**Drought Tolerant Fruit Trees from Yesterday for Today and Tomorrow**
Emily Rockey, Mission Gardens

Drought tolerance is a highly desirable characteristic of desert dwelling fruit trees, especially in current climate conditions. Tucson’s agricultural heritage museum called 'Mission Garden' grows desert adapted and native crops, and water requirements/drought tolerance are certainly qualities that are evaluated and considered. This ten year old public ethnobotanical garden project has been experimenting with heritage fruit tree cultivation including introduced plants such as pomegranate, fig and quince, as well as selected natives like prickly pear and mesquite. The presentation will offer details and observations about these specific varieties’ drought tolerance and general hardiness, as well as insight about their roles in the cultural traditions of the region. Finally, key cultivation and maintenance techniques will be discussed with regards to increasing water efficiency and mitigating the impact of extreme environmental conditions.

**Emily Rockey** is the Garden Supervisor at Mission Garden, Tucson’s Agricultural Heritage Museum. She studied Plants Sciences at the University of Arizona, focusing on Controlled Environment Agriculture to optimize food production before the incredible power of rich, "real" soil drew her back outdoors again. She served as an intern on organic farms in Italy and the US and was a manager of Tank's Green Stuff organic compost before joining Mission Garden in 2020.

**Oleander and Native Alternatives**
Carianne Funicelli, Strategic Habitat Enhancements

Oleander is a workhorse landscape plant in our region with many desirable traits, and also a few detractions depending on your landscape goals and needs. In this presentation we will demystify terminology around native, ornamental, and invasive plants. We will talk about why oleander is so ubiquitously used, and explore some regionally-native replacements for oleander that work well in desert gardens.

**Carianne Funicelli**, after receiving a Botany degree, moved to Tucson in 1998, specifically because she loves the native plants of the Sonoran Desert. Since then, she has become a well-known advocate for native plant conservation and restoration, and has conducted projects large and small throughout the southwest region, both in wild areas and urban landscapes. Carianne has served as the President of the Society for Ecological Restoration, Southwest Chapter and of the Tucson Chapter of the Arizona Native Plant Society, as well as the Wildlife Habitat Representative on the City of Tucson's Landscape Advisory Committee. She has worked in the government, business, and non-profit sectors over the past 20 years, and recently has started her own consulting firm, Strategic Habitat Enhancements (SHE), which allows her to help clients bring nature to their yards with strategic native plant choices.
Native Desert Plants and How They Survive in Urban Landscapes  
ML Robinson, University of Nevada Cooperative Extension

Many people move to the desert southwest from other areas of the country and think that by adding extra water they can plant and grow any plants they want. When one has a better understanding of how desert plants have adapted to the harsh environment of the desert Southwest and other similar areas of the world, they will be able to choose the very best plants that will thrive in the Southwest environment.

Prof. Robinson has been with the University of Nevada for over 25 years and previously with the University of Florida for 14 years. His areas of expertise include water conservation, natural resources, palms, desert plants (cactus, succulents and Mojave natives) and integrated pest management.

Rethinking Landscape Care – Low or No Maintenance  
Deborah Munoz-Chacon, Sonoran Oasis and Eli Nielsen, EcoSense Landscapes

As the climate warms and water becomes more scarce, it is time we rethink how we manage our urban desert landscapes. Urban desert landscapes do not require a lot of maintenance. If done right, it is better for plants, provides more flowers blooming, keeping plants healthy with fewer insect and disease problems. Deborah Chacon and Eli Nielsen will discuss their similar and differing methodologies to deal with a changing environment and offer low-to-no maintenance options to address the future of landscape care in Southern Arizona.

Deborah Munoz-Chacon is the owner of Sonoran Oasis Landscaping. She has been in the landscape industry for over twenty years. She is a certified arborist, desert landscape and house plant books author and desert plant enthusiast.
Eli Nielsen is a Tucson native who loves the Sonoran Desert. He likes it so much that he tries to copy and paste a piece of it into every residential landscape he works on. He doesn't understand why people who claim they love the desert move here and then plant a bunch of stuff that doesn't belong. He also doesn't understand why people prune plants into soup cans and poof balls. Eli works at EcoSense Sustainable Landscapes.

