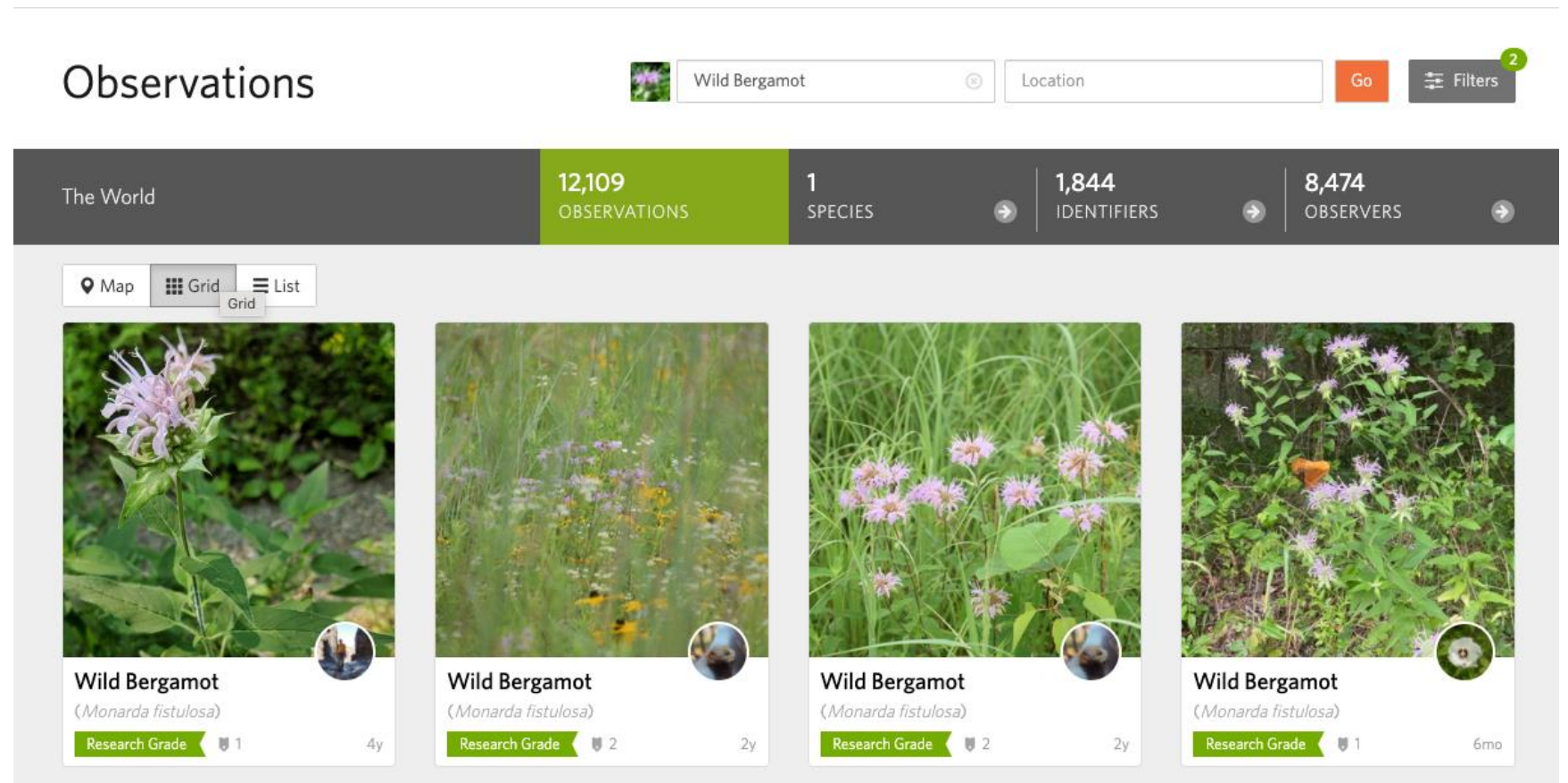


- Easy to pick up and use
- Great for species identification
- Great for one time observations
 - Casual park visitors
 - Visiting a place you won't regularly return to



Top priority species for the region



wild bergamot
(*Monarda fistulosa*)



cardinal flower
(*Lobelia cardinalis*)



common sunflower
(*Helianthus annuus*)



showy milkweed
(*Asclepias speciosa*)



tall blazing star
(*Liatris aspera*)



eastern purple coneflower
(*Echinacea purpurea*)



Buttonbush
(*Cephalanthus occidentalis*)



