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The Importance of Trees in the Fight Against Climate Change

Over the past week or so I've been watching the trees in my neighborhood go through the physical changes that herald the onset of fall. The two Sugar Tyme crabapple trees on my terrace have lost almost all of their yellow leaves, leaving behind clusters of glistening bright red apples. The wild crab that shares the terrace has leaves that turn a striking maroon and yellow each year and those leaves, too, have begun to fall. My neighbor's maple trees have burst into flame. The leaves on the oaks at the law office down the block are far less dramatic, but they too, have responded to the season and turned brown and begun to flutter to the ground. Fall, it seems, is right around the corner.

Why am I focusing on



<p>Websites</p> <p>MGV Hours Reporting: mastergardener. extension.wisc.edu/ report-your-hours/</p> <p>Canvas UW Online Classroom: https://canvas.wisc.edu/</p> <p>RPMGA Blog: rpmga.blogspot.com</p> <p>RPMGA on Facebook: Hit control/click on this link: RPMGA on Facebook</p> <p>Rotary Gardens: rotarybotanicalgardens.org</p> <p>Wisconsin Master Gardener Program: mastergardener. extension.wisc.edu</p> <p>Wisconsin Master Gardener Association (WIMGA): wimga.org</p>	<p>trees today? I want to help you understand the importance of their contribution to healing the earth's environment in this era of climate change. Trees are vital to the future as we try to heal the planet and go forward.</p> <p>A Brief History as to the Discovery of the Science Behind Global Warming</p> <p>The first person to publish the scientific discovery of the theory behind global warming was a woman, Eunice Newton Foote. In 1856 she published a paper in the <i>American Journal of Science and Arts</i> which demonstrated the absorption of heat by CO₂ and water vapor. She hypothesized that changing amounts of CO₂ in the atmosphere would alter the climate – a process which came to be known as the greenhouse effect. (It was the first known publication in a scientific journal by a woman in the field of physics.) It is interesting to note that when Foote's paper was presented at a conference that same year, the paper was handed off to a man to make the presentation.</p> <p>Global warming wasn't even a blip on the radar 84 years ago when Guy Callendar, a British combustion and steam engineer, published a paper in the <i>Quarterly Journal of the Royal Meteorological Society</i> in April of 1938 titled, "The Artificial Production of Carbon Dioxide and Its Influence on Temperature." The article expressed the scientific conclusion that the world was warming and that carbon dioxide added to the air by human activity was the primary cause. His article received little attention at the time. Decades before the use of computers all the data Callendar amassed was collected by hand from 200 meteorological stations. He calculated that temperature had been increasing at a rate of .005 °C per year. In separate research, using the laws of radiation together with absorptivity and wavelength data, he calculated the rate of temperature change attributable to CO₂ to be .003 °C per year. Ironically, Callendar did not see global warming as a long-term problem for the planet. Instead, he was convinced global warming was a positive thing which would increase degree days and make farming more productive. He concluded that it would never create a thick enough blanket of gases around the earth to affect world-wide climate. Today his work is known as the Callendar Effect.</p> <p style="text-align: right;"><i>continues on page 10</i></p>
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RPMGA November Program Easy Care Native Plants

Thursday, **November 3**, 5:30-6:30 p.m., Online

For our November continuing education event, the Rock Prairie Master Gardener Association, Inc., will host Susan Carpenter, the Wisconsin Native Plant Garden Curator at the UW-Arboretum.* She will introduce native plants that are easy to care for and discuss how they could be used in either a dedicated native garden or a traditional ornamental garden. She'll also touch on the plants' benefits to pollinators. This event is open to RPMGA members and master gardeners from Walworth and Jefferson counties. Please share the Zoom link with interested friends!