Invasive Potential of Cultivated Plants in Arizona  
Michael Chamberland, Maricopa County Cooperative Extension

How can we evaluate whether a plant is becoming invasive? We will look at an evaluation process applied to several cultivated plants which are showing weediness in southern Arizona: African sumac, African daisy, ruby saltbush, white leadtree, silver senna, and Tamarix aphylla.

Michael Chamberland serves as the Assistant Agent for Urban Horticulture with the University of Arizona Maricopa County Cooperative Extension. He works with Urban Horticulture, which includes overseeing the Maricopa County Master Gardener Program and plant problem diagnostic work, especially for the commercial horticulture industry.
Low Water Use/Low Maintenance Turf and Groundcovers
Kai Umeda, Maricopa County Cooperative Extension

This presentation will discuss alternative groundcovers and low input native grasses as potential replacements for turfgrass, especially in naturalized areas. Our goals in recent projects were to find appropriate horticultural plant species, and install and grow the most attractive, low maintenance, and least water-consuming replacement plant species for areas where turfgrasses are removed. From our latest projects, results exhibited promising year-around green grasses such as alkali sacaton, alkali muhly, plains lovegrass, and blue grama, and kurapia. In comparison to intensely managed turfgrasses, the major appealing benefits of these native grasses and kurapia were the low input features of less frequent mowing, low water, less fertilizers, and less pesticide requirements.

Kai Umeda has been a University of Arizona area extension agent for turfgrass science since 2003, working with golf course superintendents, sports turf managers, and commercial landscapers in the metropolitan Phoenix area and adjacent counties in Arizona. His turfgrass extension program areas of emphasis are in weed science and pest management. Umeda earned a B.S. degree in pest management from the University of California, Berkeley and a M.S. degree in weed science from Southern Illinois University. He is a member of the Weed Science societies; past President and Fellow of the Western Society of Weed Science; Crop Science; and Entomology Societies.

How to Foster Habitat for Beneficial Insects in the Landscape
Dr. Shaku Nair, UA Entomology and Arizona Pest Management Center

Landscape pests include insects, pathogens, weeds and wildlife that affect plants, as well as structural pests that can be found in or around buildings and are supported by human activity, such as rodents. Integrated pest management or IPM is a holistic approach to pest management that seeks to manage pests effectively with the least risk to people, property and the environment. IPM does not aim to eliminate all pests, but maintain a balanced system where pest levels can be tolerated with minimal intervention. This talk will cover some practices essential to a landscape IPM program, and give examples of IPM strategies for selected landscape pests.

Dr. Shaku Nair is an entomologist by passion and profession, and a strong advocate of integrated pest management (IPM) to manage pests in any situation. She has expertise in IPM in natural and structural environments. Her primary responsibilities include translational research on pest management and community education, and facilitating IPM implementation and adoption in different community environments in Arizona such as schools, housing, turf and landscape, recreational areas and medical facilities. Shaku currently is an Associate in Extension, Community IPM at the Arizona Pest Management Center, University of Arizona.
**Drought, Heat, Freeze – Abiotic Threats to Landscape Plants**  
Dr. Ursula Schuch, UA Plant Sciences

Abiotic factors including high and low temperatures, drought, and prolonged wet soil can damage landscape plants through root and shoot dieback up to the death of the entire plant. These factors often weaken plants which then become susceptible to biotic threats such as bark beetles, borers, root disease organisms, and other insects or diseases. This presentation will discuss recent extreme events that have negatively affected the health of trees and other landscape plants and how landscape managers can mitigate the stress effects that ultimately allow secondary pests to further damage or kill plants.

**Dr. Ursula Schuch** is a University of Arizona Extension Specialist and Professor with responsibility in environmental horticulture. 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.

