PLANTS AND DESIGN

8:00 – 9:00 a.m.  Desert Landscapes: Stormwater and Public Health Benefits
Irene Ogata, PLA, City of Tucson, Tucson Water
Installation of green infrastructure in arid communities has different drivers than eastern communities in temperate climates that have combined sewer systems. Here in the arid southwest with separate sewer systems, it is about valuing every drop of water; and how harvesting water leads to improving social and environmental quality associated with the planting of trees. Ultimately it is a public health issue: lowering night time temperatures, usually May-Sept, (also referred to as mitigating urban heat islands), clean air, walkability, increased green spaces all contributing to physical, mental and spiritual health.
Irene Ogata is a Professional Landscape Architect, a Certified Public Manager, and formerly a Registered Nurse. Working within the City of Tucson as the Urban Landscape Manager, she initiated an annual Urban Heat Island Workshop, advocated for increased urban canopy and green spaces, site-specific art and currently manages green infrastructure and limited income rainwater harvesting programs funded through Tucson Water.

9:10 – 10:10 a.m.  Differentiate When You Illuminate
Kris Klein, FX Luminaire
The lighting design differentiation presentation will discuss methods that can be used by lighting designers to separate their projects from their competitors. How to achieve your clients vision with a new pallet of fixtures, far removed from traditional path lights and up lights. The presentation will cover several design challenges and the lighting solutions for each.
Kris Klein has over 27 years of experience in the green industry. He started in the industry at 17 years old working first for a landscape contractor, then at a local distributor prior to getting hired with FX. Kris is a life learner receiving his BS in 1999 from University of Phoenix and his MBA in 2017 from Ashford University. He has a passion for landscape lighting and enjoys sharing his knowledge of lighting with anyone willing to listen.

10:25 – 11:25 a.m.  Creating Spaces for Monarch Butterflies in the Sonoran Desert
Sergio Avila, Wildlife Biologist, Sierra Club
Monarch butterflies are excellent conservation messengers. They are well known along their migratory route and help connect people from different walks of life, from the U.S. Southwest to overwintering sites in California and from the U.S. Midwest and Southern Canada to the overwintering sites in Michoacán, Mexico. Residents and visitors to the Sonoran Desert enjoy the migratory travels of monarchs annually and can help in their conservation by creating and expanding "butterfly gardens." By increasing native milkweed and nectar availability, we can restore and enhance monarch butterfly habitat in homes, schools, city, county and national parks, while accomplishing other goals like public outreach and education, creation of green spaces and access to natural areas within the city limits. Monarch butterfly gardens, big and small, support regional pollinator conservation and habitat improvement in public and private lands, expand the network of Monarch Waystations as areas for feeding, resting and breeding across the country, and complement other local green infrastructure initiatives like "rain gardens."
Sergio Avila has worked for 20 years on local and regional conservation efforts along the U.S.-Mexico borderlands, as a conservation scientist, wildlife researcher, and facilitator of bi-national conservation projects. He holds a Master's in Science degree on Arid Lands Management from Universidad de Baja
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California, and a Bachelor of Science in Biology from Universidad de Aguascalientes. He has led collaborative efforts on connectivity for wildlife, habitat restoration, public education and interpretation in the U.S. southwest and northwest Mexico. Sergio is the first regional Local Outdoors Coordinator for the Sierra Club; he lives in Tucson since 2004.

12:15 – 1:15 p.m.  New Plants in the Industry
Nicholas Staddon, Mountain States Wholesale Nursery
The passion and interest in new plants seems unwavering, matter not if an annual or ornamental shrub. Nicholas will introduce us to a variety of new plants and recent introductions to the nursery profession in the southwestern region. When it comes to the plants it is not a one size fit all. Learn the needs of the various plants as well as the best location to plant in the landscape. Nicholas will touch on the subject of plant patenting and intellectual property, including a general description of what is involved. He will also suggest some of the new and best books to add to your library and a number of the latest trends here in the United States and overseas.

Nicholas Staddon has been working with plant breeders, hybridizers, and professional Plant Explorers for the last 25 years. Nicholas is sought out as a speaker, resource, and guest for television and radio gardening shows across the United States. He spends much of his time with Mountain States Wholesale Nursery assisting in their quest for new and notable plant discoveries, supporting in the marketing of the company, presenting to Landscape Architects and Designers as well as other duties. Born in England, Nicholas attended Otley Agricultural College. When first in America, he managed garden centers in Albuquerque and Santa Fe, New Mexico. Nicholas now resides in California and has affiliations with several professional organizations including the Royal Horticulture Society, the California Association of Nurserymen, and AmericanHort. He serves on the Board of Advisors for Cal-HIP, California Horticultural Invasives Prevention, a voluntary partnership, to help gardeners and the horticultural industry to proactively address the problem of invasive plants in the trade.

