SBC Team

Allen Van Deynze
Director

Jovan Djordjevic
Education Director

Imtiyaz Khanday
Research Director

Whitney Lowe
Program Rep

Open Position

Program Rep

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

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Remembering Kelly

Kelly was a strong supporter of the SBC, a Broad Thinker and a True Gentleman.

Kelly helped shaped the SBC and certainly the Seed Industry

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**

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Education: SBC classes during Pandemic 2021 Staying nimble

Jovan Djordjevic

- UC Davis SBC and PBA has not stayed silent during pandemic
- Redoing old and innovating new content, all ONLINE:
- Hemp Breeding/Seed Production
- Seed Production – in Davis and with ASTA Seed Production for Africa
- Euro PBA, class VI in March and June,
- New E-Series, 2 sets - 2 times zones
  - Statistics/Experimental Design foundation
  - Hybrid Breeding Strategies foundation

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Upcoming classes Fall and Winter

- Hemp Breeding Seed Production- last week
- E-Series #1: Statistics & Experimental Design – English, Spanish and Portuguese
- E-Series #2 Hybrid Breeding Strategies – English, Spanish and Portuguese
- E-series #3 Advanced Statistics & Experimental Design
- Seed Business 101 Horticulture

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Plant Breeding Academy℠

- European Plant Breeding Academy
  Oct in-person
- UC Davis Plant Breeding Academy
  in-person Jan 2022
- African Plant Breeding Academy
  in person (delayed until May 2022)
- African Plant Breeding Academy Class CRISPR

NEW

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Outreach: Talks and Committees

- Indonesian Seed Innovation Center – Potential collaboration
- Van Deynze, A. Breed Local and have Global Impact. American Society of Horticulture Sciences Aug 2021 and University of Florida Jan 2021
- Van Deynze, A. African Orphan Crops. American Society for Plant Biology. July 2021
- Van Deynze, A. Nitrogen Fixation in Maize. Farm Foundation Group. July 2021
- Van Deynze, A. Genome editing in crops. Agrifood Systems April 2021.

asta | american seed trade association

California Seed Association

COLLABORATION FOR CPPSI Plant Pathogen Strain Identification

National Association of Plant Breeders NAPB Improving Plants to Improve Lives

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Seed Central℠

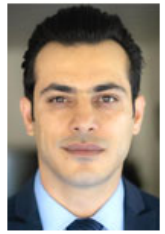
chnology Center at UC Davis and SeedQuest

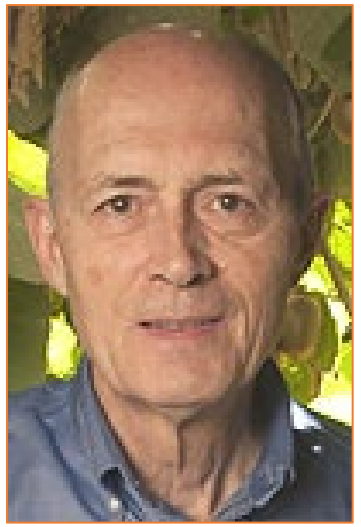
Thursday, December 9, 2021

Focus on digital ag & AI technologies

This is how the Digital Agriculture laboratory at UC Davis defines 'digital agriculture':
Digital Agriculture integrates advanced technologies to enhance agricultural production system. It include cutting-edge techniques to acquire data, convert them to practical knowledge using validated interpretation models, and exploit this knowledge as decision-support tools.

4:30 - 6:00 PM
If possible in-person, subject to UC Davis guidance for in-person activities, otherwise online

Moderator	Panelists			
				
TBA	**Christine Diepenbrock**	**Brian Bailey** Assistant Professor	**Troy Magney** Assistant Professor	**Ali Pourreza** Director, Digital


Francois Korn

January — Thursday, January 27, 2022

Seed Central℠ Center of Seed Excellence and Innovation | UCDAVIS Innovation Institute for Food and Health | UCDAVIS Microbiome Special Research Program | UCDAVIS VENTURE CATALYST

Seed Central's Innovators Showcase Online

6th Innovators Showcase @ UC Davis

Online edition 2022

Featuring startups and innovative companies in ag and food, from seed to health

8:00 - 9:00 AM Pacific time: 1st pitch session, with 20 startups

1:00 - 2:00 PM Pacific time: 2nd pitch session, with 20 startups

With options to offer online company visits during the week of January 31 - February 4.