**Pests and Diseases of Cultivated Cacti in Arizona**  
Michael Chamberland, Maricopa County Cooperative Extension

Cacti appear well defended and invulnerable. However, many pests and pathogens are not stopped by the spines. We will examine the various animals, insects, fungi, bacteria and viruses which trouble cacti under cultivation in southern Arizona.

**Michael Chamberland** serves as the Assistant Agent for Urban Horticulture with the University of Arizona Maricopa County Cooperative Extension. He works with Urban Horticulture, which includes overseeing the Maricopa County Master Gardener Program and plant problem diagnostic work, especially for the commercial horticulture industry.

**Palm Problems that aren’t Problems**  
Prof. ML Robinson, University of Nevada Cooperative Extension

This presentation will cover what types of problems are associated with palm trees. The presentation will look at different species of palms and whether or not certain conditions are biotic or abiotic problems or no problems at all. The information will be helpful for people who may or may not be familiar with growing palms and they will learn about the signs and symptoms to recognize disease, insect, or environmental problems.

**Prof. Robinson** has been with the University of Nevada for over 25 years and previously with the University of Florida for 14 years. His areas of expertise include water conservation, natural resources, palms, desert plants (cactus, succulents and Mojave natives) and integrated pest management.
Working Safely with Pesticides
Jennifer Weber, Maricopa County Cooperative Extension

During the session, Jennifer will highlight ways pesticide handlers can reduce the risk of exposure to themselves, other people and the environment when working with pesticides. She will talk about the importance of measuring and mixing pesticides correctly and will include additional safety measures handlers can take prior to and during the pesticide application.

Jennifer Weber is the Coordinator of the University of Arizona Cooperative Extension Pesticide Safety Education Program, a statewide program serving the needs of both the agricultural and structural pest control industries. Prior to this position, she worked for the Arizona Department of Agriculture’s, Ag Consultation and Training Program and the UC Davis, Statewide IPM Project’s Pesticide Safety Education Program. Through these opportunities, she gained 25 years of experience providing safety information in English and Spanish to individuals who work directly with pesticides and in areas where pesticides are applied. Ms. Weber earned a B.S. from California Polytechnic State University in San Luis Obispo and a M.S. in Multicultural and Bilingual Education from California State University, Sacramento.

Identification and Life History of Potential Insect Pests of Plants
Gene Hall, UA Entomology

This presentation will highlight insects commonly found in urban landscapes and the problems they may cause on landscape plants, including trees and shrubs. Participants will learn how to spot evidence of the presence of insects, monitor the types and population density of insects and their different life stages. Information on how to identify the insects and which ones are beneficial or a problem in the landscape will be presented.

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 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.

WATER / URBAN LANDSCAPES

Soil Care for Healthy Landscapes
Parker Filer, UA Pima County Cooperative Extension

Soil health is fundamental to plant health and desert soils have unique attributes that deserve attention. Cultivating healthy soil is a long-term investment in plant health and there are many ways that gardeners and landscape professionals can promote a robust root zone. After a review of core soil science concepts strategies will be shared to improve moisture retention, nutrient exchange, soil biology, and more.
**Parker Filer** is the Assistant Extension Agent in Horticulture, Agriculture & Natural Resources with the University of Arizona’s Pima County Cooperative Extension. He manages the Pima SmartScape and Pima Master Gardener programs which provide science-based education on desert gardening and horticulture through a variety of classes, workshops, trainings and other activities.

**Mycorrhizae and Beneficial Microorganisms for the Green Industry**

*Edu Alvizo, Symborg*

Mycorrhizae and other microorganisms are known to benefit plant health. This presentation will cover educational and practical aspects of innovative strains of microorganisms and their applications in landscaping and the green industry.

**Edu Alvizo** is a Certified Crop Adviser with Symborg Inc., a company specializing in research and manufacturing of crop bio-stimulants and soil inoculants based on selective strains of microorganisms compatible with intensive agricultural practices. He graduated from the University of Nevada, Reno with a B.S. in Agriculture and Applied Economics. His expertise is in soil health, soilless farming, and crop nutrition.

