

# Horticulture

Adventure. Leadership. Excellence. Community.

## In this Issue Working Together

Faculty, staff, and students work with partners big and small from the community

UNIVERSITY OF MINNESOTA  
Driven to Discover<sup>SM</sup>

# Adventure.

## Scholarship Meets Experience at the MN Landscape Arboretum: Student Spotlight on Madeline Esterl

**W**ind blows through the leaves of the forest canopy, the smell of fish and wet grass in the air. Insects buzz through the morning mist and birds chirp territorial warning calls to one another. Water gently laps the rocky shoreline, the sun glinting off Lake Tamarack. Today, Madeline Esterl (*B.S. 2017*) plans to set this scene on fire.

Esterl — a dual major in Anthropology and Conservation Biology — is the 2016 recipient of the George and Mary Lou Klacan Scholarship, which provides financial support to a summer intern at the Minnesota Landscape Arboretum. As part of her internship, she is performing a controlled burn. “First they spray the whole field,” explains Esterl. “After a couple weeks it all turns brown, and a small crew brings tanks around and burns the whole field, from four to five acres, for a couple of hours.” The group later comes back to treat the field, and in the fall they re-grow the native plants. “The day we got to do the controlled burn at Lake Tamarack has probably been my favorite part of my internship so far.”

Experiential learning, often completed through an internship, is an integral part of all CFANS majors. It gives students an opportunity to explore the field they’re interested in and gather new skills that they don’t learn in the classroom. While the controlled burn may be her favorite part of the internship, Esterl is assisting on a variety of projects, as well as completing her own project in monitoring bur oak blight throughout the Arboretum. The bulk of her internship has involved learning about Integrated Pest Management (IPM) at the Arboretum with her supervisor Dan Miller, the Arboretum’s IPM specialist. “Dan and I scout around the Arboretum looking for different problems like diseased plants or possible insect damage. When we find an issue we take a sample and then figure out how



to treat them without using harsh chemicals.” says Esterl.

While several students interned at the Arboretum this summer, Esterl was chosen to receive the Klacan scholarship because of her work in the classroom and her excitement for the work she’s doing. “She’s an excellent student who works well independently,” says Mary Meyer, professor in the Department of Horticultural Science. “Madeline is always ready to learn something new.” Esterl’s enthusiasm for plants is apparent within a few moments of speaking with her, and she’s eager to pass on that excitement. “We need variety in our plant life,” says Esterl. “If kids and adults can learn to truly see the plants around them, and understand the importance of biodiversity for things like food, clothes, and medicine, then they’ll have more of a stake in it.”

The Klacan scholarship is unique in that it gives recipients the chance to both complete a paid internship and get a traditional scholarship when the school year begins. Because of this setup, Esterl will be able to pursue other professional opportunities during the school year. “I’m not really sure what I want to do after college yet, but experiences like this are helping me to figure that out,” says Esterl.

Beyond the skills that she has learned, the internship has been a networking opportunity for Esterl as well.

**Above:** Madeline Esterl next to a tree infected with bur oak blight, which she is researching for her internship project.

She’s gotten to know professionals at the Arboretum as well as the founders of her scholarship. “I’ve met George and Mary Lou Klacan a couple times and had lunch with them. It’s great to see people from their generation so interested and invested in my generation.”

The results of the controlled burn, like many of Esterl’s experiences, won’t be visible until after she has left her internship. However, the skills and knowledge she has gained, and the people she has met will continue to be of value as she completes her degree and beyond. ♦

*This article was a collaboration between A’Davian Smith and Echo Martin. In the summer of 2016, the department hired Smith, a high schooler from Minneapolis, in the main office as a Step-Up intern. Step-Up is a City of Minneapolis jobs program for youth and young adults ages 14-21. Each summer STEP-UP recruits, trains, and places more than 1,500 Minneapolis youth in great jobs with over 200 top Twin Cities businesses, public agencies and nonprofits. Step-Up interns explore diverse career interests, gain valuable on-the-job skills, make strong professional connections, and prepare for meaningful careers.*

# Excellence.

## Bridging the Divide Between Public and Private

Science does not happen at the University of Minnesota without support from intersecting industries. This support can take many forms, such as directly working with a company to release a new variety of plant into the market, or the industry lobbying to get public funding for a research area. Other times these relationships are more tangential, formed when the research experience at the University complements the needs of an organization that may or may not have plants as its end product.

