SANTA FE EXTENSION MASTER GARDENERS

Santa Fe Extension Master Gardeners Newsletter

August 2022 | Volume 12, No. 7

Dryland Farming

By Peggy Rudberg

Weather data show that drought cycles have existed worldwide for centuries and most likely for millennia. Despite weather fluctuations, our ancestors developed applicable methods to manage and cultivate plants in a variety of conditions in order to survive. Dryland farming is one of those methods.

Today the term “dryland farming” refers to growing crops in water-scarce regions without irrigation. Plants obtain water that is “banked” in the soil from past rainy or snowy periods and the quality of that soil and its ability to store water is crucial.

Curtis, Edward S, photographer. *Zuni Gardens*. Southwest, New, ca. 1927. Photograph. https://www.loc.gov/item/90716880/.

Soil “porosity” refers to voids or pores in the soil that hold water and/or air. The size and arrangement of these pores depends on the size and composition of the soil particles: gritty sand, slippery silt and/or sticky clay. Most soils are made up of some combination of these particle types. The particles arrange themselves into aggregates, a process driven by roots, organic matter, microbes, fungi and other soil dwellers, that enmesh the particles into clumps. Pores are located in between these clumps. The pores in sandy soil are large and gravity pulls water through it quickly while sticky clay soils have poor drainage that allows water to pool and can drown roots.

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Santa Fe BOTANICAL GARDEN

CELEBRATE • CULTIVATE • CONSERVE

Ask a Master Gardener
11 a.m. – 2 p.m.

Master Gardeners and interns will be at the Santa Fe Botanical Garden during the Garden's upcoming Community Days, where New Mexico residents and students get in **free** with appropriate identification. Look for our volunteers between 11 a.m. and 2 p.m. on the following dates:

Saturday, Aug. 20 ➤ World Honey Bee Day
Sunday, Sept. 18 ➤ Museum Hill Community Day

Note: These dates are subject to change. For current information, check out santafebotanicalgarden.org.

In this issue ...

Our Mission

Santa Fe Extension Master Gardeners is a nonprofit volunteer organization whose mission is to learn, teach and promote locally sustainable gardening through reliable, current research-based practices.
sfemg.org

SFEMG is one of more than a dozen county-based Master Gardener programs run under the auspices of New Mexico State University's College of Agricultural, Consumer and Environmental Sciences.
aces.nmsu.edu

NMSU is an affirmative action/equal opportunity employer and educator.

NMSU Cooperative Extension Service
Santa Fe County Extension Office
3229 Rodeo Road
Santa Fe, NM 87507
505.471.4711
santafeextension.nmsu.edu

Tom Dominguez
Santa Fe County
Extension Agriculture Agent

Wendy Wilson
SFEMG President

Kathy Haq
SFEMG Newsletter Editor
news.sfemg@gmail.com

NM STATE

A Message from SFEMG Board President Wendy Wilson

Since moving to Santa Fe, I've made any number of gardening mistakes. Even after earning the Master Gardener certification, I've made mistakes. Let me list a few: I've amended my garden too generously; planted plants too far apart; planted plants with different water needs next to each other; tried to grow plants that were not hardy in our growing zone; selected hybrids that were not conducive to pollinators; selected non-native plants that did not benefit insects, birds or other animals; pruned and cleaned up my garden obsessively … oh my, the list goes on and on.

Can you learn from my mistakes? Yes. How many mistakes can you make and still have a beautiful garden that is also a beneficial habitat? Quite a few. However, doing research, talking to knowledgeable gardeners, touring successful gardens and planning your garden carefully will help ameliorate many unnecessary and probably expensive mistakes.

What resources are available to you? Participating in the Santa Fe Extension Master Gardener Intern Training Program is an excellent way to learn about gardening in Santa Fe County. There are 15 weeks of lessons and live, online presentations. Sign-ups open on Nov. 1. The class fills up quickly, so put this date on your calendar now.

