

Curriculum vitae
Lawrence B. Smart

Department of Horticulture
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Academic Background:

1992 **Doctor of Philosophy**, Genetics, Michigan State University, East Lansing, MI

1987 **Bachelor of Science with Distinction**, Biology, Cornell University, Ithaca, NY

Professional Background:

July 2009 - *present* **Associate Professor of Plant Breeding and Genetics**
Department of Horticulture
Joint Appointment: Dept. of Plant Breeding and Genetics
Cornell University
New York State Agricultural Experiment Station
Geneva, 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

June 2003 - Jan. 2004 **Visiting Fellow** (Sabbatical appointment)
Department of Plant Pathology
Cornell University
New York State Agricultural Experiment Station
Geneva, NY
Host: Harvey Hoch, Ph.D.

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

July 1996 - Aug. 1996 **Postdoctoral Research Scientist**
Department of Agronomy and Range Science

University of California, Davis
Research Advisor: Thea Wilkins, Ph.D.

Oct. 1992 - June 1996

**N.S.F. Postdoctoral Fellow in Plant Biology and
Postdoctoral Research Scientist**
Department of Vegetable Crops
University of California, Davis
Research Advisor: Alan Bennett, Ph.D.

Sept. 1987 - Oct. 1992

Graduate Research Assistant
Genetics Program / D.O.E.-Plant Research Laboratory
Michigan State University, East Lansing, MI
Research Advisor: Lee McIntosh, Ph.D.

Jan. 1987 - Aug. 1987

Research Technician
Department of Plant Pathology
Cornell University, Ithaca, NY
Project Director: Steven Beer, Ph.D.

Professional Affiliations:

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

Awards and Recognitions:

Nov. 2005	Promising Inventor Award, Research Foundation of SUNY
Oct. 1992 - Sept. 1995	N.S.F. Postdoctoral Fellowship in Plant Biology
March 1988	N.S.F. Graduate Fellowship-Honorable Mention
Sept. 1987 - Sept. 1991	Michigan Biotechnology Fellowship
Oct. 1983	Cornell University Roberts Scholar

Plant Patents:

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

Fast-growing willow shrub named 'Preble'. U.S. appl. 13/385,672. Canadian, EU Patents pending.
Fast-growing willow shrub named 'Otisco'. U.S. PP 17,997 issued Sept. 11, 2007.
Fast-growing willow shrub named 'Tully Champion'. U.S. PP 17,946 issued Aug. 28, 2007.
Fast-growing willow shrub named 'Owasco'. U.S. PP 17,845 issued July 3, 2007.
Fast-growing willow shrub named 'Canastota'. U.S. PP 17,724 issued May 15, 2007.
Fast-growing willow shrub named 'Fish Creek'. U.S. PP 17,710 issued May 8, 2007.
Fast-growing willow shrub named 'Oneida'. U.S. PP 17,682 issued May 1, 2007.
Fast-growing willow shrub named 'Millbrook'. U.S. PP 17,646 issued April 24, 2007.

Publications:

In preparation:

Lin, J., Gibbs, J.P., and Smart, L.B. Genetic characterization of the endangered sand dune willow, *Salix cordata* Michx.: Implications for conservation. (in revision).

Refereed:

Serapiglia, M.J., Humiston, M.C., Xu, H., Hogsett, D.A., Mira de Orduna, R., Stipanovic, A.J., and Smart, L.B. (2013) Enzymatic saccharification of shrub willow genotypes with differing biomass composition for biofuel production. *Front. Plant Sci.* 4. 25 March 2013, doi:10.3389/fpls.2013.00057

Serapiglia, M.J., Cameron, K.D., Stipanovic, A.J., Abrahamson, L.P., Volk, T.A., and Smart, L.B. (2012) Yield and woody biomass traits of novel shrub willow hybrids at two contrasting sites. *Bioenerg. Res.* DOI: 10.1007/s12155-012-9272-5.

Lee, S.J., Warnick, T.A., Pattathil, S., Alvelo-Maurosa, J.G., Serapiglia, M.J., McCormick, H., Brown, V., Young, N.F., Schnell, D.J., Smart, L.B., Hahn, M.G., Pedersen, J.F., Leschine, S.B., and Hazen, S.P. (2012) Biological conversion assay using *Clostridium phytofermentans* to estimate plant feedstock quality *Biotechnol. Biofuels*, 5:5, DOI: 10.1186/1754-6834-5-5.

Serapiglia, M.J., Cameron, K.D., Stipanovic, A.J., and Smart, L.B. (2012) Correlations of expression of cell wall biosynthesis genes with variation in biomass composition in shrub willow (*Salix* spp.) biomass crops. *Tree Genet. Genomes*, 8: 775-78.

Puckett, E.E., Serapiglia, M.J., Long, S., DeLeon, A.M., Minocha, R., and Smart, L.B. (2012) Differential expression of genes encoding phosphate transporters contributes to arsenic tolerance and accumulation in shrub willow (*Salix* spp.) *Environ. Exp. Bot.* 75:248-57.

Volk, T.A., Abrahamson, L.P., Cameron, K.D., Castellano, P., Corbin, T., Fabio, E., Johnson, G., Kuzovkina-Eischen, Y., Labrecque, M., Miller, R., Sidders, D., Smart, L.B., Staver, K., Stanosz, G.R., Van Rees, K. (2011) Yields of willow biomass crops across a range of sites in North America. *Aspect. Appl. Biol.* 112:67-74.

