

Rio Grande Basin Initiative

OUTCOMES

Identifying water needs for native plants

Xeriscaping plants are too often overwatered, says Texas A&M researcher

Woolly butterfly bush, Mexican bush sage and Evergreen sumac ranked among the lowest water-users in a recent study of native shrubs and trees in South Texas. Although xeriscaping—a technique that uses water-efficient native plants—has been around for some time, actual water requirements of many popular native plants have not been available until now.

Through the Rio Grande Basin Initiative, Keith Owens, professor of range ecology at the Texas A&M University Agricultural and Research Center in Uvalde, is investigating the water use, fire ecology and landscape ecology of South Texas trees and shrubs. The goal of this research is to make irrigation more efficient in urban landscapes.

“The use of native plants in landscaping has become a rising trend in Texas,” he said. “Native shrubs as a whole are very low maintenance, demand very little pruning and supplemental water, and are resistant to pests and diseases.”

Yet, Owens said xeriscaping is not used as widely as it should be. “We are trying to promote the practice to save water,” he said. “Homeowners don’t utilize the full potential of this drier landscaping tool. Too many times they overwater low water-use plants, defeating the purpose of xeriscaping.”

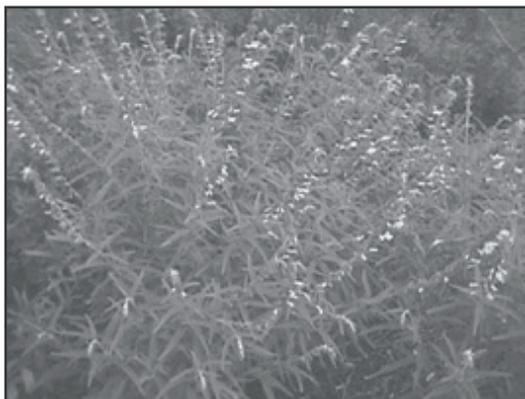
Owens’ study focuses on determining the minimum amount of water that these native plants need while still maintaining

attractive flowers and foliage.

“For most of these shrubs, the worst thing you can do is overwater,” he said. “All of the plants we used are adapted to environments with intense light.”

Owens selected varieties of ornamental trees and shrubs after talking to specialists with Texas Cooperative Extension and local nurseries throughout the Rio Grande Basin.

“Native shrubs are obviously adapted to the area and can persist without human intervention,” he said. “We



wanted to select shrubs with either flower or foliage characteristics that would be attractive in landscapes.”

Owens used 12 species of trees and shrubs to determine specifically how much water is used by nursery stock. All of the potted plants were borrowed from local nurseries. Based on the results, homeowners needing a landscaping

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by Jenna Smith

Mexican bush sage uses 0.09 gallons of water per day, according to a recent study by a Texas Agricultural Experiment Station researcher. Although xeriscaping—a technique that uses water-efficient native plants—has been around for some time, actual water requirements of many popular native plants have not been available until now.

Promoting drought-tolerant trees

City of Santa Fe and Extension partner for demonstration

by Kevin Robinson-Avila

As drought and bark beetles devour northern New Mexico landscapes, the City of Santa Fe and New Mexico State University's Cooperative Extension Service are teaming up to replace dying trees with drought- and pest-resistant species.

Santa Fe County Extension staff and Parks and Recreation Department personnel are planting a demonstration tree plot with dozens of varieties of moderate- to fast-growing native and nonnative trees. Starting in spring 2004, residents can tour the plot to learn about species that are well adapted to northern New Mexico's climate but not commonly planted in local landscapes.

"It will be a permanent demonstration garden with drought-tolerant trees that

have strong resistance to diseases and insects," said Patrick Torres, Extension agricultural agent. "We hope it encourages people to plant these species around their homes and businesses. They grow well in local conditions, and they're beautiful trees."

Torres and Fabian Chavez III, integrated pest management manager for Parks and Recreation, aim to repopulate local landscapes with trees that help conserve water and reduce pesticide use.

"Our landscapes are crowded with trees and shrubs that consume a lot of water and are vulnerable to disease and insects," Chavez said. "That's not sustainable in a high desert climate like ours where we're probably facing another 20 to 25 years of drought. There

Fabian Chavez III from Santa Fe Parks and Recreation and Extension Agricultural Agent Patrick Torres examine two shumard oak trees for planting in a new demonstration tree plot in Santa Fe. The plot, next to the city's Marty Sanchez Golf Course, will have 40 varieties of drought- and pest-resistant trees.





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are a lot of native and nonnative species that can survive well in these conditions, so we need to promote them.”

Some of the species chosen for the demonstration garden are native to the Southwest. Others come from high desert climates in Europe, Asia and elsewhere, Torres said.

Native species, particularly the oak trees, grew abundantly in New Mexico in the past, but over many generations, settlers cut down stands for firewood and other purposes and introduced nonnative species, Chavez said.

In addition, many homeowners and landscapers mistakenly believe oaks and other drought-tolerant native trees are slow growing, so they plant other trees, Torres said.

