What's Growing On?

BASTROP COUNTY MASTER GARDENER ASSOCIATION

September 2021

Fall Armyworms

By Wizzie Brown

Fall armyworm larvae, or caterpillars, are light tan to light green with a brownish-black head. These caterpillars have a white line between their eyes that forms an inverted Y-shape. Larvae have yellowish and black banding along their body as well as four large spots at the end of the abdomen. Adults are small moths with a wingspan of 1.5 inches with mottled brownish-grey wings.

Fall armyworms overwinter in the pupal stage in south Texas. Once adults emerge from the pupal stage, they migrate northward during spring as temperatures rise. Larvae feed for about 2-3 weeks and then enter soil to pupate.

Armyworms attack many types of plants. Small larvae feed on the green layer of leaves, causing a windowpane effect while larger larvae completely strip leaves. The last two larval stages eat about 85% of the total foliage consumed. Fall armyworms feed any time during the day or night but are most active in early morning or late evening. Fall armyworms strip foliage from plants and then move onto a new food source. With high populations, larvae appear to march side by side to new food sources, thus giving them the name of armyworm.

(*Continued on page 2*)

2021 Fall Plant Sale

Saturday, October 2, 2021 (9am-3pm)

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Find us at txmg.org/bastropcounty or on Facebook at BastropCountyMasterGardeners

Proceeds benefit the Bastrop County Master Gardener Association's garden & horticulture education programs

The Bastrop County Master Gardener Association, a 501 (c)3 nonprofit organization, is a program of Texas A&M Agrilife Extension

Texas A&M Agrilife Extension provides equal opportunities in its programs and employment to all persons, regardless of race, color, sex, religion, national origin, disability, age, genetic information, veteran status, sexual orientation or gender identity.

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Various predators help keep armyworm populations from becoming too large. Parasitoids, such as wasps or flies, lay their eggs in armyworm eggs and/or larvae, causing death of the developing egg or larvae. Predators, such as ground beetles, also help reduce armyworm numbers by eating larvae. Many other animals like birds, skunks, and rodents consume large numbers of armyworms. Even with these natural controls, there are certain conditions that can cause outbreak populations. Typically outbreaks occur for fall armyworms in late summer or early fall after heavy rain or irrigation.

To determine if populations are high enough to justify control, count the number of armyworms in a square foot for 8 different areas. Thresholds for lawns can vary, but treatment should be considered when there are 3 or more larvae per square foot. Look for products labeled for armyworms for use on lawns or turf. Active ingredients may include *Bacillus thuringeinsis* var. *kurstaki*, spinosad, bifenthrin, cyfluthrin, carbaryl, or permethrin.

For more information or help with identification, contact Wizzie Brown, Texas AgriLife Extension Service Program Specialist at 512.854.9600. Check out my blog at www.urban-ipm.blogspot.com

This work is supported by Crops Protection and Pest Management Competitive Grants Program [grant no. 2017-70006-27188 /project accession no. 1013905] from the USDA National Institute of Food and Agriculture.

Volunteering

Master Gardeners volunteer in the community to teach others about horticulture. We follow the research-based recommendations of Texas A&M AgriLife Extension. Members who complete 50 hours of volunteer service in the year after training earn the designation “Texas Master Gardener.” We use our title only when engaged in Texas A&M AgriLife Extension activities.

Two Patent Types and a Certificate: How Breeders Protect Their Investment and Why It Matters to Us

By Howard Nemerov

Previously, I've written about plant patents in the U.S. Patent Database, since we need to follow the law when offering plants for Master Gardener sales.[1] This update discusses two additional protection categories, one of which the USDA issues. This article helps you find relevant information, summarizing hours of research mapping out this "treasure hunt."

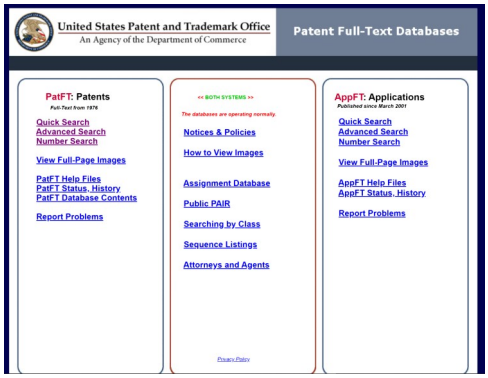
Plant Patent Review

Arguably, everybody benefits from patents:

