

NRRI Mission:

Deliver research solutions to balance our economy, resources and environment for resilient communities.

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From the Editor:

Growing trees? What's so innovative about that?

NRRI's trees are special. They've been bred and re-bred to grow four times faster than your average aspen. Our fast-growing trees will provide a steady supply of biomass as Minnesota transitions to using more plant-based, renewable materials for fuels and other products.

NRRI is also developing a unique, niche road repair product to make use of waste taconite rock. A demonstration on Duluth potholes makes everyone happy.

Minnesota, we got this.



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Duluth demonstration fills city potholes

It's a weird trifecta: waste taconite rock, potholes and NRRI innovation. But one that puts a lot of smiles on faces.

In September, the City of Duluth happily offered up some potholes to demonstrate a recently updated road repair "recipe" developed and patented at NRRI. The goal is to find alternative and valuable uses for waste taconite rock and other mineral materials from Minnesota's Iron Range.

"This project is a great example of NRRI innovations to reduce waste and find value in our natural resources," said Rolf Weberg, NRRI Executive Director. "And those of us who live in the Northland can sure appreciate a long-lasting pothole repair."

The road repair material is targeted to set to a hard, durable patch in about 10 – 20 minutes, depending on conditions. The hope is that it can solve some pothole repair challenges, like cold weather applications and endurance over many seasons.

Advanced Road Patch LLC, a small company whose operation is based on the Iron Range, purchased the license to commercialize this product from the University and has worked with NRRI to continue its evolution and evaluation.

As company president John VanderHorn explained, "Advanced Road Patch LLC licensed the patent for the patching system because we believe it has unique properties that make it a very useful tool in a road maintenance crew's toolbox."



Duluth media film and photograph NRRI researchers fill a pothole during a demonstration.

NRRI is also receiving project support from MnDOT and the Minnesota Local Road Research Board (LRRB). The Iron Range's magnetite resources provide the key reactive component that, when mixed with a common chemical reagent, allows the material to be poured into a pothole or road fissure before hardening.

"We are excited to partner with NRRI to find creative solutions for a rampant issue that plagues our city and many others across the nation," said City of Duluth Mayor Emily Larson. "Short term

patching is hard and frustrating work. This material could maximize our staff resources and provide tangible results. We thank NRRI for bringing forth this new technology and look forward to seeing the product advance."

This demonstration project with the City of Duluth will allow NRRI to further modify and test the product for durability in a real world application, and will also allow for testing of equipment to make the job faster and simpler for maintenance crews.

USDA funding to broaden hybrid poplar research

The University of Minnesota received a \$1 million grant from the U.S. Department of Agriculture for 4 years to expand research on fast-growing hybrid trees and promote industrial use. The University's Natural Resources Research Institute, Forestry Extension and Dept. of Applied Economics are teaming up on the project to meet the future demand of biomass resources.

"This is very futuristic, very anticipatory," explained NRRI forest scientist Neil Nelson. "But when the economics line up to further develop bio-based fuels and other bioproducts, we will have the feedstock."

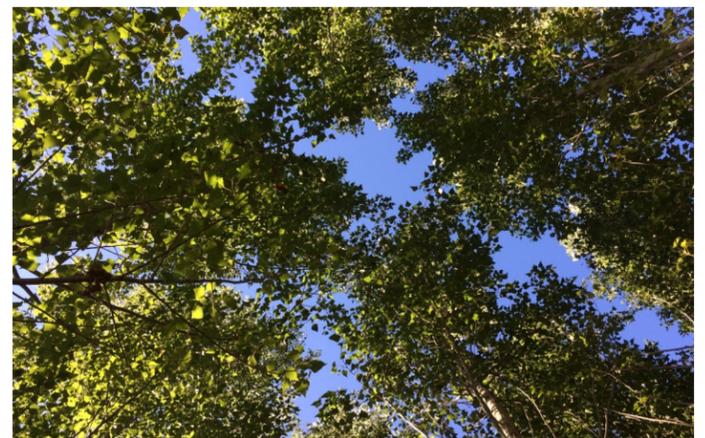
NRRI has been working for 20-plus years to develop hybrid poplar tree families that are a cross-breed of local, native cottonwood and European black poplar. These trees can reach maturity in about 10 years, as opposed to a typical aspen which would take about 40 years to grow the same size. They are grown as an agricultural crop, not in a forest, and require intensive weed management to survive.

The grant will allow NRRI to test the trees' growth success in varying environments: northern Minnesota, central Iowa and southern Indiana.

"It's important to understand how well they grow across broader landscapes," Nelson added. "We've done some preliminary work on this with Purdue University and other organizations, but this will be a larger and more in-depth test."

The funding will also support NRRI's continued family field trials, clone trials and other tests that take place over a 5-year time span.

Mike Reichenbach at the University's Regional Extension office in Cloquet will develop an outreach



NRRI's hybrid poplars can obtain harvest size in about 10 years in northern climates. Testing trials will now be expanded to warmer climates.

program to potential industry stakeholders. Workshops and webinars will help wood products and bio-energy companies decide if hybrid poplars are viable for new or traditional products. Bill Lazarus, a University Applied Economist, will develop a Decision Support Tool to help landowners decide if hybrid poplars are a good crop for their land compared to other commodity crops like corn, soybeans or wheat.

"A good example of new bio-materials under development is NRRI's work on lignin-based plastics," said George Host, NRRI Forest & Land Initiative Director. "But traditional markets like pulp and paper are still out there."

This study will quantify genetic advances to improve the economics of poplar feedstock plantations and reduce production and investment risk for farmers and industry stakeholders.

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