

Lawrence B. Smart

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Education and Training:

1992 **Doctor of Philosophy**, Genetics, Michigan State University, East Lansing, MI
1987 **Bachelor of Science with Distinction**, Biology, Cornell University, Ithaca, NY

Research and Professional Experience:

July 2009 - *present* **Associate Professor of Plant Breeding and Genetics**
Dept. of Horticultural Sciences, Cornell University
New York State Agricultural Experiment Station, Geneva, NY
Joint appointment: Department of Plant Breeding and Genetics, Ithaca, NY

July 2009 - *present* **Adjunct Associate Professor**
Department of Environmental and Forest Biology
SUNY College of Environmental Science and Forestry, Syracuse, NY

Aug. 2001 – June 2009 **Associate Professor**
Department of Environmental and Forest Biology
SUNY College of Environmental Science and Forestry, Syracuse, NY

Dec. 2008 – June 2009 **Adjunct Associate Professor**
Department of Horticultural Sciences, NYS Agricultural Experiment Station
Cornell University, Geneva, NY

June 2003 – Jan. 2004 **Visiting Fellow (Sabbatical)**
Department of Plant Pathology, NYS Agricultural Experiment Station
Cornell University, Geneva, NY

Sept. 1996 – Aug. 2001 **Assistant Professor**
Department of Environmental and Forest Biology
SUNY College of Environmental Science and Forestry, Syracuse, NY

Oct. 1992 – Aug. 1996 **N.S.F. Postdoctoral Fellow & Postdoctoral Scientist**
Department of Vegetable Crops, Univ. of California-Davis

Sept. 1987 – Oct. 1992 **Graduate Research Assistant**
Genetics Program & DOE-Plant Research Laboratory
Michigan State University, East Lansing, MI

Jan. 1987 – Aug. 1987 **Research Technician**
Department of Plant Pathology, Cornell University, Ithaca, NY

Relevant Recent Publications (last 5 years):

Smart, L.B. and Cameron, K.D. Shrub willow (*Salix* spp.) bioenergy crops. In Kole, C., Joshi, S., and Shonnard, D. (eds.) Handbook of Bioenergy Crop Plants; Taylor and Francis Group, Boca Raton, FL. *In press*.

Serapiglia, M.J., Cameron, K.D., Stipanovic, A.J., Smart, L.B. (2009) Analysis of biomass composition using high-resolution thermogravimetric analysis and percent bark content for the selection of shrub willow bioenergy crop varieties. *BioEnerg. Res.* 2:1-9.

Lin, J., Gibbs, J.P., and Smart, L.B. (2009) Population genetic structure of native versus naturalized sympatric shrub willows (*Salix*; Salicaceae). *Amer. J. Bot.* 96: 771-785.

Cameron, K.D., Phillips, I.J., Kopp, R.F., Volk, T.A., Maynard, C.A., Abrahamson, L.P., and Smart, L.B. (2008) Quantitative genetics of traits indicative of biomass production and heterosis in 34 full-sib F₁ *Salix eriocephala* families. *Bioenerg. Res.* 1:80-90.

Purdy, J.J. and Smart, L.B. (2008) Hydroponic screening of shrub willow (*Salix* spp.) for arsenic tolerance and uptake. *Intl. J. Phytoremed.* 10:515-528.

Serapiglia, M.J., Cameron, K.D., Stipanovic, A.J., Smart, L.B. (2008) High-resolution thermogravimetric analysis for rapid characterization of biomass composition and selection of shrub willow varieties. *Appl. Biochem. Biotechnol.* 145:3-11.

