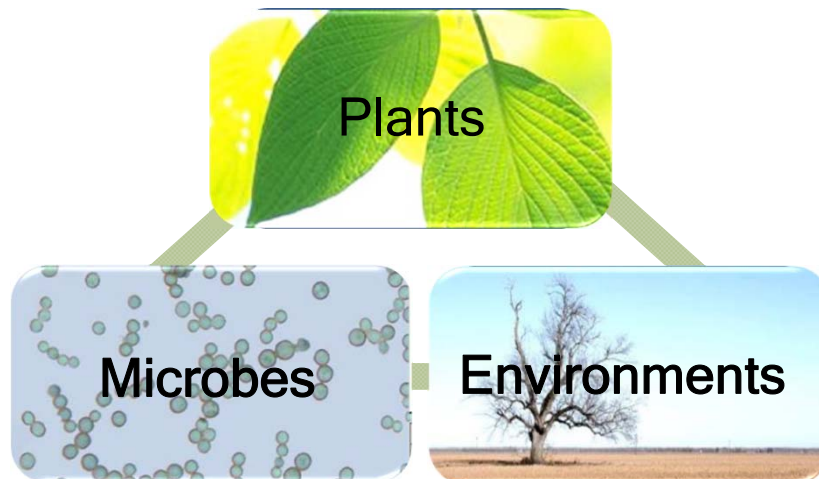


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We work on...

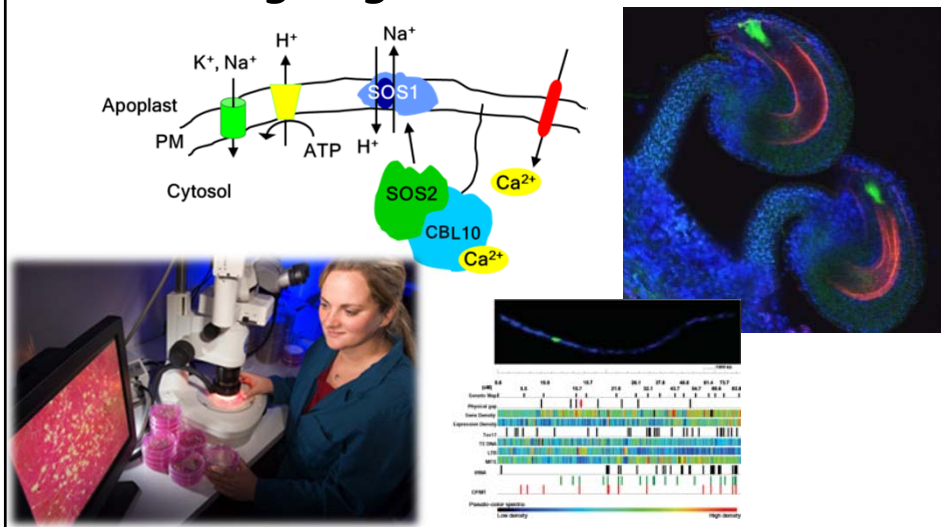


Various production systems



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From cutting-edge science...



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...to innovative applications!

Urban agriculture



Phenotyping in fields

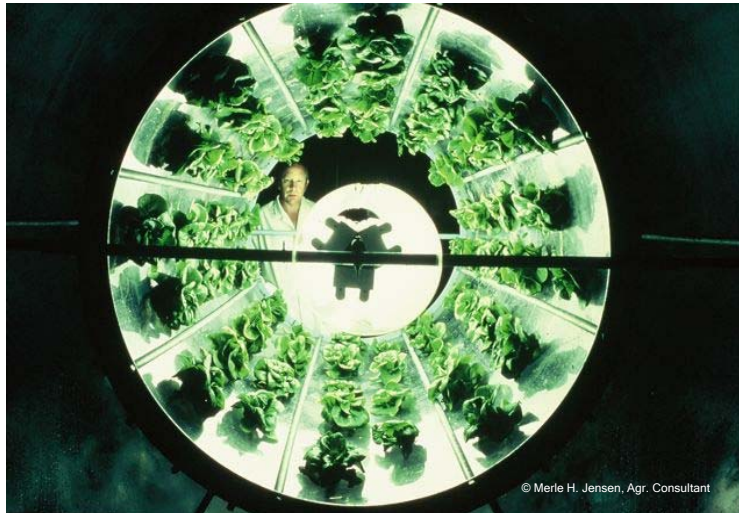
The School of Plant Sciences

***...in various crops for food, feed
& quality of life!***



The School of Plant Sciences

...beyond your imagination!!



