

The SBC Team: SAB May 2023



Allen Van Deynze
Director



Jovan Djordjevic
Education Director



Phyllis Himmel
Collaboration for Plant Pathogen
Strain Identification. (CPPSI)



Imtiyaz Khanday
Research Director



Whitney Lowe
Program Manager



Jeff Robinson
Program Manager

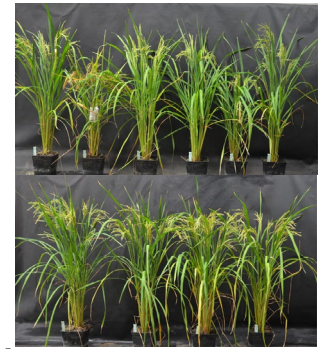
Khanday lab research:

- 1) Seed Vigor:** Understanding the role of abscisic acid in seed dormancy and germination and exploitation of this understanding to increase seed vigor in tomato.

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Recent publications:

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EDUCATION: All Courses held Oct '22 - May '23

UCDAVIS Plant Breeding AcademySM

European PBA Class VII

17 Students

Week 1: Oct 3-8, 2022

Enkhuizen, Netherlands

Week 2: Mar 6-10, 2023

Angers, France

African PBA Class V

41 Students

Session 2:

Nov 27 – Dec 10, 2022

Nairobi, Kenya

***NEW* AfPBA CRISPR** **Course Class I: 11 Students**

Session 1:

Jan 23 – Feb 1, 2023

Session 2:

Apr 24 – May 10, 2023

Nairobi, Kenya

Davis PBA Class VIII

19 Students

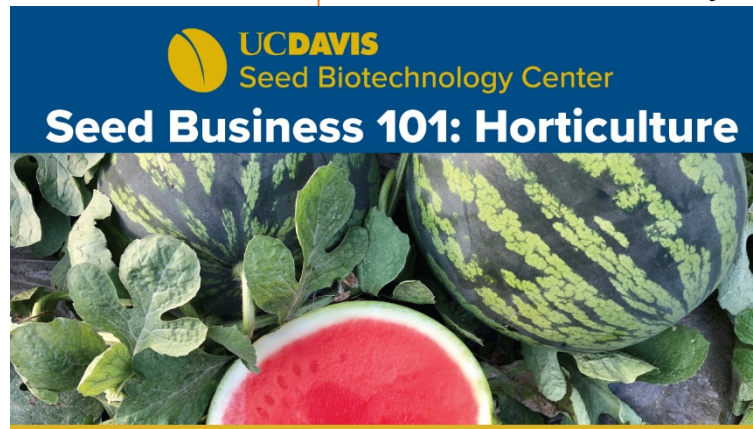
Week 4: Feb 6-11, 2023

Week 5: May 1-6, 2023

Davis, CA



**Leadership Program for
Plant Breeders & Scientists**
November 15-17, 2022: **32 Students**

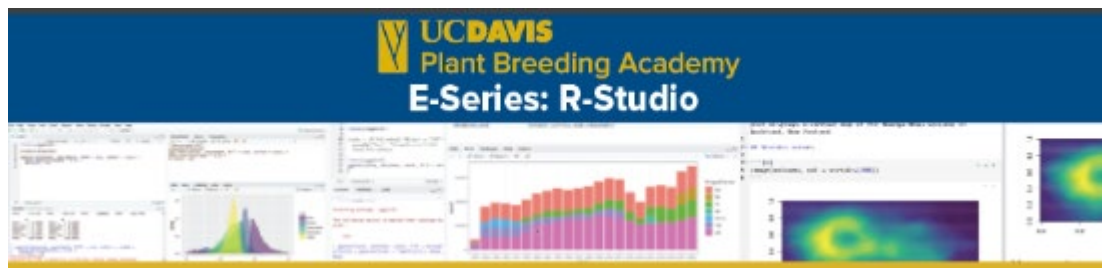


Seed Business 101: Horticulture
Nov 28 - Dec 2, 2023: **42 Students**



Seed Production
February 21-24, 2023: **25 Students**

EDUCATION: Online Courses in 2023



E-Series: RStudio – 4 Levels Available

Level 1: March 21-22, 2023 – **12 Students**

Upcoming:

Level 2: June 6-7, 2023

Level 3: September 6-7, 2023

Level 4: December 12-13, 2023



E-Series: Statistics & Experimental Design

April 11 & 13, 2023 – **21 Students**

Upcoming:

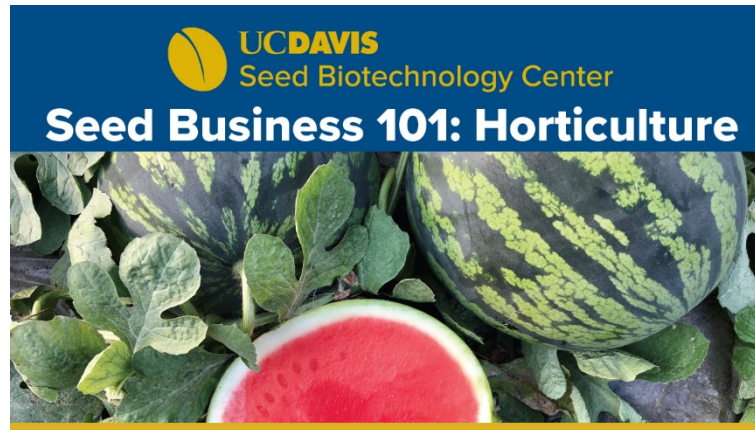
E-Series: Hybrid Breeding Strategies:

May 23 & 25, 2023

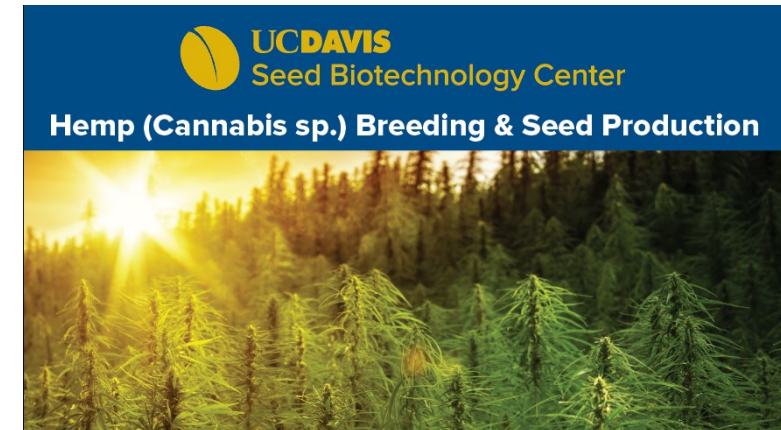
EDUCATION: Upcoming In-Person Courses in 2023



**Leadership Program for
Plant Breeders & Scientists**
November 14-16, 2023



Seed Business 101: Horticulture
Nov 27 - Dec 1, 2023



**Hemp (Cannabis sp.) Breeding &
Seed Production**
December 5-6, 2023

EDUCATION: Upcoming PBA Sessions in 2023



Davis PBA Class VIII: **19 Students**

Week 6 (Graduation)
September 11-15, 2023
Davis, CA

African PBA Class V: **41 Students**

Session 3 (Graduation)
May 14-27, 2023
Nairobi, Kenya

European PBA Class VII: **17 Students**

Week 3
June 19-23, 2023
Gatersleben, Germany
Week 4
October 16-20, 2023
Gent, Belgium

AfPBA CRISPR Class I: **11 Students**

Session 3 (Graduation)
October 2-13, 2023
Nairobi, Kenya

**Davis PBA
Class IX**
***Applications
Are Now Open***
(Class Starts February 2024)

African Plant Breeding Academy CRISPR Course

*An Initiative of the
African Orphan Crops Consortium*

pba.ucdavis.edu



Contact:
Rita Mumm, ritamumm@illinois.edu
Allen Van Deynze avandeynze@ucdavis.edu

Enabling African scientists to use CRISPR gene- editing technology for

- A quantum leap in **nutrition**, climate resiliency, and sustainability in African food systems

- An explosion of **innovation** and economic growth across the continent

- **Capacity building and mobilization** for African molecular scientists and national programs