Main link to join the Zoom Meeting:

<https://us02web.zoom.us/j/85945973455?pwd=T3dvNVdKc25yY0hmUmdHT0dGK01jdz09>

Meeting ID: 869 4597 3455

Passcode: 205933

One tap mobile

+13017158592,,85945973455#,,,,*205933# US (Washington DC)

+13092053325,,85945973455#,,,,*205933# US

For other ways to connect, look for the "RPMGA Group Email: YOU'RE INVITED" email, sent to you on October 18.

**This event is arranged through the UW's Badger Talks program. Badger Talks allow faculty and staff experts to connect directly with Wisconsin residents through community-sponsored talks and events, some open to the general public, some presented for specific groups. More info on Badger Talks at <https://badgertalks.wisc.edu/>*

Note: If you can't make it to our program, Susan is also speaking on gardening with native plants for the Racine/Kenosha master gardeners, online at 6:00 p.m., Tuesday, November 15. No charge for the program. Go to this website to find the Zoom link: <https://today.wisc.edu/events/view/175195>

Top photo: "[Silene regia Royal Catchfly IMGP0403a](#)" by [BudOhio](#) is licensed under [CC BY-NC-ND 2.0](#).

Next Coffee Chat: Tuesday, November 8 at 1:00 p.m.



RPMGA December program: Unusual Tropical Gift Plants and Their Care, Thursday, **December 1**, 5:30 p.m., Online

If you're ready to move beyond the usual suspects for holiday plants, join us December 1 at 5:30 p.m. Next month's program features Christopher Enroth and Kenneth Johnson of the University of Illinois' Good Growing Team, talking about how to choose and care for plumeria, citrus trees, tea, coffee and goji.

Rotary Gardens Update: New Hours, 2022 Holiday Light Show



It's a quiet month at Rotary Botanical Gardens as the fall season winds down and preparations gear up for the Holiday Light Show. There are **no education events** on the calendar. If you plan to visit the gardens, check their website or Facebook page for the **new daily schedule**, as hours may have changed on November 1. Also, please note someone has booked a private event, so the gardens are **closed on Saturday, November 5**.

Preparations began in mid-August for Rotary's **2022 Holiday Light Show**, and will continue up to opening night. If you're an active volunteer at Rotary, you get the first opportunity to view the show at the *Volunteer Night, Monday, Nov. 21st* from 5-7:00 p.m. Please RSVP to Carla Edgar at 608-314-8409 if you will attend that night and if you'll be bringing a guest. Friends members get the next opportunity to view the show at the *Members-Only Preview night, Tuesday, November 22*. On that night, the Parker Education Center will feature visits with Santa, Artisan Holiday Gift Shop, live holiday music by Craig HS Jazz Band, hot chocolate, cookies, coffee and 3-D glasses available for purchase (plus the outdoor show, of course). Admission is also discounted for the preview (\$10 vs. \$12 for adults). No presale tickets for the member preview—buy your entry at the door. The show opens to everyone starting the Friday after Thanksgiving. Hours: 4:30-8:30 p.m. (lights out at 9 p.m.) Dates shown below. Tickets are available now online.

Holiday Light Show Dates: Nov. 25-27, Dec. 1-4, Dec. 8-11, Dec. 15-23, Dec. 26-30

Please also consider volunteering. It takes 20 people per night for the 26 nights of the show to keep everything staffed properly. Most shifts are less than three hours. Watch your inbox on November 3 for the link to sign up.

WIMGA Annual Meeting, Thursday, December 1, 6:30 p.m., online

If you are a member of the Wisconsin Master Gardeners Association, they're holding their annual meeting virtually again this year. On the agenda are a vote on proposed changes to WIMGA's bylaws, an update on the Master Gardener Program from State Horticulture Outreach Program Manager, Jay Dampier, and a program on houseplants from author Tovah Martin (description below). Links to more information about the proposed bylaw changes and to register for the meeting on December 1 were sent to members in an email dated October 31, titled "WIMGA News".