Undergraduate Education



School of Plant Sciences

College of Agriculture and Life Sciences

Majors and Minors in:
Plant Sciences
Sustainable Plant Systems



Graduate Programs

School of Plant Sciences

College of Agriculture and Life Sciences

M.S. and Ph.D. in Plant Sciences and Plant Pathology



7,212,010,600

US Census Bureau
2/9/2014 8:55PM



The Economist

The 9 billion-people question
A special report on feeding the world | February 26th 2011

Grand Challenge Question


How do we grow enough food to feed the world in less than 40 years?

New varieties are needed with 2-3X yield
BUT
That require less water, fertilizer, pesticides & land

“Green Super Crops”

Slide by Rod Wing

Diversity in wild rice species

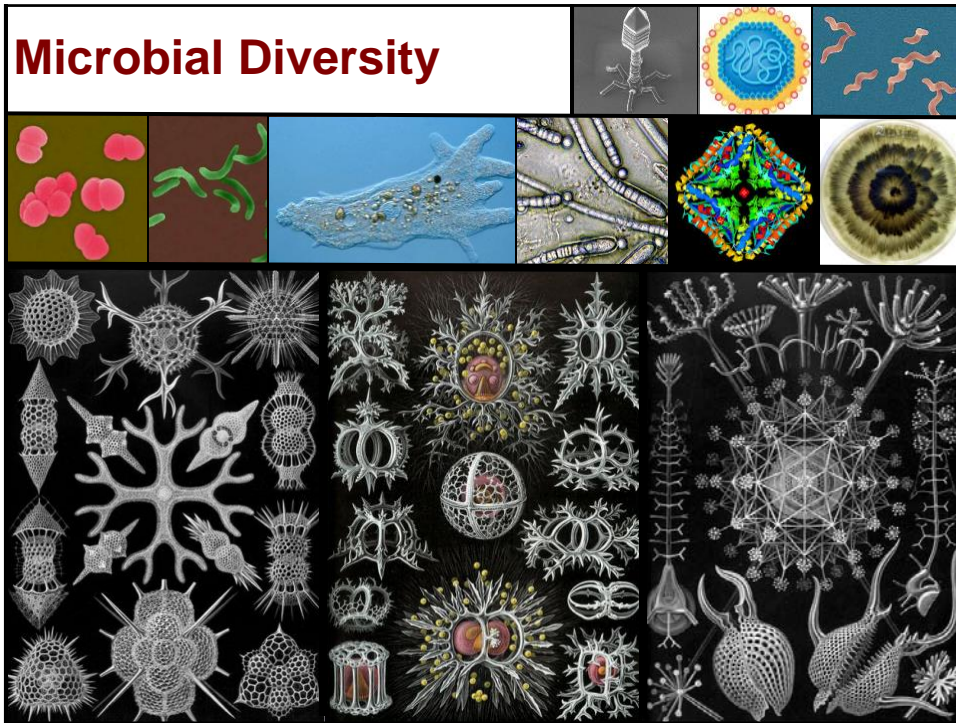


O. sativa	O. glaberrima	O. rufipogon	O. punctata	O. minuta	O. officinalis	O. alta	O. australiensis	O. brachyantha	O. granulata	O. ridleyi	O. coarctata
(AA)	(AA)	(AA)	(BB)	(BBCC)	(CC)	(CCDD)	(EE)	(FF)	(GG)	(HHJJ)	(HHKK)

Traditional crop improvement (breeding) may have overlooked important key genes to develop ‘Green Super Crops’