Other SFEMG resources are the Ask A Master Gardener (AAMG) sites at the Santa Fe Farmers' Markets at the Railyard, Presbyterian at Santa Fe Medical Center and Reunity Resources, as well as the Eldorado Farmer's Market. You can also find us during special events at the Harvey H. Cornell Memorial Rose Garden and the Santa Fe Botanical Garden. Additionally, you can send your questions to AAMG online 24 hours a day.

Touring our herb, vegetable, cactus, pollinator and native plant demonstration gardens at the County Extension Office, 3229 Rodeo Road, is an excellent way to learn about Northern New Mexico gardening. We also maintain and provide education at the Randall Davey Audubon Center & Sanctuary (1800 Upper Canyon Road), the Garden at El Zaguán (545 Canyon Road) and the Harvey Cornell rose garden (1320 Galisteo Parkway). Look for Let's Grow events on our website to find times when the gardens will be staffed with master gardeners and interns. Our volunteers are there to answer your questions and give tours.

Finally, tap into these reliable, research-based websites for answers to your gardening questions:

- NMSU College of Agricultural, Consumer, and Environmental Sciences
- NMSU Cooperative Extension Service Publications
- PlantTalk Colorado
- Utah State University Extension
- Santa Fe Botanical Garden/Explore Nature
- Denver Botanic Gardens/Gardening Resources

I wish you happy, abundant harvesting and great beauty in your gardens.

Wendy

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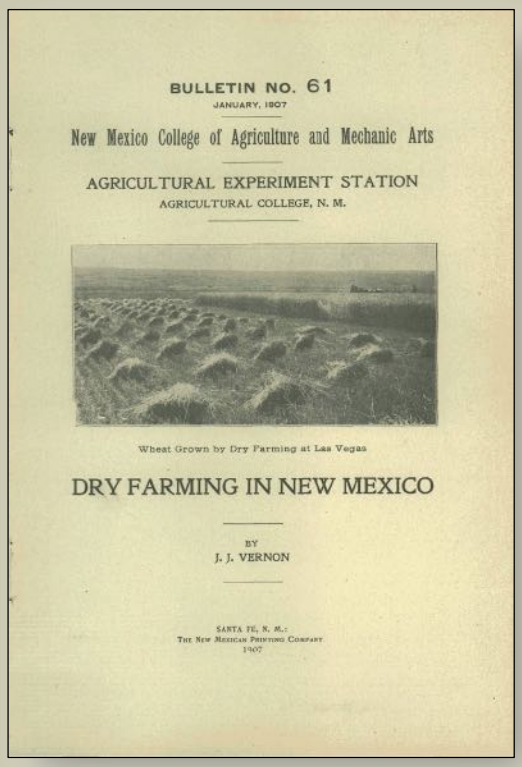
For both extremes, the addition of organic matter increases its holding capacity and soil fertility, either filling in pores between the large particles or loosening up smaller particles that tend to stick together.

The goal of dryland faming is to maximize the use of accessible water, increase the ability of soil to absorb and retain water and to reduce the conditions that allow loss and evaporation of soil moisture.

Several other conditions must be met for dryland farming to succeed. Crops should be drought tolerant with deep roots like the tepary bean (*Phaseolus acutifolius*), a Southwest native, whose roots can reach 8 feet underground. Short-cycle crops planted early avoid maturing during hot weather and wider spacing of plants allows more root expansion. Minimal tillage avoids disrupting soil structure and soil microbes. Crop rotation and fallowing allows moisture to build and maintains fertility. Weeding removes competition and leaving crop residue helps prevent evaporation. Some Ancestral Puebloans mulched with pumice, an absorbent volcanic rock. Indigenous people also experimented with dispersed and varied plot locations, perhaps mesas or washes, to find the best environment for diverse crops.


BULLETIN NO. 61
JANUARY, 1907
New Mexico College of Agriculture and Mechanic Arts
AGRICULTURAL EXPERIMENT STATION
AGRICULTURAL COLLEGE, N. M.
Wheat Grown by Dry Farming at Las Vegas
DRY FARMING IN NEW MEXICO
BY
J. J. VERNON
SANTA FE, N. M.:
THE NEW MEXICAN PRINTING COMPANY
1907

NSMU Cooperative Extension Service and Agricultural Experiment Station Publications, 1889-2021. NMSU Library Digital Collections.