UC DAVIS
Plant Breeding Academy



biosciences
eastern and central africa



**MORRISON
FOERSTER**



2023 Sponsors



2023

April 13, 2023



Christine Diepenbrock
Assistant Professor
Dept. of Plant Sciences
UC Davis



Brian Bailey
Associate Professor
Dept. of Plant Sciences
UC Davis



Mason Earles
Assistant Professor
College of Biological and
Agricultural Engineering
UC Davis

Topic: The GEMINI project
See: UC Davis Awarded \$6.5 Million to Develop AI Breeding Tool for Crops - Grant from the Gates Foundation seeks to improve modern breeding pipelines

March 9, 2023

Nitin Nitin
Professor, Food Science and Technology / Biological and Agricultural Engineering and
Rewa Rai
Project Scientist in Dr. Nitin's lab
UC Davis

Topic:
Biochemical approaches for pest and pathogen control in agriculture and food



Nitin Nitin



Rewa Rai

February 9, 2023

Heiner Lieth
Professor Emeritus
Plant Sciences Department
UC Davis

Professor Lieth helped us understand why the course he taught for many years, called "Flower Power", attracts an astonishing 1,000 students.



January 12, 2023

Eduardo Blumwald
Distinguished Professor
Department of Plant Sciences, College of Agricultural and Environmental Sciences
UC Davis

Topic: Engineering biological nitrogen fixation in cereals

See also:
August 2022 news release: Growing cereal crops with less fertilizer - Discovery could reduce nitrogen pollution, save farmers billions



May 11, 2023:

- Gail Taylor**

Distinguished Professor and John B Orr Endowed Professor in Environmental Plant Sciences
Chair of the Department of Plant Sciences
UC Davis

Dr. Taylor will speak about campus activity with the new Agricultural Innovation Center and HT phenotyping greenhouse and recent hires in the Department of Plant Sciences.

Location: Buehler Alumni Center, UC Davis



Francois Korn

January 27-31
2023



American Seed Trade Association's Vegetable & Flower Conference
Orlando, Florida

ASTA's Vegetable and Flower Seed Conference offers unrivaled networking and educational opportunities



- **Company Field Trips-monthly**
- **Grand Prize Internship—East West Seed- Thailand.**

Annual Retreat March 23rd Seed Central Field Days SCOPE Field days

UCDAVIS
DEPARTMENT OF PLANT SCIENCES

New Strawberry breeder



Borlaug Scholars, Class of 2023

Van Deynze Chair



Borlaug Scholars

**Looking for sponsors
and
mentors**

Firstname	Lastname	Current School	Degree
Navdeep	Kaur	New Mexico State University	MS
Connor	Soderstrom	Cal Poly Pomona	MS
Gaurab	Bhattarai	The University of Georgia	PhD
Grant	Billings	North Carolina State University	PhD
Mahule	Boris Alladassi	Iowa State University	PhD
Matthew	Brooke	Washington State University	PhD
Juliana	Cromie	University of Florida	PhD
Savanah	Dale	Cornell University	PhD
Harsimardeep	Gill	South Dakota State University	PhD
Amaka	Ifeduba	Texas A&M University	PhD
Hannah	Jeffery	Michigan State University	PhD
Marie	Klein	UC Davis	PhD
Audrey	Kruse	University of Wisconsin- Madison	PhD
Sudip	Kunwar	University of Florida	PhD
Juan	Panelo	Iowa State University	PhD
Stephen	Parris	Clemson University	PhD
Lucas	Roberts	University of Minnesota - Twin Cities	PhD
Jonathan	Santiago Concepcion	Michigan State University	PhD
Hannah	Stoll	University of Minnesota - Twin Cities	PhD
Hannah	Clubb	Iowa State University	UG
Andrew	Hokanson	Iowa State University	UG
Elizabeth	Krause	North Dakota State University	UG
Nadia	Phillips	University of Minnesota	UG
Lauren	Stubbs	Washington State University	UG

2022 NAPB Borlaug Scholars Sponsors



Research

- Mechanical harvesting in pepper. **New Grant**
- Breeding for resistance to Tomato Spotted Wilt in Pepper
- Breeding tools in Carrot;
- Breeding for resistance to Alternaria and water deficit in Carrot **New Grant**
- Breeding for resistance to downy mildew/
nitrogen use efficiency in spinach Nitrogen fixation in maize
- Genome editing in pepper
- Celery Genomics
- Tomato Seed Quality
- Apomixis in Rice