1:25 – 2:25 p.m.  Nomenclature Changes for Plants in Our Landscapes
Matt Johnson, University of Arizona, Desert Legume Program
It is said that change is the one universal constant. That includes changes in the botanical names that we learn for many landscape plants. It can certainly be frustrating to learn new names after having known a plant by another name for many years. Over time, as new information on plants becomes available, botanists change the names of plants to reflect this information. This presentation will introduce many of the recent name changes for legume genera such as Acacia, Caesalpinia, and other plants that are commonly grown in Southwest landscapes. The presentation will also include several promising legumes that have yet to make their way into the landscape trade.

Matt Johnson has served as Program Manager and Curator for the Desert Legume Program, a seed bank project of the Boyce Thompson Arboretum and the University of Arizona College of Agriculture and Life Sciences, since 1989. Matt has an MS from the University of Arizona and specializes in plants from arid and semiarid regions, particularly legumes (Fabaceae). He has studied plants and plant communities in dry regions on six continents and is the author of over 80 publications on the botany and horticulture of arid land plants.

2:35 – 3:35 p.m.  Place Making in the Sonoran Desert
Caryl Clement, CJ Clement Design
Place based design is a discovery of the magical balance between intuition and reason, playfulness and formality, concept and detail, form and function, program and budget, community and client. Rooted in the principles of site analysis, sustainability, cultural and economic aspects, iconography and the site’s intrinsic DNA, a dialogue occurs between analytical thinking and creative intuition. One is continually
informing the other in a reiterative process resulting in distinctive design solutions. This design process, the art and science of place making, will be presented and illustrated by selected built projects. **Caryl J. Clement**, received her Master’s degree in Landscape Architecture from the University of Arizona, a Bachelor of Science in Agriculture and is a Public Artist with the Arts Foundation for Tucson and Southern Arizona. Her landscape architectural practice has provided design, project management and construction administration experiences encompassing public transportation improvements, public facility improvements, Caribbean resort design and private residential design. As a Horticulturist with the Environmental Research Laboratory, her work ranged from urban agriculture to the development of prototypic food production systems for Disney Enterprises. As a public artist, the creation of site specific artwork profoundly impacts her design approach to place making in the Sonoran Desert.

**PLANT HEALTH**

8:00 – 9:00 a.m. **Reduced Risk Pesticides**
Kimberly Gard, Syngenta

This presentation will introduce reduced risk pesticides registered for landscape use. There is great interest in using more reduced risk pesticides, which pose less risk to human health and the environment compared to some of the existing conventional options. Attendees will learn about the history of pesticides, and the difference between organic versus synthetic chemistry relevant to pesticides. Discussions will include reduced risk pesticides and pesticides with no signal words, which carry the least amount of risk.

**Kimberly Gard** graduated from Cal Poly, San Luis Obispo with a B.S. in Biology and a Masters in Botany and Plant Sciences from UC Riverside. Kimberly has worked with Syngenta for 20 years. Five of those years were as a research biologist in the Plant Pathology group and the past fifteen have been as a Territory Manager covering the turf market in Southern California and Palm Desert, and both the turf and ornamental markets in Arizona. Kimberly is a licensed California Pest Control Advisor (PCA #71607).

9:10 – 10:10 a.m. **Cause of Witches Broom on Blue Palo Verde**
Dr. Ursula Schuch, University of Arizona Plant Sciences

Palo verde witches broom occurs primarily in the blue palo verde tree *Parkinsonia florida*. Symptoms of witches broom disease are dense clusters of short, flexible, thornless branches with stunted leaves, and branch dieback. The disease is widespread in nursery-grown trees and has been documented more than 50 years ago in landscape trees in southern Arizona. We found evidence that a previously undescribed emaravirus causes the broom tissue and the previously suspected eriophyid mite vector is always found in great numbers in broom tissue. Healthy blue palo verde contain no emaravirus-like genome and the suspected mite vector is generally absent. Although viral causality has not been demonstrated, current evidence suggests a robust association of an emaravirus with witches broom disease of blue palo verde.