Gibbs, J.P., Smart, L.B., Newhouse, A.E., and Leopold, D.J. (2011) A molecular and fitness evaluation of commercially available versus locally collected blue lupine *Lupinus perennis* L. seeds for use in ecosystem restoration efforts. *Restor. Ecol.* DOI: 10.1111/j.1526-100X.2011.00809.x.

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.

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.

- 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.
- 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.
- 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.
- Serapiglia, M.J., Cameron, K.D., Stipanovic, A.J., and 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.
- 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 events 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.
- Cameron, K.D., Teece, M.A., Bevilacqua, E., and Smart, L.B.** (2002) Diversity of epicuticular wax composition among *Salix* species and *Populus* species hybrids. *Phytochemistry*, **60**:715-725.
- Kopp, R.F., Smart, L.B., Maynard, C.A., Tuskan, G.A., and Abrahamson, L.P.** (2002) Predicting within-family variability in juvenile height growth of *Salix* based upon similarity among parental AFLP fingerprints. *Theor. Appl. Genet.*, **105**:106-112.
- Kopp, R.F., Maynard, C.A., Rocha de Niella, P., Smart, L.B., and Abrahamson, L.P.** (2002) Collection and storage of pollen from *Salix* using organic solvents. *Amer. J. Bot.*, **89**:248-252.

- Kopp, R.F., Smart, L.B., Maynard, C.A., Isebrands, J.G., Tuskan, G.A., and Abrahamson, L.P.** (2001) The development of improved willow clones for eastern North America. *Forest Chron.*, **77**:287-292.
- Smart, L.B., Moskal, W.A., Cameron, K.D., and Bennett, A.B.** (2001) *MIP* genes are down-regulated under drought stress in *Nicotiana glauca*. *Plant Cell Physiol.*, **42**:686-693.
- Smart, L.B., Cameron, K.D., and Bennett, A.B.** (2000) Isolation of genes predominantly expressed in guard cells and epidermal cells of *Nicotiana glauca*. *Plant Mol. Biol.*, **42**:857-869.
- Smart, L.B., Nall, N.M., and Bennett, A.B.** (1999) Isolation of RNA and protein from guard cells of *Nicotiana glauca*. *Plant Mol. Biol. Rep.*, **17**: 371-383.
- Smart, L.B., Vojdani, F., Maeshima, M., and Wilkins, T.A.** (1998) Genes involved in osmoregulation during turgor-driven cell expansion of developing cotton fibers are differentially regulated. *Plant Physiol.*, **116**: 1539-1549.
- Hentzen, A.E., Smart, L.B., Wimmers, L.E., Fang, H.H., Schroeder, J.I., and Bennett, A.B.** (1996) Two plasma membrane H⁺-ATPase genes expressed in guard cells of *Vicia faba* are also expressed throughout the plant. *Plant Cell Physiol.*, **37**:650-659.
- Vassiliev, I.R., Jung, Y.-S., Smart, L.B., Schulz, R., McIntosh, L., and Golbeck, J.H.** (1995) A mixed-ligand iron-sulfur cluster (C556S_{PsaB} or C565S_{PsaB}) in the F_X-binding site leads to a decreased quantum efficiency of electron transfer in photosystem I. *Biophys. J.*, **69**:1544-1553.
- Yu, J., Smart, L.B., Jung, Y.-S., Golbeck, J., and McIntosh, L.** (1995) Absence of PsaC subunit allows assembly of photosystem I core but prevents the binding of PsaD and PsaE in *Synechocystis* sp. PCC 6803. *Plant Mol. Biol.*, **29**:331-342.
- Smart, L.B., Bowlby, N.R., Anderson, S.L., Sithole, I., and McIntosh, L.** (1994) Genetic manipulation of the cyanobacterium *Synechocystis* sp. PCC 6803: development of strains lacking photosystem I for the analysis of mutations in photosystem II. *Plant Physiol.*, **104**:349-354.
- Warren, P.V., Smart, L.B., McIntosh, L., and Golbeck, J.H.** (1993) Site-directed conversion of cysteine-565 to serine in PsaB of photosystem I results in the assembly of [3Fe-4S] and [4Fe-4S] clusters in F_X. A mixed-ligand [4Fe-4S] cluster is capable of electron transfer to F_A and F_B. *Biochemistry*, **32**:4411-4419.
- Smart, L.B., Warren, P.V., Golbeck, J.H., and McIntosh, L.** (1993) Mutational analysis of the structure and biogenesis of the photosystem I reaction center in the cyanobacterium *Synechocystis* sp. PCC 6803. *Proc. Natl. Acad. Sci. USA*, **90**:1132-1136.
- Smart, L.B. and McIntosh, L.** (1993) Genetic inactivation of the *psaB* gene in *Synechocystis* sp. PCC 6803 disrupts assembly of photosystem I. *Plant Mol. Biol.*, **21**:177-180.
- Smart, L.B., Anderson, S.L., and McIntosh, L.** (1991) Targeted genetic inactivation of the

photosystem I reaction center in the cyanobacterium *Synechocystis* sp. PCC 6803. *EMBO J.*, **10**:3289-3296.

Smart, L.B. and McIntosh, L. (1991) Expression of photosynthesis genes in the cyanobacterium *Synechocystis* sp. PCC 6803: *psaA-psaB* and *psbA* transcripts accumulate in dark-grown cells. *Plant Mol. Biol.*, **17**:959-971.

Vanneste, J.L., Smart, L.B., Zumoff, C.H., Yu, J., and Beer, S.V. (1990) Control of fire blight by *Erwinia herbicola* Eh252: Role of antibiotic production. *Acta Hortic.*, **273**:393-394.

