Advanced Research Projects Agency • ENERGY

PETRO PROJECT

ARCADIA BIOSCIENCES

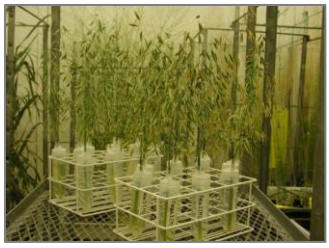
VEGETABLE OIL FROM LEAVES AND STEMS

PROJECT TITLE:	Vegetative Production of Oil in a C4 Crop		
ORGANIZATION:	Arcadia Biosciences, Inc.	LOCATION:	Davis, CA
PROGRAM:	PETRO	ARPA-E AWARD:	$947,026
TECH TOPIC:	Advanced Fuels	PROJECT TERM:	1/1/12 – 6/30/13
WEBSITE:	www.arcadiabio.com		

CRITICAL NEED

Biofuels offer renewable alternatives to petroleum-based fuels that reduce net greenhouse gas emissions to nearly zero. However, traditional biofuels production is limited not only by the small amount of solar energy that plants convert through photosynthesis into biological materials, but also by inefficient processes for converting these biological materials into fuels. Farm-ready, non-food crops are needed that produce fuels or fuel-like precursors at significantly lower costs with significantly higher productivity. To make biofuels cost-competitive with petroleum-based fuels, biofuels production costs must be cut in half.

PROJECT INNOVATION + ADVANTAGES



Arcadia Biosciences, in collaboration with the University of California-Davis, is developing plants that produce vegetable oil in their leaves and stems. Ordinarily, these oils are produced in seeds, but Arcadia Biosciences is turning parts of the plant that are not usually harvested into a source of concentrated energy. Vegetable oil is a concentrated source of energy that plants naturally produce and is easily separated after harvest. Arcadia Biosciences will isolate traits that control oil production in seeds and transfer them into leaves and stems so that all parts of the plants are oil-rich at harvest time. After demonstrating these traits in a fast-growing model plant, Arcadia Biosciences will incorporate them into a variety of dedicated biofuel crops that can be grown on land not typically suited for food production.

IMPACT

If successful, Arcadia Biosciences' project will enable large-scale production of vegetable oil from non-food crops, and will represent an environmentally friendly replacement for petroleum-based fuels.

- SECURITY: The transportation sector accounts for nearly all of our petroleum imports. Providing an advanced biofuels alternative to petroleum will allow the U.S. to reduce these imports, improving our energy independence.
- ENVIRONMENT: More than 25% of all greenhouse gas emissions in the U.S. come from the transportation sector. Because plants naturally absorb carbon dioxide as they grow, the level of greenhouse gas emissions from biofuels is less than half that of petroleum fuels.
- ECONOMY: The U.S. imports nearly $1 billion in petroleum each day, accounting for the single largest factor in our trade balance with the rest of the world. Biofuels can be produced domestically, allowing us to keep more dollars at home.
- JOBS: A self-sustaining biofuels industry that is cost-competitive with oil is well-positioned to see job growth in the agricultural, engineering, and research sectors.

CONTACTS

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