

For all of the above reasons, action is needed both at home and internationally to create a worldwide moratorium on the further development and planting of GE trees at least until an effective framework for public debate, unbiased scientific evaluation, and regulation in the public interest - with the goal of preserving biodiversity - can be brought into being.

If you agree with the above, does this make you a Luddite? This is an unfair characterization by our opponents. Sierra Club does not oppose the use of genetic science in indoor research or medical applications. Our policy about genetic research is that there should be more of it, more of it aimed at answering questions about long term effects on health and the environment, and less of it shielded as "confidential business information" as at present. We believe genetic technology belongs indoors, with containment, not outdoors in fields and forests.

We would also point out that the United States is using twice as much paper per capita as other highly civilized nations (Europe, Japan). Let us not ask genetic engineering to do what could be accomplished by lower-tech means like putting a surcharge on junk mail.

Just as there are powerful economic incentives behind logging on public lands, sprawl, and other activities which Sierra Club opposes, there are similar incentives behind genetically engineered silviculture. Not only are landed property rights and business rights involved, but also the patent

rights to genetic code which are now privatizing the genetic heritage of our planet. It is Sierra Club's task, as always, to oppose such interests and to fight for the right of nature to exist for itself, and of future generations to enjoy and be inspired by it.

To learn more about Sierra Club's positions on genetic engineering, log on to www.sierraclub.org/biotech

Sierra Club's Genetic Engineering Committee would like to hear from you and to work with you in the future in resisting the spread of hacked, corporate-patented genetic code in our fields, in our forests, and in all out-of-doors environments!

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Genetically Engineered Trees



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Genetic engineering of food crops has been a stealth technology, introduced with little public debate and arriving on grocery shelves unlabeled. Now another application of genetically engineered (GE) agriculture is sneaking up on us – the production of transgenic trees by paper and lumber companies. The possibility that the new genes spliced into GE trees will interfere with natural forests isn't a hypothetical risk but a near certainty. During our lives, genetic engineering may do as much damage to forests and wildlife habitat as chain saws and sprawl.

This is not to say that every application of GE is bad. Sierra Club has taken no positions regarding genetic engineering done in labs or in indoor manufacturing of pharmaceuticals. But common sense should warn us that commercial development of out-of-doors applications in the absence of environmental safeguards is a prescription for disaster. Sierra Club opposes the out-of-doors deployment of genetic technologies because the genes are free - as free as pollen on the wind - to invade nature, and because once this has happened they can't be recalled. The arguments below are not intended to be inclusive but only to illustrate the nature of the problem.

Corporations, as Milton Friedman pointed out, exist not to be ethical but to make money. And from the standpoint of a forestry company, wildlife habitat has very little value. "Growing the bottom line" is what such companies try to do, and among their strategies are clear cutting and replanting with uniform and fast growing trees (tree plantations). An optimal match between the manufacturing process (cutting lumber and making paper goods) and the inputs can add to profits. These companies now see an opportunity to engineer trees which grow faster, contain less lignin, are more uniform in their characteristics, are more resistant to disease and so forth. And unfortunately, if this is the way to make money, this is where corporations are headed. Sierra Club believes that pressure from society in the form of legal prohibitions and restraints, stringent regulations and liability laws, and

environmental and consumer activism must be brought to bear in order to hold the industry in check and safeguard the public good.

We are often told that commercialization of genetically engineered (GE'd) trees is at least several years away. This is also part of the "stealth" referred to above. GE'd stands of papaya trees are yielding commercial crops in Hawaii. The tip of the iceberg is already under our prow, not on the distant horizon. But it is for the traditional forestry industries of paper and lumber making that most research is presently being done. This is also an area which poses the greatest risk to nature.

The threat of GE'd trees interbreeding with wild trees is extreme. While many agricultural varieties are already quite different from their ancestors of thousands of years ago, this isn't the case with trees. And genetically engineered trees could easily become invasive. Faster growing, limp, low-lignin trees resistant to common pests could easily become a kudzu-like threat, moving into our national parks and forests and changing their character forever.

Should we object if forestry companies do genetic engineering on their own land? Sierra Club opposes genetically engineered tree plantations on private land for all the same reasons we oppose other tree plantations. To put it briefly, tree plantations aren't forests. This will be even more true of GE'd tree plantations. For instance, genetically engineered pines

might be grown without all those "useless" pine cones. They may be herbicide resistant so that competing undergrowth can be eliminated. They may produce their own pesticides so that many of the insects which live in association with trees are poisoned.

The result, then, may be a silent forest, one which doesn't support chipmunks or snakes at ground level, holds no birdsong in its branches, has no raptors soaring above. Clearly, such a stand of trees is not really a forest. And worse, the damage can't be confined to private property as trees live for many years and can't be closely observed; "birth control" among trees is less reliable than among people and even genetic engineering can't guarantee that a branch won't decide to manufacture pollen. Pine pollen can blow hundreds of miles on the wind.

Should we oppose genetic "improvements" to trees on public lands? Sierra Club believes that we can't allow the industry to be judged by its hype and that patented genes are not an improvement over nature. We also must avoid only judging what one gene may do, because once hundreds of different fragments of hacked, patented genetic code are allowed access to public lands, the consequences of unintended combinations will be unpredictable. GE trees will also be a danger in other nations, particularly in the underdeveloped world where conditions for effective regulation often don't exist.