FEATURED SPONSOR

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Seed Central events are sponsored by

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Seed Central℠ Center of Seed Excellence and Innovation + UCDAVIS Plant Breeding Center + asta american seed trade association

in cooperation with

NAPB Improving Plants to Improve Lives | American Society of Agronomy | Crop Science Society of America | Soil Science Society of America

Seed Central
Connecting students with industry

2021

December 6-9, 2021
schedule to be announced

Online sessions at the American Seed Trade Association's CSS 2021 & Seed Expo

asta american seed trade association

(schedule to be announced)

Undergraduate and graduate students, and post-docs, will be invited to attend conference sessions, present research posters, and network with industry professionals.

Fall 2021
dates to be announced

Seed Central Career Development Workshop
Efficient communication

Seed Central℠ Center of Seed Excellence and Innovation

(date and time to be announced)

Efficient, courteous communication is one of the most important soft skills you want to master by the time

Reference Material Development Status

- Watermelon *Fusarium oxysporum* f sp. *niveum* posted and available on Pepper Tobamoviruses launching October 2021
- Tomato RKN and tomato *Fusarium oxysporum* f sp. *lycopersicon* by the end of 2021

Phyllis Himmel

Round 6 Reference Materials approved by Advisory Council in June 2021 for planned launch in 2024

- Anthracnose of cucumber and watermelon
- Pepper CMV
- Watermelon *Podosphaera xanthii*

COLLABORATION FOR CPPSI Plant Pathogen Strain Identification

cppsi.ucdavis.edu

Comparative ring tests now under way

- Pepper *Phytophthora capsici* – develop differentials to distinguish standard from aggressive isolates
- Watermelon *Fusarium oxysporum* f sp. *niveum* – evaluate differential hosts and CPPSI reference races for consistent responses in 12 participating labs in the US, EU and Asia

By the end of 2021, CPPSI will be distributing 11 sets of Reference Materials

Research

- Economic study of California Seed industry
- Mechanical harvesting in pepper
- Breeding for resistance to Tomato Spotted Wilt in Pepper
- Breeding tools in Carrot
- Breeding for resistance to downy mildew/ nitrogen use efficiency in spinach
- Nitrogen fixation in maize
- Genome editing in vegetables

- Tomato Seed Quality
- Apomixis in Rice

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Value of Seed Industry

Dan Sumner
Ag Issues Center
UC Davis

Bill Matthews
Ag Issues Center

- Describe and measure the role of California seed industry in California agriculture and the economy of California
- Describe and measure the value of the California seed industry's contributions toward global food security, nutrition and food safety

Thank You

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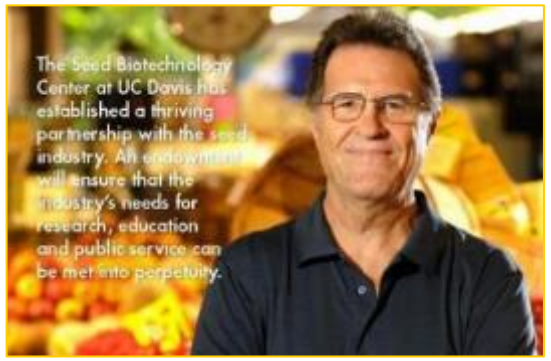
2021 Publications