Non-refereed:

Stanton, B.J., Smart, L.B., and Serapiglia, M.J. Domestication and Conservation of *Populus* and *Salix* Genetic Resources (Chap. 4). In: Richardson, J. and Isebrands, J.G. (eds.) *Poplars and Willows: Trees for Society and the Environment*. Food and Agriculture Organization, Rome, Italy. (in press).

Smart, L.B. and Cameron, K.D. (2012) Shrub willow. In Kole, C., Joshi, C. P., and Shonnard, D. R. (eds.) *Handbook of Bioenergy Crop Plants*, Taylor and Francis Group, Boca Raton, FL. pp. 687-708.

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, pp. 347-376.

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.

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.

Volk, T.A., Amidon, T.E., Abrahamson, L.P., Smart, L.B., White, E.H., and Daley, D. (2007) Environmental innovation: Growing willow biomass crops for renewable energy. *Clearwaters*, **37**:55.

Smart, L.B. (2006) "Shrub Willow Biomass Crops: Growing Energy on Underutilized Farmland", Invited Op Ed article with photo and web material, *Rochester Democrat and Chronicle*, Sept. 18, 2006.

Kopp, R.F., Smart, L.B., Maynard, C.A, Tuskan, G.T., and Abrahamson, L.P. (2001) Predicting within-family variability in juvenile height growth of *Salix* based upon similarity among parental AFLP fingerprints. In: Dean, J.F.D. (ed.) *Proceedings of the 26th Biennial Southern Forest Tree Improvement Conference*, June 26-29, 2001, Athens, GA, 112-118.

Kopp, R.F., Smart, L.B., Maynard, C.A, and Abrahamson, L.P. (2000) Willow Crop Development Center at SUNY-ESF. In: Makkonen, H.P., Stipanovich, A.J., and Winter,

W.T. (eds.) *Wood and Cellulose: Building blocks for chemicals, fuels, and advanced materials*. Proceedings of the 2nd Annual Partnerships in Environmental Improvement and Economic Development Conference, April 9-11, 2000, Syracuse, NY.

Smart, L.B. (1998) review of *Molecular Biology Made Simple and Fun*, Clark, D.P. and Russell, L.D., *Nat. Area J.*, **18**:91-92.

Wilkins, T.A. and Smart, L.B. (1996) Isolation of RNA from plant tissue. In Krieg, P.A. (ed.) *A Laboratory Guide to RNA: Isolation, Analysis, and Synthesis*. New York: Wiley-Liss, Inc., pp. 21-41.

Vassiliev, I.R., Jung, Y.-S., Schulz, R., Smart, L.B., McIntosh, L., and Golbeck, J.H. (1995) Electron transfer via the F_x cluster of PS I in PsaB mutants of *Synechocystis* sp. PCC 6803. *Photosynthesis: From Light to Biosphere*, vol. II, P. Mathis (ed.) Kluwer Academic Publishers, Dordrecht, The Netherlands, pp.131-134.

Schulz, R., Smart, L.B., Yu, J., and McIntosh, L. (1995) A new set of site-directed mutations in photosystem I core reaction center from *Synechocystis* sp. PCC 6803. *Photosynthesis: From Light to Biosphere*, vol. II, P. Mathis (ed.) Kluwer Academic Publishers, Dordrecht, The Netherlands, pp.119-122.

Warren, P.V., Smart, L.B., McIntosh, L., and Golbeck, J.H. (1992) Spectroscopic characterization of mutants in F_x and the proposed leucine zipper in photosystem I. *Research in Photosynthesis, Vol. I*, N. Murata (ed.), Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 573-576.

Extension Fact Sheets:

Smart, L.B., Rak, D., Salon, P. (2012) Willowpedia Fact Sheet: “Demonstrating Improved Yield of Shrub Willow Bioenergy Crops-Big Flats”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Smart, L.B., Capron, J., Rak, D., Wildman, R., and Wormuth, A.J. (2011) Willowpedia Fact Sheet: “Zone Tillage & GPS-Guided Planting of Shrub Willow Crop Varieties”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011) Willowpedia Fact Sheet: “Black Canker”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011) Willowpedia Fact Sheet: “*Botryosphaeria* Canker”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011) Willowpedia Fact Sheet: “Leucostoma Canker”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011)

Willowpedia Fact Sheet: “Leaf Rust”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011) Willowpedia Fact Sheet: “Willow Scab”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Kenaley, S.C., Hudler, G.W., Dailey O’Brien, D., Cameron, K.D. and Smart, L.B. (2011) Willowpedia Fact Sheet: “Powdery Mildew”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Cameron, K.D., Loeb, G.M., Abrahamson, L.P., White, C., and Smart, L.B. (2010) Willowpedia Fact Sheet: “Willow leaf beetles, *Calligrapha multipunctata* and *Plagiodera versicolora*”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Cameron, K.D., Loeb, G.M., Abrahamson, L.P., White, C., and Smart, L.B. (2010) Willowpedia Fact Sheet: “Potato leafhopper, *Empoasca fabae* Harris”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Cameron, K.D., Loeb, G.M., Abrahamson, L.P., White, C., and Smart, L.B. (2010) Willowpedia Fact Sheet: “Japanese beetle, *Popillia japonica* Newman”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Cameron, K.D., Loeb, G.M., Abrahamson, L.P., White, C., and Smart, L.B. (2010) Willowpedia Fact Sheet: “Willow sawfly, *Nematus ventralis* Say”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Smart, L.B., Cameron, K.D., Rak, D., Wrege, M. (2010) Willowpedia Fact Sheet: “Breeding and Commercialization of Shrub Willow Bioenergy Crops”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Smart, L.B., Cameron, K.D., Rak, D., Wrege, M. (2010) Willowpedia Fact Sheet: “Demonstrating Improved Yield of Shrub Willow Bioenergy Crops”, Cornell University, College of Agriculture and Life Sciences, Geneva, NY.