To maximize soil retention of rainwater, ancient farmers used catchment and diversion techniques to capture surface runoff. One of the oldest methods was terracing with stonework on hill slopes to create flat, horizontal planting beds where runoff could soak in. To stabilize the beds, deeply rooted perennials like agave and prickly pear often were planted on the outer edges. This natural barrier also captured sediment and organic debris, enriching the soil. Recent archeological studies at Perry Mesa, Arizona, found traces of 500-year-old terracing with agave plants prospering in still-fertile moist soil.

Zuni Pueblo has found success with waffle gardens — grids of sunken beds surrounded by raised earthen berms. The lower ground level collects water and helps lower evaporation rates. Rocks were often used as mulch.

Hopi farmers grow corn, melons and beans in the Arizona desert with only 6 to 10 inches of moisture a year. They plant multiple seeds 18 inches or deeper just after snowmelt using planting sticks to minimize soil disturbance. When seedlings emerge, weaker ones are thinned. Insects and weeds are removed by hand and rabbits are repelled using dog dung. Crop size is what is manageable.

Although indigenous people perfected their methods over generations, European settlers who immigrated to North America were unfamiliar with many of the American ecological regions. In fact, many were new to farming itself. Beginning in the 1890s Great Plains homesteader Hardy Campbell among others promoted a dryland farming theory that roots could draw deep water to them if the

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soil was tightly compacted with a dust mulch of loose soil on the surface. In reality, dust mulch often created a crust that inhibited moisture penetration and exposed the surface soil to wind erosion. Following the "Campbell System," newly arrived families plowed under the prairie and topped it with dust mulch.

During this time, the New Mexico College of Agriculture and Mechanic Arts, now NMSU, investigated and collected observations on farming techniques, weather patterns and crop conditions in eastern New Mexico. Unfortunately, early reports promoted the U.S. Department of Agriculture-approved "Campbell System." As experiments and interviews continued through the 1920s, "soil blowing" emerged as the greatest hindrance to successful farming in eastern New Mexico. The last line of a 1922 bulletin summary was prescient. "It (soil blowing) is, however, susceptible of control in such soils except perhaps in the occasional year of extreme winds and long continued drought." 1928 was the beginning of one of the longest drought episodes in United States history and that coupled with soil blowing created the devastating 1930s Dust Bowl.

Diminishing farmland and soil erosion became a national issue and creation of the Soil Conservation Act of 1935 helped support farmers with experiments, demonstrations and research and education on soil management, which brings us almost full circle back to the methods developed by prehistoric farmers. Some practices are labor intensive but for home gardeners they present a time-honored method worth considering in these dry times.

Buried machinery in barn lot in Dallas, South Dakota, during the Dust Bowl, an agricultural, ecological and economic disaster in the Great Plains in 1936. Source: U.S. Department of Agriculture; Image Number: 00di0971

References:

- "Multiple causes of wind erosion in the Dust Bowl" by Jeffrey A. Lee, Thomas E. Gill, Aeolian Research, 2015
- "Growing Food in a Hotter, Drier Land: Lessons from Desert Farmers in Adapting to Climate Uncertainty" by Gary Paul Nabhan
- "Dry-Land Farming" by Jerry L. Williams, University of New Mexico
- "Soil Quality Information," PennState Extension
- "Traditional Arid Lands Agriculture: Understanding the Past for the Future," The University of Arizona Press
- "Dryland Farming: Crops & Techniques for Arid Regions" by Randy Creswell and Dr. Franklin W. Martin, Univeristy of Massachusetts Amherst
- "Dry Farming in New Mexico" by J.J. Vernon, New Mexico College of Agriculture and Mechanic Arts

Switchgrass (*Panicum virgatum*)

By Pam Wolfe

Twenty million years ago increasing aridity on the Great Plains gave rise to the North American grasslands. William Dick-Peddie writes that the forests began a slow retreat to the north, east and south, leaving behind adapted grasses and forbs including *Andropogon* (bluestem), *Panicum* (switchgrass), *Sorghastrum* (Indian grass), and *Liatrus* (gayfeather). Still prominent in the suite of grasses that form the matrix of tall-grass prairie ecosystems, switchgrass has found its way into our urban landscapes. Kelly Allred explains that its botanical name is based on the Latin *panicum* "for millet (now *Setaria italica*), from *panis*, bread, or *panus*, an ear of millet." The specific epithet *virgatum* translates roughly as broomlike.

