NATIONAL INITIATIVE FOR CONSUMER HORTICULTURE

How Garden Comm International Members Can Use This Resource

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This information was compiled by members of the National Initiative for Consumer Horticulture and SERA-50. Links and resources are posted at: https://consumerhort.org/editorial-resources-for-consumer-horticulture/

How This Resource was Developed

The descriptions that follow are lay summaries of published research articles developed by Dr. Natalie Bumgarner specifically for educational use. The summaries were written to provide an overview of the published work and how it relates to consumer horticulture, gardeners and garden educators and writers. These summaries do not attempt to speak for the authors but rather show how their work can be used. The full published article can be accessed at the links provided and should.

Horticultural Applications of a Newly Revised USDA Plant Hardiness Zone Map

Lay summary of Widrlechner, et al., 2012

Open access article link:
https://journals.ashs.org/horttech/view/journals/horttech/22/1/article-p6.xml

Winter injury due to extreme low temperature is a crucial factor in selecting both woody and herbaceous ornamental plants. And, winter low temperatures are an element that is one of the most difficult to manage, so prediction becomes quite useful. Here in the United States, there is nearly a one-hundred-year history of cold hardiness maps that began in 1927 with more efforts in 1928 and 1936. The USDA ARS got involved in new maps in the early 1960s and a more comprehensive map released in 1990 follow by improved versions in 2012 and now 2023.

Table 2.
Comparison of plant hardiness zones mapped for the 11 largest Metropolitan Statistical Areas [MSAs (U.S. Census Bureau, 2003)] in the 1960, 1990, and recently revised Plant Hardiness Zone Maps.

MSA	1960 map	1990 map	Revised map
New York–Northern New Jersey–Long Island, NY–NJ–PA	6–7	6b–7a	7a–7b
Los Angeles–Long Beach–Santa Ana, CA	9–10	9b–10b	10a–11a
Chicago–Naperville–Joliet, IL–IN–WI	5–6	5a–5b	5b–6a
Philadelphia–Camden–Wilmington, PA–NJ–DE	7	6b–7a	7a–7b
Dallas–Fort Worth–Arlington, TX	7–8	7b–8a	8a
Miami–Fort Lauderdale–Miami Beach, FL	10	10a–10b	10b
Washington–Arlington–Alexandria, DC–VA–MD	7	6b–7a	7a–7b
Houston–Baytown–Sugar Land, TX	9	8b–9a	9a
Detroit–Warren–Livonia, MI	5–6	5b–6b	5b–6b
Boston–Cambridge–Quincy, MA–NH	6	6a	6a–6b
Atlanta–Sandy Springs–Marietta, GA	8	7a–7b	7b–8a

View Table

This table is directly from Widrlechner et al., 2012 and should only be used in its current format if permission was obtained from ASHS.

Metropolitan Area	2023 Map Zone
New York- Northern New Jersey- Long Island	7a-7b
Los Angeles- Long Beach- Santa Ana	10a-11a
Chicago- Napierville- Joliet	6a-6b
Philadelphia-Camden-Wilmington	7a-8a
Dallas-Fort Worth- Arlington	8b
Miami-Fort Lauderdale-Miami Beach	10b-11a
Washington-Arlington-Alexandria	7b-8a
Houston-Baytown-Sugar Land	9b
Detroit-Warren-Livonia	6a-6b
Boston-Cambridge-Quincy	6b-7a
Atlanta-Sandy Springs - Marietta	8a-8b

This updated table was developed from the 2023 map data by Bumgarner

Because of the importance of being able to accurately predict the coldest likely temperature in winter, this topic and the physiology behind it is commonly researched. We certainly value these efforts but also don't want to overlook that mid-winter low temperature events are only one of three common types of cold injury (as presented in Widrlechner, et al., 2012). Damage to plants by temperature drops during the fall season are a second important type of injury because hardening or acclimatization may not be complete, so injury can occur at temperatures that would not be as damaging in the mid-winter. A third type of injury important to horticulturists and gardeners alike is low temperature events in early spring or late winter after plants have received needed cool temperatures to fulfill dormancy requirements and have started to initiate spring growth. Because of the difficulty in replicating conditions in spring and fall low temperature events, research on the underlying physiology and practical aspects of these temperature events is more challenging. Thus, much of the emphasis in research but also general gardening is on winter low temperature data described in the Plant Hardiness Zone Map.

Horticultural Characterization of Wild *Hydrangea quercifolia* Seedlings Collected Throughout the Species Native Range

Lay summary of Sherwood, et al., 2021

Open access article link: https://journals.ashs.org/hortsci/view/journals/hortsci/56/9/article-p1023.xml

USDA Plants Database for *Hydrangea quercifolia*: https://plants.sc.egov.usda.gov/home/plantProfile?symbol=HYQU3

Often in horticulture, we use information about cold hardiness primarily as tool for plant selection at the landscape or garden scale. This is a very appropriate and practical use of hardiness information, but research into cold hardiness can also drive the supply side of ornamental plants by contributing to breeding. Sherwood et al., 2021 demonstrates how an understanding of the cold hardiness (and other key aspects) of native populations of oakleaf hydrangea can support breeding efforts and the availability of future new cultivars for the landscape. Oakleaf hydrangeas, while native to the southeastern United States, are one of the lesser used hydrangea species with relatively little effort invested in breeding or in understanding native genetic resources to date. Because of their native southeastern range, cold hardiness has been generally reported to limit them to growing zone 5a. However, this estimate is based on relatively few tested cultivars. And, there have also been studies that suggest that midwinter hardiness and late winter or early spring hardiness may vary because of genetic differences in de-acclimation (when hardiness decreases as plants prepare to resume growth in the spring).

In this study, 55 populations of oakleaf hydrangea were sampled from Louisiana, Mississippi, Alabama, Florida, Georgia, and Tennessee. Differences in plant growth habit, susceptibility to bacterial leaf disease and cold hardiness were seen when seedlings were grown out from the different native populations and subjected to field and lab tests. Plants grown from seeds sampled in more northern locations often showed greater cold hardiness when grown out as seedlings with a correlation between latitude of sampling and winter hardiness. Interestingly, cold hardiness varied more in the beginning and end of winter than in the middle. These results suggest that there may be useful genetics that could improve the ability of oakleaf hydrangea to survive both midwinter as well as early or late freezes in these native populations.