



DRIVING ECONOMIC TRANSFORMATION

Advanced Learning

**Advanced
Manufacturing**

**Conference
Services**

**Economic
Development**

Applied Research



DISCOVERY

OPPORTUNITY

PROGRESS

INNOVATION

EXCELLENCE



**What type of
organization is
IALR?**



Higher Education Center



**Subdivision of the
Commonwealth of
Virginia**



Not Academia



Not a Business

Background: Applied Research at IALR

AGRICULTURE is **VIRGINIA'S** LARGEST INDUSTRY



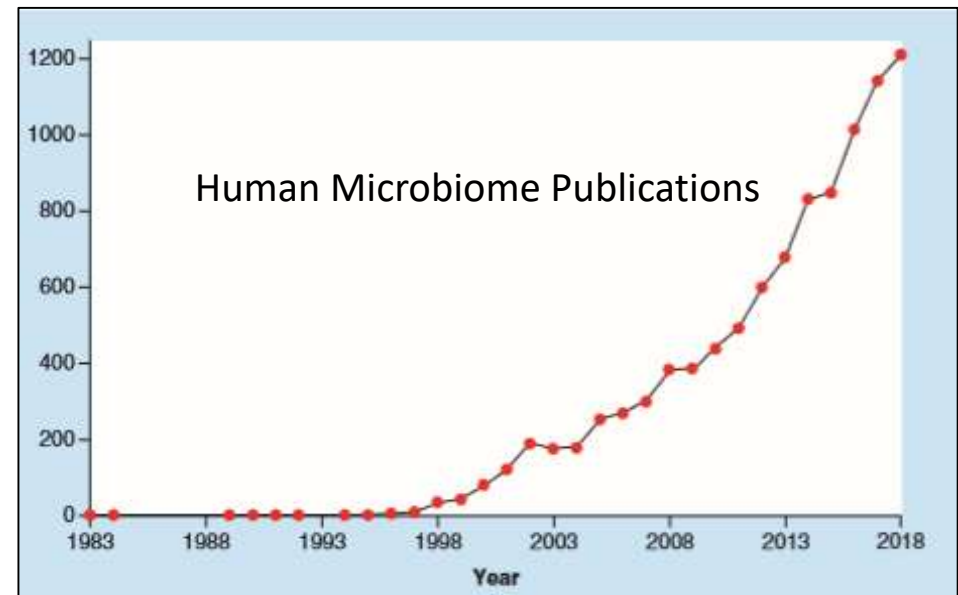
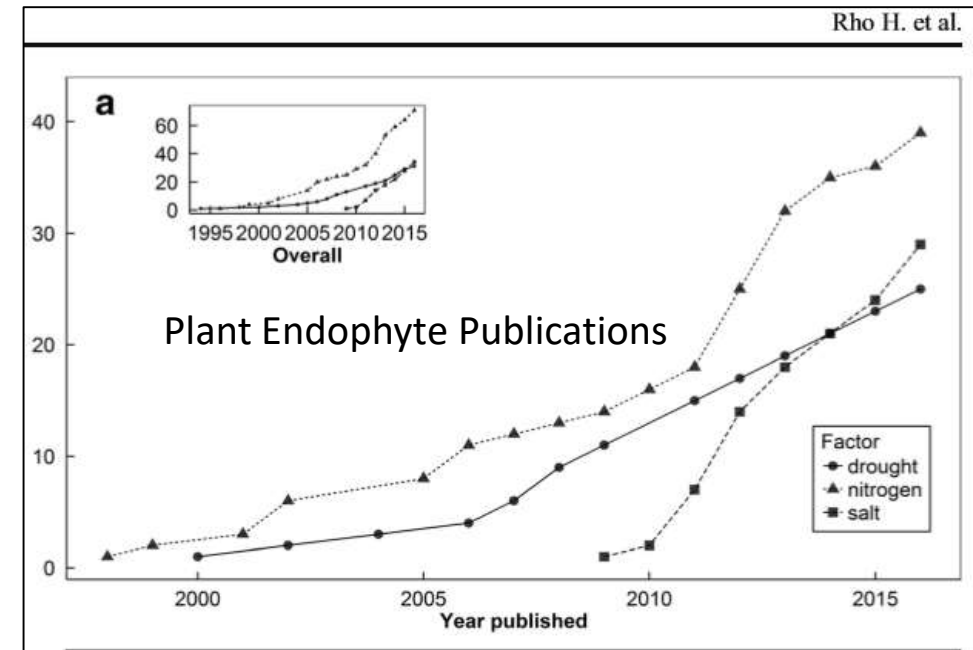
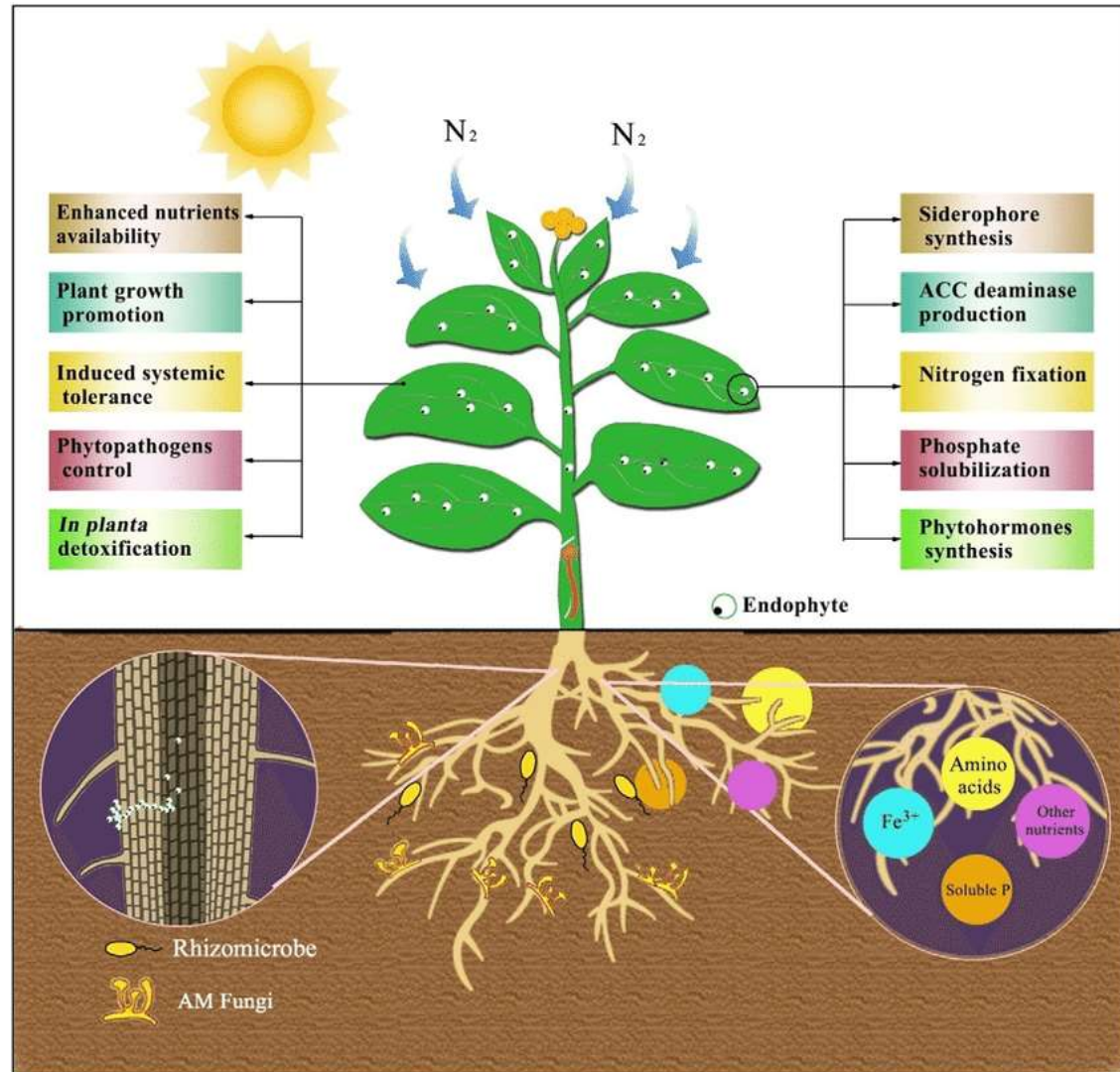
Economic Impact
\$52 Billion Annually
311,000 Jobs