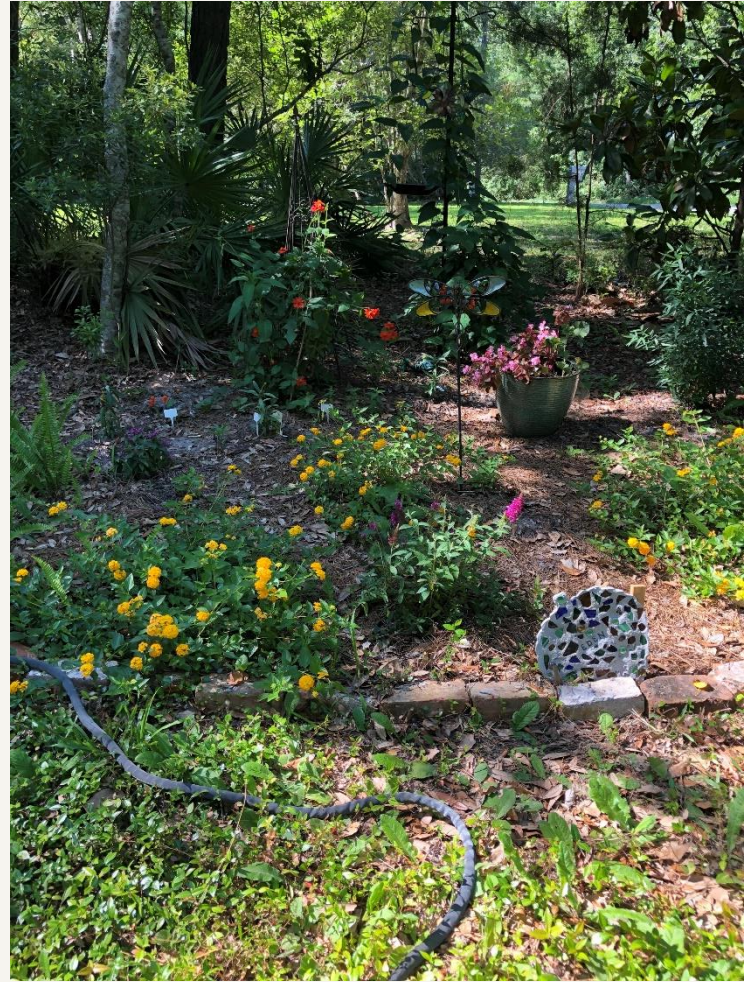
green antelopehorn
(*Asclepias viridis*)



nature's
notebook

A project of the USA-NPN

Backyard Garden



Group Site

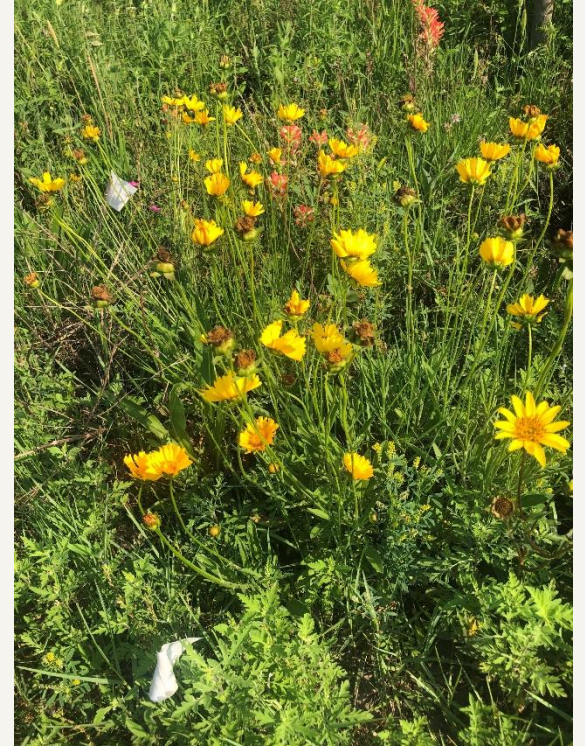
Anahuac National
Wildlife Refuge



*Observing
with
partners*



*Individual
flower or
patch of
flowers*



*Annuals that
will die back:
Sunflower
flowers to
seed*



*Animal
observations*



Nature's Notebook App



100% 11:26

Sites Plants & Animals **Observe** Review

Plants Animals Site-visit Details

Observation Date 2019-5-13

yellow palomede-1

Mark All Phenophases As No

Young leaves	Y	N	?	i
Leaves	Y	N	?	i
Colored leaves	Y	N	?	i
Falling leaves	Y	N	?	i
Flowers or flower buds	Y	N	?	i

Save Data Next Plant

Paper copies

Trees and Shrubs Drought deciduous (with pollen)

Directions: Fill in the date and time in the top rows and circle the appropriate letter in the column below (y (phenophase is occurring); n (phenophase is not occurring); ? (not certain if the phenophase is occurring). Do not circle anything if you did not check for the phenophase. In the adjacent blank, write in the a

	Date:	Date:	Date:
Do you see...	Time:	Time:	Time:
Young leaves	y n ? ____	y n ? ____	y n ? ____
Leaves	y n ? ____	y n ? ____	y n ? ____
Colored leaves	y n ? ____	y n ? ____	y n ? ____
Falling leaves	y n ? ____	y n ? ____	y n ? ____
Flowers or flower buds	y n ? ____	y n ? ____	y n ? ____
Open flowers	y n ? ____	y n ? ____	y n ? ____
Pollen release	y n ? ____	y n ? ____	y n ? ____
Fruits	y n ? ____	y n ? ____	y n ? ____
Ripe fruits	y n ? ____	y n ? ____	y n ? ____
Recent fruit or seed drop	y n ? ____	y n ? ____	y n ? ____
Check when data entered online:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments:

Training Resources

Getting started: Nature's Notebook

Certification Course Module 1

- This module will guide you through the steps required to:
- Create an account in Nature's Notebook
- Create an outdoor site used for monitoring with Nature's Notebook
- Enter Observations online or using the mobile app
- On average, it takes observers approximately 45 minutes to read through the material and answer the quiz questions. There are 10 Lessons, with 10 quizzes, and a TOTAL of 34 questions to answer. You must obtain 100% on each to successfully pass this module.
- If you do not correctly answer the quiz questions in this module on the first try, you have an unlimited number of opportunities to go back and correct your answers to satisfy the 100% requirement.
- In the future if you successfully complete the other learning modules in this Observer Certification Course, you will be recognized in our Nature's Notebook database as a "Certified Nature's Notebook Observer." In the end you will be eligible to receive a completion certificate for your effort.

