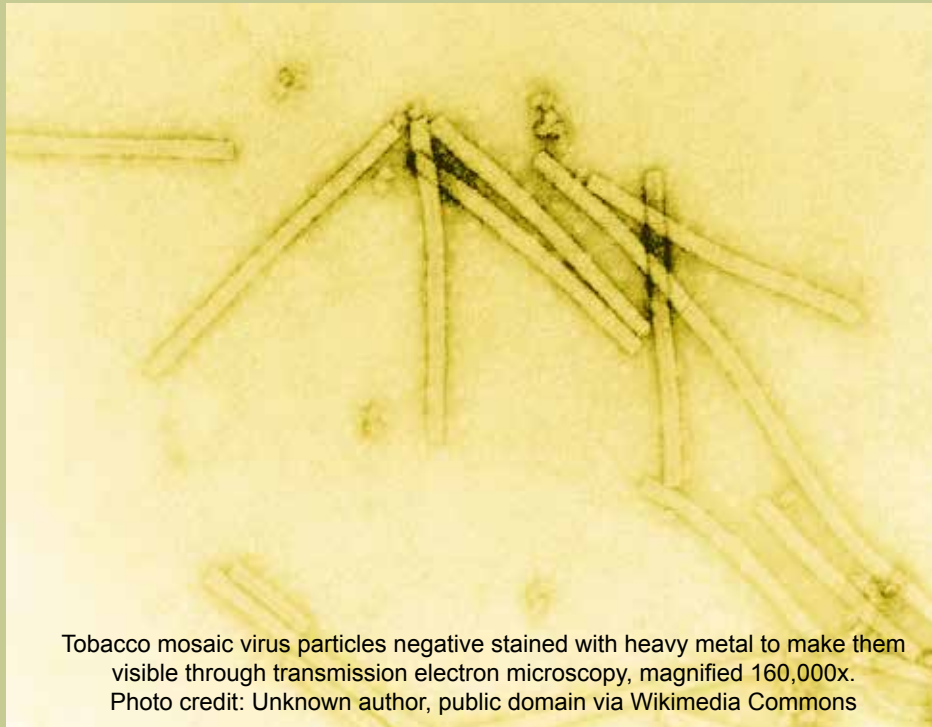


# Santa Fe Extension Master Gardeners Newsletter



Tobacco mosaic virus particles negative stained with heavy metal to make them visible through transmission electron microscopy, magnified 160,000x.  
Photo credit: Unknown author, public domain via Wikimedia Commons

## Viruses Cause Death in Humans and Plants Alike

*While COVID-19 deaths now top 3 million worldwide,  
food scarcity presents yet another threat*

By Peggy Rudberg

There are estimated to be  $10^{31}$  virus particles on Earth influencing all life forms from sub-seafloor biospheres to Tibetan glaciers. Whether viruses are living is uncertain because they are inactive and unable to reproduce without entering a living cell. They are classified with their own hierarchical taxonomy from realm to species, not in any of the five kingdoms of living things.

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Although the origin of viruses is unknown, we have been aware of them for thousands of years because of their effects on us, illnesses ranging from the common cold to smallpox. As long ago as 1000 Common Era the Chinese developed variolation, the practice of exposing people to dried smallpox scabs through the nose, usually causing a mild form of the disease and subsequent immunity. Inspired by Turkish inoculation, the injection of smallpox agents into a vein, Lady Mary Montagu in the 1720s introduced that method to Britain where it was finally accepted after trial runs using prisoners and orphans. In the late 1700s Edward Jenner found that milkmaids exposed to cowpox, a weakened form of smallpox, also gained immunity. *Vacca* is the Latin word for cow, the root for the word vaccine.

The first virus to be discovered was a plant virus, although its true nature was unclear. In 1898 Martinus Beijerinck, a Dutch scientist, was investigating a scourge attacking local tobacco crops. He determined that the pathogen was smaller than bacteria and surmised a new infectious entity existed. He called it a virus from the Latin word "*virulentus*" meaning poisonous. Viruses were finally seen in 1939 using the newly invented electron transmission microscope. With that and improved scientific understanding researchers were able to view this nanoscopic substance and its interaction with cells.