3rd Leaf Tobacco
5th Tomatoes
8th Grapes

IALR Plant Biotechnology

Beneficial Microbial Endophytes



IALR Plant Endophyte Research Center

Bio-stimulant Lab

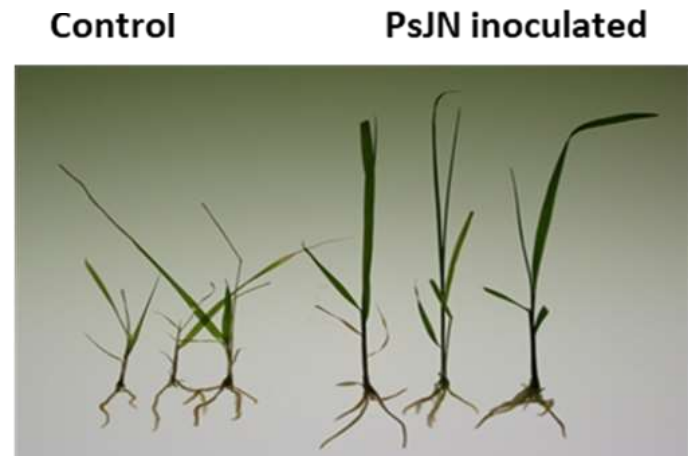
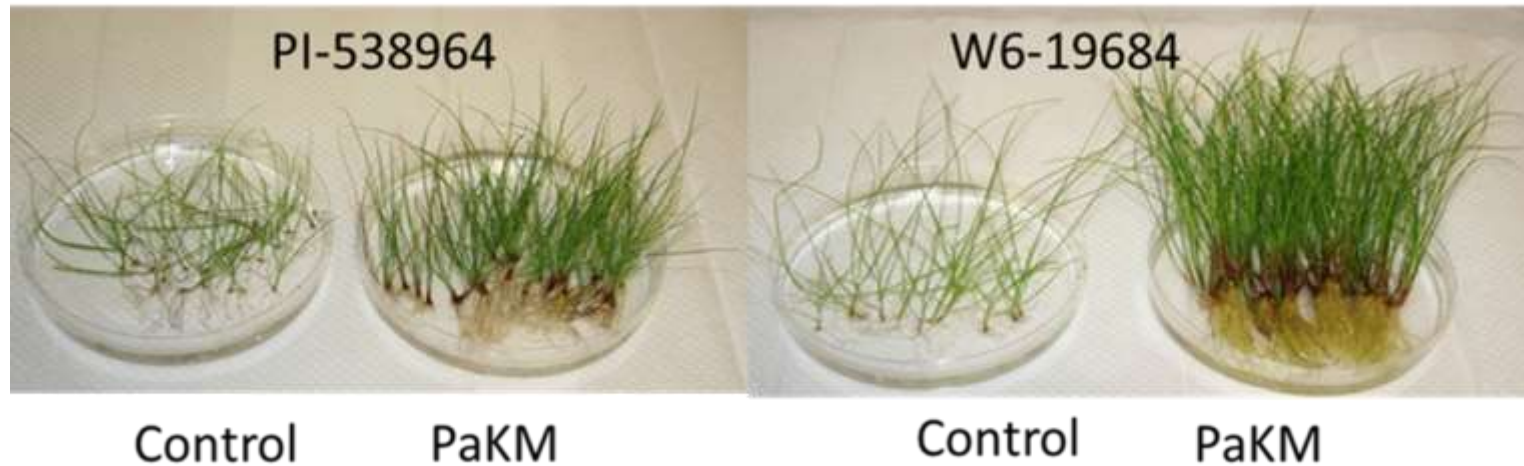


Chuansheng Mei
Chief Scientist

Home / Recent Patents on Biotechnology, Volume 4, Number 1

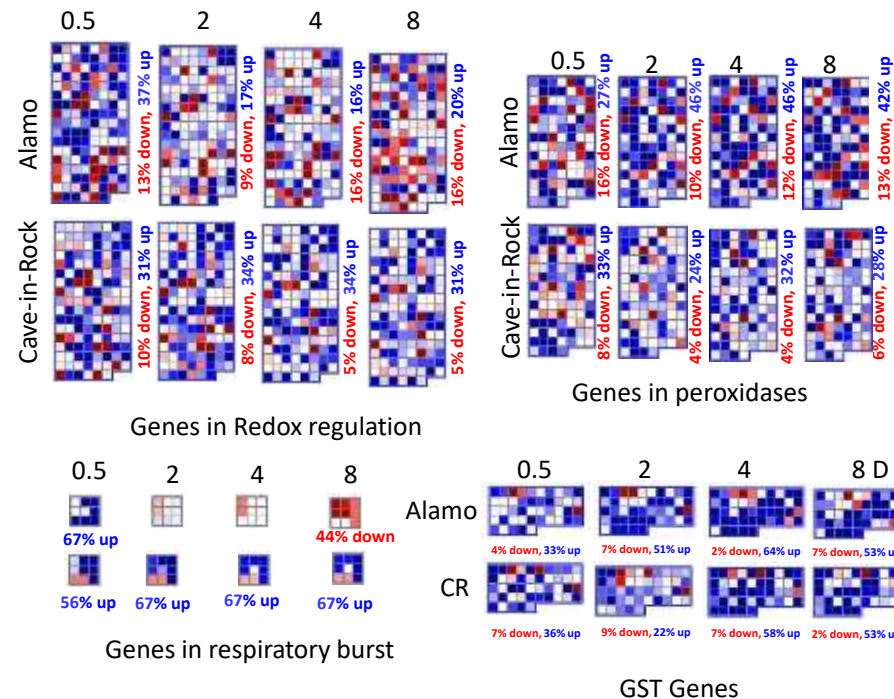
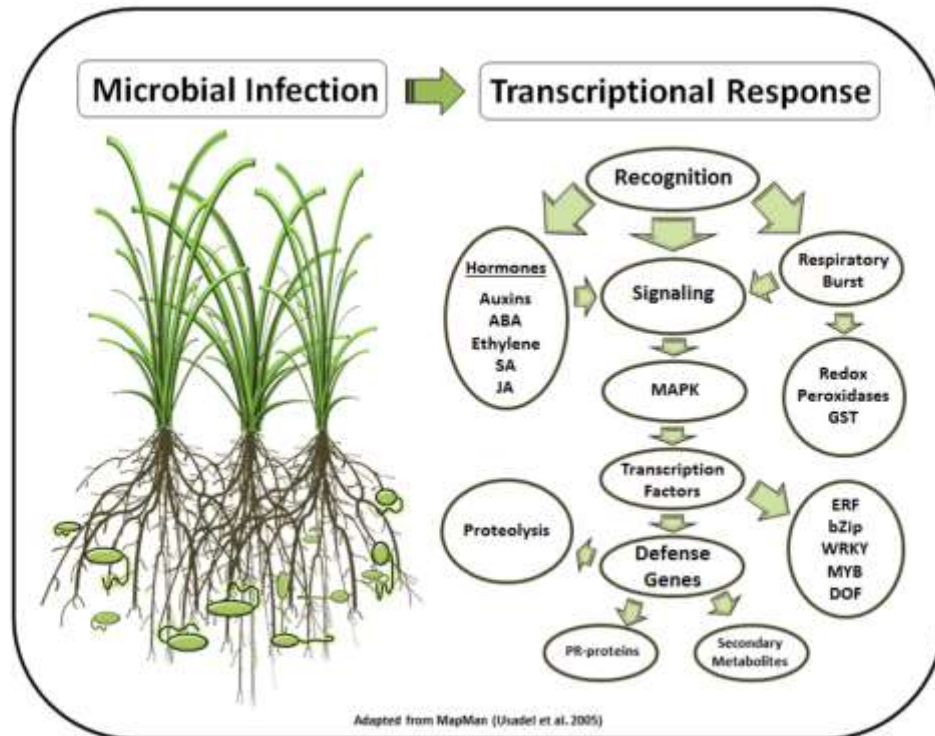