### Partnership Spotlight: Pyrethrum Breeding with MGK

Pyrethrum, a member of the chrysanthemum family, is a plant that has been used in insect control for centuries, and is one of the most commonly used green pesticides in organic agriculture. Pyrethrins, the chemical family derived from pyrethrum, have been shown to be effective on ticks, bed bugs, aphids, and more. This plant isn't new to McLaughlin Gormley King (MGK), a Minnesota-based company creating products that protect people and their environments from the impact of insects since 1902. "MGK's reputation is based on having small family farmers in East Africa grow pyrethrum as a sustainable perennial crop that earns them additional cash," Neil Anderson, professor and flower breeder, explains. "They've always had a very sustainable model and strive to produce green pesticides that are safe for humans." MGK has a long history with the U of M, and in 2011 they met with Anderson to discuss their first major partnership with the Department of Horticultural Science.

"They approached us to help with some issues on pyrethrum through breeding," says Anderson. "We have one of the best chrysanthemum breeding programs in the world right in their backyard, so it made sense for them to come to us." When a company approaches a public sector

breeding program, it's often with the goal of conducting long-term visionary research. They focus on long-term goals that look at possible crop transformations either because they are necessary or because there is the potential for added value.

Though MGK approached the University, both sides benefit from this partnership. "Working with MGK gives my breeding program the chance to broaden the crops we're working with," says Anderson. Pyrethrum has not previously been part of the chrysanthemum breeding program, but Anderson sees a great deal of potential. "There are two species of pyrethrum, one with white flowers and the other with colored daisies. They also have very ornamental foliage that is silvery-gray in color. They could be novel options for ornamental plants."

While both sides have something to offer in this partnership, Anderson stresses that it's the combination of their working groups that makes this partnership really work. "What's been critical for us is having a great team of people. They have the entomologists and the chemical extraction labs, which pairs well with what we do in breeding the flowers. We tap into their expertise and we add additional dimensions to their team."

The partnership between Anderson's breeding program and MGK is just one example of the University collaborating with industry needs. The department has expertise in a variety of fields related to horticulture, some of which are detailed to the right. Sometimes the best partnerships are created from looking for unusual intersections in expertise. ♦

### Areas of Expertise

- Plant cytogenetics
- Organic soil health
- Sustainable lawns
- Azalea breeding
- Plant metabolomics
- Native grasses
- Fruit breeding
- Economics of horticultural products
- Postharvest physiology
- Edible dry bean breeding
- Urban food systems
- Greenhouse production
- Auxins
- Plant reproduction

# Community.



## Growing as a Community: Building Horticulture into North High

The greenhouse at North Community High School is a small space, just big enough to fit the 10 students in Mr. Vreeland's 11<sup>th</sup> and 12<sup>th</sup> grade science class. Five years ago this space was just one more unused room in a school facing the cutting block. Today it is the apex of an initiative around youth development and urban agriculture in North Minneapolis, led by the University of Minnesota, social justice non-profit organization Project Sweetie Pie, and North High.

### Community Roots

In 2011, North High was in crisis. They had only 62 students enrolled in a school made to hold over a thousand, an alarmingly low graduation rate, and significant pressure from the city to close the school. That was when the community that

rallied for the school's creation back in 1888 came together again to keep it open — but school officials knew things had to change. They scaled down their classes and focused on arts and communication. It was then that Michael Chaney, founder of Project Sweetie Pie, approached the school to incorporate horticulture and food science into their curriculum.

The initiative started as an after school program. “In January 2011, students started growing sweet potatoes in an unused greenhouse,” says Chaney. It quickly became apparent that the initiative, and the greenhouse, had more value to offer. “The first year we had just 5 gardens around North Minneapolis for kids to work in and fifty partners. By year two we had 10 gardens and 75 partners, and now we have 25 gardens and 130 partners.” In 2015, Chaney met with Beth Markhart, who connected him with Mary Rogers, assistant professor in organic horticulture at the University of Minnesota. The group applied for and received a grant from Healthy Food, Healthy Lives\* to build a curriculum around food and human ecology in the science program for 11th and 12th graders.