Most viruses are composed of genetic material surrounded by a protective protein shell called a capsid.

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In order to reproduce, a virus must penetrate a plant's cell wall. Seventy percent of plant viruses are spread by insect vectors that puncture cell walls while feeding, most commonly arthropods such as aphids, whiteflies, leafhoppers and beetles. Once inside the cell, the virus capsid opens to release genomes that take over the reproductive and cell-to-cell mechanisms of the host. Eventually the viruses spread to the vascular system where they compete with the host for resources, causing damage or death to the plant.

Viruses can move to adjoining plants by means other than vectors. Contact with a diseased plant or a tool, grazing animal or human hand that carries the virus can transmit infection. Viruses also spread through contaminated pollen and seeds or in soil and overwintering weedy hosts that act as reservoirs until spring. Commercial propagation techniques like grafting and crown divisions from infected plants also transmit the virus. In addition, with globalization of agriculture and trade, mankind has introduced plants and pathogens to new environments where they encounter foreign viruses, vectors and hosts.

While the COVID-19 death toll has now surpassed 3 million worldwide, food scarcity presents another threat to humanity. About 9 million people died last year from hunger and hunger-related diseases. Viruses cause nearly half of all crop failures and cost around \$60 billion in lost harvests every year. The tobacco mosaic virus first discovered in the Netherlands can infect over 350 species of plants. It is found worldwide and is common in New Mexico where it infects chile peppers. Tomato spotted wilt virus, beet curly top virus and others have also long plagued New Mexico farmers and home gardeners, stunting growth and reducing yield. While insecticides kill arthropods, many are indiscriminant and can contaminate water and soil. More eco-friendly practices to control vectors include barrier plant borders, netting to reduce insect contact and crop rotation with non-host varieties. Improving horticultural practices like removing winter weed hosts, using disease free seeds and disinfecting adjacent surface also protect crops.

Another approach is to target the virus itself. Plants have a mechanism called gene silencing that targets viral ribonucleic acid and interferes with pathogen reproduction. Researchers

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are developing methods to replicate this natural defense to increase disease resistance. For thousands of years humans have selected and crossbred plants to improve beneficial traits. Since the 1970s scientists have sped up the process using gene-editing tools like CRISPR, altering a plant's DNA to modify gene functions that battle plant viruses. Progress is being made but as viruses evolve, so must technical weaponry. Viruses will be with us a long time and continued research is essential to understand how to live with them.

### **References:**

Roossinck, Marilyn J. (2016). *Virus*. Princeton: Princeton University Press.

Arizona State University. (2019, July 17). [Plant viruses may be reshaping our world](#).

Gergerich, R.C., and V. V. Dolja. (2006). Introduction to Plant Viruses, the Invisible Foe. *The Plant Health Instructor*. DOI: 10.1094/PHI-I-2006-0414



**ONLINE  
PLANT  
SALE**

## **Online Plant Sale Ends May 5**

You have until 5 p.m. Wednesday, May 5, to pre-order plants from the SFEMG for scheduled curbside pickup on Saturday, May 8, and Sunday, May 9. The online plant sale is our primary fundraiser and supports more than a dozen SFEMG gardening projects through Santa Fe. See [sfemg.org](http://sfemg.org) for more details.

## A Message from SFEMG Board President Wendy Wilson

The SFEMG board has worked with great creativity, diligence and optimism the past year. We have new signs for the projects. Online socials drew more than 50 people per event. We successfully elected new board members with SignUpGenius (SUG). There is a brilliant new intern format with a record number of interns (100 from Santa Fe County and 37 additional interns from Taos, San Miguel, Mora and Colfax counties). Online Continuing Education (CE) offerings have enabled members to keep learning from home. Budgets have been kept under control in spite of having to cancel our largest fundraiser, the Garden Fair, in 2020. Our first online plant sale is running its course and the projects are blasting into spring with great gusto.



In the best of years, it takes an army of leaders to keep the 300 SFEMG members and interns organized, educated and moving forward. The COVID pandemic subjected the current board members to greater responsibility and stress. Honestly, it's been hard and many of us are tired and want to step back into the general membership and play in the dirt.