Buchholz, T., Volk, T.A., Abrahamson, L.P. and Smart, L.B. (2008) Fact sheet: “EcoWillow v 1.0 (Beta) – An Economic Analysis Tool for Willow Short-Rotation Coppice for Wood Chip Production”, SUNY College of Environmental Science and Forestry, Syracuse, NY.

Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P. (2007) Fact sheet: *Salix purpurea* ‘Allegany’, SUNY College of Environmental Science and Forestry, Syracuse, NY.

Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P. (2007) Fact sheet: *Salix purpurea* ‘Onondaga’, SUNY College of Environmental Science and Forestry, Syracuse, NY.

Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P. (2007) Fact sheet: *Salix miyabeana* ‘SX64’, SUNY College of Environmental Science and Forestry, Syracuse, NY.

- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix miyabeana* 'SX67', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix eriocephala* 'S25', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix caprea* hybrid 'S365', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix sachalinensis* 'SX61', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix x dasyclados* 'SV1', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix sachalinensis* x *S. miyabeana* 'Sherburne', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix purpurea* 'Fish Creek', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix purpurea* x *S. miyabeana* 'Millbrook', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix purpurea* x *S. miyabeana* 'Oneida', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix viminalis* x *S. miyabeana* 'Tully Champion', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix viminalis* x *S. miyabeana* 'Owasco', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix viminalis* x *S. miyabeana* 'Otisco', SUNY College of Environmental Science and Forestry, Syracuse, NY.
- Cameron, K.D., Smart, L.B., Volk, T.A., and Abrahamson, L.P.** (2007) Fact sheet: *Salix sachalinensis* x *S. miyabeana* 'Canastota', SUNY College of Environmental Science and Forestry, Syracuse, NY.

Web site:

Willowpedia: A Willow Energy Crop Information Resource at Cornell University.

<http://willow.cals.cornell.edu/> (last updated: 26 Feb 2013).

Research Presentations:

Smart, L.B., Gouker, F.E., Serapiglia, M.J., Town, C.D., Tang, H., Buckler, E.S., Elshire, R.J., Mitchell, S.E., DiFazio, S., Rodgers-Melnick, E., Tuskan, G.A., Carlson, J.E., Miller, R.O., Volk, T.A., and Fabio, E.S. “Development of genomic resources and novel species hybrids for the genetic improvement of shrub willow feedstock crops”, 2013 Genomic Science Annual Contractor-Grantee Meeting/USDA-DOE Plant Feedstock Genomics for Bioenergy Program Meeting, Feb. 24-27, 2013, Bethesda, MD. *Poster and short oral presentation.*

Smart, L.B. “Genomic approaches to improve yield and biofuels conversion efficiency of shrub willow”, Cornell University, Dept. of Plant Biology, Ithaca, NY, Feb. 1, 2013. *Invited departmental seminar.*

Smart, L.B. “Breeding shrub willow for improved yield and biofuels conversion efficiency”, Annual Meeting of NEERA1005 Multistate Research, Education, and Extension Project, Geneva, NY. Dec. 19, 2012. *Oral presentation.*

Smart, L.B. “Breeding shrub willow for improved yield and biofuels conversion efficiency”, Geneva, NY, Dec. 12, 2012. *Research Project Review for U.S. Dept. of Energy Program Managers.*

Smart, L.B. “Breeding shrub willow for improved yield and biofuels conversion efficiency”, Korea Forest Research Institute, Suwon, South Korea, Oct. 18, 2012. *Invited department seminar.*

Smart, L.B. “Breeding shrub willow as a sustainable feedstock crop for biofuel production”, *International Symposium on Forest Environments and Low Carbon Green Growth*, Thirtieth Anniversary Symposium of the College of Forest and Environmental Sciences, Kangwon National University, Chuncheon, South Korea, Oct. 16, 2012. *Invited plenary speaker.*

Smart, L.B., Serapiglia, M.J., Humiston, M.C., Xu, H., Hogsett, D.A., Mira de Orduña, R., and Stipanovic, A.J. “Variation in biomass composition and enzymatic saccharification for biofuel production among cultivars of shrub willow” Sun Grant Initiative National Conference, Oct. 4, 2012, New Orleans, LA. *Invited oral presentation.*

Smart, L.B., Gouker, F.E., Serapiglia, M.J., Town, C.D., Tang, H., Buckler, E.S., Elshire, R.J., Mitchell, S.E., DiFazio, S., Rodgers-Melnick, E., Tuskan, G.A., Carlson, J.E., Miller, R.O., Volk, T.A., and Fabio, E.S. “Development of genomic resources and novel species hybrids for the genetic improvement of shrub willow feedstock crops” Sun Grant Initiative National Conference, Oct. 3, 2012, New Orleans, LA. *Poster presentation.*

Smart, L.B. “Breeding shrub willow for improved yield and biofuels conversion efficiency”, Cornell University, Dept. of Biological and Environmental Engineering, Ithaca, NY, Sept. 20, 2012. *Invited departmental seminar.*

Smart, L.B. “Breeding and genetics of yield and biomass composition in shrub willow bioenergy crops”, NEWBio Coordinated Agricultural Project All-Hands Conference Call, Sept. 20, 2012. *Invited multi-institutional webinar.*