- Smart, L.B., Cameron, K.D., Volk, T.A., and Abrahamson, L.P.** (2008) Breeding, selection, and testing of shrub willow as a dedicated energy crop. **NABC Report 19 Agricultural Biofuels: Technology, Sustainability, and Profitability**, National Agricultural Biotechnology Council, Ithaca, NY, pp. 85-92.
- Smart, L.B. and Cameron, K.D.** (2008) Genetic improvement of willow (*Salix* spp.) as a dedicated bioenergy crop. In Vermerris, W. E. (ed.) **Genetic Improvement of Bioenergy Crops**, Springer Science, NY, 347-376.
- Teece, M.A., Zengeya, T., Volk, T.A., and Smart, L.B.** (2008) Cuticular wax composition of *Salix* varieties in relation to biomass productivity. *Phytochemistry*, **69**:396-402.
- Kuzovkina, Y.A., Weih, M., Romero, M.A., Charles, J., Hurst, S., McIvor, I., Karp, A., Trybush, S, Labrecque, M., Teodorescu, T.I., Singh, N.B., Smart, L.B. and Volk, T.A.** (2008) *Salix*: Botany and Global Horticulture. *Horticultural Reviews*, Vol. 34, J. Janick (ed.), John Wiley & Sons, Inc., Hoboken, NJ, pp. 447-489.
- Lin, J., Gunter, L.E., Harding, S., Kopp, R.F., McCord, R.P., Tsai, C.-J., Tuskan, G.A., and Smart, L.B.** (2007) Development of AFLP and RAPD markers linked to a locus associated with twisted growth in corkscrew willow (*Salix matsudana* 'Tortuosa'). *Tree Physiol.*, **27**:1575-83.
- Volk, T.A., Abrahamson, L.P., Nowak, C.A., Smart, L.B., Tharakan, P.J., and White, E.H.** (2006) The development of short-rotation willow in the northeastern United States for bioenergy and bioproducts, agroforestry and phytoremediation. *Biomass Bioenerg.*, **30**:715-727.
- Cameron, K.D., Teece, M.A., and Smart, L.B.** (2006) Increased accumulation of cuticular wax and expression of lipid transfer protein in response to periodic drying in leaves of tree tobacco. *Plant Physiol.*, **140**:176-183.
- Cameron, K.D., Moskal, W.A., and Smart, L.B.** (2006) A second member of the *Nicotiana glauca* lipid transfer protein gene family, *NgLTP2*, encodes a divergent and differentially expressed protein. *Funct. Plant Biol.*, **33**:141-152.
- Smart, L.B., Volk, T.A., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., White, E.H. and Abrahamson, L.P.** (2005) Genetic improvement of shrub willow (*Salix* spp.) crops for bioenergy and environmental applications in the United States. *Unasylva*, **56**: 51-55.

Plant Patents: with co-inventors, L.P. Abrahamson, R.F. Kopp, and T.A. Volk:

Fast-growing willow shrub named 'Millbrook'. U.S. PP 17,646 issued April 24, 2007.

Fast-growing willow shrub named 'Oneida'. U.S. PP 17,682 issued May 1, 2007.

Fast-growing willow shrub named 'Fish Creek'. U.S. PP 17,710 issued May 8, 2007.

Fast-growing willow shrub named 'Canastota'. U.S. PP 17,724 issued May 15, 2007.

Fast-growing willow shrub named 'Owasco'. U.S. PP 17,845 issued July 3, 2007.

Fast-growing willow shrub named 'Tully Champion'. U.S. PP 17,946 issued Aug. 28, 2007.

Fast-growing willow shrub named 'Otisco'. U.S. PP 17,997 issued Sept. 11, 2007.

Synergistic Activities:

Teaching Activities:

Cornell University: PLBR4030 Genetic Improvement of Crop Plants

Graduate Student Training:

SUNY-ESF: Michelle Serapiglia (Ph.D., 2009), Emily Pulley (M.S., 2008), Dongqing Yan (M.P.S., 2007), Jason Purdy (M.S., 2006), Juan Lin (Ph.D. 2006), Todd Polanowicz (M.P.S. 2005), Ingrid Phillips (M.S. 2002), William Moskal, Jr. (M.S. 2002), Kimberly Cameron (Ph.D. 2001), Richard Kopp (Ph.D. 2000), Eriko Motegi (M.S. 2000), Nobutaka Kato (M.P.S. 1999)

Reviewer:

USDA-DOE Bioenergy Feedstock Genomics review panel, USDA-NRI Competitive Grants Program, USDA McIntire-Stennis Program, USDA-BARD Program, National Science Foundation, *Plant Physiology*, *Physiologia Plantarum*, *Plant Molecular Biology*, *Functional Plant Biology*, *International Journal of Plant Science*, *Trends in Plant Science*, *Journal of Plant Physiology*, *Tree Physiology*, *New Phytologist*, *Planta*, *Crop Science*, *BioEnergy Research*

University and Professional Service:

Editorial Board - BioEnergy Research; *Executive and Membership Comm.* - American Society of Plant Biologists (Oct. 2006-Sept. 2009); Institutional Biosafety Comm (SUNY-ESF); Radiation Safety Comm (SUNY-ESF); *Chair* - Lowe-Wilcox Graduate Scholarship Selection Comm (SUNY-ESF)

Professional Affiliations:

American Society of Plant Biologists; Japanese Society of Plant Physiologists, American Society for Horticultural Science, New York Flora Association, Botanical Society of America, New York Farm Bureau, New York Biomass Alliance, Short Rotation Woody Crops Operations Working Group