**Technology Panel: New Technologies for Landscapes**

*Moderator: Parker Filer, Panelists: Dr. Ed Franklin, Dave Herman, and Nick Shipley*

The panel will discuss technologies helpful to landscape managers including remote irrigation controls, electric equipment, apps, solar technology and drones. What may influence your adoption of new technology and what challenges and benefits may result from using it? Participants will better understand the benefits, costs, and potential barriers associated with the use of some new and some well-established but not widely adopted tools.

**Dr. Ed Franklin** is Professor in the Department of Agricultural Education, Technology, and Innovation.

**Dave Herman** is the Superintendent for the Town of Marana Parks & Landscape Division.

**Nick Shipley** is Chief Operations and Grow Officer at Civano Growers.

**Climate Lessons for Arizona, Drought and Extreme Temperatures**

*Dr. Erinanne Saffell, Arizona State Climatologist*

The USDA hardiness plant zones are one representation of climate, but what really controls the climate of a location? Learn how to build a microclimate and understand the impacts from Arizona’s decades-long drought. This information will help with understanding past and future effects on landscape plants.

**Erinanne Saffell** is the Arizona State Climatologist, Director of the Arizona State Climate Office, and Senior Global Futures Scientist with the Julie Ann Wrigley Global Futures Laboratory at Arizona State University. Her main research interests are extreme weather and climate events, including flood and drought, as well as climate impacts from urbanization. She was born and raised in Arizona.
Utility water meters are an important tool in monitoring for leaks and identifying water conservation opportunities. For most meters a datalog can be extracted that provides 40 days of hourly data and helps inform how water is being used on the property. There is also an emerging field of flow devices that can be attached to a water meter or on the customer side of the meter to help monitor flow that goes through the water meter. This presentation will highlight how water meters are used during water audits, what the most common problems are and how these new devices can empower customers to manage their own water use.

Angel Vega is the Zanjero Water Services Supervisor and Water Conservation Specialist with the Public Information and Conservation Office at Tucson Water. He is part of a team that conducts residential and commercial water audits to help with high water bills, conservation education, and water use efficiency both in the home and in the landscape. He has been with Tucson Water for over 10 years, holds a NGICP (National Green Infrastructure Certification), BFA (Backflow Prevention Assembly Tester Certification), Rainwater Water Harvesting Practitioner Certification, and a B.A. with a minor in education from the University of Arizona.

Candice Rupprecht is the Water Conservation Manager for Tucson Water and the City of Tucson. Her team delivers water conservation solutions to customers through one-on-one water audits and rebates and plays a key role in conservation research and demand management planning for the utility. In partnership with a suite of organizations delivering education and efficiency programs to our community, the Conservation Program has engaged over 500,000 people and helped save over 4.2 billion gallons of water in the last decade.

Water Tiers for Arizona and Impacts on Landscapes
Irene Ogata, City of Tucson

Most of Tucson’s water supply comes from the Central Arizona Project (CAP) and climate change impacts the flow of CAP to Tucson. Tucson Water continues to plan for future drought scenarios in developing the One Water 2100 Master Plan. To date, Tucson’s water conservation successes have been from the combination of utility-sponsored conservation programs, community outreach campaigns and tiered rate structures, as well as from national plumbing code changes and technology improvements that have helped reduce total and per capita demands. This discussion focuses on the tiered rate structure and how the landscape professional community is an integral part of impacting the physical and social aspects of life in Tucson.

Irene Ogata is a professional Landscape Architect and Certified Public Manager at Tucson Water. Projects she has been involved with include green stormwater infrastructure, low-income rainwater harvesting, city-wide vegetation maintenance practices and development of City-wide Landscape Maintenance Manual. Irene is also involved in the national Green Infrastructure Leadership Network, with focus on Inclusion, Diversity, Equity, Access working group.