- Fletcher et al. (2021). **The ancestral chromosome architecture of downy mildew oomycetes revealed by the genome assembly of Peronospora effusa.** BioRXiV.
- Bredeson, J. V., et al. (2021). **"Chromosome evolution and the genetic basis of agronomically important traits in greater yam."** BioRXiV.
- Khanday, I. and V. Sundaresan (2021). "**Plant zygote development: Recent insights and applications to clonal seeds."** Curr Opin Plant Biol 59: 101993.
- Bello P, Bradford KJ: **Relationships of Brassica Seed Physical Characteristics with Germination Performance and Plant Blindness.** *Agriculture 2021, 11(3):220*
- Wang X, Chen S, Ma X, Yssel AEJ, Chaluvadi SR, Johnson MS, Gangashetty P, Hamidou F, Sanogo MD, Zwaenepoel A, Wallace J, Van de Peer Y, Bennetzen JL, Van Deynze A: **Genome sequence and genetic diversity analysis of an under-domesticated orphan crop, white fonio (Digitaria exilis).** *GigaScience 2021, 10(3).*
- Ma et al. 2021. **A chromosome-level Amaranthus cruentus genome assembly highlights gene family evolutio**n and biosynthetic gene clusters that may underpin the nutritional value of this traditional crop. *Plant Journal. In press*
- Hulse-Kemp AM, Bostan H, Chen S, Ashrafi H, Stoffel KM, Sanseverino W, Li L, Cheng S, Schatz MC, Garvin T, du Toit LJ, Tseng E, Chin J, Iorizzo M, Van Deynze AE: **An anchored chromosome-scale genome assembly of spinach (Spinacia oleracea) improves annotation and reveals extensive gene rearrangements in euasterids.** *The Plant Genome 2021, e20101*

Kent J. Bradford endowment



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Kent J. Bradford and Barbara Zadra
Khosro Khodayari, SynTech Research, Inc.*
Known-You Seed Co., Ltd.
Rijk Zwaan USA, Inc.
Sakata Seed America, Inc.
Syngenta Crop Protection, LLC*
Takii Seed
The Kraft Heinz Company*

- Have raised $1.5M, initial goal for Endowed Professorship
- An additional $500,000 will give an Endowed Chair
- $200,000 to meet goal

Thank You

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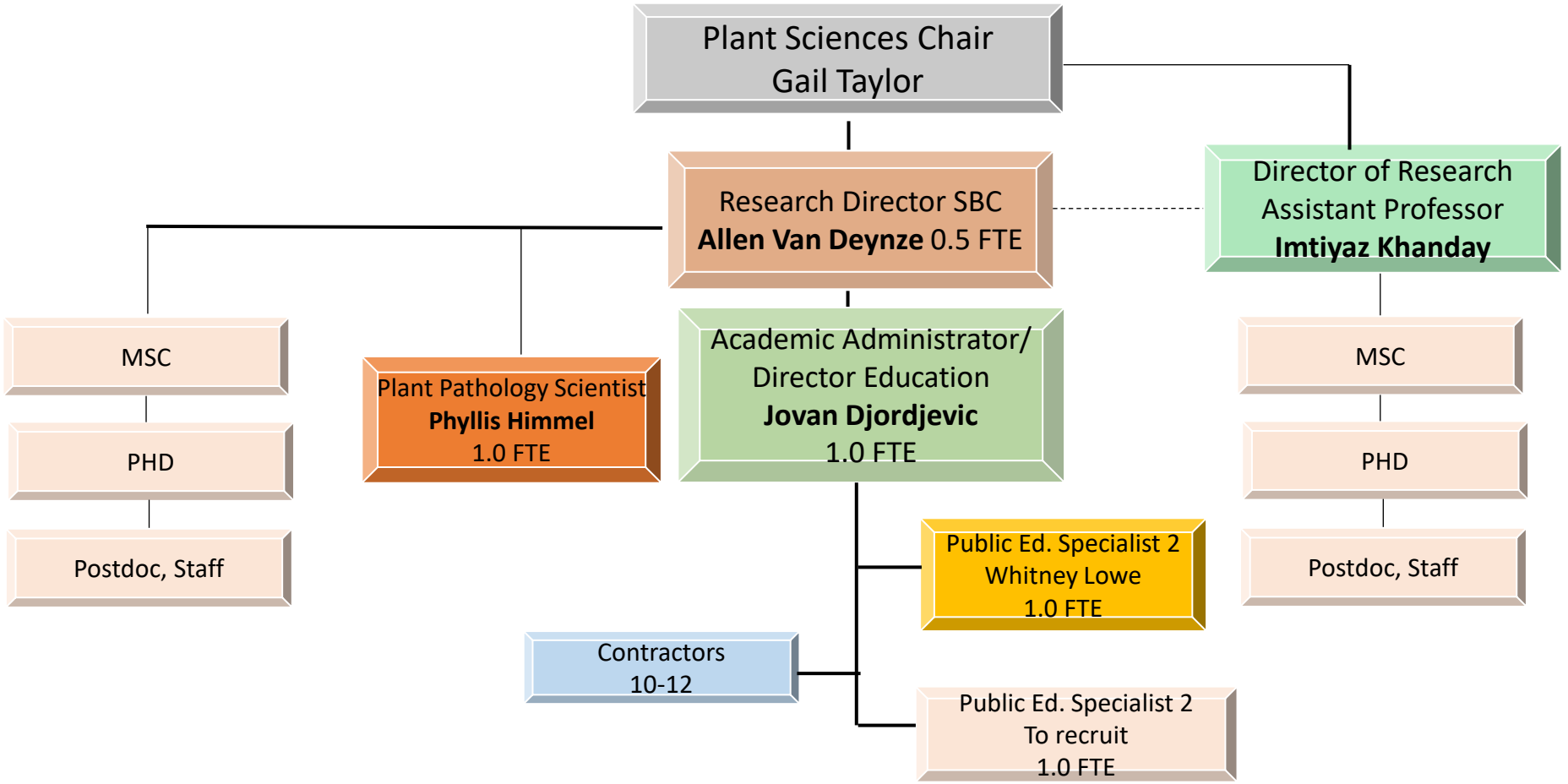
SBC: California Benefits

