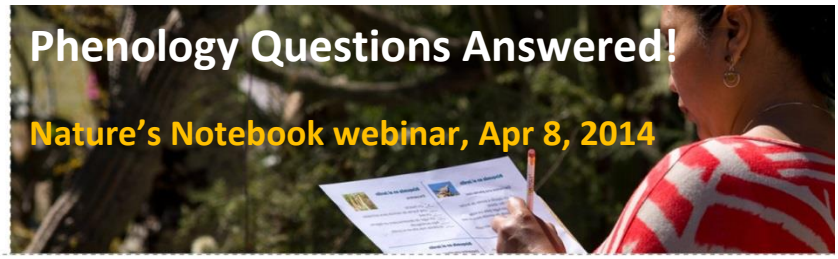


Nature's Notebook Webinar: Botany 101: Plant Parts and Tricky Phenophases
April 8, 2014
Webinar Q&As

Q: How do I get set up and started with _Nature's Notebook_?
First you will need to create a _Nature's Notebook_ account: https://www.usanpn.org/nn/become-observer. Then you will set up a site, add plants and/or animals to it, and start observing! Learn more on our Learn How to Observe page: https://www.usanpn.org/nn/guidelines.

Q: Why did USA-NPN choose these particular phenophases to observe?
We worked with many interested research communities, including modelers who want to know about carbon flux or predict allergies, to climatologists and ecologists. We have selected phenophases that will help answer a broad range of questions in these fields, as well as ones that are relatively easy-to-observe and distinct. For example, knowing about leaf canopy development helps calibrate remotely sensed images of green up and thereby predict how much carbon will be taken up by trees during a longer growing season. Knowing when a tree fruited can tell us how much food was available for migrating birds.

Q: How do you treat newly planted trees and plants? They might show colors due to un-natural stress?
When you register a plant at a site, you will have the opportunity to report whether the individual was planted, whether it gets water, fertilizer, and how much it is shaded. This metadata is stored with each individual plant. You should still report yes to colored leaves, regardless of the cause.

Q: Is it preferred to observe native species?
Our _Nature's Notebook_ list is comprised of a mix of native species, invasive species, and ornamentals. In general, we try to choose species with wide geographic ranges, usefulness as indicators, or with economic value, but we have also added other species that are requested by certain partners. We'd like observers to focus on our campaign species in particular: lilacs, dogwoods, maples, oaks and poplars!

Q: Is there a period of time beyond which you cannot go back and change an entry?
You can go back and change your data that you entered up to 4 years ago.

Q: What about cultivars that might have different characteristics than the species?
We do not have a special field in which you can fill in the cultivar, but if you know the cultivar you are monitoring, you can mention that in the comments field for the individual plant when you register it.

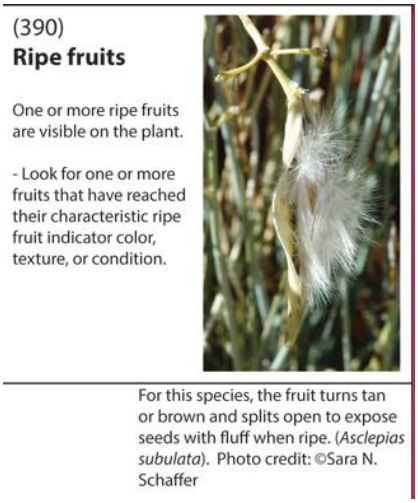
Q: Are there European or Mediterranean species included?
Some of the species that we have on our list are invasives or ornamentals that might be found in Europe. You can also check out European phenology efforts, especially in Austria, Turkey, Sweden and the UK (contact Ellen Denny ellen@usanpn.org for more info).

Q: Lots of people get confused by the 'flowers or flower bud' phenophase. They report 'yes' even if they see a closed flower bud.
Actually, you should report “yes” to flowers or flower buds, even if you only see closed buds. You will only report “yes” to open flowers when the buds open to expose the reproductive parts. An exception is for those northern deciduous trees and shrubs where overwintering flower buds are tightly enclosed in bud scales that look identical or very similar to leaf buds. Do not report the presence of “Flowers or flower buds” for these species until those buds start to swell in the spring, and the overlapping scales start to slide apart, often showing a bright green color underneath.

Q: How do you accurately report 'since your last visit' when multiple people are observing the same site concurrently?
If you are unable to talk with the other observers of a particular plant, go ahead and report when YOU see recent fruit drop since YOUR last visit.