Observer Certification Course -
learning.usanpn.org

Training Resources

Organization Phenology Trail Organization logo here

Common name: **Wild bergamot** Genus Species: ***Monarda fistulosa***



Photo credit: Elmer Verhasselt, Bugwood.org

Description: Wild bergamot is an aromatic herbaceous perennial 2½–4' tall. Flower heads, about 1-3" across, grace the tops of major stems. Individual flowers have an irregular tubular shape, are about 1" long, and are lavender or pink.

Habitats: Wild bergamot is found in moist to slightly dry prairies, sandy woodlands, thickets and abandoned pastures. The rhizomes can survive earth-moving operations and send up plants in unexpected places.

Phenology highlight: Flower buds in the center of the flower head (inflorescence) open first, with other buds gradually opening toward the periphery, forming a wreath of flowers.

Species facts

- Wild bergamot is pollinated by insects.
- Hawk moths, long-tongued eastern bumble bees and hummingbirds are common visitors to the flowers.
- Native Americans prepared wild bergamot in a wide variety ways to treat medical conditions including respiratory ailments, headaches and stomach pains.
- Wild bergamot has also been used to impart flavor to meat and as a minty tea.



Photo credit: Kerissa Battle communitygreenways.org



Map credit: USDA, NRCS. 2014. The PLANTS Database <http://plants.usda.gov>, 21 January 2016). National Plant Data Team, Greensboro, NC 27401-4901 USA

Why observe this species? Wild bergamot is one of the plant species observed by New York Phenology Project member organizations, and data gathered is contributed to the National Phenology Network database. The mission of this public participation in science research initiative is to educate and engage the public while collecting data that is useful for detecting broad scale patterns and changes in the natural world.

Tip for observing this species: Empty flower heads remain on the plant for some time after all fruits have dropped or been removed. Do not include these empty flower heads in 'fruits' or 'ripe fruits' phenophases.

For more information about phenology and the New York Phenology Project (NYPP), please visit the NYPP website (www.nyphenologyproject.org) and the USA-NPN website (www.usanpn.org).

Wild Bergamot (*Monarda fistulosa*)

Note: flower and fruit phenophases are nested so you may need to record more than one phenophase in each group; for example, if you record Y for "open flowers" you should also record Y for "flowers or flower buds."

Image Needed

email
photos@usanpn.org

Initial Growth New growth is visible after a period of no growth (winter or drought) with green shoots breaking through the soil. Growth is "initial" on each shoot until the first true leaf has fully unfolded.



© Kelly O'Donnell

Leaves One or more live, fully unfolded leaves are visible on the plant. For seedlings, consider only true leaves not the two small leaves (cotyledons) found almost immediately after the seedling germinates. Do not include fully dried or dead leaves.



Geoff Griffiths
SUNY ESF

Flowers or flower buds One or more fresh open or unopened flowers or flower buds are visible on the plant. Include flower buds that are still developing, but do not include wilted or dried flowers.



Geoff Griffiths
SUNY ESF

Open flowers One or more open, fresh flowers are visible. Flowers are "open" when the reproductive parts (male stamens or female pistils) are visible within open flower parts. Do not include wilted or dried flowers.

Image Needed

email
photos@usanpn.org

Fruits One or more fruits are visible on the plant. For wild bergamot, the fruit is a nutlet that is found tightly clustered with many other nutlets. These change from green to brown or black.

Image Needed

email
photos@usanpn.org

Ripe fruits One or more ripe fruits are visible on the plant. For wild bergamot, a fruit (nutlet) is considered ripe when it has turned brown or black.

Image Needed

email
photos@usanpn.org

Recent fruit or seed drop One or more mature fruits have dropped or been removed from the plant since your last visit. Do not include empty flower heads that had long ago dropped all their fruits but remain on the plant.



Elmer Verhasselt
Bugwood.org

Pollination adaptation Each irregularly-shaped flower is divided into a tubular upper lip with projecting stamens which hold the pollen, and three slender lower lips that function as landing pads for visiting insects, which carry pollen to other bergamot flowers.

All phenophases included here

Selecting a site

1 Join Nature's Notebook > 2 Set up your account > 3 Start observing!

On this page you'll specify your site and select a species, plants and/or animals.
If you intended to join a shared site, return to [edit your profile](#) and join a partner group. Or learn how to [set up a shared site](#).

▼ Choose Your Site

Choose your site, the place where you want to observe. A site should be convenient and easily accessible, such as your backyard, or a favorite trail or park. After you set up your account, you may change your site or add more sites at any time.


Create site

* Site Name: (e.g., home, office, my front yard, etc. Note that your site name will be publicly visible on the USA-NPN Phenology Visualization Tool and in data downloaded.)

Address:

City: State: --Please select one-- Zip Code:

Map Satellite



United States

Google Mexico Gulf of Mexico

CREATE SITE

▲ Select a Plant

To select plant species you want to observe, type the common or scientific plant name in the "Plant Species" field and click the one you want.