Smart, L.B., Serapiglia, M.J., Gouker, F.E., Town, C.D., Tang, H., Tuskan, G.A., Barry, K.W., Lindquist, E.A., Elshire, R.J., Mitchell, S.E., Buckler, E.S., DiFazio, S., and Rodgers-Melnick, E. “Genetic improvement of willow biomass crops: *Leaping forward!*” Penn State Bioenergy Symposium, Feb. 29, 2012, State College, PA. *Invited oral presentation.*

Smart, L.B., Serapiglia, M.J., Gouker, F.E., Town, C.D., Tang, H., Tuskan, G.A., Barry, K.W., Lindquist, E.A., Elshire, R.J., Mitchell, S.E., Buckler, E.S., DiFazio, S., and Rodgers-Melnick, E. “Next generation sequencing of the *Salix purpurea* L. genome and transcriptome: Tools for the genetic improvement of willow biomass crops”, International Plant and Animal Genome Conference (PAG-XX), Jan. 15, 2012, San Diego, CA. *Oral presentation.*

Smart, L.B., Serapiglia, M.J., Gouker, F.E., Town, C.D., Tang, H., Tuskan, G.A., Barry, K.W., Lindquist, E.A., “Next generation sequencing of the *Salix purpurea* L. genome and transcriptome: Comparisons with *Populus trichocarpa*”, Annual Meeting of the Poplar Council of Canada, Sept. 19, 2011, Edmonton, AB, Canada. *Oral presentation.*

Smart, L.B. “Breeding and genetics of yield and biomass composition in shrub willow bioenergy crops”, Dept. of Plant, Insect, and Soil Science, Univ. of Massachusetts, Amherst, MA, Feb. 2, 2011. *Invited departmental seminar.*

Smart, L.B. “Breeding, genomics, and commercialization of shrub willow bioenergy crops”, Annual Meeting of the American Society of Agronomy/Crop Science Society of America/Soil Science Society of America, Long Beach CA, Nov., 1, 2010. *Invited Symposium Talk.*

Cameron, K.D., Abrahamson, L.P., Volk, T.A., and Smart, L.B. “Selection of pest and disease resistance, high-yielding shrub willow (*Salix* spp.) for biomass production from novel species hybrid pedigrees”, 8th Biennial SRWC Operations Working Group: Short Rotation Woody Crops in a Renewable Energy Future, Syracuse, NY, Oct. 18, 2010. *Invited Symposium Talk.*

Serapiglia, M.J., Stipanovic, A.J., Cameron, K.D. and Smart, L.B. “Molecular Genetic Basis for Variation in Lignocellulosic Biomass Composition in Shrub Willow (*Salix* spp.) Bioenergy Crops”, 8th Biennial SRWC Operations Working Group: Short Rotation Woody Crops in a Renewable Energy Future, Syracuse, NY, Oct. 18, 2010. *Invited Symposium Talk.*

Cameron, K.D., White, C., Loeb, G.M., Abrahamson, L.P., and Smart, L.B. “Varietal susceptibility of shrub willows bred in Sweden and United Kingdom to potato leafhopper and other pests in the northeastern United States”, 8th Biennial SRWC Operations Working Group: Short Rotation Woody Crops in a Renewable Energy Future, Syracuse, NY, Oct. 17-19, 2010. *Poster presentation.*

Kenaley, S.C., Cameron, K.D., Hudler, G.W., and Smart, L.B. “Diversity of pathogenic fungi affecting shrub willows (*Salix* spp.) grown in short rotation biomass plantations in New York State”, 8th Biennial SRWC Operations Working Group: Short Rotation Woody Crops in a Renewable Energy Future, Syracuse, NY, Oct. 17-19, 2010. *Poster presentation.*

McCracken, A.R., Smart, L.B., Moore, P.J., Cameron, K.D. and Walsh, L. “Evaluation of *Salix* spp. Genotypes from European, Swedish, and American breeding programmes”, 8th Biennial SRWC Operations Working Group: Short Rotation Woody Crops in a Renewable Energy Future, Syracuse, NY, Oct. 17-19, 2010. *Poster Presentation.*

White, C., Cameron, K.D., Loeb, G.M., and Smart, L.B. Differential pest susceptibility of commercial shrub willow (*Salix* spp.) bioenergy crop varieties. Annual Meeting of the Northeast Section of the American Society of Plant Biologists, Adelphi University, April 16-17, 2010. *Poster presentation.*

Smart, L.B. “Breeding for improved yield and biomass composition in shrub willow bioenergy crops”, Dept. of Genetics and Biochemistry, Clemson University, March 26, 2010. *Invited departmental seminar.*

Smart, L.B. “Genetics, genomics, and breeding of shrub willow bioenergy crops”, Dept. of Plant Breeding and Genetics, Cornell University, March 16, 2010. *Invited departmental seminar.*

Serapiglia, M.J., Stipanovic, A.J., Cameron, K.D., and Smart, L.B. Molecular genetic basis for variation in lignocellulosic biomass composition in shrub willow (*Salix* spp.) bioenergy crops, Plant and Animal Genome XVIII, San Diego, CA. Jan. 9-13 2010. *Poster presentation.*

Smart, L.B. “Breeding of shrub willow bioenergy crops for improved yield”, Dept. of Horticultural Sciences, Cornell Lake Erie Research and Extension Lab, Portland, NY. Dec. 22, 2009. *Invited seminar.*