Tovah Martin *Houseplants by Design*

You want houseplants, you need houseplants – but do you really utilize houseplants to their fullest potential? In this virtual lecture filled with photos and inspiration from my own massive collection of houseplants, we explore some of the easiest, most rewarding houseplants appropriate for all types of home situations and varying window exposures. We talk about what to grow where and how to host houseplants. But we also add another layer. Beyond your usual practical presentation, here's ideas for profiling your plants beautifully and artistically. Your houseplant could be so much more than just the green blob in the corner. We talk about design principles and how they relate to houseplants. We discuss ways to pair houseplants and profile them meaningfully to work with your décor. We present containers that really make your houseplants shine with personality. And of course, we tell you exactly how to host and care for houseplants so they work for you. Your habitat needs houseplants—why not do it with panache?



Volunteer Opportunity

Prairie Burn and Reseeding at Divine Word Seminary, East Troy, Saturday, November 19, 10:30 a.m. - 2:30 p.m.

Join Kettle Moraine Land Trust at Divine Word Seminary (just north of East Troy) for a special stewardship workday. We will be conducting a controlled burn and training will be provided. Wear natural fibers (no polyester or nylon, windbreakers or fleece), sturdy hiking boots (no rubber boots or gym shoes), and a hat or bandana to cover your hair. Bring a brown bag lunch for break time and plenty of water. We'll also be broadcasting native seed into the black zone, so expect to get dirty knowing that you are doing something good for the environment!

Events for Fun

Winter Crafter & Farmers Market, Beloit, 9:00 a.m. – noon, Saturdays from November to April

The Beloit Farmers' Market is year round! [Downtown Beloit Association](#) is hosting the Beloit Winter Crafter & Farmers' Market indoors at their office/event space in Downtown Beloit. There will be local vendors selling their wares every Saturday November through April. Note: no market will be held on 12/24 or 12/31. Located at 557 E. Grand Ave., Beloit.

Dia de Los Muertos, Nicholas Conservatory & Gardens, Rockford, IL, Saturday, November 5, 5-8:00 p.m.

Experience this amazing holiday through music, dancing, art, stories, and more! The conservatory will be decked out for the occasion with alebrijes, papel picado and of course, our big beautiful la Catrina! Lots of new Dia de los Muertos fair trade items available for purchase in the gift store! Fee for adults: \$7 members/\$10 non-members. Pre-registration encouraged! [Click Here](#) to register.

Right: "[Day of the Dead](#)" by [Señor Codo](#) is licensed under [CC BY-SA 2.0](#)



Holiday Decorating with Garden Materials

Want to create holiday decorations with garden materials? Check out these workshops offered by public gardens and garden-related groups! If you live close to a garden not listed here, check with them—chances are good they'll have something.

Silverwood Park near Edgerton is offering a 2-hour wreath-making workshop at 7 different times from November 10-13. Details and registration form at https://docs.google.com/document/d/116ITcHgy5UfpoEHd1bDWnpgzfwDThfg_sPBIJTE0KSM/edit

Klehm Arboretum offers 3 workshops from November 13-21: A floral centerpiece for Thanksgiving, an evergreen container and a macramé holder for amaryllis or other houseplants. Details at <https://klehm.org/events/>



Hort for the Holidays 2022 Make some gnomes with evergreen boughs, tomato cages and some hats and mittens (photo at left). Workshop by the Winnebago County Master Gardeners, Rockford, IL, Saturday, November 19, 9-11:00 a.m. <https://web.extension.illinois.edu/registration/?RegistrationID=26529>

Olbrich Botanical Garden has workshops on evergreen wreaths, and ornaments from natural materials. (Workshops on making herbal gifts and wreaths with spices are currently full, but you can get on the wait list.) These all take place between December 3 and December 10. Details at <https://www.olbrich.org/education/classes.cfm> (scroll down their list to December to find these workshops).