- Most research is on CA crops
- Training programs targeted to local industry needs
- Seed Central activities in Davis and Salinas – now international exposure online
- CPPSI focuses on CA crops
- Research from other projects is translating into uses for CA crops
- Outreach for CA crops and Seed Industry- internationally exposure
- CA industry access to the talent pipeline (UC Davis, Hartnell, Woodland, Cal Poly SLO, CSU Fresno, etc.)
- Research (engineering, plant breeding, apomixis (clonal seed), etc.) for mechanical harvesting and other processes
- Continued dedication of UC Davis to Seed Industry

2021 –SBC ORG Chart



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California Seed Account

CDFA Account		FY19	FY20	FY21 Expense	Total Expense August 2021	Balance August 2021
Personnel		205,834	237,949	34,642	478,426	
Supplies		8,137	8,623	921	17,681	
Travel		993	228		1,221	
Total	$750,000	214,964	246,800	35,563	497,328	252,672

$9.5M in Research in same time period.

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Seed Biotechnology Center Operations FY19-Aug 21

Accounts FY19- Aug. 21	Income	Expenditures	Balance August 2021	Projected 06/22
SBC	821,032	569,635	251,398	(915)
Scholarship	47,102	0	47,102	45,102
Course	232,238	120,515	111,723	(92,106)
African Plant Breeding Academy	1,037,767	10,000	1,027,767	*677,799
CPSSI	400,424	16,417	384,007	293,742
SBC Education and Outreach	2,138,139	700,149	1,437,990	629,880
Research	9,496,946	9,496,946	6,273,692	3,753,916
SBC Total	11,635,085	10,197,095	7,711,682	4,383,796

17.5:1 Return on Investment

* Course delayed till May 2022

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AB20 Status

- State of California mandated contracts with UC
- Negotiations resulted in inclusion of potential overhead costs
  - 10 to 40% overhead proposed
  - Marketing orders exempted, including Seed Advisory Board, for 5 years 2018-2023

A Proposal

- SBC would gratefully request that the current $250,000 for 3 years be extended from July 2022 to June 2025
- Consider adjusting if AB20 indirect costs are incurred (beginning July 2023)

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Future Plans and Goals

Education

- Continue to work with Stakeholders to develop and deliver professional training classes relevant to the California Seed Industry, in-person and online

Outreach

- Be a scientific voice for the California Seed industry globally
- Attract new talent and companies to benefit the CA Seed industry

Research

- Continue to work with stakeholders to bring cutting edge, problem solving, relevant research to the California Seed Industry

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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!

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