Serapiglia, M.J., Stipanovic, A.J., Cameron, K.D., and Smart, L.B. “Cloning and expression analysis of cell wall biosynthesis genes in willow”, *Salix* Molecular Breeding Activities (SAMBA) Workshop, Swedish Agricultural University, Uppsala, Sweden. Nov. 19, 2009. *Invited seminar.*

Smart, L.B. “Selecting for improved yield and biomass composition in shrub willow bioenergy crops”. Dept. of Biological and Environmental Engineering, Cornell University, Ithaca, NY. Oct. 15, 2009. *Invited departmental seminar.*

Smart, L.B. “Breeding of shrub willow bioenergy crops for improved yield”, Cornell Cooperative Extension In-Service Training Conference, Ithaca, NY. Oct. 10, 2009. *Invited workshop seminar.*

Smart, L.B. “Genetic improvement and commercialization of shrub willow bioenergy crops”. Dept. of Plant Pathology and Plant-Microbe Biology, Cornell University, NYS Agricultural Experiment Station, Geneva, NY. Sept. 29, 2009. *Invited departmental seminar.*

Smart, L.B. “Development of improved shrub willow bioenergy crops for North America”. World Bioenergy-Clean Fuels and Vehicles 2009. Stockholm, Sweden. Sept. 17, 2009. *Invited session talk.*

Smart, L.B. “Genetics of yield and biomass composition of shrub willow bioenergy crops for North America”. Dept. of Horticulture/Dept. of Plant Breeding and Genetics, Cornell University,

Ithaca, NY. Mar. 9, 2009. *Invited joint departmental seminar.*

Smart, L.B. “Genetics of yield and biomass composition of shrub willow bioenergy crops for North America”. Dept. of Horticultural Sciences, Cornell University, NYS Agricultural Experiment Station, Geneva, NY. Nov. 4, 2008. *Invited departmental seminar.*

Smart, L.B., Cameron, K.D., Serapiglia, M.J., Stipanovic, A.J., Volk, T.A., and Abrahamson L.P. “Genetics of yield and biomass composition of shrub willow bioenergy crops for North America”. Short Rotation Crops International Conference, Minneapolis, MN, August 19, 2008. *Invited oral presentation* (also session chair).

Pulley, E.E. and Smart, L.B. “Characterization of arsenic uptake under phosphorus sufficient and deficient conditions in shrub willow (*Salix* spp.) clones of differing As sensitivities”. Short Rotation Crops International Conference, Minneapolis, MN, August 18-22, 2008. *Poster presentation.*

Smart, L.B., Cameron, K.D., Serapiglia, M.J., Volk, T.A., and Abrahamson L.P. “Breeding, selection, and commercialization of shrub willow bioenergy crops in North America” Pan-American Congress on Plants and BioEnergy, Mérida, Mexico, June 25, 2008. *Invited mini-symposium talk* (also mini-symposium chair) and poster presentation.

Smart, L.B. “Genetic improvement of shrub willow for bioenergy in North America” Rothamsted Research, UK, June 3, 2008. *Invited unit seminar.*

Smart, L.B. “Genetics of shrub willow as a bioenergy crop and for phytoremediation”, Dept. of Biological and Environmental Engineering - Cornell University - April 29, 2008. *Invited departmental seminar.*

Smart, L.B. “Genetic improvement of shrub willow as a bioenergy crop for marginal ag land”, Dept. of Biology - SUNY Potsdam - March 12, 2008. *Invited departmental seminar.*

Smart, L.B. “Genetic improvement of shrub willow as a bioenergy crop”, Northeast SunGrant Meeting, Ithaca, NY, Nov. 13, 2007. *Invited oral presentation.*

Smart, L.B. “Development of fast-growing shrub willow as a bioenergy crop”. Dept. of Forestry - Michigan State University - Oct. 23, 2007. *Invited departmental seminar.*

Smart, L.B., Cameron, K.D., Serapiglia, M.J., Volk, T.A., and Abrahamson, L.P. “Breeding and selection of new fast-growing varieties of shrub willow for bioenergy, biofuels, and bioproducts”. Plant Biology and Bioenergy Symposium, University of Massachusetts, Amherst, MA, Oct. 13, 2007. *Poster presentation.*

Smart, L.B., Cameron, K.D., Serapiglia, M.J., Volk, T.A., and Abrahamson L.P. “Breeding and selection of new, high-yielding varieties of shrub willow for bioenergy, biofuels, and bioproducts” Annual Meeting of the American Society of Plant Biologists, July 8-13, 2007, Chicago, IL. *Invited Minisymposium talk* to over 500 in audience and poster presentation.

Smart, L.B., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. “Breeding, selection, and testing of shrub willow as a dedicated energy crop.” 19th Conference of the National Agricultural Biotechnology Council, Brookings, SD, May 22-24, 2007. *Invited platform presentation.*

Smart, L.B., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. “Breeding and Selection of New, High-Yielding Varieties of Shrub Willow for Bioenergy, Biofuels, and Bioproducts in North America.” EPOBIO2 Conference, Eretria Resort and Conference Center, Greece, May 14-17, 2007. *Invited poster presentation.*

Smart, L.B., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. “Selection and field testing of new high yield varieties of shrub willow for bioenergy, biofuels and bioproducts.” 29th Symposium on Biotechnology for Fuels and Chemicals. Denver, CO, April 29 – May 2, 2007. Poster presentation.