One of my goals as president has been to systemize the succession of leadership. It is now time to identify future leaders. Any Santa Fe Extension Master Gardener can run for office. (This includes current interns, since they will have finished their requirements for Master Gardener by the January 2022 swearing in.) Christine Hauschel, our secretary, is forming the nominating committee. The committee will take nominations, publish biographies and conduct the voting.

The current Board members are eager to pass along their experience, answer questions about position responsibilities, time commitments and upcoming projects. Please consider running for any of the following offices:

*President* – currently held by Wendy Wilson

*Vice-president* – currently held by Karen Browne-Armijo

*Secretary* – currently held by Christine Hauschel

*Treasurer* – currently held by Jaimie Painter

*Project Coordinator* – currently held by Jennifer Pedneau

*Intern Coordinator* – currently held by Barbara Ellis

*Education Coordinator* – currently vacant (coordinated by Wendy Wilson)

*Publicity/Branding* – currently vacant (coordinated by Wendy Wilson)

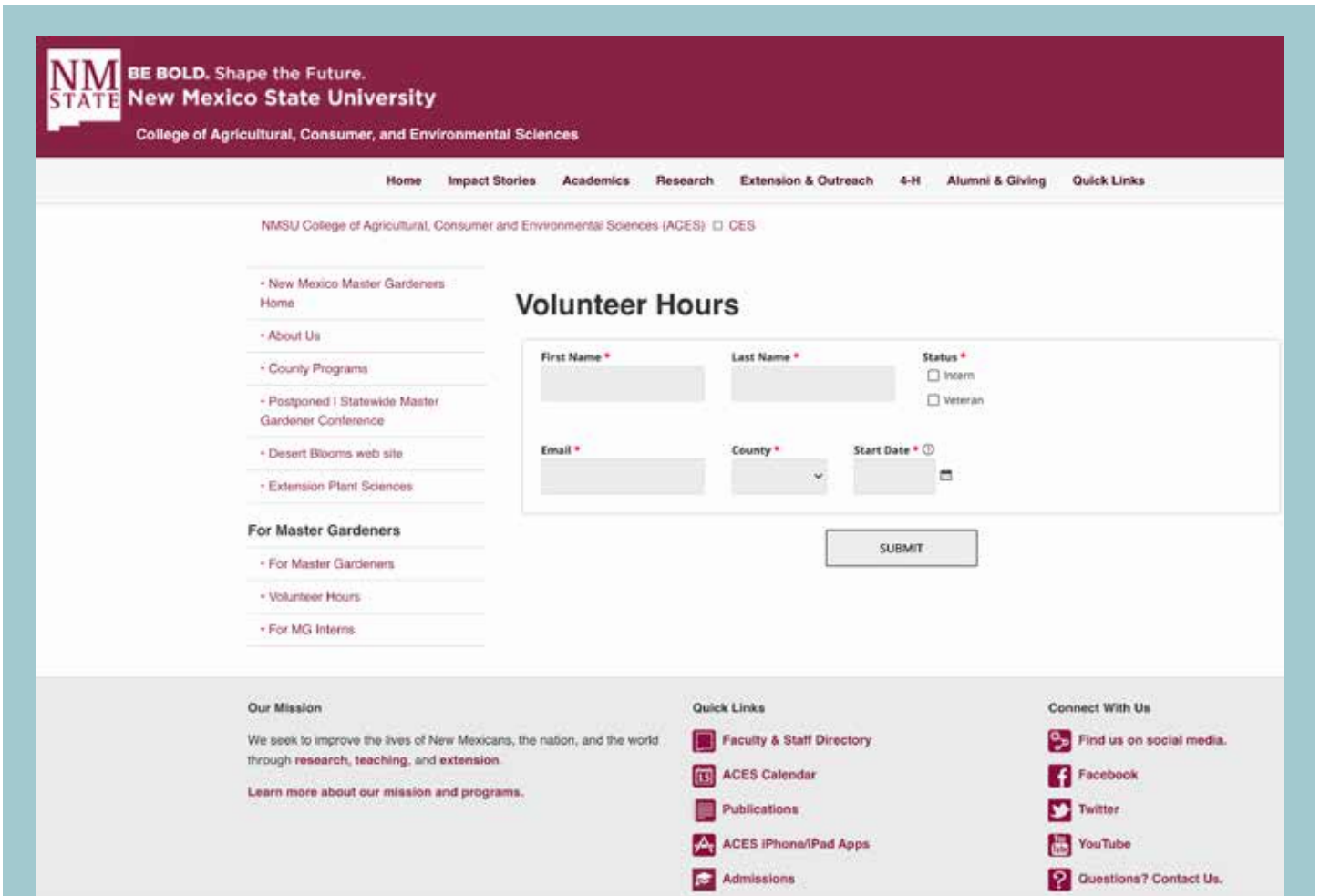
*Plant Sale Coordinator is also a Member-at-Large* – two positions currently held by Bonnie Martin and Susie Summers