> *The agricultural sector leverages patent and other types of IP [Intellectual Property] protection to establish market exclusivity, fund research, maintain control over key genetic assets, and command significant price premiums for its proprietary products.*[2]

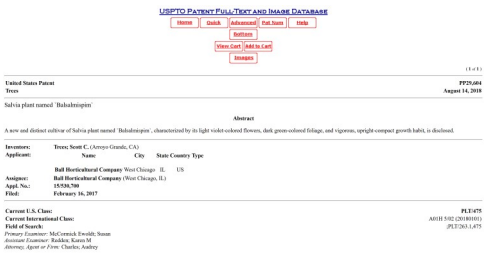
Patents are issued through the United States Patent and Trademark Office (USPTO). A plant patent is perhaps the most straightforward protection to obtain, and is narrow in scope:

> *This type of patent, unique to the United States, was introduced via the U.S. Plant Patent Act of 1930 to provide plant breeders with a mechanism for protecting asexually propagated plants.*[3]



The USPTO indicates a plant patent by using "PP" before a number. For example, Monrovia's offering of Salvia Mystic Spires Blue has the patent number *PP29,604*.[4] Use "*PP29,604*" to locate this plant patent at the USPTO Patent Database (on right).[5] On the main page, in the left column, select "Number Search."

On the resulting search page, enter "PP29,604" (no spaces; commas not required) in the Query box, and click the "search" button (on left) to access the patent page. Since patents are filed under the cultivar name, you will see the patent title as "Salvia plant named 'Balsalmispim'". (Single quotes denote cultivar names according to botanical nomenclature.) "Mystic Spires Blue" is called a marketing or commercial name; there may be additional trademark protection associated with a commercial name (on right).



(*Continued on page 4*)

New Website Features

Check out our website, which features project slideshows, a new photo gallery section, and an events calendar to check out upcoming activities. Find news articles and our newsletters. Thanks to Dave Posh for keeping the info timely for us https://txmg.org/bastropcounty/

(*Continued from page 3*)

Just below the abstract is relevant information like the patent owner (Ball Horticultural Company) and the file date of February 16, 2017. This date is important for understanding patent term:

> *"A plant patent expires 20 years from the filing date of the patent application. As with utility patents, when the plant patent expires, the subject matter of the patent is in the public domain."*[6]

Over twenty years ago, the USPTO began to adjust the patent term to account for Office delays. In this example if you select the "Images" tab (shown in Figure 3) you will see a "Notice" that extends the patent term 45 days. This means that as of April 2, 2037, Master Gardeners can begin to vegetatively propagate and then later offer Salvia 'Balsalmispim' at plant sales.

It is important to confirm on the plant tag of the purchased plant from which cuttings will be taken that the cultivar is 'Balsalmispim'. Companies can make improvements and sell the improved cultivars under an existing marketing name. That is what you see here: The older Mystic Spires Blue cultivar 'Balsalmisp' is protected under PP18,054, which expires on December 11, 2025.

We could propagate and sell Salvia 'Balsalmispim' plants if we obtained a license from the patent owner. Plant patents protect against unauthorized asexual propagation (e.g., cuttings, divisions) and covers any part from a plant that is the result of asexual propagation of the protected plant.[7] For the latter part, think selling of cut flowers from plants that were unlawfully propagated. Selling these cut flowers would be blocked. This amendment was written in part to block the importation of cut flowers from protected plants propagated offshore.

A careful read of the grant shows that the plant patent does not block breeding with lawfully purchased plants. Also, any discovered mutant or sport does not fall under the protection of the parent plant, and the resulting plants can be protected under a new plant patent.

Utility Patents

In addition to plant patents, plants can be protected under utility patents, which typically offer broader protection. It's important to carefully read the back of the plant tag to see if a utility patent number is listed. It's also helpful to search the breeder's website. Utility patents can cover broad traits as well individual cultivars, both seed and vegetative.

A look at Sakata's SunPatiens® Compact Purple 'SAKIMP044' shows that this cultivar is protected under utility patent US10,149,452.[8] A more extensive search of the U.S. Patent Database identifies that this also has a plant patent PP27,995. The difference is that the utility patent has broader claims that are written to block breeding and methods of making mutants and GMOs.