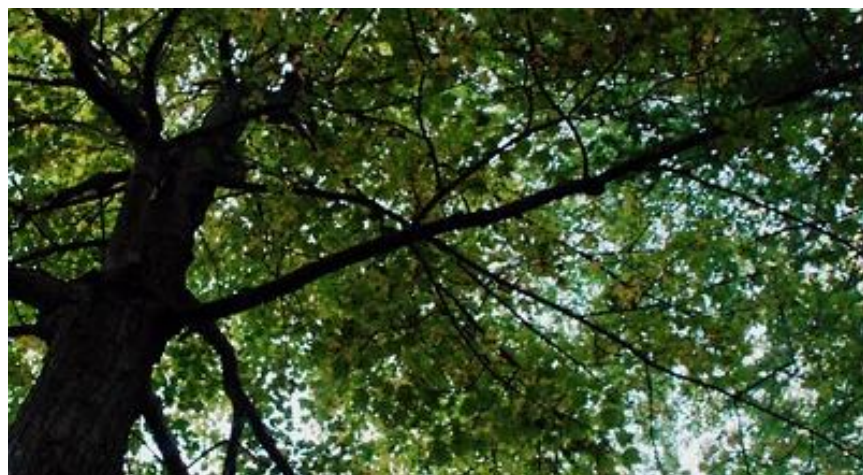
Real People, Real Climate, Real Changes, Welty Environmental Center, Beloit, continues through November 21.

This exhibit takes you on an interactive journey through climate change and how it's affecting people's lives around the country and around the world. It was developed by the National Center for Atmospheric Research and the UCAR Center for Science Education to help share the science of climate change and how it impacts people's lives. The exhibit is traveling around the country and is coming to Beloit thanks to generous support from UW's Nelson Institute Center for Climatic Research. Admission is free to both the exhibit and the event. Exhibit hours: Weekdays 9am-3pm; Weekends from 12-4 p.m.



More Training Coming Up in November and Beyond

Looking for Level 2 MGV training--The Plants Plus modules? You can find them in the online classroom, Canvas, which you access with your UW NetID at <https://canvas.wisc.edu/> Check regularly for new modules! There's a new series just starting that deals with **soil contaminants**.



"Tree - leaf canopy" by [blmiers2](#) is licensed under [CC BY-NC-SA 2.0](#).

Deep Bark Secrets of Tree Selection, Tuesday, November 1, 1:30-2:30 p.m., Online

Are you looking to plant more trees in your yard? Confused about what species might be best? Have something in mind and want to ensure its success? Branch out to find methods for selecting the right tree for your site. Make informed decisions when selecting your next tree! Presenter: Sarah Vogel, Illinois Extension Horticulture Educator. Free, but registration required. Go to <https://web.extension.illinois.edu/registration/?RegistrationID=26179>. If you miss it, it'll also be available around mid-November at [Illinois Extension Horticulture YouTube channel](#).

Creating a Pollinator's Paradise, Edgerton Hospital, Thursday, November 10, noon-1:00 p.m.

From Mark Dwyer: "Our landscapes and gardens can be a refuge for pollinators with through the combination of using specific plants and adding additional garden features. We'll discuss some of the best plants for our pollinators as well as cover many tips on how to make our own landscapes a "pollinator's paradise"! Guests are invited to purchase lunch from the cafe, and enjoy complementary coffee and cookies. Part of the hospital's Coffee and Chat series. Free, no registration required.

