest biology basics across every fundamental discipline. The Doctor of Plant Medicine is quickly becoming the standard for hiring agronomic specialists who can cover biology basics from A-Z.

Prior to graduation, I was offered a position managing a regional technical service group for FMC. Currently my geography is from Louisiana to Maine, including Tennessee, Arkansas and Kentucky. The diversity in agriculture in Florida is a true blessing as you begin to enter into your career and work in commodities across row crops and specialty crops. The investment I made into the program was returned the first year of employment in my new role.

Thank you to the faculty and staff as well as my peers for the educational training and the relationships. Go Gators.
STUDENT ACCOMPLISHMENTS

MATT BORDEN

At the ESA conference in Vancouver, BC, Matt earned first place in the P-IE Ecology and Conservation category for his talk, “Do soil mitigation strategies following residential development facilitate invertebrate community recovery and ecosystem services?” Matt also won a Best of Show medal in the 2018 National Insect Salon (PSA) Sequence category for a cicada emergence series. Great job!

JESSICA AWAD

Jessica orchestrated an excellent symposium about scale insects at the joint ESA meeting in Vancouver. She is the first DPM student to organize a conference symposium. Great work Jessica!

TAYLOR SMITH

Taylor Smith was promoted to Biological Scientist III at DPI! Taylor has been an employee of FDACS-DPI since 2013, where she works to diagnose citrus diseases. Congratulations Taylor!

ELEANOR PHILLIPS

Eleanor was the recipient of two UF travel grants which enabled her to give a talk titled “Olive Pests in Florida: A survey of arthropods in north central Florida olive groves” on November 11 at the 2018 ESA, ESC, and ESBC Joint Meeting in Vancouver, Canada. Her presentation included preliminary findings from her entomology thesis research, and how it will inform IPM plans for Florida olive growers.

ALICIA KELLEY

Alicia Kelley presented her research on nutrient cycling at the 19th Annual Soil and Water Sciences Research Forum.

BRIANNA WHITMAN

Why did you choose to enroll in the DPM program?

While pursuing my MS in Plant Science, I knew that I wanted to continue my education. I found the DPM program online and after some research on the degree, I knew it was for me. I am a hands-on person who loves to be in the field and the DPM degree trains students to become excellent scouts, diagnosticians, and ultimately managers of crops. The broad scope of the degree allows you to understand multiple areas related to plant growth and health. A DPM can understand literature regarding an insect or nematode affecting plants as easily as plant pathology problems and have the knowledge to apply IPM tools to manage these issues.

What is your current occupation, and how has your DPM degree aided you in the tasks and responsibilities associated with your position?

I am currently the Crop Protection Manager for Hopewell Nursery. We are one of the largest ornamental nurseries in New Jersey and primarily grow for Home Depot stores. We grow trees, shrubs and perennials on multiple farms. I run a spray crew for each farm. My primary job is scouting and identification of pests and diseases through incubation, microscopy, and lab techniques. After diagnosis, I work through a management plan of biotic and/or abiotic factors which may contribute to the spread of the pest or disease. I train all my pesticide handlers and make sure they have the proper equipment for the job. I calibrate and service every sprayer with the help of my workers. During the winter, I coordinate fertilizer applications and collect water record data for the state.

After graduation, what career paths/opportunities were available to you?

After graduation, I applied to many positions relating to extension, pest management and IPM. There were many research positions open at the time which a DPM would be qualified, however, that was not the route for me. My first position after graduating was with a large potato farm managing pesticide and fertilizer applications as well as scouting for insect and diseases.

Are there any challenges that your DPM degree has helped you overcome?

The DPM degree has allowed me to be well-rounded and allows me to step back and assess a situation from multiple angles. Prior to my arrival, there were problems with plants that were constantly being sprayed with fungicides but with no success. After examination and research, the pathogen turned out to be bacterial. Changing chemicals resolved the issue and saved the company money. Other plants were being sprayed when the problem was edema and culprit was abiotic. This was resolved by moving the plants to a more suitable environment. My knowledge in entomology has helped me find insect problems previously undetected at the farm as well as the association of known insects on the farm as vectors of diseases the company has battled for years.

Do you have any advice for current DPM students?

My advice is to be open to all career possibilities. For the vast majority, the first job after graduation will not be your only one. It will open doors though and allow you to understand the industry better. The DPM program is making great strides in establishing itself. You may have to educate your employer as to the importance of your degree. My past job was previously held by a DPM whereas my current employer had never heard of us and had many questions through the interview about exactly what it is that we do. Don't get discouraged. After a few years, your experience in the industry combined with your education and great track record will open many doors.
### External Advisory Committee

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<tr>
<th>Name</th>
<th>Position and Organization</th>
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<tbody>
<tr>
<td>BEN BOLUSKY</td>
<td>Chief Executive Officer, Florida Nursery, Growers and Landscape Association</td>
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<tr>
<td>REGGIE BROWN</td>
<td>Executive Vice President, Florida Tomato Exchange</td>
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<tr>
<td>TREVOR SMITH</td>
<td>State Plant Regulatory Official/Director, FDACS-Division of Plant Industry</td>
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<tr>
<td>MARY HARTNEY</td>
<td>President and Executive Director, Florida Fertilizer and Agrichemical Association, Committee Chair</td>
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<tr>
<td>GARY HEIN</td>
<td>Doctor of Plant Health Director, University of Nebraska</td>
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<tr>
<td>RICHARD MIRANDA</td>
<td>Florida State Plant Health Director, USDA-APHIS-PPQ</td>
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<tr>
<td>MADELINE MELLINGER</td>
<td>President, Glades Crop Care, Past Committee Chair</td>
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<tr>
<td>CLAY PEDERSON</td>
<td>Managing Director, Agromillora Florida, Chair of the DPM Alumni Support Committee</td>
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<tr>
<td>TIM DURHAM</td>
<td>Associate Professor of Crop Science, Ferrum College, Vice Chair of the DPM Alumni Support Committee</td>
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<tr>
<td>MARTHA RHODES ROBERTS</td>
<td>Former FDACS, Deputy Commissioner of Agriculture, Adjunct Professor, University of Florida</td>
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### Faculty Advisory Committee

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<th>Name</th>
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<tr>
<td>JOHN CAPINERA</td>
<td>Entomology and Nematology Department</td>
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<tr>
<td>BILLY CROW</td>
<td>Entomology and Nematology Department</td>
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<td>NICK DUFAULT</td>
<td>Department of Plant Pathology</td>
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<td>JOHN ERICKSON</td>
<td>Agronomy Department</td>
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<td>NORMAN LEPPLA</td>
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<td>HEATHER MCAUSLANE</td>
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<td>KIMBERLY MOORE</td>
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<td>JOHN PETERSON</td>
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<td>KEITH SCHNEIDER</td>
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<td>XIN ZHAO</td>
<td>Horticultural Sciences Department</td>
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### Doctor of Plant Medicine Student Organization (DPMSO)

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<tr>
<td>PLOY KURDMONGKOLTHAM</td>
<td>President</td>
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<td>ARIANE MCCORQUODALE</td>
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<td>MATT BORDEN</td>
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<td>BENJAMIN WALDO</td>
<td>Historian</td>
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<tr>
<td>ARJUN KHADKA</td>
<td>GSC Representative</td>
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<tr>
<td>AMANDA HODGES</td>
<td>Faculty Advisor</td>
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### DPM Program Staff

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<tr>
<td>AMANDA HODGES</td>
<td>DPM Director</td>
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<tr>
<td>ELENA ALYANAYA</td>
<td>Academic Advisor I</td>
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Volume 15 Fall 2018 | 15