

US University G.E. Tree Research

Universities play a critical role in conducting research which is largely if not solely funded by government subsidies and private corporations such as Monsanto and ArborGen. Below is a list of U.S. universities that are actively experimenting on and/or publicly supporting GE trees. Permits active and pending reviewed are those with the US Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS).

Oregon State University

Professor Steve Straussⁱ has been conducting GE Tree experiments for over 20 years at Oregon State University (OSU). Some of his new work is on Zinc finger sterility in Poplars. His team is working on RNAi transgenic trees with sterility. OSU gets minimum \$1 million in grants/year. Strauss founded the Tree Biosafety and Genomics Research Cooperativeⁱⁱ which is made up of OSU, ArborGen, Futuragene and SweTree Technologies.ⁱⁱⁱ TBGRC is sponsored by the US National Science Foundation. Associate Sponsors of TBGRC are Forest Molecular Genetics Programme, University of Pretoria, Broadacres Nursery, Oregon Department of Agriculture and the Oak Ridge National Laboratory. In addition, OSU promotes a pro-biotech info website called agribiotech.info. OSU has test plots of GE poplar, apple and sweetgum for a vast amount of traits in Oregon. 24 acres are permitted of GE poplar for phenotypes ranging from herbicide tolerance, insect resistance, ability to glow, early flowering, altered fertility altered growth and more.^{iv}

Purdue University

Keeping one of the genes Confidential Business Information (CBI), Purdue University is genetically engineering up to 4 acres of poplars for cell wall alterations in Indiana and Mississippi.^v Another 3 acres in Indiana is permitted for altered lignin content, composition in addition to decreased lignin levels.^{vi}

Texas A&M University

Texas A & M University currently has 3.5 acres permitted for grapefruits, oranges and C-22 engineered for various resistances.^{vii} Just last year in June they let a trial permit lapse of 43 acres of the same items and phenotypes in both Texas and FL.^{viii}

Washington State University

As of 2014, WSU alleges about 12,000 GE Poplars on 11 Acres in western Washington. Norman Lewis^{ix} believes his poplars represent the biggest ongoing field test of genetically engineered trees in the country — and perhaps the world. In 2014 WSU pursued rose, basil and clove scent^x in GE Poplars. The pursuit was to have more chemical called 2-phenylethanol produced in the Poplars, where upon extraction it possibly could be used to produce those scents.

WSU is a major driver of Advanced Hardwood Biofuels Northwest (AHB) AHB is an research project that finished in the fall of 2015 to make poplars a commercially viable producer of liquid biofuels and biochemicals in the Northwest from Northern California to Washington. AHB has funding from the USDA under the Agriculture and Food Resource Initiative number 2011-68005-30407.^{xi} Partners in this are the University of Washington, Washington State University, Oregon State University, Agriculture Center of Excellence, ZeaChem, Greenwood Resources, University of California Davis, University of Iowa and more.

From the AHB website^{xii}: "Through the Energy Independence and Security Act of 2007, Congress established regional biofuel production targets known as the 2022 Renewable Fuel Standard (RFS2). AHB is carrying out research and development to support a system that will use renewable feedstocks like hybrid poplar to produce a suite of products that are currently derived from petroleum."

"As a first step toward developing a biofuels industry, AHB will focus on the development of a renewable bio-based chemical industry. High value chemicals, such as acetic acid, ethyl acetate, ethylene, and cellulosic ethanol, which are produced during the first stages of the biofuel production process, can be used to make bioproducts including paints and plastics."

"The longer-term goal is to develop poplar-based biofuels including jet fuel, diesel, and gasoline that can supplement existing fossil fuels. These biofuels will be certified to run in conventional car, truck, and aircraft engines and will be 100% compatible with existing infrastructure."

University of California Davis

The University of California based in Davis has active test plots for 1.68 acres of GE Walnut trees in California. Engineering of the Walnuts is for crown-gall resistance in addition to altering the polyphenol oxidase levels.^{xiii}

Michigan State University

Michigan State University has 2 acres of GE Poplars in Pennsylvania for increased height, biomass, secondary cell wall thickness, root growth and increased secondary wall formation.^{xiv}

University of Florida

The University of Florida (UF), based in Gainesville, has active permits for 30 acres Grapefruit, Sweet Orange, Mexican Lime and Carrizo Citrange for a variety of resistances^{xv}. In 2011 the University of Florida was issued a \$6.3 million dollar grant^{xvi} under the Department of Energy's (DOE) Advanced Research Project Agency-Energy (ARPA-E) program to research increasing the terpene levels in loblolly pines for liquid biofuels. ArborGen served on their research team in Florida.