Growing Resilient Trees, Olbrich Botanical Gardens, Madison, Thursday, November 10, 6-7:30 p.m., Online

In our changing climate, maintaining healthy trees has become increasingly challenging. This virtual lecture will discuss current management issues brought on by climate change, as well as anticipated future challenges. We will also discuss the increasingly important role that our community trees play in fostering a sustainable environment and strategies for success in the future. Instructor: Briana Frank of Tree Health Management. Fee: \$12 members/\$15 general public. Register by November 3. For more info, copy and paste this address: <http://www.olbrich.org/education/classes.cfm>

**Making More Plants: a Free Houseplant Propagation Workshop,
Dane County Extension, Madison, Saturday, November 12, 1:30 p.m.**

We will begin with a PowerPoint presentation on propagating houseplants, and handout copies of the presentation and other information. You will get to practice propagating on plants we provide and you will leave with several small potted plants. If you'd like to bring plants of your own to propagate and share, please do! Class takes place at the UW South Madison Partnership, 2238 South Park Street (a few blocks north of the beltline). Free, but registration required. Go to <https://www.eventbrite.coCrffffm/e/making-more-plants-a-free-houseplant-propagation-workshop-tickets-443747178757>

**A Year in Review, Anderson Japanese Gardens, Rockford, IL,
Thursday, November 17, 7-8:00 p.m.**

Join Tim Gruner, Garden Curator and Head of Horticulture, as he discusses the "insider's view" of Anderson Japanese Gardens. Mr. Gruner will look back at the many factors that influenced Garden over the last twelve months. He will share the routine and not so routine, from winter to fall, weather patterns and special projects – they all have an impact on the Garden. Gruner oversees all construction and horticulture activities within the Gardens. He currently serves on the Board of Directors of the North American Japanese Garden Association. Fee: Free for Anderson members/\$5 general public. Space is limited so registration is required. Go to <https://52957.blackbaudhosting.com/52957/2022-Lecture-Series-17Nov2022>

Green Thumb Gardening Series, online, days of week as noted, 6:00-8:00 p.m.

The Green Thumb Gardening class series gives you the practical knowledge to keep your home garden thriving! Dane County Extension educators and local horticulture experts will provide in-depth and accessible information for everyone from the novice to the experienced gardener. Register for individual classes at \$12 each. Attend virtually from home. [Click Here to Register](#). Zoom links will be provided after registration. Photo: "[Green thumb](#)" by [smohundro](#) is licensed under [CC BY-NC-SA 2.0](#).



November 1 (Tuesday): Planning/Techniques for Organic Vegetable Gardens

November 3 (Thursday): Weed ID and Management

November 7 (Monday): Vegetable Garden Crop Management, Pests and Diseases

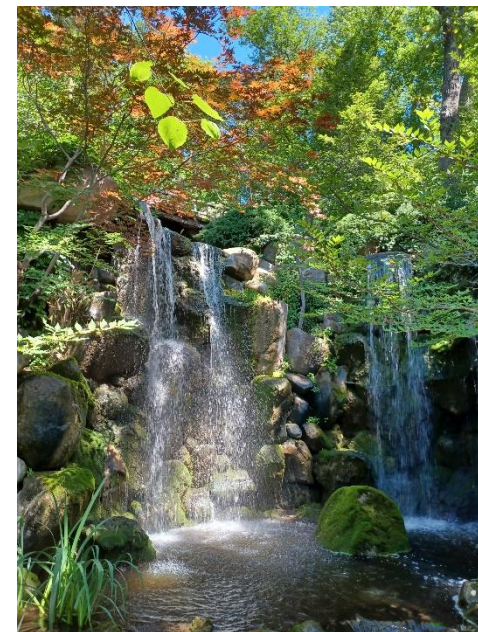
November 10 (Thursday): Fruit Trees

November 14 (Monday): Wildlife in the Garden

November 17 (Thursday): Invasive Plant Management

November 21 (Monday): Intro to Growing Berries

November 28 (Monday): Perennials



The Importance of Trees in the Fight Against Climate Change, continued

Where We Are Today

Unless you've been living under a rock without access to climate change information in the recent past, you are no doubt aware that we are currently experiencing the effects of global warming. It's no joke, no conspiracy theory, no wild supposition. Scientific research based on fact says climate change is real, it's here, and we need to do whatever we can to slow it down. Reversing global warming is a worthy dream, but it will require all of us to work together – now – because we are nearing the tipping point.