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Each of these board members has put in countless hours this year shepherding us through the pandemic. We look forward to fresh leadership to continue the exciting work the board has done this year and the tradition of gardening advice and education that is the cornerstone of the Santa Fe Extension Master Gardeners.

Respectfully,  
Wendy



## Track It Forward a Thing of the Past *New NMSU tracking system is honor-based*

As of April 1, the SFEMG discontinued its use of Track It Forward (TIF) and began using a statewide system hosted by NMSU to capture volunteer hours logged by Master Gardeners

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and interns. The NMSU system was introduced to establish a consistent approach to tracking volunteer hours performed by Master Gardeners throughout the state and will be used to determine a person's eligibility for certification or continued certification as a Master Gardener in the coming year. A link to the new system is available on the Members Only section of the SFEMG website.

The new system features a simplified interface and requires less detail. Each person is responsible for the hours they report.

**Volunteer requirements for 2021 are:**

**10 hours of Continuing Education (CE)**

**6 hours of Outreach and Public Education (formerly PE)**

**14 hours of Program & Project Support (formerly Operational Support or OS).**

To enter information into the new system:

1. Identify yourself and indicate whether you are an intern or a veteran Master Gardener.
2. Select from a pull-down menu of Santa Fe projects or select "other" if the supported activity is not listed. No further detail is requested or required.
3. Check one of the following: Continuing Education, Outreach & Public Education or Program & Project Support.
4. Log hours worked in half-hour increments.
5. Be sure to hit the "submit" button.
6. You will see a confirmation of success on your screen and will almost immediately receive an email confirmation from Formsite. If you do not see this, check your spam folder. (If you want to track your hours in more detail, you will need to keep your own records.)

The SFEMG has requested several corrections to the activities listing and reported a few 'bugs.' All changes to the new site have to be made by Information Technology staff at NMSU. Please do not continue to post to TIF!

If you still have questions, feel free to contact Kathy Brechner at [LastingNature@gmail.com](mailto:LastingNature@gmail.com)

**"Soil is only the darkest and coldest of all living things. The most widespread. And the most receptive. Warmed, it blooms. So may I in my darkest moments be attentive to the penetrating rays of the sun that finds the seed."**

Author and arborist [William Bryant Logan](#) from his 1995 book, "Dirt," which was made into the award-winning documentary, "[Dirt! The Movie](#)."

# Backyard Bugs

## Yucca Moth (*Tegeticula yuccasella*)

by Pam Wolfe

My prairie remnant in South Capitol is home to a thriving population of Soapweed Yucca (*Yucca glauca*). It's a lovely evergreen shrub that blooms reliably with no supplemental water and spreads by both rhizomes (thick fibrous roots) and seed. The plant is wholly dependent on *Tegeticula yuccasella* ([Family: Prodoxidae](#)) to pollinate the flowers. The plant and moth are often cited as a classic example of “obligate mutualism,” co-evolving over millennia, neither viable without the other.



Photo credit: Joshua Tree National Park, public domain via Wikimedia Commons

The moths mate in the fragrant chamber of the pendulous flower. The female collects pollen from one flower and then flies to another to lay her eggs. She actively pollinates that flower to ensure sustenance for the larva, which can feed only on the developing seeds. The relationship is finely tuned; her progeny devour a modest proportion of seeds, leaving enough to guarantee the next generation of the host.