Utility patents are used extensively to protect agronomic crops. In comparison, there are very few in the horticulture industry. One example of an ornamental seed cultivar protected under a utility patent is Echinacea PowWow® Wild Berry 'PAS702917' also known as 'G0052Y'. A search of the PanAmerican Seed website will show this cultivar is protected under patent number US7,982,110.[9] As discussed above with Salvia 'Balsalmispim', navigate over to the U.S. Patent database, select "Number Search" and enter "7,982,110" in the search box. This brings up the page (on left) entitled "Echinacea purpurea


USPTO Patent Full-Text and Image Database

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Images

(1 of 1)

United States Patent 7,982,110

Ren July 19, 2011

Echinacea purpurea G0052Y

Abstract

The present invention relates to an Echinacea plant, seed, variety and hybrid. More specifically, the invention relates to an Echinacea plant having a compact, well-branched plant, having bright, deep rose-colored flowers. The invention relates to the seeds of Echinacea purpurea G0052Y, to the plants of Echinacea purpurea G0052Y, to plant parts of Echinacea purpurea G0052Y and to methods for producing an Echinacea plant produced by crossing Echinacea purpurea G0052Y with itself or with another Echinacea variety or hybrid. The invention also relates to methods for producing an Echinacea plant containing in its genetic material one or more transgenes and to the transgenic Echinacea plants and plant parts produced by those methods. This invention also relates to Echinacea cultivars or hybrids and plant parts derived from Echinacea purpurea G0052Y, to methods for producing other Echinacea cultivars, lines, hybrids or plant parts derived from Echinacea purpurea G0052Y and to the Echinacea plants, varieties, hybrids and their parts derived from use of those methods. The invention further relates to hybrid Echinacea seeds, plants and plant parts produced by crossing plants of Echinacea purpurea G0052Y with another Echinacea plant.

Inventors: Ren; Jianping (Geneva, IL)

Assignee: Ball Horticultural Company (West Chicago, IL)

Family ID: 42110825

Appl. No.: 12/258,179

Filed: October 24, 2008

Prior Publication Data

Document Identifier	Publication Date
US 20100107266 A1	Apr 29, 2010

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G0052Y".[10] Reading the patent application, it becomes clear that 'G0052Y' is a complex project involving years of breeding and selection to stabilize desirable features.

A utility patent "gives the patent holder the right, for a limited time, to exclude others from making, using, offering to sell, selling, or importing into the United States the subject matter that is within the scope of protection granted by the patent."[11] In this case, the patent holder's scope covers all bases to protect the cultivar and breeding methods.

Saving seed from these plants—even if they provide only one parent—is illegal until June 23, 2029. Utility patent term calculation can get complicated and it is best to confirm the product is off patent.

A utility patent to a trait is illustrated with Selecta Klemm's double-flowered Calibrachoa patent US7,786,342.[12] This patent covers all calibrachoa having more than five petals on a flower. While not common, these types of patents offer the broadest protection available.

Plant Variety Protection Certificates

The U.S. Department of Agriculture provides protection in the form of a certificate, enabling plant breeders to protect their research investments for at least 20 years from the grant date.

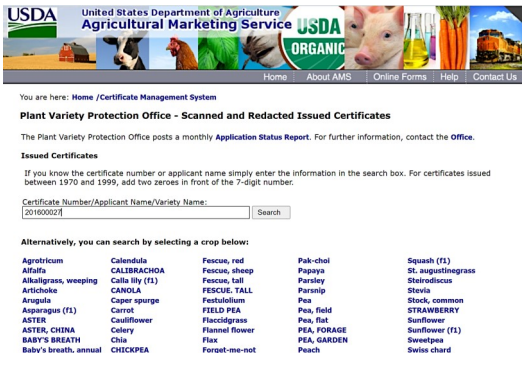
> *The Plant Variety Protection Office (PVPO) provides intellectual property protection to breeders of new varieties of seeds, tubers, and asexually propagated plants. Implementing the Plant Variety Protection Act (PVPA), we examine new applications and grant certificates that protect varieties for 20 years (25 years for vines and trees). Our certificates are recognized worldwide and allow faster filing of PVP in other countries. Certificate owners have rights to exclude others from marketing and selling their varieties, manage the use of their varieties by other breeders, and enjoy legal protection of their work.*[13]

Note the reference to "tubers" in the above quote. A PVP or a utility patent are the only means to protect tuber propagated plants like potato. Plant patents are not granted to tuber propagated plants.

The 2018 Farm Bill "amended the Plant Variety Protection Act so that PVP was expanded to cover asexually reproduced varieties."[14] If you examine the USDA's PVP database, you'll now find crops like vegetatively propagated berries, apples; even some hemp varieties are asexually propagated.[15]

Let's say you purchased seeds of Double Zahara™ Cherry Zinnias this year. A search of "zahara double cherry zinnia" returns PanAmerican Seed's page (PanAmerican is a division on Ball Horticultural Company).[16] Under "Protection Information" is "US PVP201600027"; "PVP" stands for Plant Variety Protection, requiring a visit to the USDA's PVP database.[17]

Click on "issued certificates database" and enter "201600027" in the search box and click the "search" button (on right).[18] ("PVP" prefix assumed; adding it returns no records).



