



### **Trees and forests**

## **US climate change reforestation plans face key problem: lack of tree seedlings**

**US tree nurseries do not grow enough trees and lack the plant species diversity to meet ambitious plans, research says**

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## Dharna Noor

Mon 31 Jul 2023 21.06 BST

In an effort to slash carbon emissions and provide relief from extreme heat, governments across the nation and globally have pledged to plant trees. But the US is not equipped with the tree seedlings to furnish its own plans, [according to a new study](#).

US tree nurseries do not grow nearly enough trees to bring ambitious planting schemes to fruition, and they also lack the plant species diversity those plans require, according to research [published](#) in the journal Bioscience on Monday,

For the study, 13 scientists examined 605 plant nurseries across 20 northern states. Only 56 of them - or less than 10% - grow and sell seedlings in the volumes needed for conservation and reforestation.

The team, led by two scientists at the University of Vermont's Rubenstein School of Environment and Natural Resources, also found that forest nurseries tend to maintain a limited inventory of a select few species of trees, with priority placed on trees valued for commercial timber production. As a result, nurseries suffer from an "overwhelming scarcity of seedlings" that are well-suited for climate plans, the authors write.

"Despite the excitement and novelty of that idea in many policy and philanthropy circles - when push comes to shove, it's very challenging on the ground to actually find either the species or the seed sources needed," said Peter Clark, a forest ecologist at the University of Vermont, who led the new study.

The research comes as swaths of the US face relentless heatwaves. Phoenix, which has experienced record-shattering heat this summer, has said it intends to plant 200 trees a mile in select areas, and has invested \$1.5m into the plan. Many US municipalities have made similar tree planting pledges.

On the federal level, the 2021 Infrastructure Investment and Jobs Act provided money for the US Forest Service to plant more than 1bn trees in the next nine years. And the World Economic Forum also aims to help plant 1tn trees around the world by 2030.

But trees that can thrive amid local ecological and climate conditions are crucial to meeting such plans, and many nurseries the researchers examined had no stock available of seedlings that have adapted to local

conditions. The researchers also found a dearth of “future-climate-suitable” varieties, or varieties that will survive amid worsening heat and extreme weather conditions.

Trees that play key roles in local ecosystems were also scarce, the study found. The red spruce, for instance, is highly carbon-sequestering and serves as a habitat for many species, but has been threatened in recent decades by development and acid rain.

“Efforts are in the works to restore the species, [but] in our investigation, we found only two nurseries that sold the species,” said Clark.

Many factors led to the dearth of crucial seedlings, said Clark. Among them: the decline of government nurseries.

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“In recent years, many states have elected to close their publicly funded nurseries because of budgetary concerns and the economics haven’t supported maintaining it in the eyes of those writing the checks,” said Clark.

The decline of nurseries has also resulted in a loss of knowledge about seeds. And skilled seed collectors are also becoming rarer, meaning diverse seeds are becoming harder for nurseries to obtain, Clark added.

The researchers argue that dramatic increases in both seedling production and diversity at many regional nurseries will be central to any successful campaign to address climate crisis with tree planting.

The research calls for expanded federal and state investment into government owned and operated tree nurseries, as well as public seed collection efforts.

“This strategy may stimulate production from private nurseries once a stable demand is apparent,” they write.

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**With daily reports of extreme heat, the time for denial is over.** Heatwaves across the northern hemisphere are more alarming evidence of the accelerating levels of climate damage; reminders that people across the world are losing their livelihoods - and lives - due to deadlier and more frequent heatwaves, floods, wildfires and droughts. Journalism alone won't reverse our trajectory. But as you join us today from India, we want to explain three reasons why properly funded independent reporting will help us address it.

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