Smart, L.B. “Development of High-Yielding Varieties of Shrub Willow as a Dedicated Energy Crop.” Bioenergy Seminar Series - SUNY-ESF, Jan. 31, 2007. *Invited seminar.*

Smart, L.B., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. “Development of High-Yielding Varieties of Shrub Willow as a Dedicated Energy Crop.” The 2nd University of Connecticut Biofuels Symposium. Storrs, CT. Jan. 11, 2007 - *Invited plenary speaker.*

Smart, L.B., Cameron, K. D., Volk, T.A., Kopp, R.F. and Abrahamson, L.P. “Breeding, selection, testing and commercialization of high-yielding varieties of shrub willow for bioenergy, biofuels and bioproducts.” Short Rotation Woody Crops Operation Working Group 7th Biennial Meeting. Pasco, WA, Sept 25, 2006. Oral presentation.

Volk, T.A., Mirck, J., Purdy, J.J., Cameron, K.D., Smart, L.B., Daley, D., and Abrahamson, L.P. Screening and selection of willow clones for growth on Solvay process waste. Meeting of the International Poplar Commission Working Party in Environmental Applications of Poplar and Willow. May 17-20, 2006, Derry, N. Ireland, U.K. Oral Presentation.

Smart, L.B., Cameron, K.D., Kopp, R.F., Volk, T.A., and Abrahamson, L.P. Breeding, selection, testing, and commercialization of high-yielding varieties of shrub willow for bioenergy, biofuels, and bioproducts. 28th Symposium on Biotechnology for Fuels and Chemicals. April 30-May 3, 2006, Nashville, TN. Poster presentation.

Smart, L.B., Cameron, K.D., Lin, J., Volk, T.A., Kopp, R.F., Phillips, I.S., and Abrahamson, L.P. Breeding and Selection of High-Yielding Shrub Willow Crops in New York State. Meeting of the International Poplar Commission Working Parties in Environmental Applications, Diseases, and Production. May 24-31, 2005, Enköping, Sweden and Tartu, Estonia. *Invited oral presentation.*

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., Volk, T.A., White, E.H., and Abrahamson, L.P. Genetic Improvement of Shrub Willow (*Salix*) as a Dedicated Crop for Bioenergy, Biofuels, and Bioproducts 27th Symposium on Biotechnology for Fuels and Chemicals. May 1-4, 2005, Denver, CO. *Invited symposium talk.*

Smart, L.B. Genetic Improvement of Shrub Willow (*Salix*) Crops for Bioenergy, Biofuels, and Bioproducts. Cornell-ESF Dialog on Biobased Industries. March 29, 2005, Ithaca, NY. Oral presentation.

Smart, L.B. Genetic improvement of willow: Its’ not just for baskets anymore. Department of Plant

Biology, University of New Hampshire, Durham, NH; March 24, 2005; *Graduate student invited seminar speaker.*

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., Volk, T.A., White, E.H., and Abrahamson, L.P. Genetic improvement of shrub willow (*Salix*) crops for bioenergy and environmental applications. 22nd Session of the International Poplar Commission - The Contribution of Poplars and Willows to Sustainable Forestry and Rural Development, Nov. 28 - Dec. 4, 2004, Santiago, Chile; *Plenary Oral Presentation.*

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. Genetic improvement of shrub willow (*Salix*) crops for bioenergy, biofuels, and bioproducts. Syracuse Symposium on Environmental and Energy Systems, Syracuse, NY; Oct. 25-26, 2004; Poster presentation.

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. Genetic improvement of shrub willow (*Salix*) crops for bioenergy, biofuels, and bioproducts. Annual Meeting of the American Society of Plant Biologists, July 24-28, 2004, Lake Buena Vista, FL; Poster presentation.

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Cameron, K.D., Volk, T.A., and Abrahamson, L.P. Genetic improvement of shrub willow (*Salix*) crops for bioenergy, biofuels, and bioproducts. Annual Meeting of the Northeast Section of the American Society of Plant Biologists, June 4-5, 2004, Providence, RI; Poster presentation.

Smart, L.B., Lin, J., Kopp, R.F., Phillips, I.S., Volk, T.A., and Abrahamson, L.P. Genetic improvement of shrub willow (*Salix*) crops for bioenergy, biofuels, and bioproducts. Northeast Sun Grant Initiative Planning Meeting, Buffalo, NY, April 25-27, 2004; Poster presentation.

Smart, L.B. Genetic improvement of willow: It's not just for baskets anymore. Department of Plant Pathology, Cornell University, NYS Agricultural Experiment Station, Geneva, NY; Nov. 18, 2003; *Invited seminar.*

Smart, L.B., Moskal, W.A., Wayne, L., Jack, T.J., Eshed, Y., and Bowman, J.L. Characterization of genes associated with guard cell differentiation and function in *Arabidopsis thaliana*. Plant Genetics 2003: Mechanisms of Genetic Variation, Snowbird, UT, Oct. 22-26, 2003; Poster presentation.

Smart, L.B., Cameron, K.D., Teece, M.A., and Bevilacqua, E. Diversity of epicuticular wax among willow and hybrid poplar clones. Annual Meeting of the American Society of Plant Biologists, Denver, CO, Aug. 3-7, 2002; Poster presentation.

Brant, J.O. and Smart, L.B. Expression of members of the lipid transfer protein gene family in *Arabidopsis thaliana*. Annual Meeting of the American Society of Plant Biologists, Denver, CO, Aug. 3-7, 2002; Poster presentation.