University of Georgia

The University of Georgia is testing on GE American chestnut. It has permitting for .002 acres in SC for 3 types of resistance and a gene marker.^{xvii} It has .05 acres permitted of GE American chestnut in GA for the same resistances in addition to chestnut blight resistance and herbicide tolerance.^{xviii}

University of Arizona

The University of Arizona has 0.25 acres permitted in AZ for GE hybrid Poplar.^{xxix}

University of Wisconsin/Madison

The University of Wisconsin/Madison has a permit pending for .6 acres of GE poplar in Wisconsin. The traits would be for easier digestibility, suggesting the genetic engineering would be for processing into liquid biofuels.^{xx}

Virginia Tech

Virginia tech has active permits for American Chestnut and Poplar in the state of Virginia. 3.5 acres are for GE American Chestnut. Phenotypes include chestnut blight resistance, antibiotic resistance, visual markers and more. .83 Acres are permitted for GE Poplar, providing a visual marker and undisclosed to the public phenotypes^{xxi}. Virginia tech received \$1.2 million in 2007 from the DOE to conduct tests on poplars for biofuels.^{xxii}

State University of New York College of Environmental Science and Forestry

Under the guidance of William Powell and Charles Maynard, SUNY ESF is conducting field trials of GE American chestnut trees in NY for blight resistance, herbicide tolerance, markers and antibiotic resistance.^{xxiii} Currently there are 8.1 acres permitted in New York. Both Powell and Maynard are the first scientists who are publicly working toward intentional contamination of wild American chestnut trees with GE American chestnut trees in hopes to gain public acceptance of genetic engineering under the guise of forest restoration.

University of Connecticut

The University of Connecticut has an active permit for .7 acres of GE Poplar for flower and root sucker inhibition.^{xxiv} “University of Connecticut: This project is identifying poplar varieties for field evaluation and demonstration followed by characterization of genetically improved poplar with enhanced growth rate and altered wood chemical compositions. Subsequent tasks included development of a method for genomics-guided mutation breeding of poplar for bioenergy applications as well as preparation and characterization of heterogeneous catalysts for biomass conversion.”^{xxv}

Mississippi State University

Although Mississippi State University currently has no active GE field trials, it historically had permits for GE poplars for up to 40 acres in the state of Mississippi.^{xxvi} Experiments were permitted till the end of 2014 which appeared to have the most genes engineered into the poplar of any genetic engineering of poplars to date.

- i <http://people.forestry.oregonstate.edu/steve-strauss/home-page>
- ii <http://people.forestry.oregonstate.edu/steve-strauss/tbgrc-tree-biosafety-and-genomics-research-cooperative>
- iii Summary of research : <http://people.forestry.oregonstate.edu/steve-strauss/summary-tbgrc-major-research-project>
- iv <http://www.isb.vt.edu/getRelDetail.aspx?bp=13-330-102r>
- v <http://www.isb.vt.edu/getRelDetail.aspx?bp=14-013-104rm> <http://www.isb.vt.edu/getRelDetail.aspx?bp=13-081-101r>
- vi <http://www.isb.vt.edu/getRelDetail.aspx?bp=14-008-104r>
- vii <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-062-104r>
- viii <http://www.isb.vt.edu/getRelDetail.aspx?bp=12-072-102rm>
- ix Norman Lewis WSU Profile, <http://ibc.wsu.edu/research-faculty/lewis/>
- x Doughton, S., Seattle Times, 9 February, 2014, [Rose Scent in Poplar Trees? WSU Turns to Genetic Engineering](#)
- xi <http://hardwoodbiofuels.org/about/funding/>
- xii <http://hardwoodbiofuels.org/about/>
- xiii <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-280-101r>
- xiv <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-257-104r>
- xv <http://www.isb.vt.edu/getRelDetail.aspx?bp=14-132-102r>
- xvi Business Wire, 4 October 2011, [ArborGen Partners with University of Florida to Advance Pine-based Biofuels as Part of \\$6.3 Million DOE ARPA-E Grant](#)
- xvii <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-222-104rm>
- xviii <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-092-101r>
- xix <http://www.isb.vt.edu/getRelDetail.aspx?bp=14-192-102r>
- xx <http://www.isb.vt.edu/getRelDetail.aspx?bp=16-032-108r>
- xxi <http://www.isb.vt.edu/getRelDetail.aspx?bp=15-112-103rm>
- xxii <https://www.vtnews.vt.edu/articles/2007/07/2007-378.html>
- xxiii <http://www.isb.vt.edu/getRelDetail.aspx?bp=14-022-102r>
- xxiv <http://www.isb.vt.edu/getRelDetail.aspx?bp=13-185-104r>
- xxv http://biomassboard.gov/pdfs/interagency_feedstocks_logistics_july_2014.pdf
- xxvi <http://www.isb.vt.edu/getRelDetail.aspx?bp=11-150-102r>