Q: Can you review the fruit phases for milkweed?
Here is the definition for ripe fruits of common milkweed: One or more ripe fruits are visible on the plant. For *Asclepias syriaca*, 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. For the pictures below (from left to right) you would report (1) fruits, (2) fruits AND ripe fruits, (3) recent fruit or seed drop (assuming new seeds blew away since your last visit).

Fruits continue to develop (*Asclepias subulata*). Photo credit: ©Sara N. Schaffer



For this species, the fruit turns tan or brown and splits open to expose seeds with fluff when ripe. (*Asclepias subulata*). Photo credit: ©Sara N. Schaffer

In this photo fruits have recently dropped their all of their seeds (*Asclepias subulata*). Photo credit: ©Sara N. Schaffer

Q: For *Cornus sericea*, the breaking leaf bud phase is difficult to assess, since it doesn't really have protective scales over the new leaves. How do we know when these are breaking?
Plant species having naked, uncovered buds do not re-initiate their seasonal growth with the opening of protective bud scales. There is no “breaking leaf bud” phenophases, per se, but, generally, tiny new leaves do begin to separate from their tight cluster at the growing point/meristems on a stem. The new leaves can start out partially formed or be rather shapeless and begin to take shape and expand. In many species, there usually is a definitive start to their re-initialed growth and expansion that could be equated to “breaking leaf buds”, for instance, once the bright green leaf surface begins to become visible.

Q: What if you are using a phenocamera as an observer, and you can’t see all the details?
If you are unsure what you are seeing on your photos, just report on those phenophases that you

can definitely see, and either use a "?" or don't report anything on the other phenophases.

Q: How are the comments used by NPN? Are they somehow factored into the data?
The comments that you enter for an individual plant on the Add or Edit Plants form, or for a particular observation of your plant or animal on the Enter Observations form, are tied to that plant or observation and are available for download along with your data. It's true that comments are less likely to be used in data analysis than the structured data (eg, intensity or snow cover fields) itself, but data-end users do rely on them to follow up on atypical results.

Q: I'm observing *Baccharis pilularis* -- coyote brush. They are prone to insect galls. Can I remove the galls or just leave the plant alone?
We recommend leaving the plant alone. Insect galls usually do not hurt a plant and are part of a natural interaction between insect and plant.

Q: I'm wondering how often I should check my sugar maple in the spring to make sure I catch everything…daily, every few days, weekly? For a sugar maple, how quickly do changes typically occur in the spring?
We recommend you check weekly in the early spring, and then every 2 or 3 days once the buds start to swell. The time it takes for things to develop is very dependent on the temperature. If the spring weather is consistently warm, buds will swell and then break relatively quickly. But if a few warm days are interspersed with cold days, it will take longer for the buds to break once they have started to swell. Once the buds break, it will probably take about a month for the leaves to reach their full size.

Q: The colored leaves phase specifies "late-season" colors. But it sounds like we are supposed to mark yes to color changes not necessarily linked to late season changes.
You should report "yes" to colored leaves when you see the tree leaves changing to the color *typical* of "late-season." The cause of this color change might be drought or insect damage instead of normal late-season leaf senescence, but it's still important to know that the color changed because it signals stress to the plant.

Q: The dogwoods we monitor are very tall. It is almost impossible to see the flowers inside the bracts except those on a few low hanging branches. Should we extrapolate from the few visible flowers to those on high branches or use question marks?
Yes, you can extrapolate from what you are able to see. However, be aware that sometimes the flowers on lower branches open before or after those on high branches. Once you get to know your individual plants over the course of a season, you can tell more easily if the flowers at the top and the bottom of the plant seem to be developing at the same rate, or if one set develops and withers sooner than the other.

Q: For trees that hold on to their leaves all winter (dry and brown), when do you report fallen leaves? (examples: hornbeams and red oaks)
Usually many of the leaves on hornbeams and red oaks do fall off, just not all of them. You can report "Falling leaves" when you notice that some leaves are gone from the tree since your last visit.

Q: How often should we be making observations?
We recommend making observations once a week in general. However, it helps if you can increase your frequency to once every 2 or 3 days when in the active transition seasons, when things change quickly. This would be in the spring and fall in cooler temperate zones, and after precipitation events in deserts and other dry areas. You can also cease observations in seasons when it is highly unlikely the plants will

be changing, for instance during cold winters in the north.