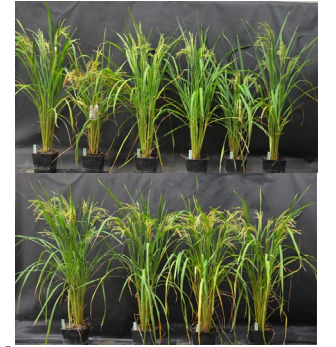
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Outreach: Collaboration for Plant Pathogen Strain Identification (CPPSI)



Phyllis Himmel



- CPPSI director planned retirement is September 30, 2023
 - Position posted 4 April – 4 May 2023
 - Two qualified applicants identified
 - Interviews planned for early June 2023
- Proposed Round 7 Reverence Materials approval pending
 - Sunflower Downy mildew
 - Melon CMV
 - Cucumber CMV
- Comparative ring tests with ISF members in EU and US, to be discussed during June 2023 ISF meetings in Madrid
 - Pepper TEV – based on initial Plantum test results, host & isolate distribution for testing under way
 - Pepper Phytophthora crown and root rot – Phyto requirements finally met, hosts and isolates for EU tests ready for shipping to validate ng hosts and reference isolates identified
 - Watermelon Fusarium wilt results analyzed, hosts validated
 - Watermelon Powdery mildew hosts identified & acquisition/seed increases underway. Races 1 and 2
- Ongoing comparative ring tests with APSA members delayed by phytosanitary requirements for seed movement

Reference Materials development status

	Host	Pathogen	Approval date	Current Activities	Expected deployment
Round 1	melon	Fusarium wilt	2007	Complete	Deployed 2010
	pepper	Bacterial spot	2007	Complete	Deployed 2010
	spinach	Downy mildew	2007	Complete	Deployed 2010
	tomato	ToMV	2007	Complete	Deployed 2010
Round 2	lettuce	DM	2016	Complete	Deployed 2020
	pepper	TSWV	2016	Complete	Deployed 2019
	tomato	TSWV	2016	Complete	Deployed 2019
	watermelon	Fusarium wilt	2016	Complete	Deployed 2021
Round 3	tomato	RKN	2017	Complete, not deposited	2023*
	tomato	Fusarium wilt	2017	Complete, not deposited	2023*
	melon	Powdery mildew	2017	Final ring test completed	2022 - 2023
Round 4	pepper	PVY	2018	Host final verification	2023
	pepper	PepMoV	2018	Host final verification	2023
	pepper	Tobamoviruses	2018	Complete, not deposited	2023*
	tomato	Verticillium wilt	2018	White paper	2023
Round 5	tomato	Spot	2019	Host increase ready in June 2023, white paper	2024
	tomato	Speck	2019	Host increase ready in June 2023, white paper	2024
	pepper	Phytophthora crown and root rot	2019	Final ring test under way, white paper	2024
Round 6	cucumber and watermelon	Anthraxnose	2021	Differentiating hosts identified, being increased, reference strains cultured	2024
	watermelon	Powdery mildew	2021	Differentiating hosts identified, need to be increased, collecting reference races	2024
	pepper	CMV	2021	Differentiating hosts being increased, reference strains cultured in plants	2024
Round 7	sunflower	Downy mildew	2023	Proposals to be discussed	2026
	melon	CMV	2023		
	cucumber	CMV	2023		

* delayed to 2023 by recent personnel turnover at USDA National Plant Germplasm Center - all permits must be renewed before accepting additional CPPSI Reference Material deposits.

Status of Reference Materials under development:

- Still waiting to hear from USDA National Germplasm Lab that microbe permits are renewed before these Reference Materials can be deposited with them:

Pepper Tobamoviruses

Tomato RKN

Tomato Fusarium wilt

- Pepper CMV differential hosts and isolates identified, final validation test is next, then a final seed increase prior to USDA deposit
- Seed increases are taking longer to complete than originally planned – a lack of planting space is the limiting factor
- The launches of most round 5 and 6 materials have been delayed 6 months to a year

Seed Biotechnology Center Mission

To be a liaison between the seed and plant breeding industry and the University of California for
Education, Outreach and Research

Thank you for being our partner!