Recent research has shown *T. yuccasella* to be a complex consisting of about 13 species that are biologically distinct, with at least two “[cheater](#)” species. That is, they leave their eggs but do not pollinate the host.

In four years of watching the arthropod life around me, I have never seen the Yucca Moth. Something in the 13-species complex must be active here, though. Several times I've collected seeds to test for viability; after an overnight soak and a few days on a sunny window sill, voila! — nearly 100 percent germination.

### We are here to help!

If you have a gardening question, Santa Fe Extension Master Gardeners are available to help. Go to [sfemg.org](http://sfemg.org) and pose your question. Someone will do research and get back to you.







## Curl Leaf Mountain Mahogany (*Cercocarpus ledifolius*)

by Sally M. Roberts

Curl leaf mountain mahogany (*Cercocarpus ledifolius*) is a marvelous broadleaf evergreen shrub to small tree that is found in the western United States, growing in the Chapparal, high desert and low mountain foothills regions. The common name is misleading, as it has nothing to do with the mahogany tree in the Meliaceae family; *Cercocarpus* is in the Rose family. The name *Cercocarpus* is derived from Greek words meaning “tail” and “fruit,” referring to the plume on the fruits in the fall. *Ledifolius* basically means having leaves like *Ledum*, the genus for wild rosemary. The common name may come from the fact that the wood is very dense like true mahogany. Dried *Cercocarpus* bark concoctions were used by many indigenous peoples as a treatment for burns, colds, cuts, sores, tuberculosis and other medical conditions; the very hard wood was used for making tools and weapons.



This handsome plant is a densely branched shrub, which grows relatively slowly into a tree up to 30 feet high, having a spreading, umbrella shape. The shiny, leathery, dark green leaves are lanceolate, about 1½ inches long and slightly curled under at the edges. The bark is a smooth gray. Flowers are quite inconspicuous, pink with long plumes that are attached to the seed that emerges. It is unclear why, but the plant exudes a very agreeable fragrance all season.

Curl leaf mahogany is a valuable addition to the home landscape because, besides being evergreen and a distinct contrast to coniferous plants, it is very drought tolerant. It grows in poor rocky soil and in a wide range of zones, 3-8, at elevations between 5,000-10,000 feet. As a shrub it may be pruned

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into a hedge, or the outer branches may be trimmed to facilitate more of a gnarled tree shape as it grows. It can be used for screening purposes and soil stabilization. It is not prone to pest problems with the exception that deer like to browse on it.

**Propagation:** seed or hardwood cuttings

**Plant type:** broadleaf evergreen

**Bloom time:** April-May

**Size:** depending on irrigation or pruning, the tree can eventually reach 20 to 30 feet

**Sun:** full sun, part shade

**Soil:** rocky, alkaline, lean

**Water:** low, once established

**USDA zones:** 3-8

Photo Credit: Sally M. Roberts

#### References:

[“Curl-leaf Mountain Mahogany in the Landscape,”](#) Heidi Kratsch, Utah State University, Center for Water Efficient Landscaping, Cooperative Extension

[“Mountain Mahogany: One Tough Rose,”](#) Natural History Museum of Utah, Michael Mozdy

## Webinars, etc.

[Secrets of the Soil Sociobiome](#) (GCS) 1 CE

[Nature’s Best Hope with Doug Tallamy](#) (DRKC) 1 CE

[Fruit Tree Pruning Workshop](#) (SFBG) 1 CE

[“Yucca,”](#) a brief introduction by Sylvan Kaufman of Sylvan Green Earth Consulting

**DRKC:** [Deep Roots KC](#)

**GCS:** [Green Cover Seed](#)

**SFBG:** [Santa Fe Botanical Garden](#)

## 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 include the information in the next issue. **Note that some of these sources may have paywalls.**

["100 Plants to Feed the Monarch: Create a Healthy Habitat to Sustain North America's Most Beloved Butterfly."](#) The Xerces Society. (Storey Publishing, 2021)

["Why we should be embracing no-dig gardening"](#) by Charlie Harpur, *House & Garden* (April 13, 2021)

["Water-worried Vegas wants useless grass a thing of the past"](#) by Sam Metz and Ken Ritter, *AP News* (April 12, 2021)