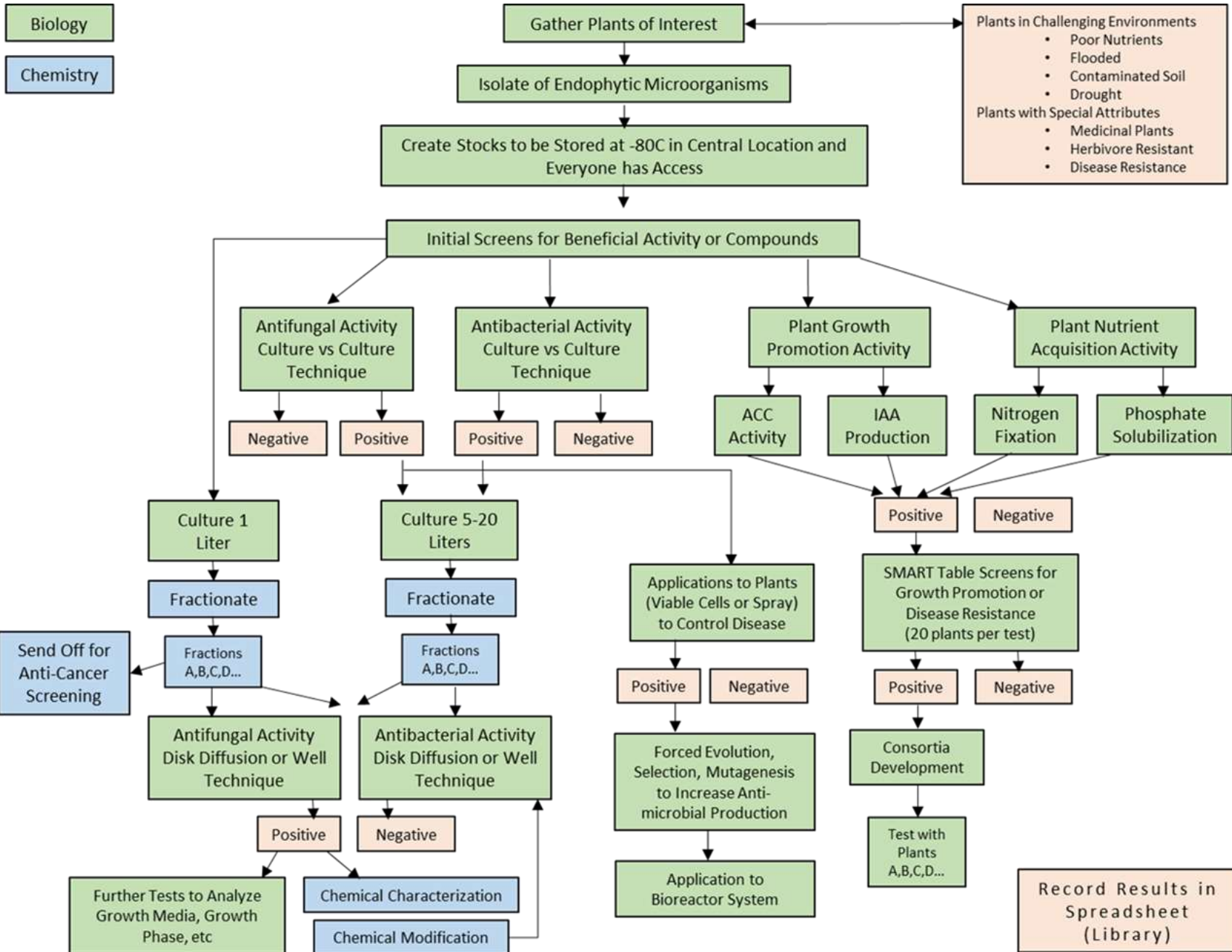
The Use of Beneficial Microbial Endophytes for Plant Biomass and Stress Tolerance Improvement



