



NAME: Yi Wang

TITLE: Assistant professor, extension specialist, Department of Horticulture

INSTITUTION: University of Wisconsin (UW)-Madison

LOCATION: Madison, WI

HOMETOWN: Zhengzhou, He'nan, China

YEARS IN PRESENT POSITION: 3

PREVIOUS EMPLOYMENT: Assistant professor at University of Idaho

SCHOOLING: Ph.D. in potato physiology, UW-Madison

ACTIVITIES/ORGANIZATIONS: Potato Association of America, American Society of Agronomy and Crop Science Society of America

AWARDS/HONORS: Alfred Toepfer Faculty Fellow, 2020 Fruit + Vegetable 40 Under 40 Award and 2017 Spudman Emerging Leader Award

FAMILY: Mom, dad, grandma, uncle, aunt, boyfriend

HOBBIES: Accordion, piano, touring and skiing

INTERVIEW

YI WANG, assistant professor and extension specialist, University of Wisconsin-Madison

By Joe Kertzman, managing editor, *Badger Common Tater*

Growing up in a large metropolitan area in China, Yi Wang earned her bachelor's degree in biological science from Nanjing Agricultural University.

Wang had big shoes to fill, as her uncle, Renyi Zhang, is a distinguished professor of atmospheric sciences at Texas A&M University who earned his Ph.D. from MIT with Dr. Mario Malina, and the 1995 Nobel Prize Laureate in Chemistry.

"Uncle Renyi encouraged me to come to the U.S. to receive higher education," Yi says. "After getting my Ph.D. and doing some postdoc research at UW-Madison, I was offered an assistant professor position in potato physiology at the Kimberly Research and Extension Center in the University of Idaho."

"There, I learned a lot from every facet of the largest potato production system in the country," Yi enthuses. "I rejoined UW-Madison three years ago."

As an assistant professor and

extension specialist in the Department of Horticulture at UW-Madison, Wang's team members include Mack Naber, lab manager, Trevor Crosby, Ph.D. student, and Guolong Liang, Master of Science student.

Is your family in China staying well and safe during the coronavirus

Above: Yi Wang, assistant professor and extension specialist, University of Wisconsin-Madison Department of Horticulture, holds some potato petioles from one of the fields she and her team are trialing at the Hancock Agricultural Research Station.

pandemic? Yes, thank you, they are doing well. My mom, dad and 90-year-old grandma stayed at home for about three months with almost no outdoor activities except grocery shopping.

My hometown had low coronavirus cases, but still imposed strict lockdown policies.

What attracted you to UW-Madison?

I got my Ph.D. from Madison and stayed here for seven years before taking a job in Idaho, so coming back to Madison is like coming home. Madison is my second hometown.

What made you interested in potato physiology and why do you like it?

I love crops, and I love to watch tiny seeds growing into vigorous, leafy plants. It fills me with energy.

Working with potatoes as a graduate student, I was interested in understanding what is going on within the plants—the processes from photosynthesis in the leaves to tuber bulking below the ground.

How has your job at UW-Madison evolved since you have been in your present position? I am lucky to work with the potato and vegetable growers and processors in Wisconsin who have been extremely supportive and collaborative.

They help me develop new research ideas and fund them, correctly interpret my research results and provide timely feedback on my extension projects so I can improve my program all the time.



I am also lucky to hire hard-working and intelligent people (lab manager, and graduate and undergrad students) to work with me so that my program stays highly productive.

You were approved for 2020-'21 base funding from the Wisconsin Potato & Vegetable Growers Association (WPVGA) for potato and vegetable production research.

Explain the focus of that research project. I have three major research focuses:

1. Investigate innovative technologies and practices, including precision agriculture, variable rate irrigation and remote sensing, to improve the resource use sustainability of vegetable cropping systems;

Above: Practicing safe social distancing, UW-Madison Assistant Professor Yi Wang (second from left) poses with her research team, from left to right, Mack Naber (lab manager), Guolong Liang (master's student) and Trevor Crosby (Ph.D. student).

- 2. Develop useful machine learning tools to predict real-time and end-of-season crop yield and quality, and water and nitrogen balance; and
- 3. Make production recommendations on planting population, irrigation, fertilization and storage management of new vegetable crops or new varieties with higher water and nitrogen use efficiency.