This returns one result; click on the certificate number "201600027" to view the listing (below).

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On page 2 of the PDF is the issue date of July 31, 2018: propagating this cultivar is considered infringement until July 31, 2038.[19] For an open-pollinated cultivar like this, selfed seed propagation (seed saving) is blocked. PVPs do not block crossing.

One value of a PVP is the right to block the marketing of an essentially derived variety (EDV). If a new plant is considered to be predominately derived from a protected parent plant, the owner of a new plant must seek permission from the owner of the parent plant to market the new plant. This could be a flower color mutant like is common with chrysanthemum. This is not a concept that fits within plant patent law.

For Master Gardeners or any individuals involved in public plant sales for charitable causes, it's vital we understand legal restrictions on propagating protected plants and offering them for sale. It may seem a bother and a lot to take in, but embroiling your organization in a legal battle is a bigger bother than a little research.

(Acknowledgement: I would like to thank Audrey Charles, Ball Horticultural Company's Patent Agent, who generously spent time answering questions and clarifying legal processes regarding protected plant material.)

Endnotes

[1] Howard Nemerov. "Salvia 'Mystic Spires Blue'—Great Landscape Plant, Illegal to Propagate." What's Growing On? August 2020, pp. 9–10. https://txmg-wpengine.netdna-ssl.com/bastropcounty/files/2020/08/2020-08-Aug.pdf
[2] Pomeranz, Marcelo; Holly, Chris; Knauss, Daniel J.; Veitenheimer, Erich E. " IP Protection for Vegetatively Reproduced Plants: New Paths Forward." Journal of the Patent and Trademark Office Society, volume 101, number 3, June 2021, page 375.
[3] Ibid.
[4] "Mystic Spires Blue Salvia." Monrovia Nursery. Accessed July 12, 2021. https://www.monrovia.com/mystic-spires-blue-salvia-07330.html
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[9] "Echinacea PowWow® Wild Berry." PanAmerican Seed. Accessed July 19, 2021. https://www.panamseed.com/plant_info.aspx?phid=024101714024978
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[12] "Double flower Calibrachoa breeding methods and plants produced therefrom." U.S. Patent and Trademark Office. Accessed July 19, 2021. https://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=7,786,342.PN.&OS=PN/7,786,342&RS=PN/7,786,342
[13] "Plant Variety Protection." USDA Agricultural Marketing Service. Accessed January 24, 2021. https://www.ams.usda.gov/services/plant-variety-protection
[14] Pomeranz, Marcelo; Holly, Chris; Knauss, Daniel J.; Veitenheimer, Erich E. "IP Protection for Vegetatively Reproduced Plants: New Paths Forward." Journal of the Patent and Trademark Office Society, volume 101, number 3, June 2021, page 379.
[15] Potato Tissue Culture Lab. Wisconsin Department of Plant Pathology. Accessed July 14, 2021. https://seedpotato.russell.wisc.edu/potato-tissue-culture-lab/
[16] "Double Zahara™ Cherry Zinnia." PanAmerican Seed. Accessed July 12, 2021. https://www.panamseed.com/plant_info.aspx?phid=065705372001110
[17] "Plant Variety Database." United States Department of Agriculture. Accessed July 12, 2021. https://www.ams.usda.gov/datasets/plant-variety
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2021 Fall Monarch Migration: Help It Succeed

By Howard Nemerov

After seeing numerous Facebook gardening posts of Monarch larvae on Central Texas milkweeds in recent weeks, and seeing a couple of stray Monarchs on my Zinnias, I wondered if there's an early fall migration. The answer is complex, and here's what you can do to help what appears to be a healthy 2021 fall migration.