▼ Select an Animal

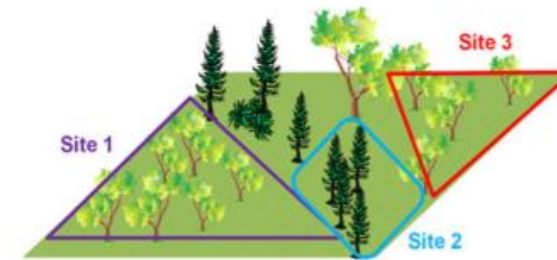
In the left box, select an animal(s) species that you will look for at your site. Click "Add to Checklist" to move them into the right box checklist. Save your checklist.

Please create a site before continuing to step B.

PROCEED TO STEP 3

Select a site that is:

- Convenient
- Representative
- Uniform Habitat
- Appropriate Size



Selecting plants

Example list of individual plants at a site:

Penstemon 1

Penstemon 2

Poppy Patch 1



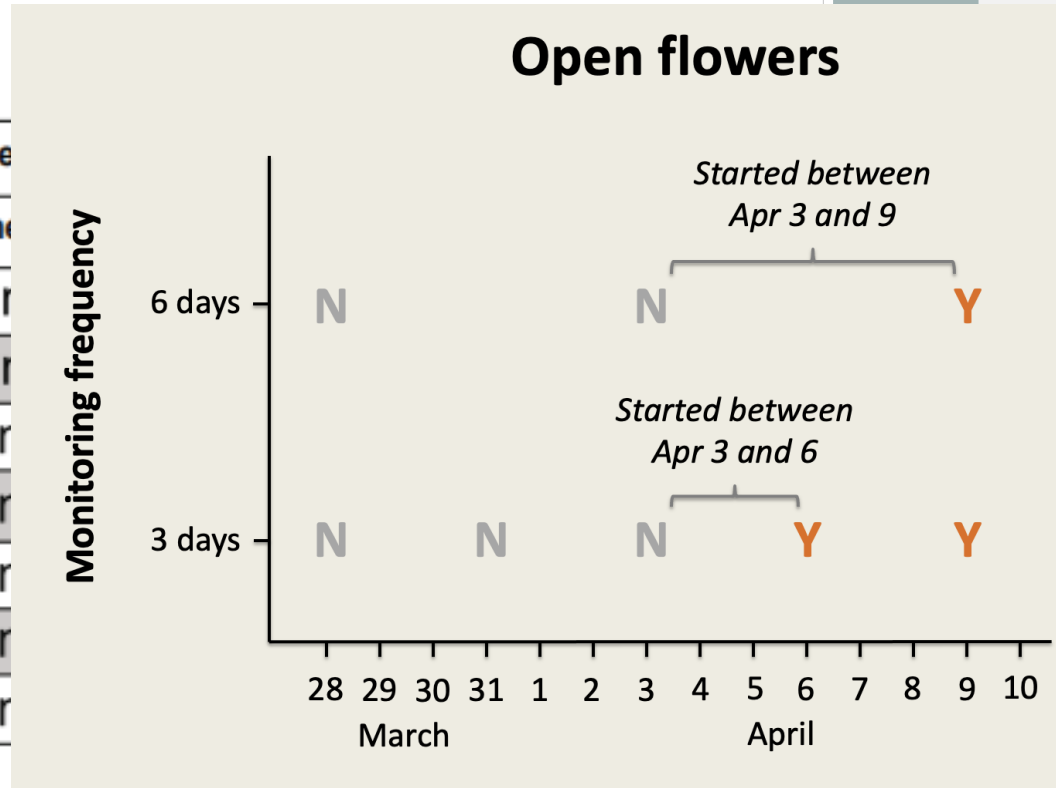
Monitoring frequency

Species	Common name	General Flowering Time
<i>Helianthus annuus</i>	common sunflower	January - December
<i>Asclepias viridis</i>	green antelopehorn	March - October
<i>Monarda fistulosa</i>	wild bergamot	April - August
<i>Echinacea purpurea</i>	eastern purple coneflower	April - July & August - November
<i>Cephalanthus occidentalis</i>	buttonbush	May - September
<i>Asclepias speciosa</i>	showy milkweed	May - August
<i>Liatris aspera</i>	tall blazing star	July - November
<i>Lobelia cardinalis</i>	cardinal flower	July - November

Monitoring frequency

2-3 times a week, particularly at start of open flowers and peak flowering

Forbs		Date	Time
Do you see...			
Initial growth	y r		
Leaves	y r		
Flowers or flower buds	y r		
Open flowers	y r		
Fruits	y r		
Ripe fruits	y r		
Recent fruit or seed drop	y r		
Check when data entered online:			
Comments:			



FLOWERS

Flowers or flower buds
One or more fresh open or unopened flowers or flower buds are visible on the plant. Include flower buds or inflorescences that are swelling or expanding, but do not include those that are tightly closed and not actively growing (dormant). Also do not include wilted or dried flowers.

More...

How many flowers and flower buds are present? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), simply estimate the number of flower heads, spikes or catkins and not the number of individual flowers.

- Less than 3
- 3 to 10
- 11 to 100
- 101 to 1,000
- More than 1,000

Open flowers
Open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower petals, floral tubes or sepals). Do not include wilted or dried flowers.

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all flowers that are open.

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

Fruits
Ripe fruits are visible on the plant. For *Monarda fistulosa*, the fruit is a nutlet, tightly clustered other nutlets, that changes from green to brown or black.

What percentage of all fruits (unripe plus ripe) on the plant are ripe?