**Dr. Ursula Schuch** is a University of Arizona Extension Specialist and Professor with responsibility in environmental horticulture. Dr. Schuch received a Ph.D. in Horticulture and a MS in Forest Science from Oregon State University. She presents seminars and workshops for professionals in the green industry and conducts research to address relevant issues in horticulture production practices and landscape management. Her research interests include irrigation requirements of trees and shrubs, abiotic stress affecting landscape and other plants, and minimizing inputs in nursery production and landscape management. Current research projects include cultivar trials of pomegranates and identifying the causal agent of palo verde broom.
10:25 – 11:25 a.m.  Recognizing and Managing Insects in the Urban Landscape
Gene Hall, University of Arizona Entomology

Arizona, especially the southeastern section of the state, is home to the highest amount of insect and other arthropod diversity than any other region in North America. This talk will highlight the major insects found in Arizona, with emphasis on those occurring in urban areas. A number of insects that damage trees, shrubs, and other plants in landscapes will be discussed. This will include symptoms of damage, life cycles, and management options ranging from prevention through appropriate cultural practices. Insects that will be covered include pine bark beetles, borers, beetles, and scale.

**Gene Hall** has studied the insects of the Sonoran Desert for 35 years and is the manager of the University of Arizona Insect Collection. He also provides insect and other arthropod identifications as part of UA’s CALS Cooperative Extension’s Insect Diagnostics Clinic. Gene is interested in museum collections as resources to preserve and document our planet’s biodiversity, using specimens and associated data for scientific research and public outreach worldwide. Current research include monitoring bark beetles in the Tucson area and revising the blister beetles of Arizona. Gene’s research also focuses on the evolutionary biology of insects, primarily the systematics, taxonomy and biogeography of beetles. He also studies fossil insects associated with pack rat middens to help us better understand the past & recent fauna, flora and climate of southwestern deserts.

12:15 – 1:15 p.m.  Recognizing and Managing Diseases on Landscape Plants
Dr. Alex Hu, University of Arizona Plant Sciences

The urban environment in the low desert of Arizona is stressful for landscape trees, which predisposes them to attack by a number of fungal and bacterial pathogens. This talk will demonstrate how to recognize and manage the most common diseases, including Phomopsis Blight/Canker, Phymatotrichopsis Root Rot, Fire Blight, Rhizosphaera Needle Cast, Phylllosticta Leaf Spot, Crown Gall, Cytospora Canker, Powdery Mildew, and Bacterial Leaf Scorch.

**Dr. Alex Hu** is an Extension Plant Pathologist in the School of Plant Sciences. His research covers many commodity crops, with a focus on integrated disease management. His extension program covers a wide array of horticultural commodities, including turfgrass, ornamentals, fruit and nut trees, agronomic crops, and vegetables. He works with diverse audiences in diverse settings. He develops and delivers education programming through traditional face-to-face presentations, hands-on workshops, print publications, and various online delivery systems. He also handles disease diagnostics for commercial crops and horticulture crops that are submitted to our Plant Diagnostic Network.

1:25 – 2:25 p.m.  Pollinator Health: Effects of Pesticides and How to Minimize Them
Dr. Shaku Nair, University of Arizona, Maricopa Ag Center

Many valuable crops benefit from insect pollination. Generally, growers worldwide are receiving less "free" pollination from wild pollinators and increasingly they must make up for this by using managed pollinators. Pesticides play an important role in public health protection, invasive species control, and crop production. While advances have been made to improve the chemistries, formulations, and applications of these compounds to protect human health and to reduce overall use, many pesticides still have negative impacts on pollinators and other non-target organisms. Protection from pesticide exposure is one of the most important ways we can provide a safer environment for pollinators. This presentation will discuss potential pesticide risks to managed pollinators, and strategies to minimize them through IPM, effective and correct pesticide use, improved stakeholder communication, and reducing colony stress.

**Dr. Shaku Nair** is an entomologist experienced in Integrated Pest Management in natural and structural environments. She currently serves as Assistant in Extension – Community Integrated Pest Management.
(IPM) at the University of Arizona. Her primary responsibilities include translational research on pest management and community education focused on national EPA priorities (school integrated pest management), pests of public health concern (e.g. bed bugs and mosquitoes) as well as turf and landscape pests. In her current position, Shaku coordinates the Community IPM Team, which is an interdisciplinary team of extension and research faculty within the University of Arizona, and they develop and implement priority extension programs for Community Integrated Pest Management (IPM) statewide.