RESEARCH PAPER

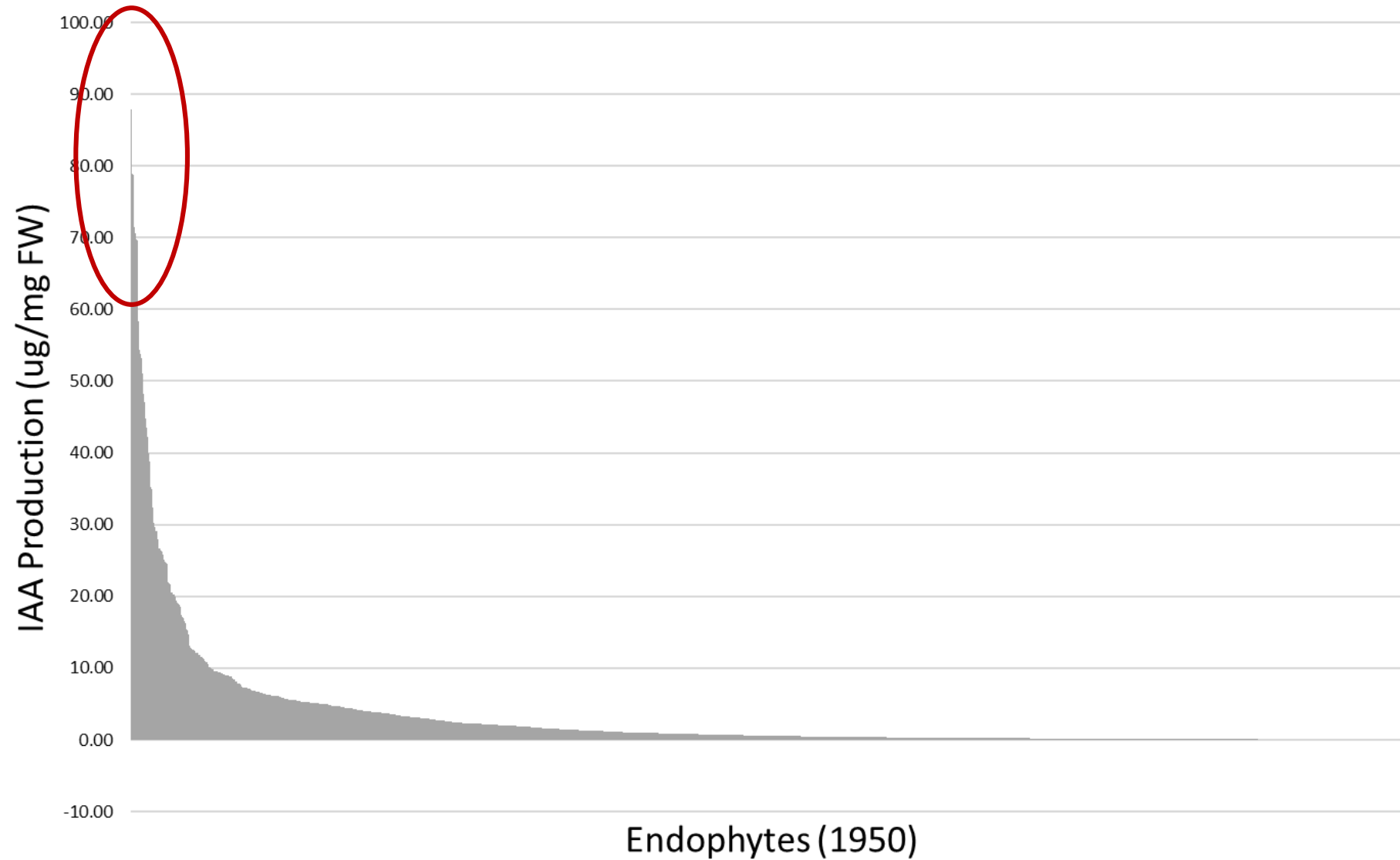
Global gene expression profiling of two switchgrass cultivars following inoculation with *Burkholderia phytofirmans* strain PsJN