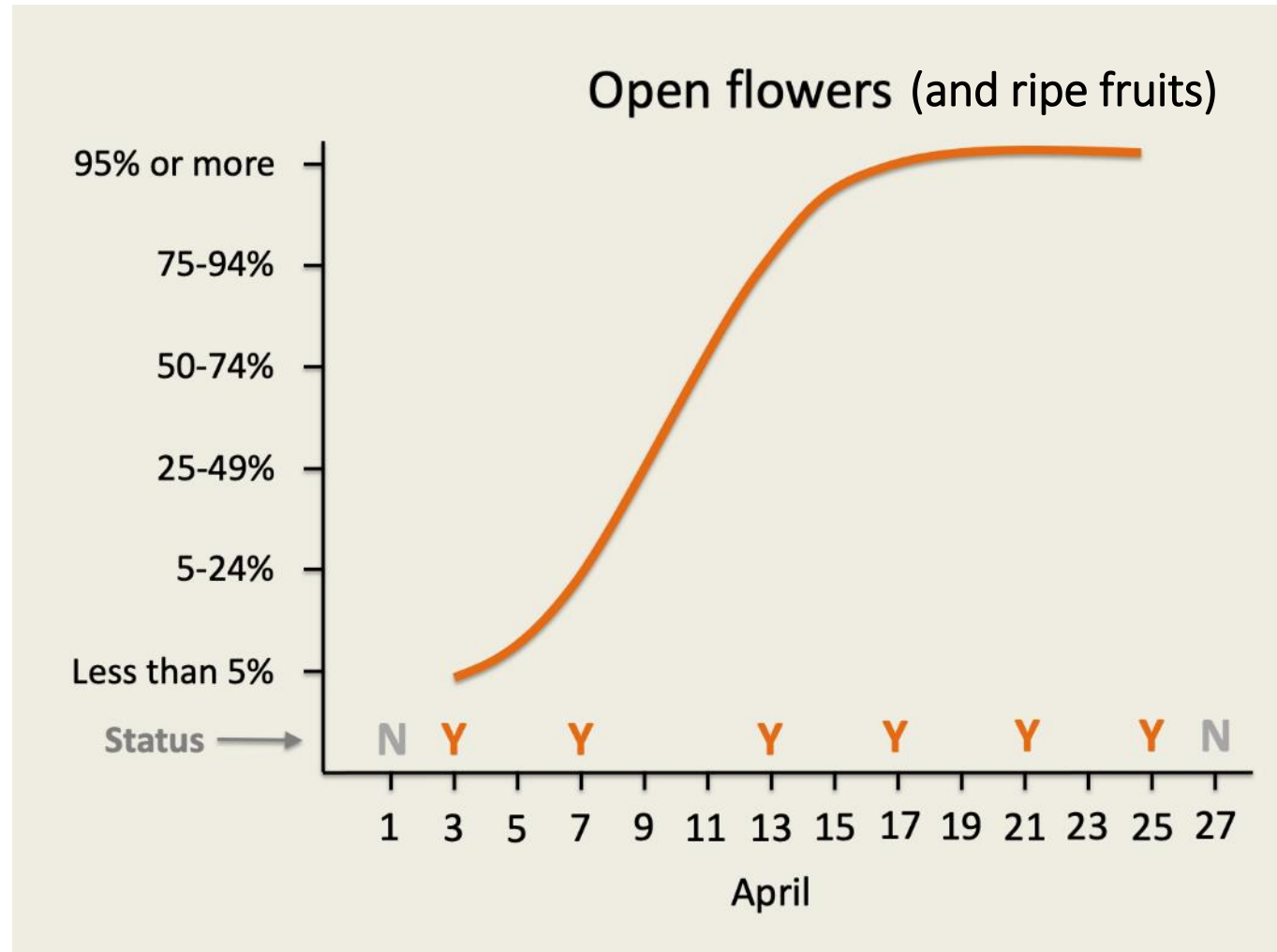
- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

More...

What percentage of all fruits (unripe plus ripe) on the plant are ripe?

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

Goal: Record peak in open flowers/ripe fruits



Do you see flowers or flower buds?

Photo: Cure Nursery



Flowers or flower buds

One or more fresh open or unopened flowers or flower buds are visible on the plant. Include flower buds or inflorescences that are swelling or expanding, but do not include those that are tightly closed and not actively growing (dormant). Also do not include wilted or dried flowers.

[More...](#)

How many flowers and flower buds are present? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), simply estimate the number of flower heads, spikes or catkins and not the number of individual flowers.

- Less than 3
- 3 to 10
- 11 to 100
- 101 to 1,000
- More than 1,000

Do you see open flowers?

Photo: High Country Gardens

Open flowers

One or more open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals). Do not include wilted or dried flowers.

[More...](#)

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open.

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more



Do you see flowers or flower buds?

Flowers or flower buds

One or more fresh open or unopened flowers or flower buds are visible on the plant. Include flower buds or inflorescences that are swelling or expanding, but do not include those that are tightly closed and not actively growing (dormant). Also do not include wilted or dried flowers.