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An advertisement for Ron's Refrigeration & Air Conditioning, Inc. The background is a close-up of a large pile of brown, textured material, likely potato tubers. The text is overlaid in red and white. The company name 'Ron's Refrigeration & Air Conditioning, Inc.' is in a large, stylized red font. Below it, the phone number '1-800-236-0005' and website 'www.ronsrefrigeration.com' are in white. At the bottom, '24 Hour Emergency Service' is written in a large, bold red font.

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You also submitted and were approved for a competitive grant proposal, again funded by the WPVGA, for making agronomic recommendations for production of new elite Wisconsin fresh market potato cultivars. What data will you be using to make

the recommendations? We are conducting three variety trials this year: one is under multiple nitrogen (N) rates, one is under a low N environment with different harvesting dates, and a third evaluates storage quality, such as weight loss, tuber appearance and dormancy of tubers,

from trials one and two.

Our objective is to find some promising fresh market cultivars that yield and store well under low N fertilization. This is necessary for future sustainable management of groundwater quality by our potato and vegetable industry.

You were recently awarded a large grant by the USDA National Institute of Food and Agriculture. These types of grants are highly competitive.

Why was your proposal selected and what are its objectives? I think the major reasons that my proposal, entitled “Using Hyperspectral Remote Sensing to Develop Decision Support Models for Potato Nitrogen Management,” was funded include:

1. Water quality is an urgent issue that needs to be addressed.
2. Our proposal has a highly competent team (Yi is the leading PI [principal investigator] and Drs. Phil Townsend and Paul Mitchell are the co-PI’s).
3. We get great support/collaboration from the potato industry.

In the study, we will develop some



Above: Assistant Professor Yi Wang’s research team checks the moisture level of a dark red kidney bean field at the Hancock Agricultural Research Station, June 2020. Five varieties of dark red kidney beans are planted for research on nitrogen and water use.

machine learning tools to predict plant N status using hyperspectral imagery with good accuracy.

We will also identify critical spectral bands that are closely related to in-season potato N status and end-of-season tuber yield, so that time for image processing and data extraction will be greatly reduced.

The ultimate goal is to build an app to help growers manage in-season N fertilization without laborious and time-consuming petiole collection or destructive digging.

How has it been trying to do research during the COVID-19 coronavirus? Are you able to get out into the field, and what have been the biggest challenges? We were able to start our field season on time, but with reduced project sizes, an average of a 30 percent cut because we were not allowed to hire undergrad help and visiting scholars during the pandemic.

We need to comply with the campus policy of one person per vehicle for field trips, wearing face coverings indoors and restricted travel without the Dean's approval.

Those policies have impacted my research and extension program to some extent, but I have been trying my best to use online tools such as Zoom meetings, phone calls, extension newsletters and the YouTube platform to stay productive.

I greatly appreciate that the WPVGA and my growers understand this situation. They keep me updated on their production progress via online communication (I am not able to make farm visits as I could before).

What are you most excited about involving your current research or your position at UW-Madison? There is a fantastic potato science team at UW-Madison. We have a nationally reputed expert in every major potato research area, and I enjoy collaborating with and receiving advice from the team members.



Yi Wang's uncle, Renyi Zhang, is a distinguished professor of atmospheric sciences at Texas A&M University who earned his Ph.D. from MIT with Dr. Mario Malina, the 1995 Nobel Prize Laureate in Chemistry.

As an extension specialist, do you also teach, and if so, what classes?

I have a 10 percent appointment of teaching, which means I need to teach a three-credit class every other year.

I taught Horticulture 375: A Growing Dilemma—The Future of Food, in the

spring of 2019, and will teach it again in 2021. The class is based on panel discussions.

I invited dozens of ag experts from across the UW-Madison campus and College of Agricultural and Life Sciences to my class. We discussed

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Looking back on the past 50 years,

we realize how fortunate we are to be part of agriculture and of the central Wisconsin community. We started as a husband-and-wife-owned packaging company and have grown to be known as "Your Total Agri-Supplier."

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We can't wait to see what the next 50 years will look like!

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hot issues in the ag industry, such as organic food versus GMOs (genetically modified organisms), water quality, urban farming and ag automation. The students liked the class.