Switchgrass 'Shenandoah' at the Santa Fe Botanical Garden Photo by Pam Wolfe

Switchgrass is found throughout North America below 55 degrees north latitude and east of the Rocky Mountains. Its genetic diversity has led to more than a dozen cultivars in the nursery trade. The collection at the Santa Fe Botanical Garden includes two of these, 'Heavy Metal', with distinctive blue-green foliage, and 'Shenandoah', with vibrant red fall color. There is a straight species planted in the Native Plant Demonstration Garden on the south side of the Santa Fe County Extension Office.

Landscape use: Native to prairies, woodland edges and savannahs, switchgrass is used extensively in prairie restoration and erosion control. It provides excellent cover, nesting sites and seed for small birds. National Wildlife Federation lists 14 species of butterflies and moths known to use switchgrass as a host for their caterpillars. Its drought tolerance and attractive fall color have made it popular as a garden ornamental. Deep roots and adaptability make switchgrass an ideal choice for rain gardens and bioswales.

Propagation and care: The species is easily grown from seed, germinating in two to three weeks in warm conditions, but cultivars are best propagated by root division; seeds from cultivars may not produce plants true to parent. Water regularly during the first year to help establish a deep root system. Plants will spread slowly by rhizomes. Divide every three to four years. No known serious pests or diseases.

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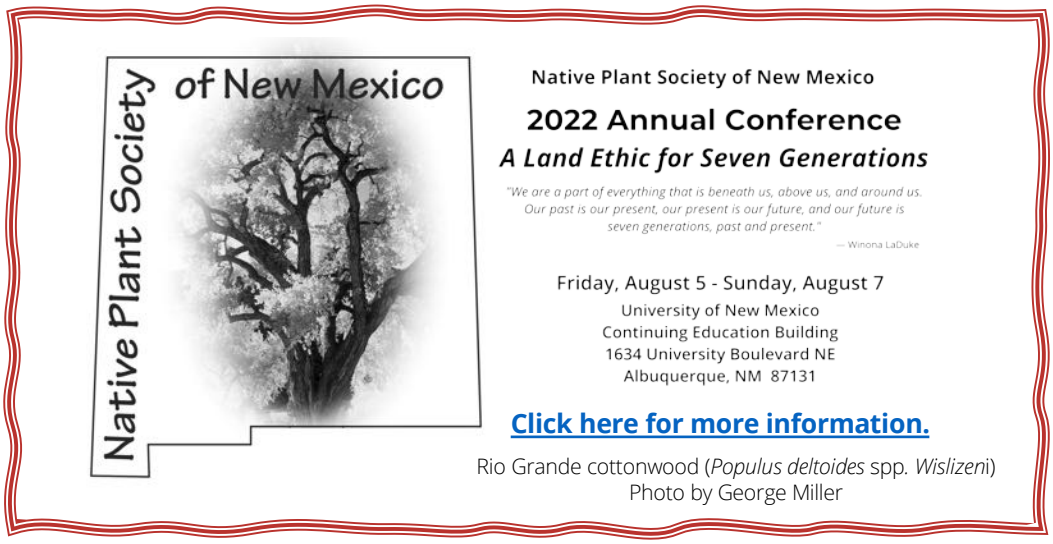
Plant type: warm-season bunch grass, sometimes sod forming
Bloom time: summer
Size: 3-6 feet tall by 2-3 feet wide
Sun: full sun/part shade
Water: low/medium
Soil: any well-drained soil, including clay
USDA zones: 3-9
Elevation: 3,500-7,000 feet

References:

- William A. Dick-Peddie (1993) *New Mexico Vegetation, Past, Present, and Future*, University of New Mexico Press
- Kelly W. Allred (2020) *Flora Neomexicana II: Glossarium Nominum*, Lulu Press

Smith, R.W. via The Lady Bird Johnson Wildflower Center. Inflorescence, showing purple stigmas and orange anthers.