"Premigration Migration"

Texas Butterfly Ranch, a Texas-based Monarch advocacy group, discussed the local activity in a recent newsletter:

> *Dozens of monarch butterflies have been spotted along the San Antonio River in downtown San Antonio in recent weeks. Numerous accounts of monarch eggs, caterpillars, adults–even native milkweeds–have been reported, unusual for this time of year. Typically such sightings occur in these parts around Labor Day, and are known as the "**premigration migration.**"*[1]

Chip Taylor, University of Kansas ecology professor and founder of Monarch Watch, defines premigration as "a migration of apparently reproductive monarchs that moves south beginning in late July and continuing, in Kansas at least, until mid August."[2]

It appears that this year's relatively moist and mild summer encouraged Monarchs to venture south earlier than usual, resulting in a late summer reproductive cycle in Texas before the true fall migration arrives. According to Taylor: "due perhaps to adequate rainfall and moderate summer temperatures, monarchs are much more abundant in Oklahoma and Texas at this time…" He believes that "high numbers of monarchs could join the migration from this region in late September and October."[3]

"Monarchs Either Migrate or Mate"

In the rush to help Monarchs, many retailers have begun offering Tropical Milkweed (*Asclepias curassavica*). Tropical Milkweed is as easy to grow as annual flowers and the seed is relatively cheap, while native Milkweed seeds usually need cold/moist stratification and are expensive—if you can find them.

When planning your fall garden and managing Tropical Milkweed —if you grow it—this "migrate or mate" message is critical:

> *For those unaware, monarchs either migrate or mate. They don't have the energy to do both. The butterflies that spend their winters in the Mexican mountains experience what's called **reproductive diapause**–that is, they postpone all reproductive activities until spring.*[4]

If migrating Monarchs find milkweed, they fall out of reproductive diapause, mate, lay eggs, and die. This means Monarchs originally intended to over-winter in Mexico and then lay eggs on fresh milkweed next spring are lost: They die; the generation they were to produce next spring won't exist. Monarch caterpillars cannot survive cold temperatures. If you bring them indoors, what will you do with adult Monarchs that emerge way too early for next spring's migration? A Monarch lost to reproduction this fall is one less Monarch in next spring's migration. ***Disrupting this natural cycle threatens the future survivability of the Monarchs.***

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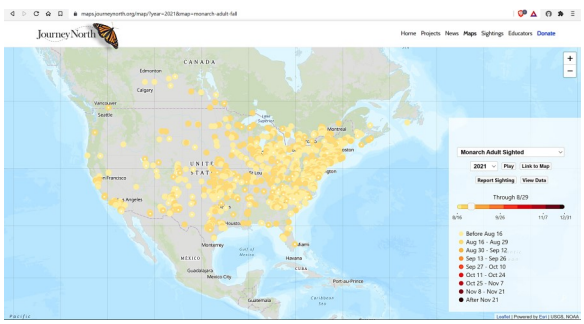
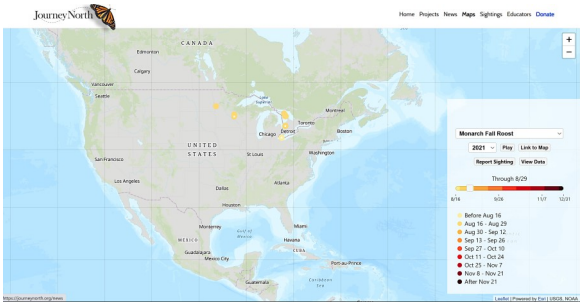
How to Help the Fall Migration

Bookmark the Journey North 2021 fall migration



(Image courtesy of Journey North)

Journey North provides an accurate migration map that's updated weekly. The map on the left is adult sightings through August 29.[5] You can click the dropdown window that says "Monarch Adult Sighted" and select "Monarch Fall Roost," which tells you if the migration has arrived in your area. Roosting site data tells you how far south the fall migration has travelled. For example, as of the week ending August 29, roosting sites are in southern Canada and northern U.S. states.



(Image courtesy of Journey North)

> *Monarchs only travel during the day and need to find a roost at night. Monarchs gather close together during the cool autumn evenings. Roost sites are important to the monarch migration. Many of these locations are used year after year. Often pine, fir and cedar trees are chosen for roosting. These trees have thick canopies that moderate the temperature and humidity at the roost site. In the mornings, monarchs bask in the sunlight to warm themselves.*[6]

Keep checking Journey North for weekly updates. In the upper right, you'll see the +/- box, allowing you to zoom into your location and make more accurate decisions. According to Texas Butterfly Ranch, peak migration in the San Antonio area is from October 10–22, but Monarchs arrive earlier the farther north you live. This is why Journey North is such a valuable reference.

Remove Tropical Milkweed

If you're growing Tropical Milkweed, you'll want to chop it to the ground or pull it out before the migration arrives. Check Journey North to determine when arrival is imminent. Large retailers offer Tropical Milkweed more often than native varieties in an effort to help Monarchs with the least investment. It serves as larval food for Monarchs and our local Queen populations, and its flowers provide nectar to many pollinators. While not such a problem in the spring, it can literally be poison if left growing in the fall.