2:35 – 3:35 p.m. The Role of Micronutrients in Plant Nutrition and Disease
Dr. Jim Walworth, University of Arizona Soil, Water, and Environmental Science
Eight essential plant nutrients (boron, chlorine, copper, iron, manganese, molybdenum, nickel, and zinc) are considered micronutrients, simply meaning that they are required by plants in relatively low concentrations. Essential nutrients are required by all green plants to complete a life cycle and that demand cannot be satisfied with another element. A sub-group of micronutrients, the metal micronutrients (copper, iron, manganese, nickel, and zinc), are most likely to limit plant growth in alkaline desert soils. Of the remaining micronutrients, boron is most likely to cause damage to plants growing in Arizona soils, and can be present in either deficient or toxic quantities. Lack or excess of individual plant nutrients induce unique plant symptoms that allow a practitioner to diagnose plant nutritional status by observation. We will explore the cause and effect of nutrient induced maladies, and learn to identify some common associated plant problems. In addition to direct effects, nutritional imbalances can affect disease resistance and susceptibility. We will examine some of prevalent impacts of nutrition on plant disease incidence.

Dr. Jim Walworth is a Professor of Soil Science and an Extension Specialist in the Department of Soil Water, and Environmental Science at the University of Arizona, where he has been employed since 1998. He received BS and MS degrees in Soil Science from the University of Wisconsin and a PhD in Agronomy from the University of Georgia, and has more than thirty years of experience working with crops and soils in the midwestern, northeastern, and southeastern US, in addition to the deserts of the southwest. He also has extensive experience with soils in the far North (Alaska) and far South (sub-Antarctic Australia). Dr. Walworth specializes in the behavior and management of soil nutrients, salts, and water. A major focus of his research and extension programs is desert tree nut production. He currently conducts research on salinity tolerance, zinc management, specific nutrient (nickel, nitrogen, phosphorus, zinc) demands, and water use in certain Arizona crop plants.

WATER

8:00 – 9:00 a.m. Internet Connected Solutions for Your Outdoor Space
Paul Tammelleo, Irritrol & Toro Irrigation
More and more homeowners and contractors are looking for smart home solutions that connect with their outdoor landscape. Internet website or mobile phone app-based solutions bring the ability to monitor, control, and adjust many different facets of your outdoor landscape, from irrigation systems, to outdoor water features, outdoor lighting, and beyond. This session discusses the new technologies available and how they can directly benefit homeowners and landscape contractors alike.

Paul Tammelleo has been living and working in the irrigation industry in Arizona his whole life. For the past 18 years he has been the Area Business Manager for both Irritrol and Toro Irrigation. He works with contractors, distributors, public agencies, landscape architects and others to try to provide the best solutions for the landscape needs of the Desert Southwest.
9:10 – 10:10 a.m.  **Greening our Streets with Water Harvesting**  
Grant McCormick, UA Soil, Water, and Environmental Sciences

Many urban centers were originally settled based on the presence of water and human movement corridors. This presentation explores how streets and water combine today in support of livable cities. Examples and case studies of streetscapes greened through water harvesting will be presented.  

**Grant McCormick**, AICP, is a Campus Planner in the University of Arizona's Department of Planning, Design & Construction, where his work includes integrating stormwater management practices and rainwater harvesting techniques within campus development projects. He has participated in many local jurisdiction efforts to create water harvesting and GI/LID programs and regulations. At the UA he serves as Adjunct Professor in the Soil, Water and Environmental Science Department where he teaches Water Harvesting and Green Infrastructure. Additionally, he manages the University’s Enterprise GIS program.

10:25 – 11:25 a.m.  **Increasing Irrigation Efficiency with Renovation and Modernization**  
Jason Kuklinski and Chris Stebe, Norris Design

Water use in landscapes throughout the desert southwest is becoming more and more critical to the long-term sustainability of our water supply. Increasing efficiencies in irrigation systems from residential systems to large public parks is a key part of conserving our water supply. Beyond the use of reclaimed water, managing the delivery of water and updating the components of inefficient irrigation system and designing efficient irrigation systems are paramount. With many irrigation systems reaching the end of their lifespan, renovating and modernizing these aging irrigation systems for ease of maintenance, efficient and easier water management will decrease overall water use. This session will highlight emerging technologies in irrigation systems and water management. We will profile two recent local Tucson irrigation renovation projects to illustrate how the renovation of existing irrigation systems through the implementation of new technologies can be used to increase the ability to manage water, decrease water use and the associated costs, and reduce long term maintenance concerns.