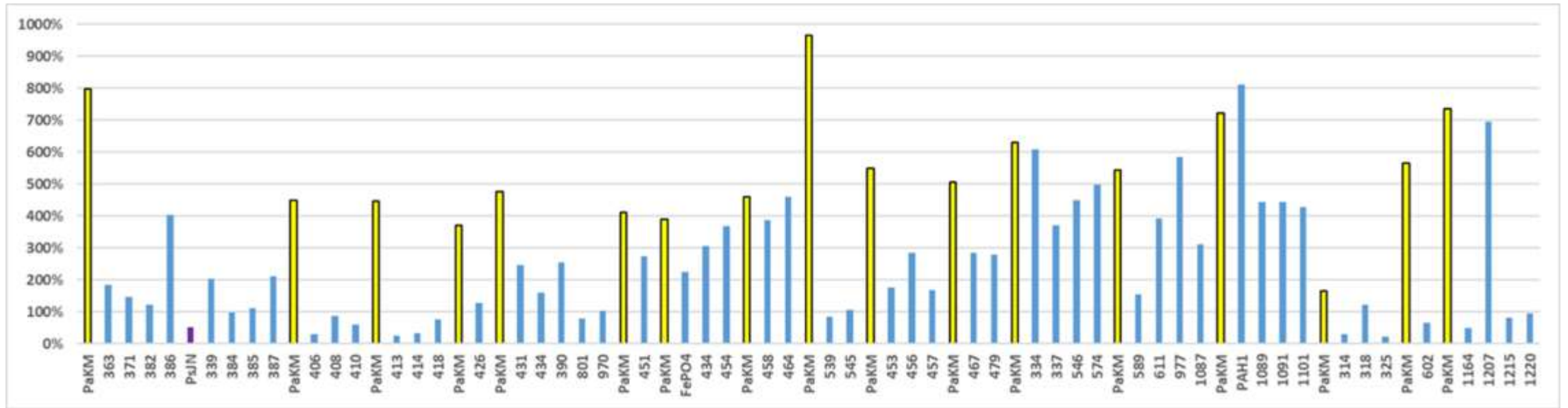




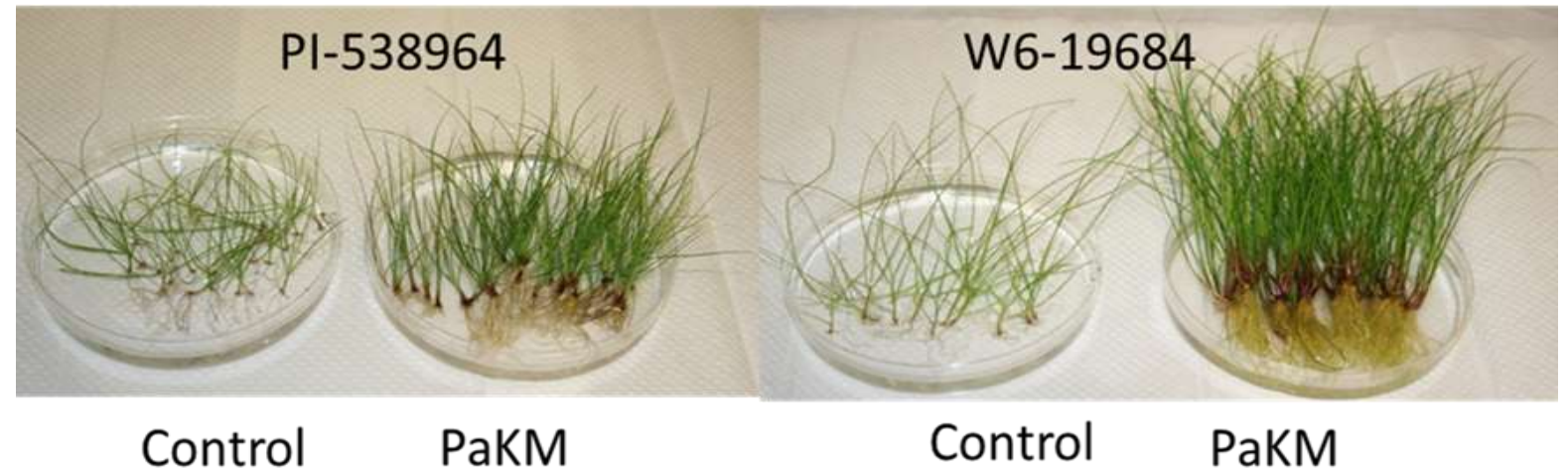
Endophyte Library Establishment

Auxin Production





IAA Producers



IALR Plant Endophyte Research Center

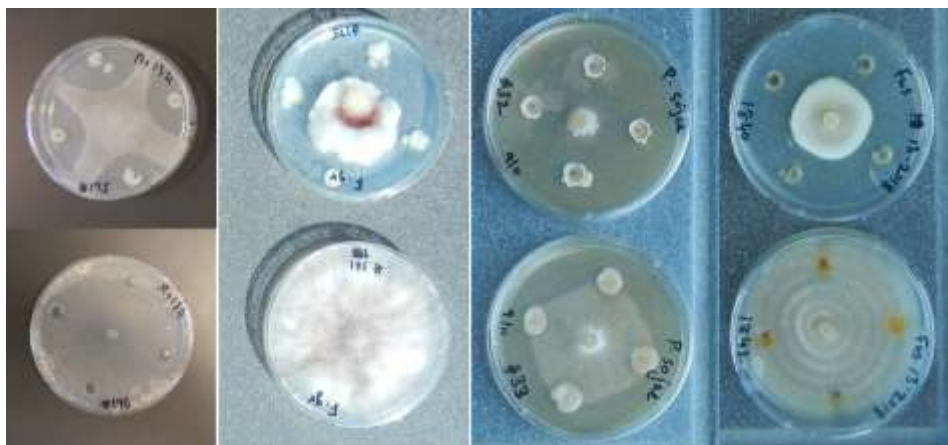
Biocontrol Lab

Summary

Plant Pathogen	# Potential endophytes with biocontrol activity
<i>Rhizoctonia solani</i>	8
<i>Fusarium graminearum</i>	11
<i>Phytophthora nicotianae</i>	9
<i>P. sojae</i>	62
<i>F. virguliformae</i>	58
<i>F. oxysporum</i>	5
<i>Ceratobasidium sp.</i>	5
<i>Colletotrichum acutatum</i>	54
<i>Botryosphaeria dothidea</i>	27
<i>Magnaporthe oryzae</i>	65



Sajeewa Amaradasa
Plant Pathology





Fusarium sp.

C. acutatum

C. gloeosporioides



Control



#619



A Potential Application of Endophytic Bacteria in Strawberry Production

Chuansheng Mei ^{1,*}, B. Sajeewa Amaradasa ¹, Robert L. Chretien ¹, Danyang Liu ², George Snead ³, Jayesh B. Samtani ² and Scott Lowman ¹

¹ The Plant Endophyte Research Center, The Institute for Advanced Learning and Research, Danville, VA 24540, USA; Sajeewa.Amaradasa@ialr.org (B.S.A.); Robert.Chretien@ialr.org (R.L.C.); scott.lowman@ialr.org (S.L.)

Elan: increase 90.8% in total fresh weight and increase 49% of survival rate with pathogen infection.

Sweet Charlie: Increase 26% in total fresh weight and increase 19.4% of survival rate with pathogen infection.

Chandler: Increase 30% in total fresh weight and increase 20.5% of survival rate with pathogen infection

Site 1: 15% increase in marketable yield and 17% in total yield

Site 2: 16% increase in marketable yield and 16% in total yield

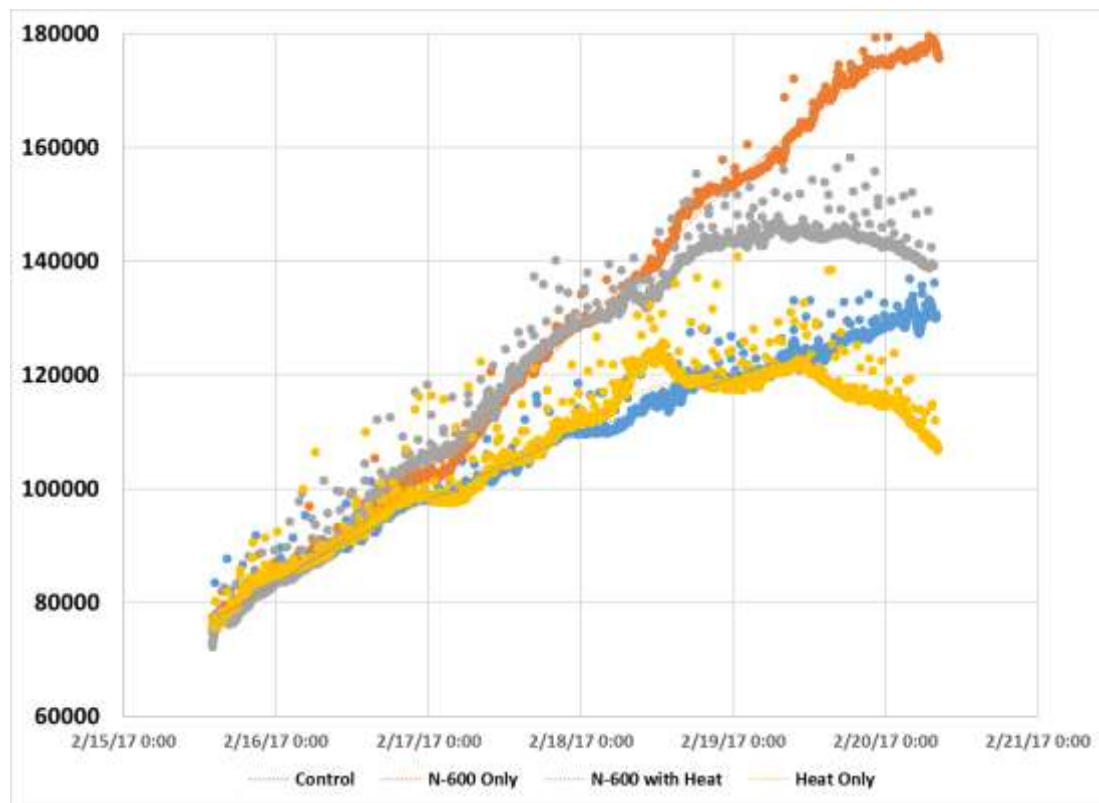
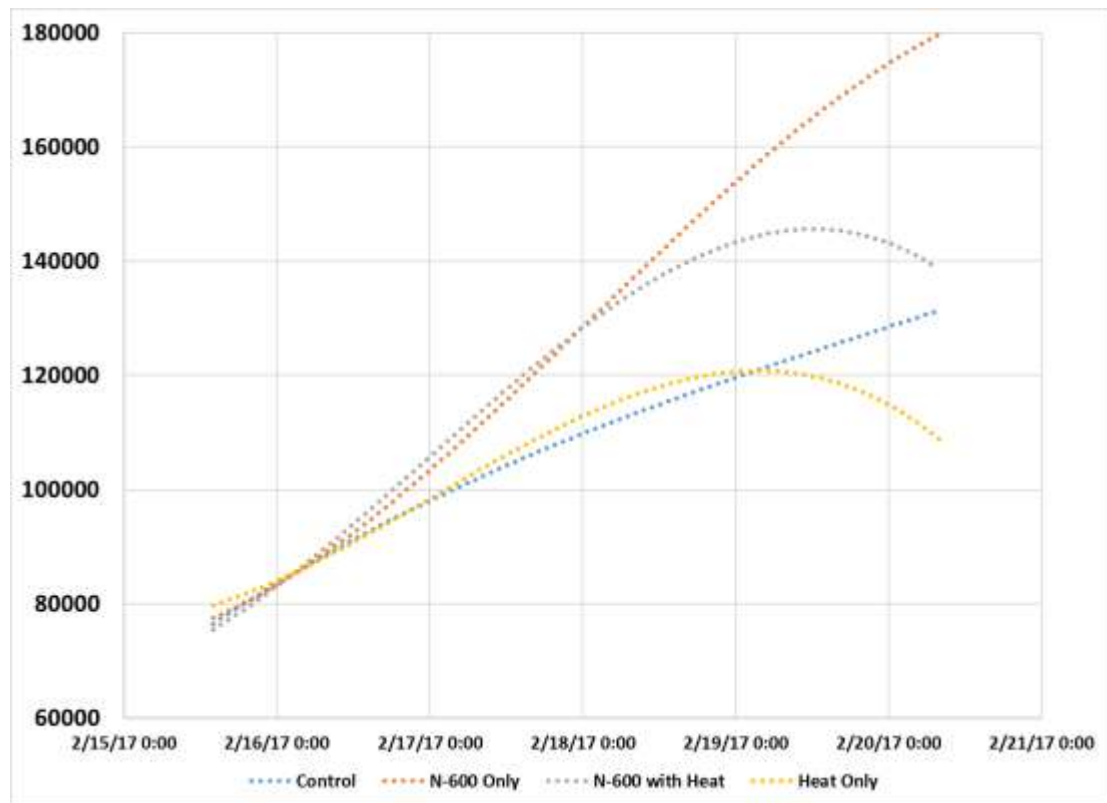
Site 3: 8.8% increase in marketable yield and 14.3% increase in total yield



