

Iowa Climate Statement 2022: The Many Benefits of Our Trees

Trees live a long time, decades or even centuries. Existing and future trees will grow in a climate that is warmer and that will have greater extremes of precipitation over the next 40-80 years. Recent results from IPCC model projections for climate (if emissions continue to rise rapidly) show Iowa becoming much hotter, with 5-15 days each year over 106 °F during the period 2041-2060.¹ Precipitation is likely to increase in winter and decrease in summer, leading to more floods and droughts, and further stresses on both urban trees and rural woodlands.

The August 2020 derecho is emblematic of the impact of climate change on our trees: this extreme weather event led to the loss of an estimated 7 million rural and urban trees in Iowa.² Many tree-planting programs are now underway to begin to replace them. These new trees give us a connection to our future, as many of those we plant now could be growing well into the next century, in a new and changing climate. Attention to the species of trees we plant and their care will be crucial for their survival. Strategies are needed both to sustain the many benefits of existing large mature trees³ and to increase planting of appropriate new trees for mitigating and adapting to climate change.

Urban trees are especially beneficial for reducing the urban heat island effect.⁴ Trees cool the urban environment by providing shade. They also dissipate the sun's radiant energy by releasing water vapor rather than increasing tissue/nearby air temperatures.⁵ A Midwest electric utility explains that the proper placement of just three trees can save an average household between \$100 and \$250 in energy costs annually, and a well-designed landscape provides a return on initial investment in less than 8 years.⁶ Trees also provide a myriad of other important ecosystem services, for example by controlling stormwater, improving soil quality, providing wildlife habitat, and cleaning the air^{7,8,9}. The many benefits of urban trees are greater than the costs of planting and maintaining street and park trees.¹⁰

Longer dry periods mean that proper watering is crucial for newly planted trees. During drought, even mature trees should be watered out to the "drip line" which extends as far as the tree's canopy. In addition, under extreme heat stress even well-watered trees can suffer regardless of the amount of moisture in the soil. Signs of heat stress include irregular yellowing of a tree's interior leaves or needles, wilting of leaves and branches, rust-colored spots on leaves, or scorched leaf edges. Additional tree maintenance should include pruning to increase structural integrity and provide resistance to and recovery from storm damage while increasing the life span and ecosystem services provided by the tree.

We also need to plant diverse species of trees to promote resilience given an increasing number of pests/pathogens in addition to the effects of climate change. Choosing long-lived tree and/or native species to plant in urban and rural areas will more effectively store carbon: in today's carbon economy, the CO₂ emissions of an average global citizen can be absorbed by approximately 165 mature trees.^{7,11}

With their wealth of ecological and social benefits, the trees we have are valuable, and we need to support and strengthen on-going tree planting programs. In the face of climate change we should both plant more trees and provide essential care for the precious trees we already have.

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