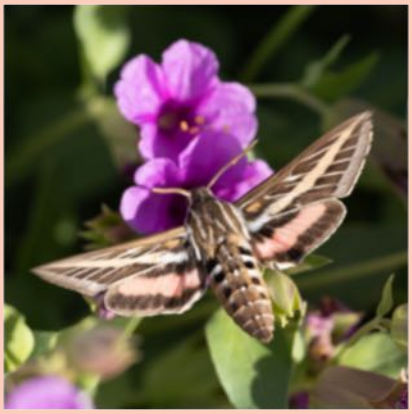


Rio Grande cottonwood (*Populus deltoides* spp. *Wislizeni*)
Photo by George Miller

"A firm resolution should be made to purchase only a plant for a place, and never to come home wondering where to place a plant."

— The late English horticulturist Graham Stuart Thomas (1909-2003)

Backyard Bugs


White-lined Sphinx Moth (*Hyles lineata*)
Order Lepidoptera | Family Sphingidae

Narrative by Pam Wolfe

Why are there so many this year? In 2008 conditions were also just right to produce white-lined sphinx moths in biblical proportions. It's usually the caterpillars that draw comment by denuding Evening Primrose (*Oenothera*) or Four O'clock (*Mirabilis*) in the landscape. In 2008 Dr. Carol Sutherland, NMSU Extension entomologist, commented on the abundance *of Hyles lineata* caterpillars in Southern New Mexico: "When monsoon started this year, the rains just kept coming at the right intervals. Seed in the soil bank sprouted providing food for the caterpillars and the little worms had a real buffet. They probably succeeded better than any natural enemies and now, about five to six weeks after hatching, they are ready to move on. The hordes are mature caterpillars leaving their pasture, looking for whatever is right to stimulate pupation. Sometimes the hordes can get so dense that they cross roadways, making them slick as cars squash them."

Extreme drought preceding this year's early monsoon in Santa Fe likely reduced the usual complement of predators and parasitoids. The rains produced a bumper crop of wildflowers for the polyphagous larvae and resulted in an unusually high proportion surviving to pupate underground and emerge as adults to delight us in their hummingbird-like behavior and size, thus another common name: hummingbird moth. These handsome animals are found throughout North America, their abundance varying greatly from year to year.

Photos (above, left to right): *Hyles lineata egg* and the moth nectaring on Desert Four O'clock (*Mirabilis multiflora*), wingspan 6-9cm. Photos by Brian Hagenbuch. The long proboscis allows access to nectar in tubular flowers; it rolls up neatly when not in use. Photo by Kathy Haq.

The larval stage of *Hyles lineata* (right). Body color varies from yellowish to black. The distinctive dorsal extension on the tip of the abdomen is common to most Sphingids, including *Manduca quinquemaculata*, the notorious tomato hornworm (far right), whose adult form is the five-spotted hawkmoth. Photos by Brian Hagenbuch and Kathy Haq.


Calendar

Please read the fine print!

- Master Gardeners must complete 10 hours of continuing education (CE) by Nov. 30 and are encouraged to record CE credit hours in Track It Forward as soon as possible after completing the activity. **Note: SFEMG no longer uses the NMSU database for tracking volunteer hours that was piloted in 2021.**
- If there is a dollar sign, there is a fee.
- The acronym "phc" means Master Gardeners can earn 1 credit hour of continuing education for each hour attended.
- If there are other opportunities, suggestions, or questions please send them to Stephanie Deutsch: deutsch.stephanie@gmail.com

Thursday, Aug. 4

Planning Your Fall Vegetable Garden

Free class offered by the SFEMG's Santa Fe Seed Stewards at 6 p.m. at the Southside Branch Library, 6599 Jaguar Drive. No registration is required. To learn more about seed saving, visit Santa Fe Seed Library on the SFEMG website. For questions about the 'Seeding Resilience' gardening class, contact Christine Salem at jcsalem@comcast.net.

