

Extremely dry, hot conditions this fall causing early, muted foliage display

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Abnormally dry conditions and high temperatures have caused poor leaf colors and early leaf drop in late September and early October. Credit: Thomas James Caldwell/Flickr

With last year being the wettest year on record in Pennsylvania, and this year starting out wet again, 2019 was set up to be the mother of all fall foliage displays. Trees in most areas were in great condition going into late summer.

But then it quit raining—in a big way. A drought kicked in, with rainfall 25% to 75% below normal over the last 30 days for most of the state. The extremely [dry conditions](#) have been coupled with a series of near-record and record high temperatures from mid-September through the first week in October.

"Yet, we have had reasonably low temps at night—getting into the 40s," said Marc Abrams, professor of forest ecology and physiology in Penn State's College of Agricultural Sciences. "All of these factors have produced greater than average amounts of early fall colors, which have been quite muted. This is an indicator of what is likely to follow."

While drought at this time of year is normally good for fall colors, the abnormally dry conditions and high temperatures have caused poor leaf colors and early leaf drop in late September and early October, Abrams noted. And all the leaves that are changing now will not be around to contribute to peak colors in mid-October, he added.

Unusually dry and warm weather is predicted over the next couple weeks—but not as extreme as the last 30 days—exacerbating Abrams' concerns for the foliage.

"However, a lessening of the extreme heat and drought and a continuation of cool nights in the next two weeks will go a long way to save this fall season," Abrams.

Abrams' prediction is that fall colors for most of Pennsylvania will be good but not great in the coming weeks.

"Despite all the negatives this year, fall coloration is pretty resilient in most trees and it will come," he said. "Pockets of good color can be found in areas less affected by the extreme drought. People should try to visit these areas, including northern and western parts of the state."

For nearly four decades, Abrams has studied how seasonal precipitation and temperature influence timing and intensity of fall colors in central Pennsylvania. He contends that clear, bright days, low but not freezing temperatures, and dry but not drought conditions promote the best fall colors.

Cooler temperatures signal [deciduous trees](#) to stop producing chlorophyll, the green pigment responsible for photosynthesis, he explained. The chlorophyll breaks down and disappears, unmasking other leaf pigments. These other pigments—called xanthophylls and carotenes—are what create the yellows and oranges seen in the leaves of yellow poplar, hickory, sycamore, honey locust, birch, beech and certain maples.

After chlorophyll production stops, trees also produce another pigment in their leaves called anthocyanin, according to Abrams. The anthocyanins create the brilliant reds and purples seen in maple, sassafras, sumac, blackgum and scarlet oak.

"One thing that I have been impressed with in my more than 30 years of gauging foliage is the resiliency of the display," he said. "Year after year, despite the conditions, there are places where the trees show good color, but perhaps not great color."

Provided by Pennsylvania State University

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