**Jason Kuklinski**, PLA, CID, is Principal at the Tucson office of Norris Design. He is a professional landscape architect and certified irrigation designer with 20 years of regional and national experience in both the private and public sectors. He is committed to providing exceptional and relevant design solutions. Jason is a graduate of the University of Arizona with a bachelor’s degree in landscape architecture. He utilizes his broad experience to incorporate the client’s objectives while considering the end-user to ultimately provide safe and environmentally sound design solutions. As a certified irrigation designer, Jason ensures clients receive an efficient cost-effective design that meets the plant water requirements.

**Chris Stebe**, PLA, leads the irrigation design for Norris Design’s seven offices. He is a professional landscape architect with 20 years of experience in landscape architecture, irrigation design, and design-build landscape contracting projects. Chris is a graduate of the University of Arizona with a bachelor’s degree in landscape architecture. He uses his experience to design efficient, cost-effective irrigation systems that meet the unique requirements for every project. Chris is able to utilize his knowledge to constantly seek out more efficient ways to deliver the right amount of water. His passion for responsible water management is evident in the work he does.

**URBAN LANDSCAPES**

12:15 – 1:15 p.m.  **Physiology of Mature Trees**  
Dr. Tanya Quist, UA Plant Sciences

For you and I, a life with only bread and water equates to a life of poverty. For most trees, however, (even on the good days) daily life requires a perpetual choice between *either* bread (carbon) *or* water.
For trees, the choice to take up carbon for photosynthesis comes at the cost of water loss, so, to ensure survival, these two essential processes must be carefully regulated. The fundamental need for communication between these two competing, but equally important, processes guarantees the biology is complex, interesting and tightly coordinated. Furthermore, the quality and health of the plants we grow hinges on how well we translate our understanding of these regulatory processes to specific production/management practices. For this reason, in this talk we’ll learn not only the science underlying how plants direct the navigation of water and carbon through the soil-plant-atmosphere continuum, but also discuss cultural practices that optimize water relations and carbon distribution in plants.

Dr. Tanya Quist received a Ph.D. in plant physiology and molecular genetics from Purdue University with a focus on plant drought and salinity stress responses. Previous work explored horticultural impacts of water quality on growth and quality of woody landscape plants. Presently, as Associate Professor of Practice in the UA School of Plant Sciences and Director of the UA Campus Arboretum, her interests relate to arid adapted woody ornamental landscape plants with a focus on sustainable horticultural practices.

1:25 – 2:25 p.m. Battery Operated Landscape Equipment
Geoff Eichel, Pacific STIHL
This presentation will cover the use of small battery equipment commonly used by landscapers. Reasons for using battery operated versus gas powered equipment will be discussed. Runtime, equipment weight, cost, and other performance measures as well as disposal of batteries will be covered. Geoff Eichel is a Technical Sales Specialist with Pacific STIHL. He is a trainer/demonstrator who educates individuals in the proper and safe use of STIHL power equipment. He provides the knowledge people need to use STIHL equipment properly, safely, and he also provides the necessary preventative maintenance training that is needed to keep the equipment running at its' optimum. Geoff works with all types of end users, including professional landscapers, and all local, state, and federal agencies. Prior to this position, Geoff worked several years as a Gold Level Technician at a dealership.

2:35 – 3:35 p.m. Use of Plant Growth Regulators in Arboriculture
Rick Cober, Treegan Jubilee
This presentation will cover a brief overview of plant hormones and their role in plant growth and development. Plant growth regulators (PGR’s) are used in horticulture and arboriculture to maintain plants at a desired size, protect plants from stresses, and prevent fruit formation in some plants. Attendees will learn about current PGR’s available for arborists, application methods, and strategies to obtain the desired management goals. Future developments and possible applications for arborists will be discussed.

Rick Cober studied Forestry and Horticulture at the University of Illinois and Murray State University and received his BS degree from Arizona State University. In the past four decades, he worked in building production wholesale nursery facilities and as a consulting arborist. He is the current TREE Fund Liaison for the Western Chapter ISA, holds an ISA Arborist Certification, and is involved in tree care and landscape consulting and auditing.