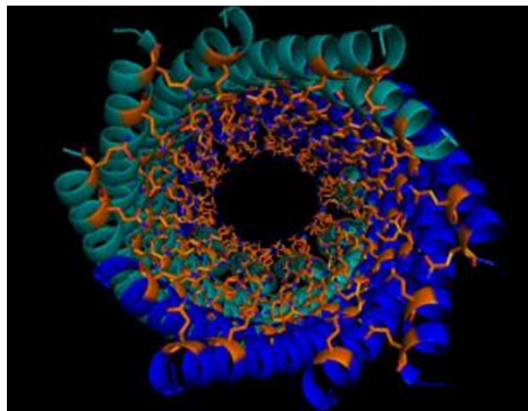
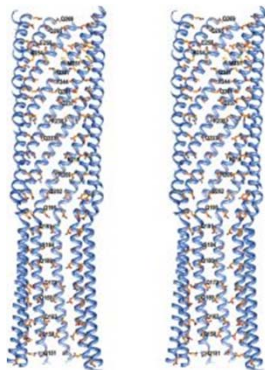
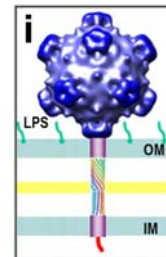
After slide provided by Rod Wing

Microbial Diversity



Virus Structure and Morphogenesis

Dr. Bentley Fane and his research team recently solved the first atomic structure of a virally encoded, DNA translocating conduit.



Growing Gourmet Mushrooms that Recycle Waste



Dr. Barry Pryor is developing systems for recycling landscape and consumer waste products as substrates for growing gourmet and medicinal mushrooms.

New Arid Land Animal Feed Crop

By 2050, global needs are 70% more food and 235% more animal production, which requires animal feed production to double.

Dr. Eliot Herman has used biotechnology to restructure a Camelina from being an oil-dominant to a protein-dominant seed, with a 30% protein and 18% oil composition similar to soybean.

Camelina is productive on marginal lands and water. In Arizona it may be feasible to have two crops per winter that together could rival the per acre soybean protein production of the Midwest.



Over-Winter Test Crop

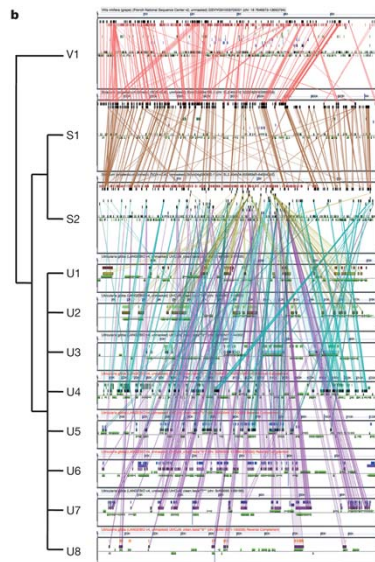


Plant-based Therapeutics

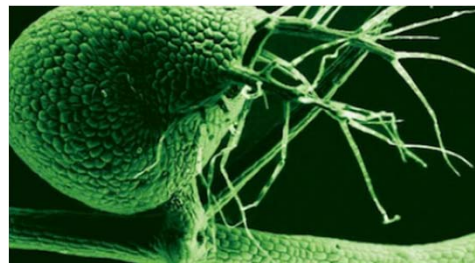
Drs. Eliot Herman and Monica Schmidt work on developing a novel approach to prevent death in premature infants through addition a therapeutic protein to soybeans.



Comparative Genomics



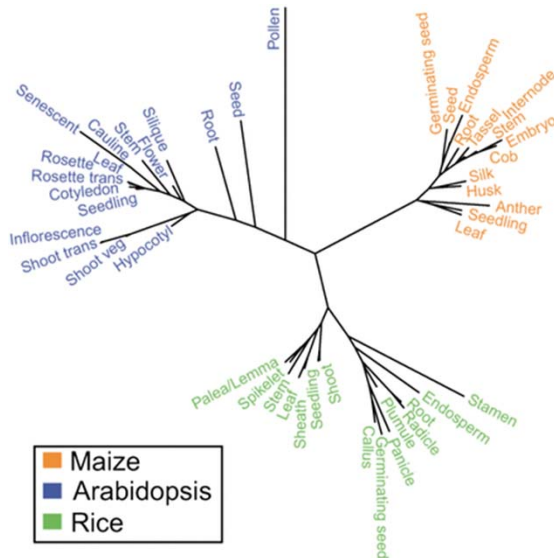
Dr. Eric Lyons developed a comparative genomics software system (CoGe), and used it to reveal the evolutionary history of a carnivorous plant.