[More...](#)

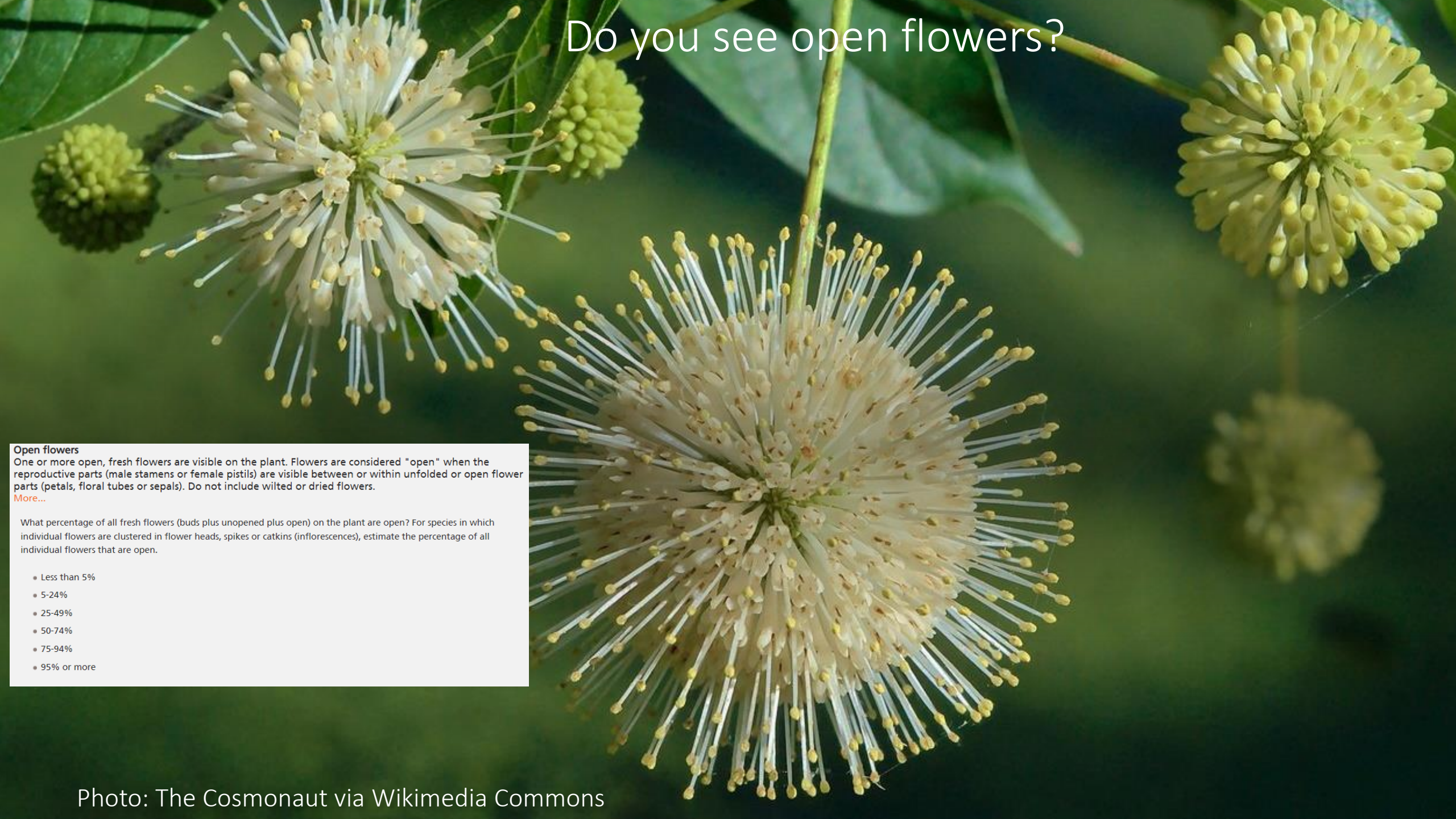
How many flowers and flower buds are present? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), simply estimate the number of flower heads, spikes or catkins and not the number of individual flowers.

- Less than 3
- 3 to 10
- 11 to 100
- 101 to 1,000
- More than 1,000



Photo: Clemson Cooperative Extension; Courtesy of Plants Nouveau, LLCv

Do you see open flowers?



Open flowers

One or more open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals). Do not include wilted or dried flowers.

[More...](#)

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open.

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

Fruits

One or more fruits are visible on the plant. For *Asclepias speciosa*, the fruit is large and pod-like and changes from green to tan or brown and splits open to expose seeds with fluff. Do not include empty fruits that have already dropped all of their seeds.

[More...](#)

How many fruits are present?

- Less than 3
- 3 to 10
- 11 to 100
- 101 to 1,000
- More than 1,000

Ripe fruits

One or more ripe fruits are visible on the plant. For *Asclepias speciosa*, a fruit is considered ripe when it has turned tan or brown and has split open to expose seeds with fluff. Do not include empty fruits that have already dropped all of their seeds.

[More...](#)

What percentage of all fruits (unripe plus ripe) on the plant are ripe?

- Less than 5%
- 5-24%
- 25-49%
- 50-74%
- 75-94%
- 95% or more

Do you see fruits?