Friday, Aug. 5

If we are what we eat, then where are we from?

New York Botanical Garden / 1 CE

Wednesday, Aug. 17

"Pollinators" with Miranda Kersten

New Mexico State University "Ready, Set, GROW!" Webinar / 1 CE phc

Thursday, Aug. 25

Bring Back the Pollinators: Get the word out!

Xerces Society for Invertebrate Conservation / 1 CE

More Events of Note

The Santa Fe Botanical Garden and Institute of American Arts welcome well-known author **Robin Wall Kimmerer** (Citizen Potowatomi Nation), to Santa Fe for in-person events on Wednesday, Aug. 31, and Thursday, Sept. 1.

Dr. Kimmerer, a botanist and author of *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*, embraces the notion that plants and animals are our oldest teachers.

For more information, see: https://santafebotanicalgarden.org/robin-wall-kimmerer/

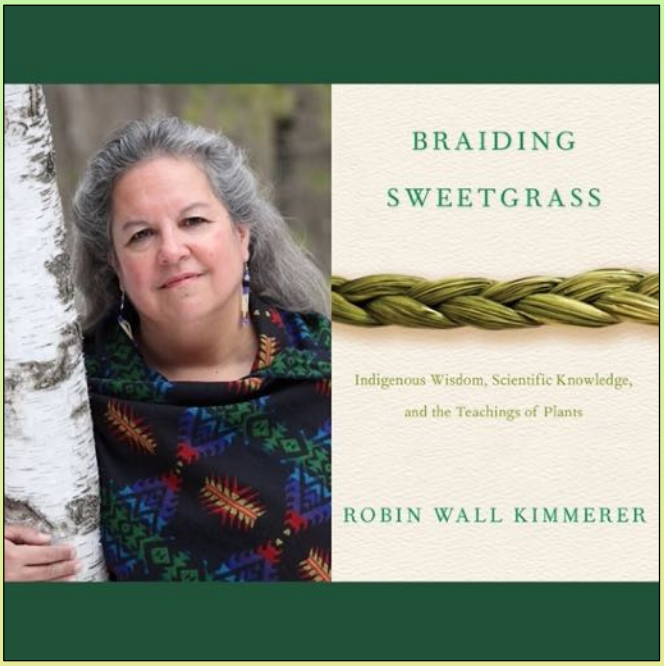
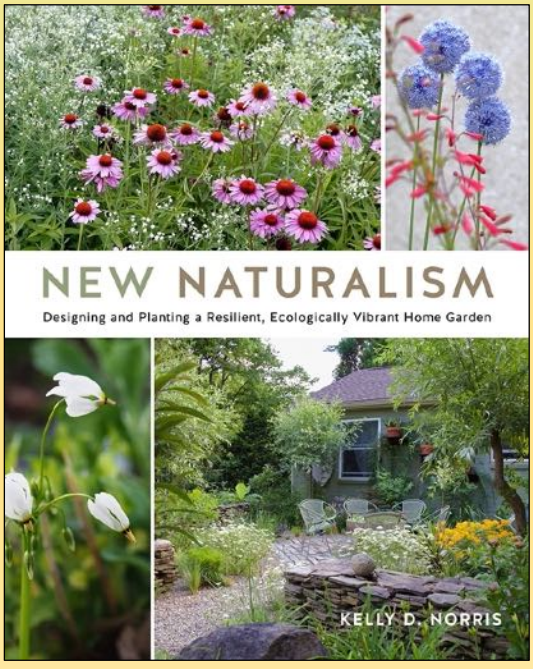


Photo credit: Dale Kakkak | Graphic by Cristina Salvador



On Wednesday, Oct. 5, the Santa Fe Garden Club will welcome award-winning author **Kelly D. Norris**, known for his ability to transform the most challenging landscape into a work of art.