The grant allowed them to hire Christian Curran to help develop curriculum and manage the program as it grew. “We wanted to use the greenhouse to

teach students about horticulture and agriculture and build educational awareness around local food systems,” says Curran. “Everything anchors back to a holistic understanding of food and human systems. It also gives the students hands-on experiences, which can lead to better career prospects and opportunities.”

### Integrating Horticulture

Two days a week, for two hours, the students in Kenneth Vreeland's science class are challenged to learn about subjects under the overarching theme *From the Ground Up*. “We'll start with composting one week, then soils, then stems, leaves, shoots — all the way up to atmosphere and climate and how it affects agriculture and human health,” says Curran. “Each week is basically a new topic.” Each week they invite guest speakers to go over the topic more in depth and showcase the different jobs students could pursue.

Outside of the classroom, program collaborators have incorporated events around food, ecology, and social justice to generate interest among the rest of the school. Last spring they held a school-

*\*The Healthy Food, Healthy Lives grant is titled Next Steps in Reshaping the North Minneapolis Local Food System: Connecting to North High School (15FCUR-1YR50DBK).*

*North Minneapolis is going green!  
Give us a call  
and learn what we mean.  
Where once lie urban blight  
now sits luscious garden sites.  
Gardens without borders  
classrooms without walls;  
architects of our own destinies.  
Access to food,  
justice for all.*

- Michael Chaney  
Founder of Project Sweetie Pie

wide event on Earth Day, and this fall they celebrated World Food Day, which had a theme of food and climate change. “It was an amazing opportunity to reach out, educate students, and get the community rallied around these principles,” says Curran. “We had roughly 2/3 of the student body involved. There were so many interested and asking questions, just learning. It was a great day.”

Students are exposed to higher education through the curriculum to see how what they’re studying now can transfer to their future. Social and economic barriers for many students can make higher education seem out of reach, or like they might not belong there — in 2016, nearly 87% of North High students qualified for free or reduced priced lunch, and 93% were people of color. “The University’s role in this program is to try to engage these students,” says Rogers. “I want to reinforce a high school to college mentality, let them know that there are careers in food systems if this is something that they’re interested in, and that there’s a place for them at the University.” Faculty and graduate students at the University are frequently brought into the classroom as well to help reinforce the pathway to higher education that the program is trying to build. The curriculum has also brought guest speakers to North

High from the University’s Multicultural Center for Academic Excellence to speak with students about how they can plan for life beyond high school.

Torrey Lau, STEM coordinator at North High, has been a major advocate for the program at the school, “Not many of our students garden, and they didn’t see it as a possibility in the city. But, through the partnership, they learned that it isn’t hard to do, it isn’t expensive, and anyone can garden in a small urban space.”

### Continuing to Grow

Chaney and Lau, along with a host of partners, have been working on building the capacity of the program even further at North High. “With more gardens and aquaponics systems that give us year-round production, we can then donate food to local food shelves, and even sell food at farmer’s markets or engage in the Minneapolis Public Schools lunch buy-back program, where Minneapolis will buy our school’s produce to use in school lunches,” says Lau. “We see the local food movement as not only a healthy option for our school and community, but also as a way to expose students to long-term life and career choices.”

The initiative at North High may have begun with a single, dilapidated

greenhouse, but it has grown beyond its walls to involve the students and community. Chaney is hopeful that the success they’ve had with the current Healthy Food, Healthy Lives grant will help propel the program forward as they apply for additional funding. “We’re trying to raise awareness of the problems in our community and to make people practitioners of their own future,” says Chaney. To this end, the curriculum being built for next year will expand to include youth enterprise development and entrepreneurship opportunities.

“We’re creating an escalator to higher education through food and horticulture,” says Chaney. “It’s no easy task, but where there’s a will, there’s a way.” If you’re interested in becoming a collaborator, volunteering, or donating physical supplies or funds, please contact Christian Curran at [cddcurran@umn.edu](mailto:cddcurran@umn.edu) or Mary Rogers at [roge0168@umn.edu](mailto:roge0168@umn.edu). ♦

**Right:** Students learn about composting from guest speaker Patsy Parker. **Bottom left:** Minnesota ecology students sample veggies and learn about the importance of composting food waste. **Bottom right:** Minnesota ecology students work in the community garden, preparing the beds for spring planting.



