Drought Monitoring Resources for Perennial Fruit Crops in the Midwest—Through the Seasons

Annual/Inter-annual/Longer Term

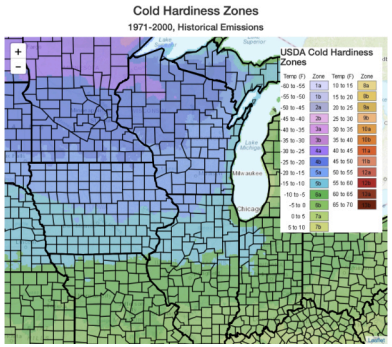
Perennial fruit growers make decisions that will affect their operations for many years to come, including choosing specific crops and varieties, locating crops for optimal health and productivity, and planting under circumstances that get trees/shrubs/vines off to a strong start. Future climate decision-support tools can inform these long-term strategic decisions by demonstrating how precipitation, temperature, evapotranspiration demand, and growing seasons might change over the next few years to decades.

Future Climate Dashboard
(climatetoolbox.org/tool/future-climate-dashboard)

This tool displays a dashboard of projected future climate information for any location in the contiguous US. This tool is useful for evaluating how an individual climate variable is projected to change in future 30-year periods at a set location. The dashboard compares what was normal for 1971–2000 with projections derived from an ensemble of downscaled climate model projections using multiple future emissions scenarios.

Future Cold Hardiness Zones
(climatetoolbox.org/tool/Future-Cold-Hardiness-Zones)

This tool visualizes contemporary and future cold hardiness zones, also known as the USDA Plant Hardiness Zone. Cold hardiness zones can help growers determine which perennial crops and plants are most likely to tolerate their winter temperatures. The cold hardiness map is based on the average coldest single overnight temperature of the winter. Users can also map the potential geographic range under current and future climate from a number of perennial crops based on their hardiness zones.

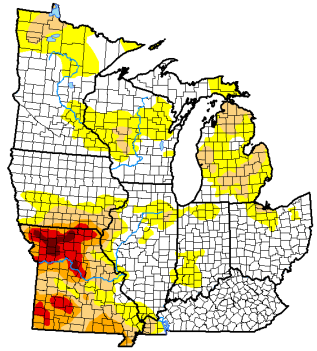


Climate Information Needs of Midwest Specialty Crop Growers is a project of the National Drought Mitigation Center and the University of Wisconsin, with the U.S. Department of Agriculture Midwest Climate Hub and the National Integrated Drought Information System. We are grateful for the participation of advisors representing Iowa State University, the Iowa Winegrowers Association, University of Missouri Extension, University of Wisconsin-Madison Extension, Wisconsin Potato and Vegetable Growers Association, and Wisconsin State Cranberry Growers Association. The project was funded by the National Oceanic and Atmospheric Association Sectoral Applications Research Program the NOAA Climate Program Office.

Spring/Summer

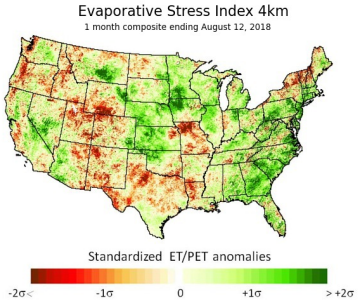
Drought conditions in the spring may make it risky for planting new trees or vines. In the summer, drought may affect how heavily fruit clusters are thinned, which pest and disease problems emerge, and how quickly fruits ripen. With perennial crops, drought conditions may also affect the development of next year's fruit crops.

U.S. Drought Monitor
(droughtmonitor.unl.edu)



The U.S. Drought Monitor provides a weekly snapshot of drought conditions across the United States, and may provide early cues of emerging dryness before it is noticeable in the landscape. Areas in yellow are experiencing abnormally dry conditions, which itself may not be a concern for perennial fruit crops. Areas in darker tan and red colors are currently experiencing moderate to extreme drought, indicating where irrigation and heavier fruit thinning may be necessary, where drought-stressed trees or vines may be vulnerable to pests, and where the quality and size of crops may be affected.

Evaporative Stress Index (ESI)
(hrsl.ba.ars.usda.gov/drought/index.php)



Satellite-based monitoring tools track vegetation health with high spatial resolution, showing the cumulative impact of elevated evaporative demand and dry soils. These tools monitor relatively fast changes in vegetation conditions, and can act as an "alarm" of rapidly developing drought. Orange-to-red colors indicate plant stress due to abnormally high evaporative demand. Green colors show areas where the vegetation is healthy.

Outlooks and Forecasts

Throughout the spring and summer, perennial fruit growers will be looking ahead for potential drought emergence to plan irrigation, thinning fruits, pest and disease monitoring, and the timing of harvest. Outlooks can provide growers with information on what the coming two weeks, month, and season might bring as far as precipitation, temperatures, soil moisture, and drought development and recovery.

