The New USDA Plant Hardiness Zone Map: A Look Behind the Scenes at How It Was Developed and What It and Can (and Cannot) Tell You

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What is the Purpose and Meaning of the Plant Hardiness Zone Map?

- Provides a guide for the selection of perennial (overwintering) plants
- Question addressed: How well will plants tolerate the average coldest temperatures during winter?
- Plant Hardiness Statistic: Mean annual extreme minimum temperature
    - Coldest temperature of the year averaged over a period of years

  "What's the coldest it typically gets during the winter?"
- Maps are divided into 10ºF zones and 5ºF half zones

What's the History Behind the Plant Hardiness Zone Map?

- First version developed in 1927; USDA got into the act in 1928
- Various competing versions in 1938, 1948, 1960, 1967 – USDA won the battle
- 1990 – first map to include all 50 states
- 2012 – first fully digital map and use of 30-year averaging period
- 2023 – first map to adhere to a decadal "normal" 30-year averaging period (1991-2020)

Who developed the 2012 and 2023 digital maps?

- PRISM Group/Oregon State University and USDA Agricultural Research Service
- Lead author: Chris Daly
- Uses PRISM computerized weather/climate mapping technology
- Maps subject to expert peer review process

How Has the Plant Hardiness Statistic Changed Over Time?

- About ½ the country moved into a warmer half zone between the 2012 and 2023 maps
- The PH statistic warmed ~2.5ºF when averaged across the country but is highly volatile from year to year
- Most PH variation is controlled by the intensity, direction, and timing of arctic outbreak patterns
- PH trends vary regionally, apparently dependent on exposure to these outbreaks and other local factors
- Long-term warming temperatures due to climate change underlie these variations

What the Plant Hardiness Zone Map Cannot Tell You

- When to plant in spring (it's all about winter)
- How cold it has been or will be (it's an historical average)
- The duration or frequencies of cold events (it's just one number)
- When the coldest temperature occurred (it's just the coldest)
- How hot the growing season is (again, it's all about winter)

Other Things to Know

- The PHZM reflects what already happened in your garden – you know best
    - It does not "tell" you what you can or cannot grow – it's a risk management guide
    - Your garden has microclimates the PHZM doesn't know about
    - Structures, shade/sun, hills/depressions, wind exposure, humidity
    - No explicit accounting for land use/urban effects
- Gardens near water bodies may be milder
    - Oceans and Great Lakes are accounted for, however
- Plant tag ratings may not be completely accurate, especially for new varieties!

Useful links

Official USDA Plant Hardiness Website:

https://planthardiness.ars.usda.gov/

PRISM Plant hardiness Zip code zone listing and GIS files:

https://prism.oregonstate.edu/phzm/

PRISM Data Explorer – get time series of past weather data for individual locations:

https://prism.oregonstate.edu/explorer/

Participate in collecting data!

http://prism.oregonstate.edu/participate

Questions?

Email to prism-questions@nacse.org