“It’s a misconception,” he said. “These

“Our landscapes are crowded with trees and shrubs that consume a lot of water and are vulnerable to disease and insects. That’s not sustainable in a high desert climate like ours where we’re probably facing another 20 to 25 years of drought.”

native oak varieties grow much faster than oaks in other parts of the country. Within six to eight years they can have a pretty substantial canopy on them.”

Shumard oaks, for example, are long-lived shade trees that can grow quickly once established, Chavez said. “Shumard oak transplants will sit the first season, but then they can put on four or five feet per year,” Chavez said.

Torres and Chavez will plant up to four samples of each tree variety on a 1.5-acre plot next to the city-owned Marty Sanchez Golf Course in northwest Santa Fe. Transplants range from one-half inch to 1.5 inches in diameter, and about three

Species in Demonstration Garden

- ◆ Big tooth maple
- ◆ Bur oak
- ◆ Canyon hackberry
- ◆ Dawn redwood
- ◆ Golden rain
- ◆ Japanese lilac
- ◆ Manchurian ash
- ◆ Osage orange
- ◆ Sawtooth oak
- ◆ Shumard oak

to five feet tall, Chavez said.

The New Mexico State University Water Task Force provided \$5,000 to buy tree starts and other materials through the Rio Grande Basin Initiative.

All water for the plot will come from the Santa Fe Waste Water Treatment Plant, which has direct pipelines to irrigate the golf course. Torres and Chavez will track water use and tree growth. They will make the data available to visitors at an information booth on the plot, Chavez said.

All trees will be under drip irrigation to show how those systems conserve water and demonstrate proper installation and maintenance, Torres said.

Next year, Extension and Parks and Recreation will team up for another demonstration project to compare water use and growth of three different drought-tolerant turfgrasses—buffalo, blue grama and zoysia—with the traditional, cool-season “park mix” grass currently used in landscapes. The plot will also show how subsurface irrigation saves water compared with sprinkler systems, Torres said.

Extension already has two water-conservation projects in Santa Fe financed by the Rio Grande Basin Initiative, Torres said. One is a demonstration herb garden at the county Extension office that shows how drip irrigation and mulch help save water and reduce weeds. It also demonstrates local adaptability of about 30 varieties of culinary and ornamental herbs.

To visit the demonstration herb garden or for more information about the classes and other projects, call Torres at (505) 471-4711.

Landscape Design School

Course helps homeowners earn rebate for turf replacement

by Rachel Alexander

A landscaping course offered by Texas Cooperative Extension and design experts in El Paso is helping homeowners earn a rebate for replacing turfgrass with native, water-smart plants.

The rebate program, coordinated by El Paso Water Utilities, offers \$1 per square foot of turfgrass that is converted into a water-conserving landscape.

Daphne Richards, horticultural agent with Texas Cooperative Extension in El Paso County, leads the Landscape School for Homeowners, supported in part by the Rio Grande Basin Initiative.

"We wanted to give homeowners the information and knowledge to design a natural landscape for their yards and take advantage of the rebate program," she said. "Our involvement in the educational component is important, because affordable landscape professionals are lacking in our area."

El Paso Water Utilities Water Conservation Manager Anai Padilla also emphasized the importance of such a program in El Paso.

"The El Paso Water Utilities has been

"The most important lesson we teach is that xeriscaping is not just rocks. We teach them how to deal with sandy soils, how to select plants that are ideal for the El Paso climate, how to safely use fertilizers and how to properly irrigate any remaining turf."

promoting landscapes that are sensitive to our Chihuahuan Desert environment," she said. "For us, it is really important that customers understand that landscapes in this area can be as beautiful and exciting as landscapes found in any other region of the United States. We are trying to increase appreciation of the desert."

Padilla said that El Paso Water Utilities assists the Landscape Design School by providing educational materials and staff support.

"We promote those classes via our back-of-the-bill information," she said. "The classes that we have attended are



Jennifer Barr-Ardovino, landscape designer with Urban Oasis, helps a class participant with her design plan.

To receive the rebate, homeowners must complete a design plan that incorporates drought-tolerant trees for shade and low water-use plants as an alternative to grass. In addition, the redesigned landscape must include mulch to help prevent water loss through evaporation.

"What the Landscape School does is give homeowners the knowledge and background necessary to plan and implement a desert landscape for their home," said David Kania, water conservation technician with El Paso Water Utilities.

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usually well received by the community and are a great resource to the citizens of El Paso. Comments from participants are always positive.”

Topics covered during Landscape School include selection and maintenance of low water-use plants, use of fertilizers, irrigation, and landscape design principles. Additionally, homeowners are offered one-on-one consultations with design professionals regarding their landscape plans.

“The most important lesson we teach is that xeriscaping is not just rocks,” Richards said. “We teach them how to deal with sandy soils, how to select plants that are ideal for the El Paso climate, how to safely use fertilizers and how to properly irrigate any remaining turf.”

Tony and Eva Burdett attended the Landscape School to learn more about the rebate program and get help with their landscape design plan.