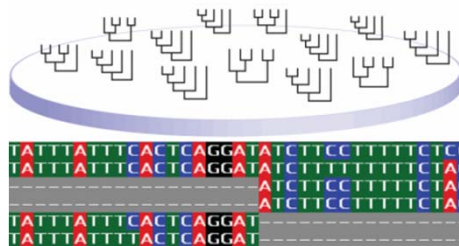
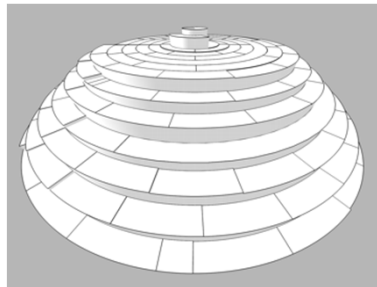
Bioinformatics – Gene Expression in Angiosperm Organ Evolution

Dr. Xiangfeng (Bryan) Wang

analyzed transcriptome data of maize, rice and Arabidopsis to chart gene expression divergence across organs.



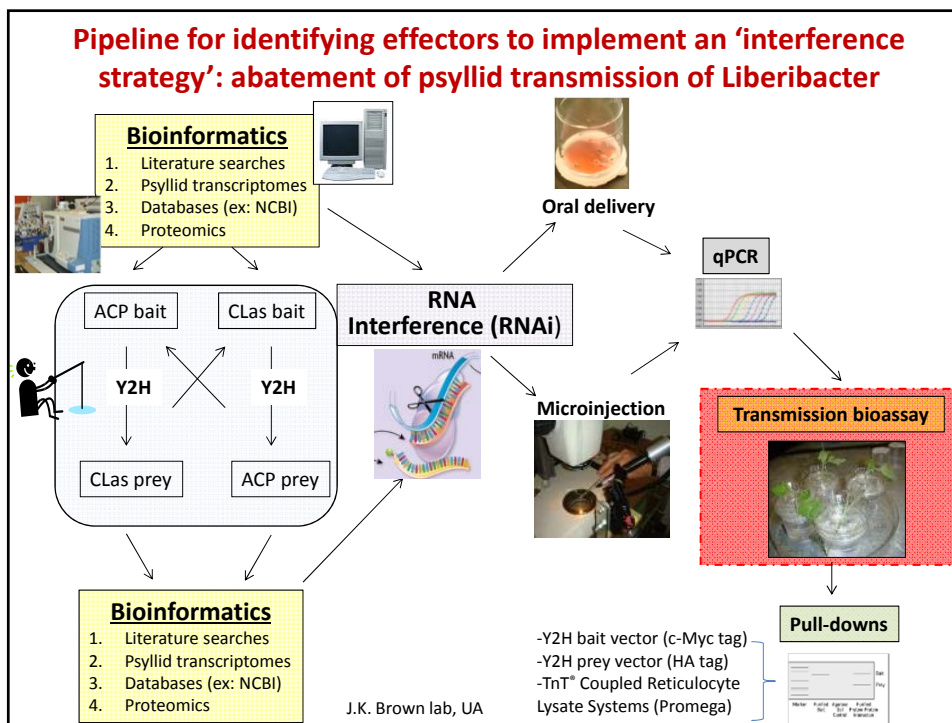
Terraces in Phylogenetic Tree Space



Dr. Michelle McMahon works on computational analyses to assemble the tree of life, and has developed new algorithms to find evolutionary relatedness.

Prevent Citrus Greening Disease

Dr. Judy Brown works on finding molecular effectors that mediate interactions between psyllids and the bacterium that causes citrus greening.



High Throughput Phenotyping



The Arizona Phenotyping Network (AZPN) Yuma – Maricopa – Tucson



Rod Wing – UA Plant Sciences/Arizona Genomics Institute
Matt Jenks/Jeff White – USDA/ARS Maricopa
Chieri Kubota – UA Plant Sciences/Controlled Environmental Agriculture







Reduce Aflatoxin in Crops



Dr. Peter Cotty

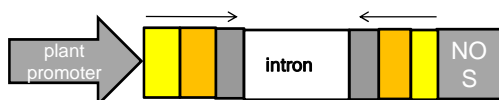
works nationally and internationally on ways to reduce aflatoxins, toxic chemicals that certain fungi produce during crop infection.