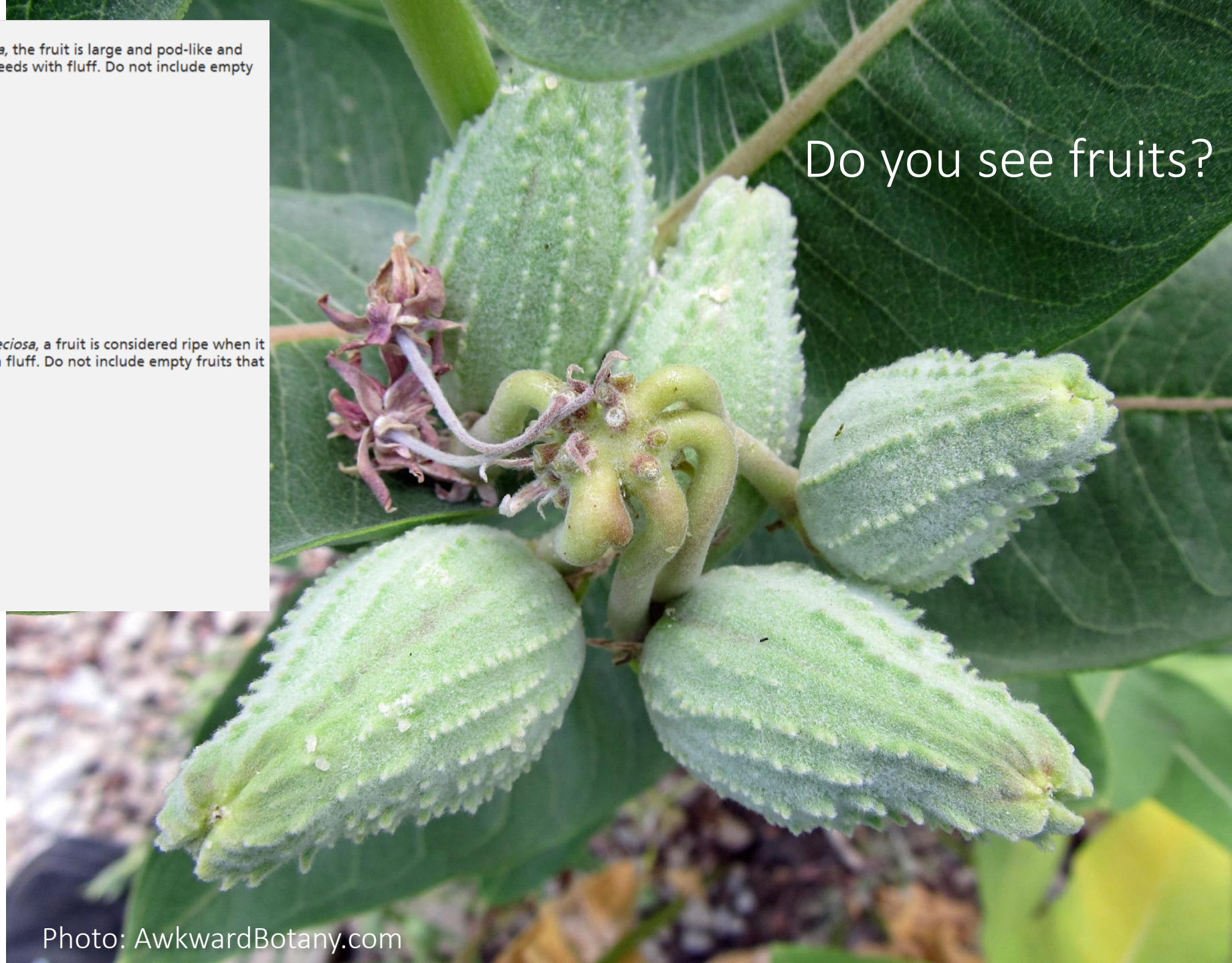


Photo: AwkwardBotany.com

Some species may be difficult to count fruits

Remember, all questions are optional -- skip if needed!

Fruits

One or more fruits are visible on the plant. For *Monarda fistulosa*, the fruit is a nutlet, tightly clustered with many other nutlets, that changes from green to brown or black.

[More...](#)

How many fruits are present?

- Less than 3
- 3 to 10
- 11 to 100
- 101 to 1,000
- More than 1,000

Ripe fruits

One or more ripe fruits are visible on the plant. For *Monarda fistulosa*, a fruit is considered ripe when it has turned brown or black.

[More...](#)

What percentage of all fruits (unripe plus ripe) on the plant are ripe?

- Less than 5%
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- 50-74%
- 75-94%
- 95% or more



Photos: growitbuildit.com

Join the Nectar Connectors Campaign



www.usanpn.org/nn/NectarConnectors

- Milkweeds (*Asclepias* spp.)
- Blazing stars (*Liatris* spp.)
- Asters (*Symphyotrichum* spp.)
- Goldenrods (*Solidago* spp.)
- Joe Pye Weed (*Eutrochium fistulosum*)
- Lanceleaf coreopsis (*Coreopsis lanceolata*)
- Lupines (*Lupinus* spp.)
- Bee balm/bergamot (*Monarda* spp.)
- Black-eyed Susan (*Rudbeckia hirta*)
- Coneflowers (*Echinacea* spp.)
- Sunflowers (*Helianthus* spp.)
- Prairie clovers (*Dalea* spp.)
- Thistles (*Cirsium* spp.)
- Cardinal flower (*Lobelia cardinalis*)
- Golden Alexanders (*Zizia aurea*)
- Baccharis (*Baccharis halimifolia*)

...and more coming this year!

Sign up for campaign messages

Nectar Connectors campaign

Greetings!
This year's Nectar Connectors campaign has come to a close. We hope that you have enjoyed getting to know the changes on your nectar plants throughout the season this year!

Your observations of where and when flowers are available for monarchs and other pollinators will help to shine a light on any potential mismatches that are occurring between pollinators and the plants on which they depend.

Some good news recently for monarchs - after an all-time low of less than 2,000 butterflies last year at the California overwintering sites of Western monarch butterflies, there is some hope from early counts this year. Thousands are already showing up at some sites, according to a blog post from [Western Monarch Count](#).