“This was a great class,” Tony Burdett



said. “Now we have the information that we need to relandscape our home and conserve water for the future.”

Padilla said that since the rebate program has been established, more than 1,611 customers have replaced 3.4 million square feet of grass with water-efficient landscapes, saving 130 million gallons per year.

A homeowner in the Landscape Design School submitted these before- and after-pictures of his redesigned yard. The homeowner replaced 100 percent of the turf in his yard with native plants.



Salt-tolerant shrubs identified

Research offers guide for irrigating with poor quality water

by Jenna Smith

The Texas Legislature named the crape myrtle Texas' Official Shrub in 1997—due in part to its widespread use in landscaping. Although without an official title, roses also represent a visible and abundant bush in the state. Texas alone produces 16 to 20 percent of the total US garden rose plants.

Because of the popularity of both crape

problems that affect a large portion of the state, particularly the Rio Grande Basin, Panhandle, and West Texas," he said.

"Salinity affects everybody, from growers to homeowners in both urban and rural areas."

Saline irrigation water can damage both the production and maintenance of quality ornamental plants, particularly if

Almost 500 plants representing 13 cultivars from four species of Lagerstroemia were exposed to five salinity levels as part of Raul Cabrera's research.

Cabrera, associate professor of woody ornamental horticulture at the Texas A&M University Agricultural Research and Extension Center in Dallas, is focusing on the tolerance of crape myrtles and roses to poor-quality water, searching for specific varieties that can survive a harsh environment.



myrtles and roses in Texas, Raul Cabrera, associate professor of woody ornamental horticulture at the Texas A&M University Agricultural Research and Extension Center in Dallas, is focusing on their tolerance to poor quality water, searching for specific varieties that can survive a harsh environment. This project is funded in part by the Rio Grande Basin Initiative.

"Poor water quality and salinity are

the irrigation water is in direct contact with the foliage or leaves, which are much more sensitive to salt damage than roots.

Unlike the production of food and fiber crops, aesthetic appearance of foliage and flowers is the feature sought after in ornamental and landscape plants. Therefore, Cabrera said, irrigation water quality plays a more critical role in ornamentals than in other crops.



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“Homeowners in regions facing water quality issues may still be able to grow popular ornamental shrubs like crape myrtles and roses just by selecting those cultivars or varieties that are salt-tolerant,” he said.

Cabrera is developing production and landscape management recommendations for successful growth of these plants in areas irrigated with water of poor quality.

Cabrera identified *Rosa manetti* and the *Rosa* x “Dr. Huey” hybrids as the most salt-tolerant rose rootstocks for greenhouse cut flower production and landscape purposes, respectively.

After reviewing several species and over 20 cultivars of crape myrtles, Cabrera found that the *L. indica* (common crape myrtle) and *L. speciosa* (Queen’s

crape myrtle) plants are the most salt-sensitive. Whereas, *L. fauriei* (Japanese crape myrtle) cultivars and the *L. indica* X *L. fauriei* hybrids are the most tolerant. Most Japanese crape myrtle cultivars and hybrids can be easily identified by their Native American names, such as Acoma, Apalachee, Natchez, Tonto and Tuscarora.

Each of these varieties can be easily found at local nurseries throughout the state, Cabrera said. He is sharing his results with the public, making presentations at local, national and international horticulture meetings, including master gardener programs and educational meetings of the Texas Nursery and Landscape Association.

Native

Continued from page 1

shrub with limited water uptake are advised to use the Woolly Butterfly Bush, which only needs 0.04 gallons of water per day. Crape myrtles, on the other hand, one of Texas’ most widely used landscaping trees, require 0.21 gallons per day.

Owens will present his information and offer recommendations to the public through printed material. More information can be accessed through his Web site at <http://uvalde.tamu.edu/ornamental/index.htm>.

The shrubs used in this study are from the Uvalde area south to the border, so homeowners in this region can locate any of these trees or shrubs at a local nursery.

Owens is also conducting a follow-up experiment that addresses the actual water use of mature plants rather than nursery stock in a landscape setting. The

field experiment uses a sap flow system that measures the amount of sap (or water) flowing through the stem on a continuous basis.

Water Usage (gallons per day)	
Evergreen sumac	0.04
Woolly butterfly bush	0.04
Dwarf yaupon holly	0.06
Mountain laurel	0.06
Purple sage	0.065
Mexican bush sage	0.09
Mexican mint marigold	0.09
Wild olive	0.09
Autumn sage	0.14
Esperanza	0.15
Lantana	0.17
Crape myrtle	0.21

Increasing irrigation efficiency in the Rio Grande Basin through research and education

Through Extension and research efforts, the Texas A&M University System Agriculture Program and the New Mexico State University College of Agriculture and Home Economics are implementing strategies for meeting present and future water demand in the Rio Grande Basin. These strategies expand the efficient use of available water and create new water supplies. This federally funded initiative is administered by the Texas Water Resources Institute and the New Mexico State University Water Task Force.

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