Developing Aflatoxin free Crops

	Maize 16 million tons		Soybean 2.3 million tons
	Rice 12 million tons		Groundnut 1.8 million tons
	Copra 3.7 million tons		Sorghum & Millet 0.4 million tons

Dr. Monica Schmidt

works on engineering the ability to suppress aflatoxin production in both corn kernels and peanut seeds



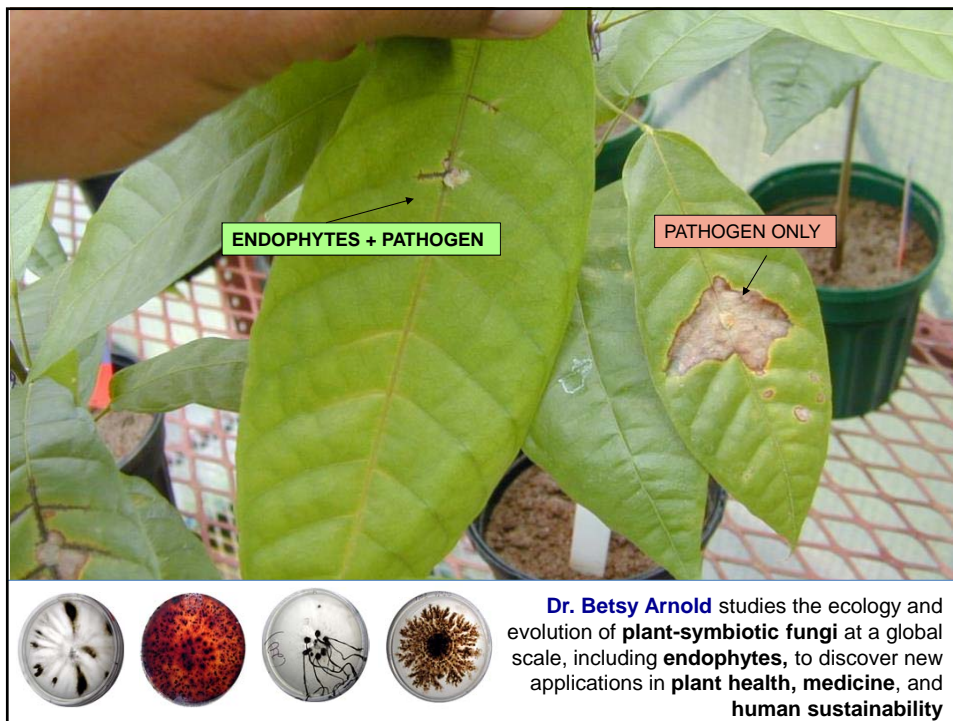
RNAi plant expression cassette targeting 3 sections of the polyketide synthase gene in *Aspergillus* - a initial step in the aflatoxin pathway

Grand Challenges | EXPLORATIONS

Measuring Differences in Gene Expression in Different Plant Cells

Dr. David Galbraith

is an expert in developing methods for analyzing the differences in gene expression within the many different cell types that make up plant organs. He is now applying these methods to probe the earliest events in the onset of pancreatic cancer.



Growing Flavorful Strawberries in Arizona

Dr. Chieri Kubota

develops ways to grow high quality strawberry hydroponically in Arizona greenhouses for potential winter production.



Establishing Guayule Production



Dr. Dennis Ray works on introducing guayule as alternative crop in Arizona. The Ray lab contributes to breeding guayule and optimizing horticultural practices to increase yields.



Plant and fungal diversity

The UA Herbaria identify plants and fungi for veterinarians, producers, gardeners, and enthusiasts.