# Leadership.

## Royal Heins Receives Inaugural Distinguished Alumnus Award

**W**hen Royal Heins (*Ph.D.* '78) was first starting graduate school, he made a decisive promise to himself that he would continue to be an active part of the floriculture industry until the very last day of his career. With that in mind from day one, Heins became a faculty member at Michigan State University. After retiring he established a vegetative stock farm in Guatemala with two partners and today continues to consult for greenhouse growers across the country. This spring he will receive the inaugural Horticultural Science Distinguished Alumnus Award for his accomplishments and present the Kermit Olson Memorial Lecture.



*Above: Royal Heins, Ph.D. 1978*

Heins grew up in Colorado and received his bachelor's degree from Colorado State University. "As far back as I have memories, I always had an interest in plants," says Heins. "In junior high school I started working Saturdays at a local greenhouse, and I've been hooked ever since." At the time Colorado was major producer of cut flowers, and CSU had a highly reputable floriculture program. His work as an undergraduate eventually led him to the University of Minnesota, where he was advised by Harold Wilkins.

Looking back on his career, Heins cites the graduate students he's mentored as his greatest legacy. Today his students continue to influence the world and hold faculty positions from Alaska to Puerto Rico, including current University of Minnesota professor John Erwin. That passion for mentoring was established in part thanks to his relationship with Dr. Wilkins as a graduate student. "Where I'm at today is greatly affected by the mentoring I received, especially from Harold. I was the first one in my family to even look at college, and Harold took me under his arm in a way many advisors wouldn't have," says Heins. "I feel very strongly about how blessed I was in that, and so I try to pass that on through mentoring the students I've encountered."

After graduating in 1978, Heins started as a faculty member at Michigan State University, where he grew a reputa-

tion as a leading researcher in environmental and flowering physiology of floricultural crops for the greenhouse industry, and was honored as a Distinguished Faculty member at MSU. While he was a faculty member he also started private consulting with commercial greenhouse growers around the country. Shortly before his retirement from MSU in 2003, one of his consulting partners, grower Brian Gold, approached him with an offer to join in a business. Gold and his partner from Guatemala, Estuardo Arriaga, were contracting vegetative cutting production in Guatemala and were interested in establishing a production farm that was owned by their company, Oro Farms. The company grew to produce over 100 million cuttings a year and employ over 500 workers. In 2011 Oro Farms was purchased by a Dutch company, which ultimately merged to become part of the Dümme Orange organization, which produces over 1 billion cuttings per year. Since retiring from MSU and selling Oro Farms, Heins has also continued to be a private consultant for greenhouses specializing in bedding plants, flowering potted plants, and herbaceous perennials.

Royal Heins will be formally recognized and give a presentation on the process of breeding a new flower variety though production and ultimately to the garden center for sale as part of HortSci Grows on March 29, 2017 at 3:30 p.m. in 110 Green Hall. ♦

## Celebrating a Multi-Generational Partnership

**B**ailey Nurseries, a fifth-generation family-owned company, has been involved with the department for decades. They have provided plants for the display garden, scholarships for graduate and undergraduate students, and supported conferences hosted on campus. In 1980 Gordon and Margaret Bailey even established the first endowed faculty chair in CFANS, housed in our department and currently held by Professor Jerry Cohen.

On October 6, the Bailey family was invited to campus to thank them for their myriad of contributions.

The family toured the greenhouses, display garden, and Jerry Cohen's laboratory. To finish the afternoon the department hosted a reception for the Bailey family, attended by Dean Buhr. As a special surprise, once the speeches were over the crowd sang happy birthday to the three family members with birthdays in October.