Is Recovery Even Possible? The Reality of Tipping Points

According to an article by Renee Cho for the Columbia Climate School, tipping points are real. The article, [How Close Are We to Climate Tipping Points](#) was written almost exactly a year ago, and published on November 11, 2021.

A tipping point is that moment in time when the ability to stop something is rendered moot. Beyond that point effective change becomes impossible. Cho contends that there is a tipping point beyond which the effects of climate change will become unstoppable - like a runaway locomotive. She cites the occurrence of ice sheet glacial melt, the warming of the oceans causing the changing of ocean currents, thawing permafrost, deforestation of the Amazon rainforest, the increasing fury of seasonal storms like El Ninos and La Ninas, the increase in the range and occurrence of hurricanes and tornados. Scientific data collected over decades indicates that the causative factor in this cascade of system failure is us.

TIPPING POINT - NOUN – (MERRIAM WEBSTER DICTIONARY)
THE CRITICAL POINT IN A SITUATION, PROCESS, OR SYSTEM BEYOND WHICH A
SIGNIFICANT AND OFTEN UNSTOPPABLE EFFECT OR CHANGE TAKES PLACE



Evidence of Climate Change Effects

Let's be clear about the effects of climate change. Empirical evidence says the earth is becoming less hospitable for us. Let me repeat. Less hospitable FOR US. Where is the evidence, you ask? I submit the evidence is all around us, but let me list a few of the more extreme and obvious pieces of evidence of climate change to support that claim.

- The earth's ambient temperature has risen to dangerous levels. Earth's temperature has risen by 0.14° Fahrenheit (0.08° Celsius) per decade since 1880, but the rate of warming since 1981 is more than twice that: 0.32° F (0.18° C) per decade. (Source: Climate.gov)
- Lakes and streams are disappearing. Case in point, Hoover Dam. At the end of July 2000, around the time of a first satellite image, the water elevation at the Hoover Dam was at 1,199.97 feet above sea level. By July 18 this year, around the time of a second image, it dropped to 1,041.30 feet, according to data from the U.S. Bureau of Reclamation. The all-time low is attributed to a crippling drought exacerbated by rising temperatures due to climate change.
- The Amazon Rainforest – one of the world's last old growth forests. In the 1990s and 2000s, deforestation of the rainforest was out of control. One county in Brazil, São Félix do Xingu, felled 300 acres of trees in 2008. "Deforestation out of control," says Ian Thompson, director of conservation for The Nature Conservancy, an organization that is working to rebuild the forest. Brazil enacted a blacklist in 2008 which listed companies developing the rainforest and forced them into compliance with environmental laws. Today about 80% of the rainforest still stands because the Brazilian government began to shift away from promoting settlement and toward encouraging sustainable development. To date, thousands of acres have been replanted. Sadly, there is data that says there are areas of the forest that cannot be rejuvenated, revived, bought back to life. They are truly dead – an artifact to hubris and greed.
- Political expediency has resulted in blanket denial of climate change as a plank in many campaign platforms. Elected officials who we rely on to tell us the truth have been brazenly fudging the facts for far too long. We have been selectively deaf to the cries of environmentalists that we are killing our planet because for a short moment in time, the planet was able to adapt. That moment has passed. We have fouled our nest and in order to survive we must clean it up.



So How Do Trees Help Heal the Environment?

At last we reach the subject of this essay. Trees. Can they really help mitigate climate change? Scientific research says yes. In a study published in the [Journal of Science](#), Jean-Francois Bastin of ETH-Zurich in Switzerland, used direct measurements of forest cover around the world to create a model for estimating Earth's forest restoration potential. They found Earth's ecosystems could support another 900 million hectares (2.2 billion acres) of forests—25 percent more forested area than we have now. By planting more than a half trillion trees, the authors say, we could capture about 205 gigatons of carbon (a gigaton is 1 billion metric tons), reducing atmospheric carbon by about 25 percent. That's enough to negate about 20 years of human-produced carbon emissions at the current rate, or about half of all carbon emitted by humans since 1960. The study attracted worldwide attention, as well as some criticism within the science community.