We hope that you will join us again next year for the Nectar Connectors campaign! Your reports on the same plants over multiple years are really valuable to help us understand how nectar plants are responding to changes in climate.

What you are reporting on nectar plants

This year, 309 observers reported on Nectar Connectors species, up from 255 last year. These observers submitted data at 199 sites. The most observed species across the country were common milkweed (*Asclepias syriaca*), butterfly milkweed (*Asclepias tuberosa*), eastern purple coneflower (*Echinacea purpurea*), wild bergamot (*Monarda fistulosa*), and eastern baccharis (*Baccharis halimifolia*).

We have 45 Local Phenology Programs tracking Nectar Connectors species this year. The 10 LPPs submitting the most records this year are below. We also had 125 individual observers. Thanks to you all for your efforts - every record that you submit is valuable!

Local Phenology Program	# Records
Vassar College	2574
Mohonk Preserve	2326
Earthwise Aware	1918
Southeastern Virginia Phenology Network	1763
Reid Park Zoo Pollinator Garden	1590
Minnesota Valley National Wildlife Refuge	1188
Ben Franklin School	1146
Mississippi Sandhill Crane NWR	1109
Neal Smith National Wildlife Refuge	1085
Bayou Sauvage NWR	997

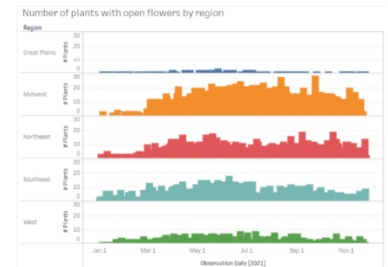
The map below indicates the sites where you reported on Nectar Connectors species this year. The colors of the dots indicate when the average first date of open flowers was reported at that site, with earlier dates in yellow and later dates in green. The shape of the dots represents the different genera of nectar plants.

Generally, your reports of first flowers in the Southeast this year were early or late in the year, corresponding with the time when monarchs are migrating through the region. In the Midwest and Northeast, you reported onset of flowering throughout the spring, summer, and fall. In the West, your reports were generally early in the year, particularly in the Southwest.

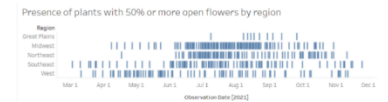


To get a better idea of how many flowers were available at different times of the year, we can look at the number of individual plants with open flowers by region.

- In the Great Plains, a higher number of plants with flowers occurred in the summer.
- In the Midwest and Northeast, flowers were available for much of the year but the highest number of plants with flowers occurred in the summer and fall.
- In the Southeast, flowers were available throughout the year.
- In the West, flowers were available most of the year with slightly higher numbers in the spring and summer.



In addition to reporting whether or not flowers on your plants are open, we also ask you what percent of flowers are open. The graph below shows when you reported 50% or more open flowers. The pattern is consistent with those above - more flowers are available in the summer months, especially in northern regions. Southern regions and the West have flowers more consistently available in the spring and fall.



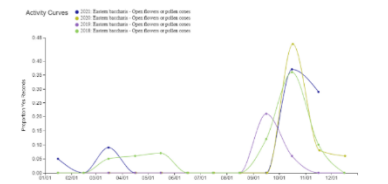
You can explore these results on our interactive [Nectar Connectors Campaign Results Dashboard](#).

What does this mean for monarchs? In the Eastern United States, monarchs migrate north from Mexico in the spring, and subsequent generations eventually reach the northern United States and Canada in the summer. Monarchs then make their migration back south in the late summer and fall. The Western population follows a distinct migration pattern and generally winters in coastal California.

As we found in previous years, your reports indicate that generally flowers were available for monarchs at locations along their migration route at the time monarchs would need them in a typical year.

As we see more unusual seasonal climate such as early springs and late autumns, your data will help us to better understand the subtle changes in the timing of flowering from year to year. This will help us to know how nectar sources are shifting, and whether sufficient flowers are available where and when monarchs and other pollinators need them the most.

For example, let's look at the timing of open flowers in eastern baccharis (*Baccharis halimifolia*) reported by observers along the Gulf Coast over the past four years. This species is an important fall blooming plant for monarchs as they make their way south to their wintering grounds. The observations vary by several weeks, though most years had a peak in mid-late October. Your observations of flowering reported at the same locations over multiple years are incredibly valuable to help us see changes from year to year.



Did you earn your Nectar Connectors badge this year? See it on your [Observation Deck](#).

We hope that you will join us again next year to continue to report on flowering of your nectar plants.

Thank you for your contributions to this important project!

Contact: Erin Probst, erin@usanpn.org, 520-621-1670 bio

USA npn National Phenology Network

Share with a friend

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What's Next?

Host a virtual or in-person training

Observe the same plants, together at a shared location OR different plants at locations of your choice (parks or backyards), with Nature's Notebook and/or iNaturalist

Promote the project in your networks - help us get the word out



State Leads



Kim Eichhorst
Bosque Ecosystem
Monitoring Program

New Mexico



April Taylor
South Central
Climate Adaptation Science
Center

Oklahoma



Jane Breckinridge
Tribal Alliance for
Pollinators



Gail Bishop

Gulf Coast Phenology Trail

Louisiana



Sue Wilder

What's Next?

In the next week – we will send you handouts and other training materials

March – check-in meeting to see how data collection is going

Summer – we'll take a look at the data collected so far, share back preliminary results!



Funding
provided by:



SOUTH CENTRAL
CLIMATE ADAPTATION SCIENCE CENTER