Dr. Michelle McMahon
and Dr. Betsy Arnold,
Curators



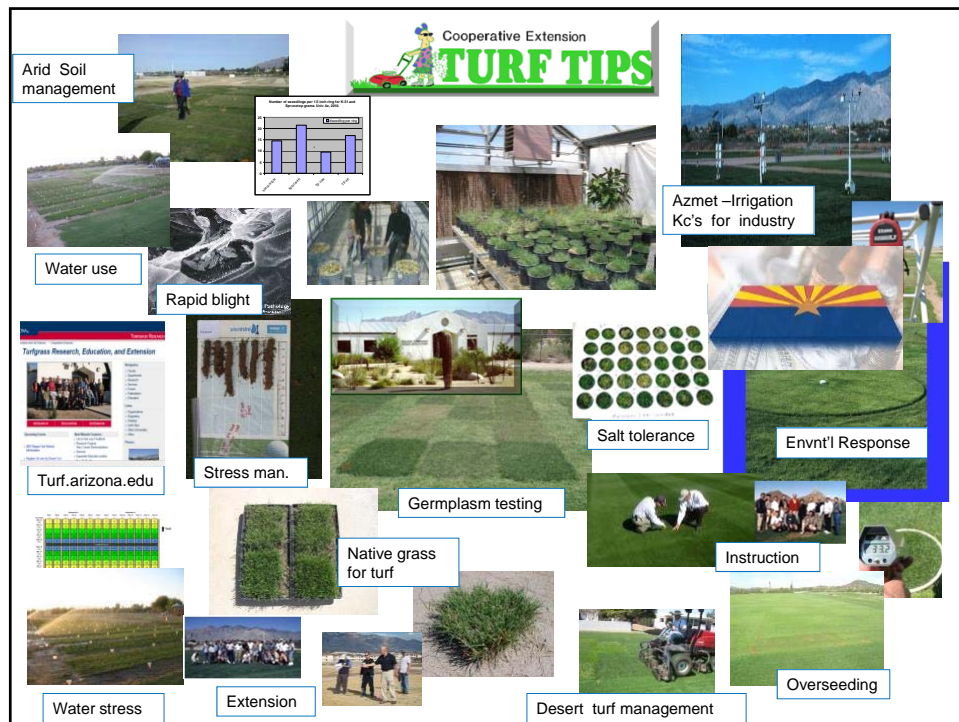
Turfgrass Science & Management

Dr. Dave Kopec studies: New grass use/development, weed control, and specialized golf management practices.

Career opportunities for students:

- Plant stress physiologist.
- Irrigation and water management.
- Soils and nutrition specialist for turf.
- Golf Course Superintendent
- Sports Turf Manager
- General turf agronomist
- Product development, irrigation, fertilizer, cultivars.
- Sod production.
- Environmental fate and use of amenity grasses.
- Seeds specialist.
- Equipment engineering.





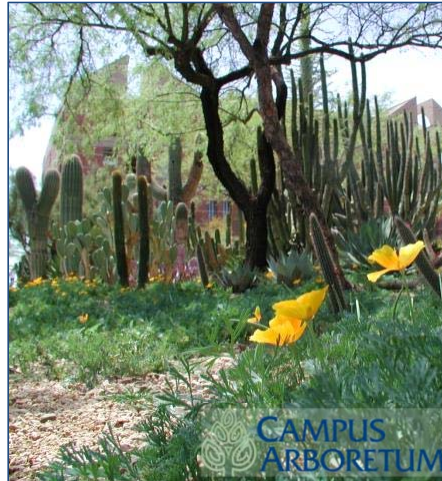
Drought-tolerant Turfgrass

Dr. Mohammad Pessaraki works on various turfgrass species and cultivars to handle the major environmental stresses (salinity, drought, and heat) of the Desert Southwest.



Improving Landscape Management Through Science-Based Practices

Dr. Tanya Quist directs the University of Arizona Campus Arboretum in promoting conservation and stewardship of urban trees. The program provides training to students, landscape professionals and community leaders who support decisions relating to urban tree health and sustainable landscapes.



Irrigation Requirements of Landscape Trees

September 2007



April 2010



Desert willow



Mesquite



Pistachio



Palo verde



June 2013

Dr. Ursula Schuch is investigating how much or how little irrigation landscape trees need to stay healthy and give us the shade we need in our desert environments.





The School of Plant Sciences

**Translating
basic plant and
microbial
science
research into
applications**