["How to use coffee grounds in the garden — from worm food to fertiliser"](#) by Aidan Milan, *Metro* (April 10, 2021)

["Inside artist Yayoi Kusama's trippy New York Botanical Garden exhibit"](#) by Raquel Laneri, *New York Post* (April 9, 2021)

["Plant your Garden of Eden"](#) by Phil McCann, *The Telegraph* (April 9, 2021)

["Buckingham Palace visitors can picnic in its gardens for first time"](#) by Danyal Hussain for Mailonline, *Daily Mail* (April 7, 2021)

["18 Flowers That Attract Butterflies — and How to Keep Them Coming Back"](#) by Lauren Wicks, *Veranda* (April 1, 2021)

["The Ecology of Herbal Medicine: A Guide to Plants and Living Landscapes of the American Southwest"](#) by Dara Saville, University of New Mexico Press (March 2021)

["Field Guide to the Trees of the Gila Region of New Mexico"](#) by Richard Stephen Felger, James Thomas Verrier, Kelly Kindscher and Xavier Raj Herbst Khera, University of New Mexico Press (March 2021)

["Landscape Architect Visit: A Japanese-Inspired Oasis in Sonoma, by ROCHE+ROCHE"](#) by Kier Holmes, *Gardenista* (March 31, 2021)

["Required Reading: Dan Pearson's 'Tokachi Millennium Forest'"](#) by Kendra Wilson, *Gardenista* (March 11, 2021)

# The Garden Journal Radio Show

Every Saturday  
10-10:30 a.m.



Tune in to KSFR 101.1 FM on Saturday mornings from 10 to 10:30 to listen to a lively entertaining, and informative gardening show. Show host: Christine Salem

## May 1: Slow Food Santa Fe edition

Hosts Lissa Johnson and Nina Rosenberg talk with Thomas Swendson of New Mexico Harvest about Community Supported Agriculture.

## May 8: SFEMG edition

Dara Saville, author of "[The Ecology of Herbal Medicine: A Guide to Plants and Living Landscapes of the American Southwest](#)," joins host Christine Salem.

## May 15: Food, Farms & Friends edition

Host Carrie Core presents "Soil Stories."

## May 22: SFEMG edition

Host Tom Dominguez, Santa Fe County Extension Agricultural Agent

## May 29: Home Grown New Mexico edition

Jannine Cabossel, "The Tomato Lady," offers vegetable gardening to-dos, tips and techniques for June. More info at [Giant Veggie Gardener](#).

Schedule subject to change . To listen to previous broadcasts, click [here](#).

# May Calendar of Events

We do not know when face-to-face events will be viable again, but please continue to check the SFEMG website and the websites of other organizations to see what's being offered. Note that "phc" stands for "per hour of class time."

May 5

[Ready, Set, GROW! Permaculture for the Home Garden](#) (NMSU) 1 CE phc

May 6

[Supporting Pollinators Over Time: How to Maintain Wildflower Diversity](#) (XS) 1.5 CE

May 12

[Common Weeds in Front Range Landscapes](#) (CSU) 1 CE phc

May 18

[Comparing Benefits & Costs of Pursuing Bee Campus USA Certification](#) (XS) 1 CE

May 19

[Ready, Set, GROW! Pest Management for the Home Garden](#) (NMSU) 1 CE phc

Aug. 20-22

[Native Plant Society of New Mexico Annual Conference \(live/virtual\)](#) 1 CE phc

Sept. 12-17

[2021 International Master Gardener Conference](#) (virtual) 1 CE phc

See next month's SFEMG Newsletter for more Continuing Education options.

**DBG:** [Denver Botanic Gardens](#)

**CSU:** [Colorado State University Extension](#)

**NMSU:** [New Mexico State University Cooperative Extension Service](#)

**XS:** [Xerces Society](#)

**Members Only:** For a complete list of Master Gardener projects and to sign up, please visit SignUpGenius, a link to which is in the Members Only section of the SFEMG website. To log volunteer hours worked, visit the NMSU tracking site that you can link to from the same location.



**Mission Statement:**

*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.*

*New Mexico State University is an affirmative action/equal opportunity employer and educator.*