Just exactly how do trees fight climate change?

The answer is deceptively simple. Through the natural process of photosynthesis, trees absorb CO² (carbon dioxide) and other pollutant particulates, then store the carbon and emit pure oxygen. The carbon they take from the air is stored in their trunks, limbs, leaves and bark, and underground in their roots. Without this simple process the tree couldn't survive. It's a simple give and take. The tree takes carbon dioxide from the atmosphere, and gives back pure oxygen – the gas we all need to survive.

The study was cited in a 2019 Internet article on the NASA website, [Examining the Viability of Planting Trees to Help Mitigate Climate Change](#). Sassan Saatchi, a senior scientist at the Jet Propulsion Lab in Pasadena, CA, thinks the idea has some merit. He agrees that pumping up the planting of trees worldwide will help mitigate some of the effects of climate change, but he cautions that planting trees alone will never outstrip the effect on the world's biome that is the massive impact of fossil fuel emissions. Our love affair with gasoline powered vehicles must end. Alternative power sources must be explored. Wind, solar, hydraulic.

While that opinion may seem to dampen the enthusiasm inherent in the idea of saving the planet by planting trees, the original idea has merit. Perhaps the most significant factor to be found in encouraging people to plant trees is that it is something we can all do.

A vast array of communities nationwide have established what are known as STACs – or Shade Tree Advisory Committees. Janesville is one of those cities. A founding group of tree care specialists and garden variety private citizens came together to create the Janesville Shade

Tree Advisory Committee back in 1993 – today it is known as [the Janesville Urban Forest Alliance](#). I'm a member. We plant trees using donations and grants, and we have done so for over 20 years. The organization is always looking for new participants.

Examples of Current Reforestation Projects, Worldwide



- [The Arbor Day Foundation](#) is perhaps the most familiar to us. They are working toward a goal of getting [500 Million New Trees](#) in the ground.
- China's Grain for Green Program (GGP) is the largest reforestation project in the world. The program was launched by the Chinese government in 1999 and implemented in 25 provinces in 2002 to mitigate the effect of soil erosion and restore ecosystems by planting trees on former steep areas of cropland or uncultivated barren land. It had the added benefit of carbon sequestration. Although the project as resulted in many monocultures or simple forests (forests with four or less species), the economic benefit, which is where the project started, is morphing into a more ecologically sound paradigm.
- [The Nature Conservancy](#) is the nexus of a half dozen or so very ambitious reforestation projects all over the southern United States. Their goal is to [Plant A Billion](#) trees.

- The Wisconsin DNR has resources and programs that help citizen foresters and communities throughout the state. [Their reforestation efforts](#) provide native nursery stock seedlings and shrubs to plant on public and private land.

When there's a new baby in the family, plant a tree. When your best buddy gets married, plant a tree. When your niece gets a scholarship, plant a tree. When someone you loved very much dies, plant a tree. Birthdays, weddings, funerals, promotions, new homes, engagements. Plant a tree. We are custodians of this little green planet, and planting a tree is a simple and important way to share in the duty we have to it. So, don't buy candy, or wine, or a new app for your phone. Buy a tree – and plant it with someone you love.

Mary Thompson

The **Master Gardener Update** is developed by and distributed online monthly by the Rock Prairie Master Gardener Association, Incorporated, for master gardener volunteers and other interested people who have ties to Rock County, Wisconsin. Current officers of the association include Ruth Flescher, president (yafello2@gail.com); Mary Kay Thompson, vice president (mastergardenermary@gmail.com); Sue Wood, Secretary (wood-slibrarymedia@gmail.com) and Deb Grams, treasurer (debgrams@yahoo.com).

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