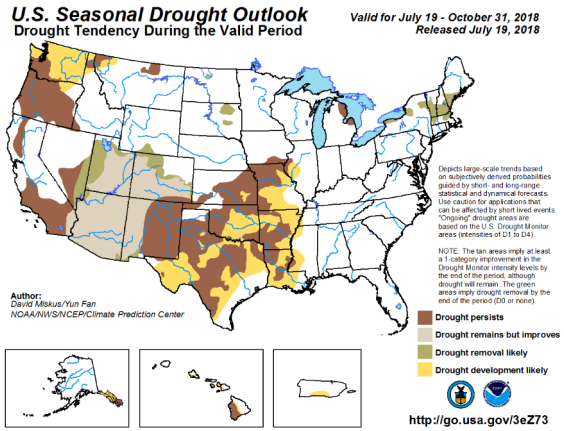
Find Monthly and Seasonal Outlooks at Any of These Websites:

U.S. Drought Monitor Outlooks tab (droughtmonitor.unl.edu/ConditionsOutlooks/Outlooks.aspx)

National Weather Service's Climate Prediction Center (www.cpc.ncep.noaa.gov)

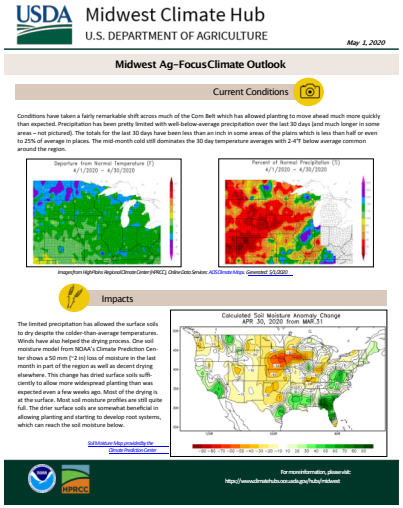
Midwest Regional Climate Center Drought Information Page (mrcc.illinois.edu/cliwatch/drought/drought.jsp)

National Integrated Drought Information System Outlooks and Forecasts (www.drought.gov/drought/data-maps-tools/outlooks-forecasts)



Monthly Drought and Climate Webinar and Climate Outlook Summary

Want more context and discussion? NOAA and the U.S. Department of Agriculture's Midwest Climate Hub offers a monthly webinar and two-page climate outlook summary that can help put the current conditions into context with prior years. Register for the webinars and find outlook summaries here: (www.climatehubs.usda.gov/hubs/midwest/climate-outlooks).

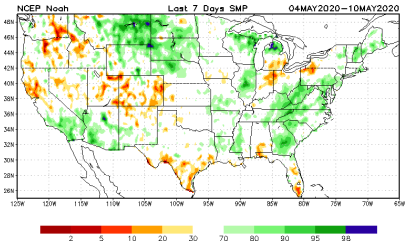


Autumn/Winter

Once fruit harvest has occurred, perennial fruit growers monitor moisture to maintain trees/vines over the winter, for winter cover crop emergence and growth, and for preparing for next year's tree planting through tillage, nutrient and pH management, and grass seeding. Inadequate soil moisture or snowpack, combined with extreme cold, may result in root damage to fruit trees/shrubs/vines.

Soil Moisture Maps of the U.S.

(www.cpc.ncep.noaa.gov/products/Drought/Monitoring/smp_new.shtml)



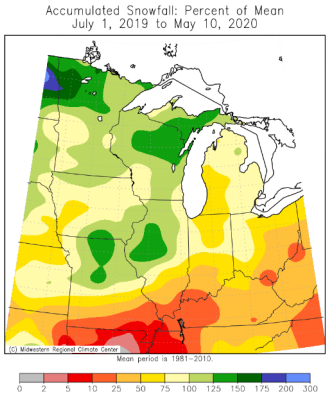
These maps show how soil moisture in different layers of the soil column differs from normal. The soil moisture data account for regional differences in soil moisture field capacity. Yellow and orange colors indicate where there is less soil moisture than normal for that time of the year, while green colors show that the soil conditions are wetter than normal. The user can view current conditions as well as the past week or month.

Midwestern Regional Climate Center's Climate Watch

(mrcc.illinois.edu/cliwatch)

"Seasonal Maps" tab

"Percent of Normal" maps show how current snowfall compares to the 30-year normal. Areas in green/blue have received more snow than normal, while areas in orange/red have received less snow than normal. These maps can provide an early indicator of soil conditions come spring.



Mesonet Soil Temperature Maps

(mrcc.illinois.edu/RMP/currentMaps.html)

Soil temperature can be affected by soil moisture conditions. Information gathered at Mesonet sites can provide clues to local soil temperature conditions.