How do you feel your work relates to the Wisconsin Idea? The nature of my job is all about the Wisconsin Idea. As an extension specialist in potato and vegetable sustainable production, I am working closely with members of the Wisconsin potato and vegetable industry daily.

I learn about their needs by reaching out to them, conduct science-based applied research to address those needs, and then disseminate the research results back to them.

I also have on-farm trials to directly demonstrate my research to the growers. I really enjoy having a great working relationship with my stakeholders.

What do you hope to accomplish in your research or professionally in the coming years? For extension, I am working with my counterparts

Left: Even at 5 years old, Yi was studying hard!

Right: Yi Wang (right) talks to potato grower Andy Diercks (left) of Coloma Farms while standing in front of a Spudnik AirSep Harvester.

in Michigan, Minnesota and North Dakota to develop a cross-state program that addresses common potato production issues in the Midwest.

I would like my extension program to gain national recognition in the coming five years.



Yi Wang is shown with her parents during a visit at Devil's Lake, and with her Mom at a Wisconsin Badgers football game.



Thirty days after emergence, tiny potato tubers start to form on a dark red Norland plant that is part of Yi's potato trial at the Hancock Agricultural Research Station.

For research, I am targeting use of cutting-edge technologies such as UAV (unmanned aerial vehicles), precision ag and AI (artificial intelligence) in potato and vegetable production, and hope to publish in

“We have a nationally reputed expert in every major potato research area, and I enjoy collaborating with and receiving advice from them.”
– Yi Wang

high-profile scientific journals so that my plant science community recognizes our innovative research.

For teaching, I just hope that my students love my class.

What will be your biggest challenges in the coming years? There are always challenges in research. For me, finding and fine-tuning the right cutting-edge technologies that are applicable to potato and vegetable production will be the major challenges I need to address.

For example, there are lots of available machine learning models, and I need to look for the one that is the most efficient and relevant to potato irrigation or nitrogen management.

Collaboration with experts in the related areas will be a good way to go.

What do you want potato and vegetable growers to know about you or your work that they might

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not know? I have three big findings from my research and one big extension project to share:

1. If your potatoes are harvested healthy out of the field, increasing the wound healing temperature to 60 degrees Fahrenheit for one week might help you avoid dark fry color on Russet Burbanks or help you mitigate senescent sweetening on Snowden;
2. Variable rate irrigation (VRI) is a good option if you have different elevations or soil textures in one field. Even the simple speed control VRI is efficient to manage a low, water-logging prone spot without rotting or a high, water-stress prone spot without reduced yield; and
3. Petiole nitrate analysis is a common approach to guide in-season N fertilization. You can also consider whole leaf total N analysis, which does not give you sharp spikes but is still relevant to plant N status and not as misleading as petiole nitrate at times.

We have developed an online self-guided course with six modules about



In 2018, Yi Wang (right) poses with 70th Alice in Dairyland Crystal Siemers-Peterman, and a Holstein behind them.

agricultural water management in Wisconsin. Please contact Dr. Deana Knuteson (dknuteson@wisc.edu) to enroll in the class.

Why do you think your work is important to growers' businesses?

I hope that, through my research and extension, I can provide my stakeholders with useful information on practices or tools that can

improve their production efficiency, help them be great stewards of natural resources and have an environmentally, economically and socially sustainable cropping system.

You were recently awarded the Fruit + Vegetable 40 Under 40 Award and the UW Alfred Toepfer Faculty Fellow Award. What do these awards mean to you? They



Two of Yi Wang's hobbies include skiing and playing accordion, the latter at Overture Center for the Arts in Madison, Wisconsin.

mean a lot to me. They are huge encouragement for me and a big recognition of my team's past efforts. And they inspire me to keep up the good work.

I heard that you play accordion and piano, Yi. You must enjoy music.

I started to play accordion and piano at age six and had my first solo performance in a large theater at age nine. I love music! It is so relaxing and can refill my fuel tank when I am stressed out.

My music advisor suggested that I go to the musical school and receive higher education in Europe. Being from a science family, I didn't choose that path, but music is always a very important component of my daily life. **BCT**

Right: An aerial selfie shows Yi Wang (right) posing with her UW-Madison Ph.D. advisor, Paul Bethke, in front of potato research plots.



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