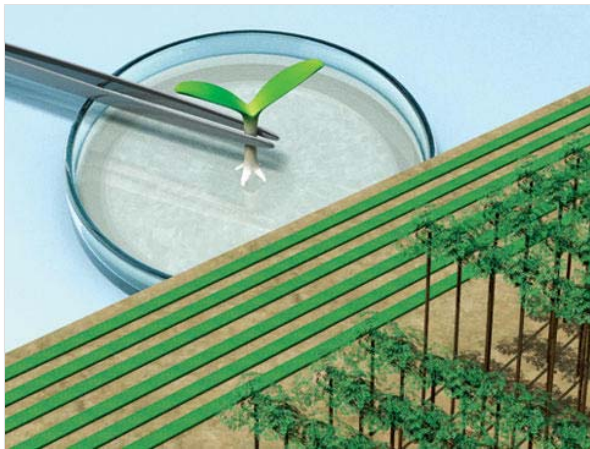




Duct Tape Methods to Save the Earth: Grow Super-Trees in Factories

How robot-run factories will save the rainforest

By Rena Marie Pacella; Illustrations by Graham Murdoch Posted 06.29.2007 at 2:00 am



biotrees_485.jpg Feed the Trees: Genetically modified trees will be reared in labs and grown on plantations.

Where: Rainforests

Cost: \$120,000 per square mile

The Problem

The world's rainforests lose 100,000 acres and as many as 100 species every day. The Amazon alone loses 10,000 square miles a year. As the demand for timber (used for wood, paper and biofuel, among other products) increases, experts predict that the rainforests could be wiped out by 2050—and with them, the habitat for half of the world's species of plants, animals and microorganisms and the source of 25 percent of all pharmaceuticals.

The Fix

Genetically modified tree plantations that will undercut the market for cheap rainforest wood. ArborGen, a biotech company in Charleston, South Carolina, is spearheading research that will help farmers mass-produce trees on 5 percent of the land currently required. It will also eliminate the need to ever again fell a native rainforest tree for timber (clear-cutting for farmland will not be affected).

Since 2000, the company has been identifying useful genes from half a dozen tree and plant species to produce trees with desirable traits like fast growth, stress tolerance and reduced lignin (the material that must be chemically removed to make paper). For example, by speeding up the trees' growth cycle, ArborGen is on track to decreasing the time it takes to harvest pine trees from roughly 30 years to about 18. It's also created a low-lignin eucalyptus tree that's perfect for pulping.

The two big hurdles are time and money. Transgenic trees are painstaking and expensive to cultivate. Even after scientists develop a new line of trees, they must still handle each seedling individually, from petri dish to plantation.

Next Steps

To make this approach economically viable, ArborGen plans to churn out the designer seedlings in fully automated tree factories, so it has begun designing the robots that will transplant and evaluate seedlings autonomously. The company hopes it can also save endangered tree species—one project aims to splice blight-resistance genes into the near-extinct American chestnut tree.

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