

Populus for Biofuels Feedstock Research and Development



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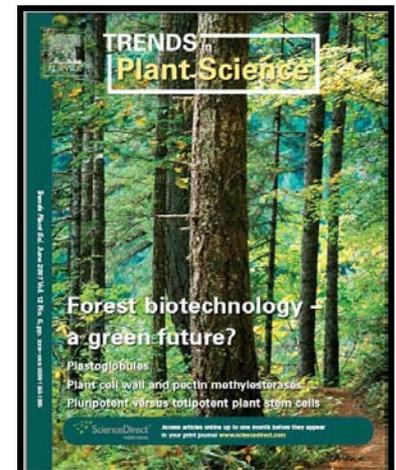
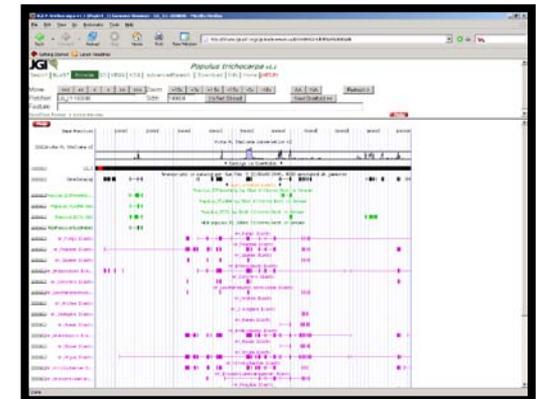
Davis CA



<http://www.fs.fed.us/psw/programs/ifg/>

Why *Populus*?

- Allows basic research and development directly in feedstock.
- Fully sequenced genome, transformation, and genomic tools.
- Potential for accelerated, genomics assisted breeding.
- Same genomic tools for breeding can be used for conservation.



Genetic Regulation of Wood Formation

- Identification of the key genes and mechanisms controlling woody growth using genomics.
- We have identified transcription factors that regulate:
 - Total lignin
 - S:G lignin
 - Polarity and patterning of woody stems
 - Cambium initiation and maintenance



Genomics-Assisted Breeding for *Populus* as a Sustainable Bioenergy Crop

Currently, there is no major initiative to translate genomics to Populus breeding.



Photo: Brian Stanton, Greenwood Resources

Major Goals:

- Realize genomics-assisted breeding for *Populus*.
- Establish a national database of *Populus* germplasm.
- Provide support and coordination to *Populus* breeding programs.
- Extend ecological and sustainability practices to *Populus* as a bioenergy crop.
- Establish education and extension for *Populus* breeding and cultivation.

Leveraging:

- Large investments in *Populus* genomics and genome sequencing by DOE, NSF, and USDA.
- Long term investments in *Populus* breeding by USDA and DOE.
- Large investments by NSF, BLM and USDA in *Populus* ecological and ecosystem genomics.
- DOE and USDA SUN GRANT investment in *Populus* regional bioenergy trials.

Genomics-Assisted Breeding for *Populus* as a Sustainable Bioenergy Crop

Co-Organizers:



Andrew Groover, Forest Service – Project coordinator



Gery Allan and Tom Whitham, Northern Arizona University – Ecosystem Genomics and Sustainability Issues



Randy Rousseau, Mississippi State University – Education and Extension



Brian Stanton, Greenwood Resources – Populus Breeding



Chung-Jui (CJ) Tsai, University of Georgia – Genomics and Informatics