*Above: Three generations of the Bailey family.*

It was wonderful to show the family the impact of their gifts, and the department looks forward to working with the Bailey family for many more years to come. ♦



Above: Department Head Emily Hoover

## Letter from the Department Head

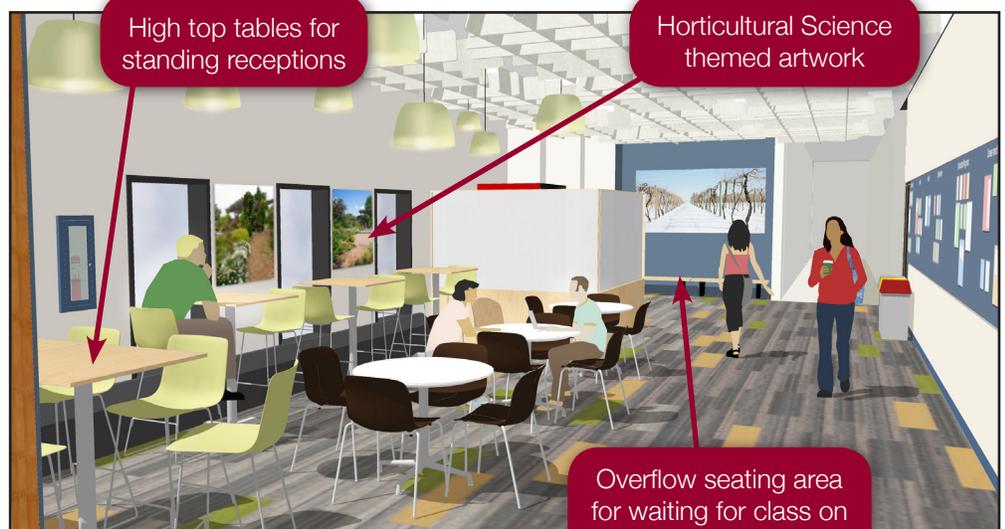
As you've seen throughout this issue, our faculty are making connections and working with diverse communities outside the University. These collaborations make our department and the community around us stronger—we truly do work better together. If you work with an organization that is interested in a similar partnership, we hope you will reach out to talk about possibilities. If so, feel free to connect directly with any faculty member or contact me at [hoover@umn.edu](mailto:hoover@umn.edu) or 612-624-6220.

If you're looking for a more concrete way to support the department as the end of the year approaches, I invite you to read about the 3rd floor atrium renovation. This is a project that will help to build community by increasing our collaborative work space. Enjoy the snow (if it ever arrives in Minnesota!). ♦

## Help Create a Welcoming Space in Alderman

The third floor atrium is a hub of activity for Alderman Hall. It is the only public gathering space in the building, located between the front entrance and all three classrooms. This area is a popular spot to study, hold impromptu meetings, eat lunch, or wait for classes to begin — but it is sorely in need of updates and a redesign.

Recently we received a generous gift of up to \$10,000 to be used to match additional donations. Your support can help us create a more welcoming and functional space for building users. Our vision includes an expanded seating area and a flexible design to allow for a variety of uses.



### Fundraising Goal

\$10,000 by December 31, 2016

Donations will be matched 1:1 up to \$10,000

### Ways to Give

Visit [z.umn.edu/AldermanAtrium](http://z.umn.edu/AldermanAtrium)

Contact Head Emily Hoover  
[hoover@umn.edu](mailto:hoover@umn.edu), (612)-624-6220

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<http://horticulture.umn.edu/support>

## Introducing HortSci Grows: A Day Long Celebration of Horticulture

Every year the seeds planted in the department grow beyond the walls of the University. Students graduate to pursue jobs across the country, post-docs move on to industry and faculty positions, and innovative research opens up even more questions to be answered. We invite alumni and friends of the department to save the date for HortSci Grows, a day celebrating where we've been and where we're going.



**March 29, 2017**  
**St. Paul Campus**

- Network with industry professionals and alumni.
- Attend research tours highlighting faculty members working with ornamental crops.
- Meet Royal Heins, recipient of the inaugural Horticultural Science Distinguished Alumnus Award.
- See what students are doing with our first ever poster competition — or help judge!

This newsletter was written by Echo Martin, and edited by Samantha Grover and Lauren Matushin.  
Please direct any questions or comments to Echo Martin at [mart1794@umn.edu](mailto:mart1794@umn.edu).

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