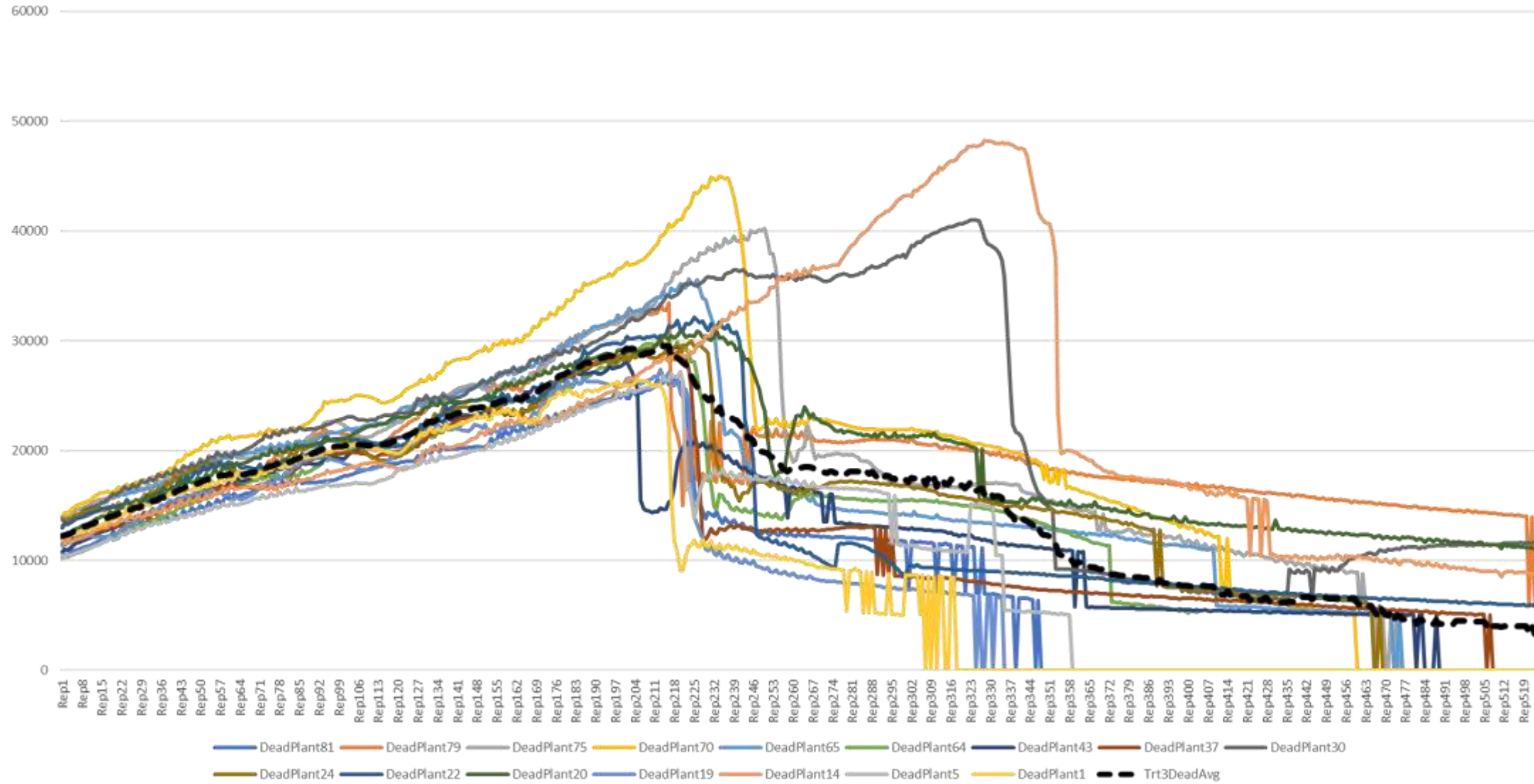
candy labs.com / VideoVelocity

Robotic Plant Imaging Systems

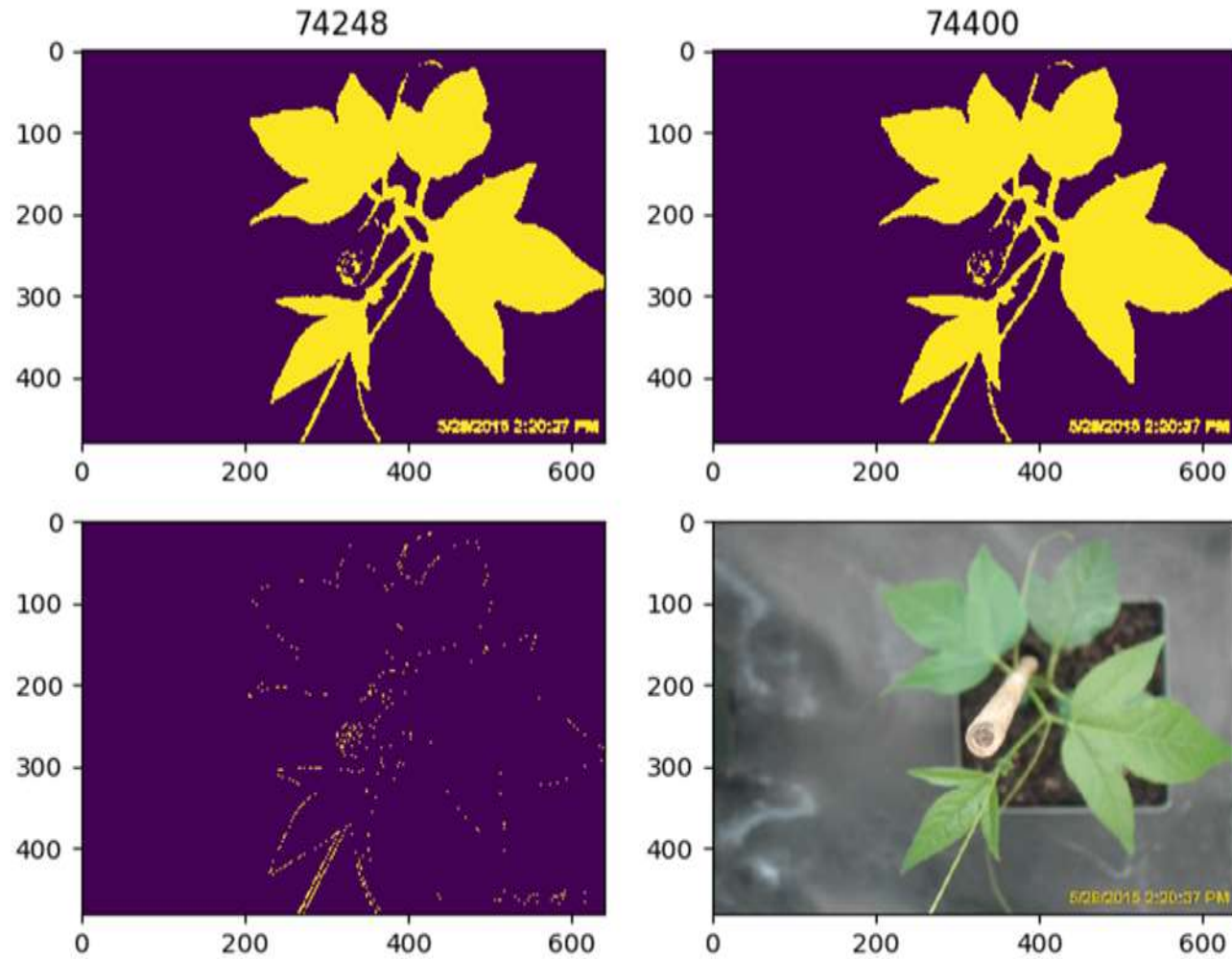
Bell Peppers Heat and Fertilizer Response – Plant Growth