Q: If I was going to buy two field guides to help me with this, which two would you suggest?
The answer to this question really depends upon where, in the United States, you are and personal preference. Many excellent guides are regional, and often you can find publications from your local Cooperative Extension Office that deal with species that frequently occur in your area.

I prefer the Sibley guides to Birds, but the National Geographic guide is a close second. If you are interested in wildflowers, Newcomb's Wildflower Guide is a good choice. If you know how to use a dichotomous key, I really enjoy the Winter Tree Finder and Tree Finder by Watts, but those are only for eastern tree species. There is a whole series of those "Finders" visible at the bottom of that Amazon link. The Peterson Guides to all the other species (insects, trees, reptiles, etc.) are also quite good.

We should also note that there is not, as far as I am aware, any field guide that uses phenology as a specific lens. Some of the Peterson guides and Audubon guides have photographs of species in different life cycle stages, but nothing has been written specifically with phenology in mind, if that is what you were asking.

Q: Is moss growth on bark considered a phenophase?
That's a great observation of what's happening on a tree, though not strictly speaking a phenophase for the tree. And, we don't currently have any species of moss on our *Nature's Notebook* list. However, you are welcome to report those observations in the comments field for that individual.

Q: Are you collecting local weather data in association with our phenophase reports so that you know, for example, that there was a freeze that might have caused blossoms to drop early?
At this time, we do not store weather data or ask our observers to record it for *Nature's Notebook*. Data are being analyzed together with weather data collected by other organizations.

Q: I hope you are going to have a webinar on the question "What percentage of full sizes are most leaves?" This almost drove us mad last year.
This phenophase is intended for deciduous species that normally have a single large flush of leaves at the beginning of the growing season, as usually happens in spring in the cooler temperate regions of the US. After a week or two, you might see that most of leaves from this big flush are just under half of the full size they will achieve by summer, and so report that most leaves are 25-49% of full leaf size. However, in some parts of the US, leaf flushes occur in different pulses and it is never apparent that "a majority" of leaves are growing at the same rate. If this is the case at your site, just ignore this phenophase!

For help on how to determine what percentage of the canopy is full with leaves or needles, please refer to this FAQ on our webpage: https://www.usanpn.org/nn/faq#canopy_full. We are in the process of developing a phenophase primer that will illustrate this (and other) phenophase with photos.

Q: Have you tips for figuring out how to answer the questions on quantity?
In general, for the exponential bins (3-10, 11-100 etc), you can count ten flowers (or fruits), and then visually estimate how many areas of that size there are on the plant covered in flowers. Don't worry about being exact – we just want a rough estimate of how many flowers. For the percentage bins, you'll need to be able to picture what 100% would look like, so you might need to have one year observing an

individual plant. You can then visualize the plant in four quadrants and consider how many quadrants would be completely full with the phenophase.

Q: Does an oak tree (e.g., blue oak, valley oak, coast live oak) tend to have a total of >10,000 leaves?
It depends on the individual plant, but a large oak certainly could have more than 10,000 buds or leaves.

Q: For flowers in inflorescence: do we count every flower within a given inflorescence? Are there typically the same number of flowers within each inflorescence?
For the "Flowers or flower buds" phenophase, when you are reporting how many are present, count each inflorescence as "1", NOT each individual flower as "1". For the "Open flowers" phenophase, we ask you to estimate the percentage of INDIVIDUAL flowers that are open. There generally are a similar number of individual flowers in each inflorescence (although this can depend on the species). Therefore to estimate the percentage of individual flowers that are open, you can simply choose a representative inflorescence, and divide the number of open flowers on it by the total number of flower or flower buds on it. If you do this for a few different inflorescences (for instance, one at the top, middle and bottom of your tree) you can use the average of those percentages to report a value for your whole plant.

Q: Also for flowers in inflorescence: the phenophases definition says estimate the % of all individual flowers that are open…Is that the tiny flowers in the middle or the opening of the bracts?
As outlined in the previous answer, this refers to the tiny flowers in the middle of a dogwood inflorescence and not the opening of the showy white bracts.

Check out our list of future webinars to see what's next!
www.usanpn.org/nn/connect/Webinars2014

Helpful links:
Become an Observer: https://www.usanpn.org/nn/become-observer
Learn How to Observe: https://www.usanpn.org/nn/guidelines
Join a Nature's Notebook Campaign: https://www.usanpn.org/nn/campaigns
Frequently Asked Question page: https://www.usanpn.org/nn/faq
For help with plant phenophases questions: email observe@usanpn.org

USA npn National Phenology Network