Norris' garden design presentation and a luncheon will be followed with book sales and signing of his his newest book, *New Naturalism: Designing and Planting a Resilient, Ecologically Vibrant Home Garden*.

Tickets go on sale Aug. 1.

For more information, see: https://santafegardenclub.org/garden-design-presentation-and-luncheon/

New & Noteworthy

Have you recently read a gardening-related article or book, visited a horticultural website or blog, listened to a podcast, or seen a nature show or documentary you think other gardeners would enjoy or find useful? Send a link to the newsletter (news.sfemg@gmail.com) and we'll try to include the information in the next issue. **Note that some of these sources may have paywalls.**

"Turning with the sun: The iconic native sunflower" by Laurie McGrath, shared with permission of *HOME/Santa Fe New Mexican* (July 2022)

"Plant Russian Sage for a Boost of Fall Color" by Emily Hannemann, *Birds & Blooms* (July 26, 2022)

"Top 10 Brand-New Types of Dahlias for 2022" by Luke Miller, *Birds & Blooms* (July 25, 2022)

"Flower Festivals Blooming Around the World" by Meghan Gunn, *Newsweek* (July 20, 2022)

"Heatwave drought reveals secret garden in stately home for first time in 300 years" by Dave Himelfield, *Mirror* (July 20, 2022)

"Researchers Identify Genes Making Strawberries Resistant to Fusarium Wilt" by Emily C. Dooley, UC Davis press release (July 19, 2022)

"NMSU engineering leadership students give new life to campus community garden" by Linda Fresques, NMSU press release (July 18, 2022)

"How to Use Coco Liners" by Kathy Adams, *Hunker* (July 18, 2022)

"5 Popular Houseplants You Can Propagate in a Cinch" by Michelle Mastro, *Architectural Digest* (July 18, 2022)

"How to Plant and Care for Marigolds, Splashy Bedding Plants That You Can Grow in Almost Every Hardiness Zone" by Shivani Vyas, *Martha Stewart* (July 18, 2022)

"How to Grow Roses from Cuttings in 10 Simple Steps" by Benjamin Whitacre, *Better Homes & Gardens* (July 14, 2022)

"The Flower Garden Style That's Sure to Turn Heads" by Bart Ziegler, *The Wall Street Journal* (July 13, 2022)

"Annuals and Perennials: Answers to All Your Questions" by staff, *Sunset* (July 13, 2022)

"Two NMSU Extension gardening publications now available in Spanish" by Nicole E. Drake, NMSU press release (July 12, 2022)

"Researchers rediscover oak tree thought to be extinct," United States Botanic Garden press release (July 7, 2022)

"11 Edible Flowers With Potential Health Benefits," *Healthline* (June 30, 2022)

"Where to find an island with a thousand orchids" by Katie Knorovsky, *National Georgraphic* (June 7, 2022)

The Garden Journal Radio Show

Every Saturday
10 to 10:30 a.m. on KSFR 101.1 FM

August 6: Slow Food Santa Fe Outloud Edition
Hosts Lissa Johnson and Nina Rosenberg interview Chef Fernando Olea of Sazón restaurant, recent recipient of a James Beard Award for the Southwest.

August 13: SFEMG Edition
The Rio Grande Grain team joins co-host Alexa Bradford with heritage grain stories and news of upcoming harvest and tortilla-making events.

August 20: Soil Stories Edition
Host Carrie Core features regenerative agriculture heroes who are working to restore farming and the earth.

August 27 : Home Grown New Mexico Edition
Jannine Cabossel, "The Tomato Lady," shares tips and techniques for backyard vegetable gardening and a to-do list for September. See more at Giant Veggie Gardener.

You can find past episodes of *The Garden Journal* here at sfemg.org.

We are here to help!

If you have a gardening question,
Santa Fe Extension Master Gardeners
are available to help.

Just go to sfemg.org and
pose your question.
We'll do some research and
get back to you.