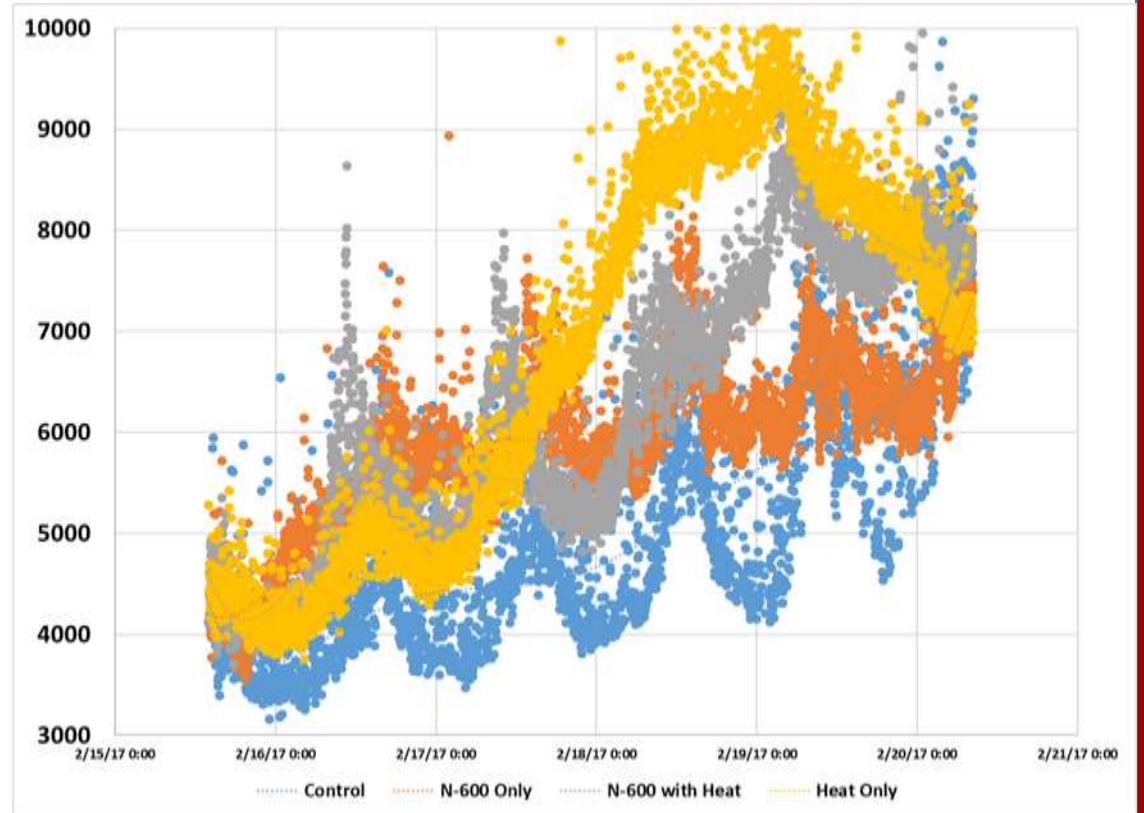
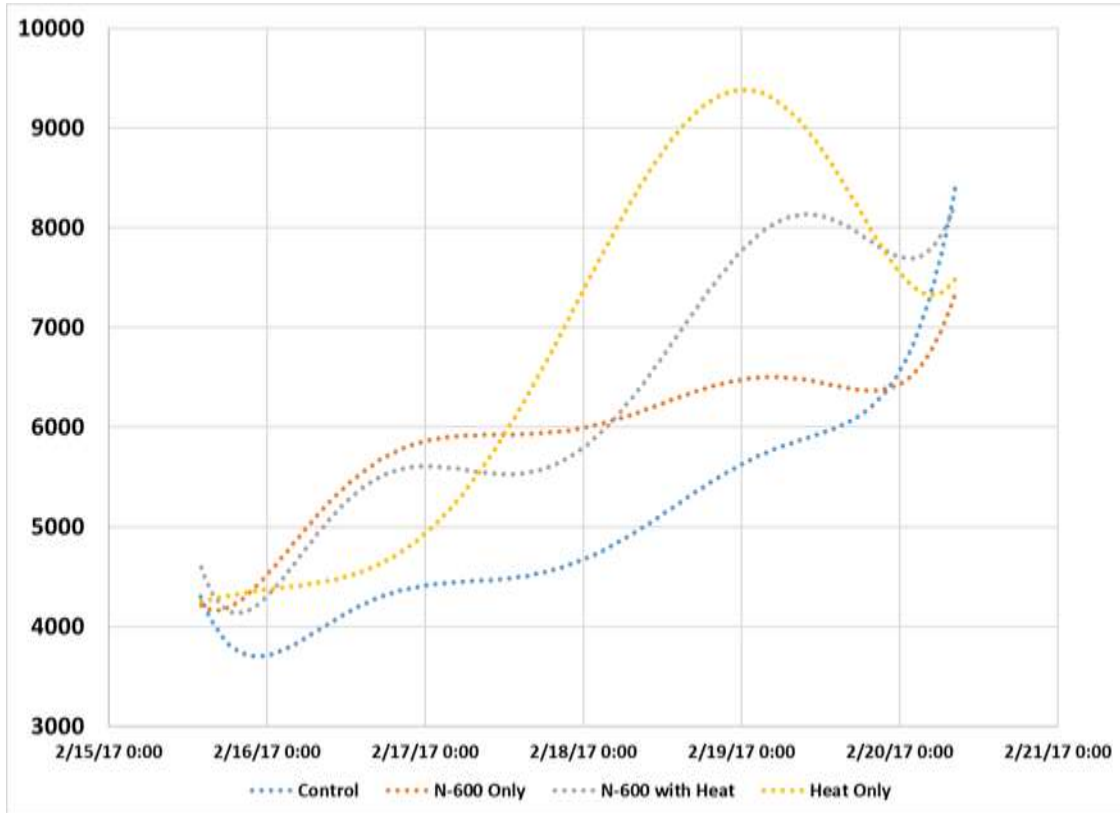
TRT3 Dead Plant Leaf Area