Tropical Milkweed has a long growing season in the south, which offers Monarchs an opportunity to hang around and breed. Repeated use of Tropical Milkweed plants can lead to disease buildup, especially in mild climates where it may persist all winter. One of the biggest disease threats is a debilitating protozoan parasite Ophryocystis elektroscirrha, often referred to as "OE".

Adult monarchs pick up spores from milkweed plants and harbor them on their bodies. "When dormant spores are scattered onto eggs or milkweed leaves by infected adults, monarch larvae consume the spores, and these parasites then replicate inside the larvae and pupae."[7]

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Symptoms include failure to emerge from pupal stage, deformities, and shorter lifespan. The best autumn management strategy is to cut down or pull plants completely. Since Tropical Milkweed is a reliable seed producer, you can grow it as an annual and save seed for next year.

Natives can also carry OE, but don't present similar risk because they go dormant: no leaves, no parasite. According to Xerxes Society for Invertebrate Conservation:

> *When native milkweeds die back after blooming, the parasite dies along with them so that each summer's monarch population feeds on fresh, parasite-free foliage. In contrast, tropical milkweed that remains evergreen through winter allows for OE levels to build up on the plant over time, meaning successive generations of monarch caterpillars feeding on the plant can be exposed to dangerous levels of OE.*[8]

Also, because Tropical Milkweed is a prolific seed producer, there's the risk of it naturalizing outside the land under your management, which may be another reason why Xerxes Society considers it to be a "no-grow" option.[9]

Have mature nectar plants ready

Migrating takes *a lot* of energy. Arriving Monarchs need to refuel, so nectar-rich flowers will be in high demand. Some that work for me are Cowpen Daisy (*Verbesina encelioides*), Mexican Sunflower (*Tithonia rotundifolia*), and Zinnias (*Zinnia elegans*). This list is not comprehensive. I only have so much room, and since I start from seed, there's room for only so many flats and starts. This short list works for me, but you may find other flowers work better for you, so observe the migration and make your own list of what Monarchs prefer. Plan to grow your own: Most retailers don't sell the best nectar plants, like Zinnias, in the fall.

Fall-blooming perennials are another good option. Natives like Fall Aster (*Symphyotrichum oblongifolium*), Shrubby Boneset (*Ageratina havanensis*), and Blue Mistflower (*Conoclinium coelestinum*) can bloom up to first frost.

Plan for the future

Monarch caterpillar on Asclepias asperula, April 6, 2020. Photo by Howard Nemerov

If you decide to grow Tropical Milkweed, work towards replacing it with native Milkweeds over time so that it becomes an optional supplement to your main Milkweed crop. As with many concerns—e.g. freeze hardiness, nectar for local pollinators, reducing resource consumption—natives are the best long-term investment. Bastrop County Master Gardener Association plans to begin offering locally-grown, native Milkweeds beginning with our Spring 2022 plant sale.

Endnotes

[1] Maekle, Monika. "'Things look good' as 2021 monarch butterfly migration takes flight." Texas Butterfly Ranch, August 24, 2021. Accessed August 25, 2021. https://texasbutterflyranch.com/2021/08/24/things-look-good-as-2021-monarch-butterfly-migration-takes-flight/

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Creating "Texas Giant" Zinnias

Text and Photos By Howard Nemerov

Texas is a big state, but we don't have a Zinnia to call our own.

I've begun toying with the idea of another breeding project, this time to create *Zinnia elegans* 'Texas Giant'. Starting with *Zinnia elegans* 'California Giant', I've selected 16 plants from this year's crop whose flowers are a little different or even striking in color. Next year, each one gets a starting flat.

One important reason for this project lies in understanding "local genotype."

> *Plant species become adapted to their local environments by passing on those genes that favor survival in a particular place. Over time, plants of the same species from different parts of their range may develop different genetic makeups called genotypes, even if they look very similar.*[1]

Zinnia elegans is not native to Texas. If we're going to grow Zinnias—which have proven themselves well-adapted here and excellent pollinator plants—then what better than growing "Texas Giant" Zinnias that, as they adapt each generation, may become less resource-intensive and more valuable to local pollinators?

Endnote

[1] "Choosing plants." Michigan State University. Accessed August 27, 2021. https://www.canr.msu.edu/nativeplants/getting_started/choosing_plant

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