Plant Movement as an Indicator of Plant Health



Bell Peppers Heat and Fertilizer Response – Plant Movement



ISO Analytical Chemistry Lab



Jack He
Analytical Chemistry



SCHOOL OF PLANT AND ENVIRONMENTAL SCIENCES



Dr. Michael Evans
Director SPES
Virginia Tech



Dr. Kaylee South
Assistant Professor
Virginia Tech



Mitchel Doss (VT)
Robotics and Coding



Virginia Tobacco Commission



The VT IALR Controlled Environment Innovation Center

Invest in Leading-edge

- Initiatives
- Equipment
- Skills

Supporting Industry Growth

- Contract Research
- Product Testing Validation
- Optimization of Systems
- Equipment Rental
- Lab Space
- Workforce Training
- Monitoring and Testing

Create an Innovation Hub

- Research to Spinoffs to Jobs
- Ecosystem



SCHOOL OF PLANT AND ENVIRONMENTAL
SCIENCES



VIRGINIA AGRICULTURAL EXPERIMENT STATION
VIRGINIA SEAFOOD AGRICULTURAL
RESEARCH AND EXTENSION CENTER
VIRGINIA TECH

 **the INSTITUTE**
FOR ADVANCED LEARNING AND RESEARCH

Workforce Development

Internship Programs



Excite Teacher Program





World's Largest Campus for Indoor Vertical Farming Coming to Virginia

California-based Plenty Unlimited Inc. will create 300 jobs at \$300 million campus in Chesterfield County

RICHMOND, VA - Governor Glenn Youngkin today announced that California-based Plenty Unlimited Inc. will build the world's largest indoor vertical farming campus, a \$300 million investment in Chesterfield County's Meadowville Technology Park. The company recently secured \$400 million in a Series E financing round, the largest investment to date for an indoor farming company. Plenty has developed the world's most advanced indoor farm, powered by the company's more than 200 patent assets, to efficiently and sustainably grow clean, flavorful produce year-round on its more than 30-foot grow towers. Plenty will complete its Richmond Farm Campus in multiple phases over the next six years, creating more than 300 full-time jobs. The company's first farm on this site, a dedicated Driscoll's berry farm to be completed by winter 2023-2024, will be the first to grow indoor, vertically farmed strawberries at scale.

Virginia successfully competed with five other states for the project, which further advances the Commonwealth's reputation as a leader in the fast-growing industry of Controlled Environment Agriculture.



Leveraging IALR's Facility to Foster Growth in the Industry



CEA SUMMIT EAST INNOVATION CENTER

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October 25 - 26, Danville, Virginia, USA

CONTROLLED ENVIRONMENT AGRICULTURE (CEA) SUMMIT EAST - 2022

Where industry and academia intersect to share research, business strategies and build partnerships to drive future growth for the Controlled Environment Agriculture (CEA) sector and its stakeholders.

SHARING IDEAS, OPPORTUNITIES

City hosts summit to bring business, academic audiences together for agriculture



INSTITUTE FOR ADVANCED LEARNING AND RESEARCH PHOTOS, CONTRIBUTED

Participants of last week's Controlled Environment Agriculture Summit East tour the Controlled Environment Agriculture Innovation Center at the Institute for Advanced Learning and Research in Danville.

FROM STAFF REPORTS

Danville was center stage last week for an event that reimagines the agriculture industry.

The Institute for Advanced Learning and Research hosted the first Controlled Environment Agriculture Summit East on Tuesday and Wednesday.

The event brought in more than 200 people from 28 states — plus Puerto Rico and Canada — a news release reported.

Among the attendees were growers, educators, scientists, extension specialists, suppliers, engineers, tech specialists and architect/developers.

The event was co-hosted by Indoor Ag-Con and the Controlled Environment Agriculture Innovation Center, a joint venture of the School of Plant and Environmental Sciences at Virginia Tech, Virginia Seafood Agricultural Research and Extension Center at Virginia Tech and the Institute.

"We are so pleased with



Attendees network at Controlled Environment Agriculture Summit East last week in Danville.

the results of this first edition and our partnership with the CEA Innovation Center," Brian Sullivan, CEO of Indoor Ag-Con, said in the release. "Both organizations saw a tremendous opportunity to create a different kind of event for this industry — bringing a concen-

trated sector of business and academic audiences together in an incredible research facility setting that fostered an environment for sharing ideas and opportunities."

The day-and-a-half event allowed participants to meet, network and explore conference

sessions. In addition, there were 17 exhibits showcasing innovations and services, according to the Institute.

"This event really crystallized our vision of bringing our research and education program together to help move the CEA industry forward," said Dr. Scott Lowman, co-director of the Controlled Environment Agriculture Innovation Center and vice president of applied research at the Institute.

Thrusting the Dan River Region further into the spotlight, Roger Buelow, the chief technology officer at AeroFarms — a recently opened vertical

Please see SUMMIT, Page A5



WATCH: Indoors with no soil could be the the future of farming. To learn more in a video, point your smartphone camera at the QR code, then tap the link. [NEWSVU](#)

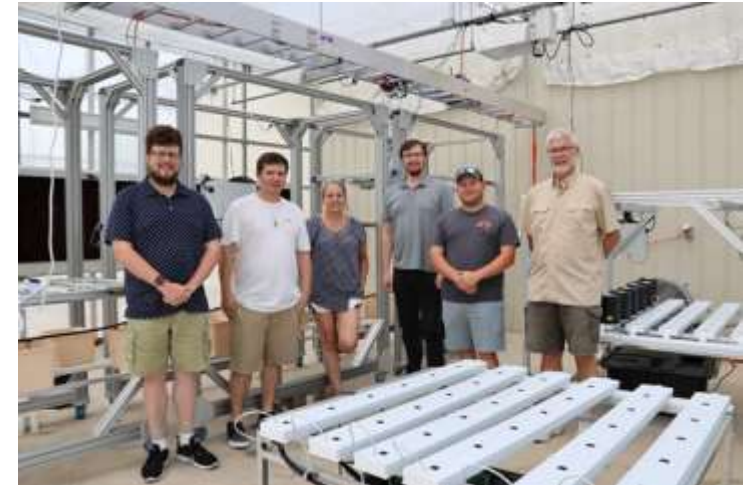
Driving Innovation in Partnership with Industry

Canon

 **ELECTROCEL**
SYSTEMS

 **AeroFarms**

 **the INSTITUTE**
FOR ADVANCED LEARNING AND RESEARCH





candybats.com / VideoVelocity

Thanks!

Questions?

Scott Lowman

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