Smart, L.B., Kopp, R.F., Phillips, I.S., Maynard, C.M., Isebrands, J.G., and Abrahamson, L.P. Willow Crop Development Center for the Northeast and North-central United States. *Invited seminars presented at:*

Beijing Forestry University, Beijing, China – Dec. 10, 2001
Chinese Academy of Forestry, Beijing, China – Dec. 10, 2001
Jiangsu Province Academy of Forestry, Nanjing, China – Dec. 12, 2001
Nanjing Forestry University, Nanjing, China – Dec. 13, 2001

Smart, L.B., Kopp, R.F., Phillips, I.S., Maynard, C.M., and Abrahamson, L.P. Willow Crop Development Center for the Northeast and North-central United States. Annual D.O.E. Bioenergy Feedstock Development Program Collaborators Meeting; Memphis, TN; Nov. 6-8 2001; Oral presentation.

Smart, L.B. Gene expression in the epidermis: Guard cell differentiation and drought tolerance. Plant Biology Seminar Series, Cornell University; March 30, 2001; *Invited seminar*.

Smart, L.B. Identification of genes involved in drought tolerance. Adaptive Peaks Seminar Series, Faculty of Environmental and Forest Biology, SUNY College of Environmental Science and Forestry, Syracuse, NY; Nov. 9, 2000; *Invited seminar*.

Smart, L.B., Kopp, R.F., Maynard, C.M., and Abrahamson, L.P. Willow Crop Development Center for the Northeast and North-central United States. Annual D.O.E. Bioenergy Feedstock Development Program Collaborators Meeting; Portland, OR; Sept. 2000; Oral presentation.

Smart, L.B., Kato, N., Smart, C.D., and Fry, W.E. Primary structure of the plasma membrane H⁺-ATPase from the oomycete, *Phytophthora infestans*, the causal agent of potato late blight. Annual Meeting of the American Society of Plant Physiologists; San Diego, CA; July 2000; Poster presentation.

Kopp, R.F., Smart, L.B., Abrahamson, L.P., and Maynard, C.M. Genetic improvement of *Salix* as a biomass energy feedstock. Annual Meeting of the Northeast Section of the American Society of Plant Physiologists; Storrs, CT; April 2000; Poster presentation.

Smart, L.B. Differentiation of the epidermis and response to drought stress. Biology Department, Binghamton University; March 31, 2000; *Invited seminar*.

Smart, L.B. Developing willows as a feedstock for bioenergy/biobased products. Ecology and Evolutionary Biology Group, Binghamton University; March 31, 2000; *Invited seminar*.

Smart, L.B., Moskal, W.A., Cameron, K.D., and Roth, J.M. Patterns of gene expression of putative aquaporin genes in guard cells and other tissues of *Nicotiana glauca*. Annual Meeting of the American Society of Plant Physiologists; Baltimore, MD; July 1999; Poster presentation.

Smart, L.B., Cameron, K.D., and Nall, N.M. The lipid transfer protein gene family and its role in plant response to drought stress. Annual Meeting of the American Society of Plant Physiologists; Baltimore, MD; July 1999; *Invited mini-symposium presentation*.

Smart, L.B., Moskal, W.A., Cameron, K.D., and Roth, J.M. Characterization of putative aquaporin genes expressed in guard cells of *Nicotiana glauca*. Annual Meeting of the Northeast Section of the American Society of Plant Physiologists; Durham, NH; April 1999;

Poster presentation.

Smart, L.B., Werner, N.A., and Hammerschmidt, R. A laboratory exercise demonstrating plant defense response. Annual Meeting of the American Society of Plant Physiologists; Vancouver, British Columbia, Canada; August 1997; Poster presentation.

Smart, L.B. and Bennett, A.B. Isolation and characterization of genes predominantly expressed in guard cells of *Nicotiana glauca*. Annual Meeting of the Northeast Section of the American Society of Plant Physiologists; Ithaca, NY; April 1997; Oral presentation.

Smart, L.B., Vojdani, F., Wan, C.-Y., Maeshima, M., and Wilkins, T.A. Regulation of genes involved in cell elongation during cotton (*Gossypium hirsutum*) fiber development. Annual Meeting of the American Society of Plant Physiologists; San Antonio, TX.; July 1996; Poster presentation.

Smart, L.B. and Bennett, A.B. Characterization of genes expressed predominantly in guard cells of *Nicotiana glauca*. Annual Meeting of the American Society of Plant Physiologists; San Antonio, TX; July 1996; Poster presentation.

Smart, L.B. and Bennett, A.B. Isolation of genes with specific or enhanced expression in guard cells of *Nicotiana glauca*. Annual Meeting of the American Society of Plant Physiologists; Charlotte, NC; July 1995; Oral presentation.

Smart, L.B., Hentzen, A.E., Wimmers, L.E., Schroeder, J.I., and Bennett, A.B. Molecular characterization of H⁺-ATPase genes expressed in guard cells of *Vicia faba*. Fourth International Congress of Plant Molecular Biology; Amsterdam, The Netherlands; June 1994; Poster presentation.

Smart, L.B., Warren, P.V., Golbeck, J.H., and McIntosh, L. Mutational analysis of the photosystem I core. Gordon Conference on Plant Molecular Biology; Proctor Academy, NH; June 1992; Poster presentation.

Smart, L.B., Anderson, S.L., and McIntosh, L. Directed mutagenesis of the photosystem I core. Third Int'l Congress of Plant Molecular Biology; Tucson, AZ; Oct. 1991; Poster presentation.

Smart, L.B., Anderson, S.L., and McIntosh, L. Directed mutagenesis of the *psaB* gene encoding a PS I reaction center polypeptide in *Synechocystis* 6803. Satellite conference "Molecular Biology of Photosynthesis"; Tempe, AZ; Oct. 1991; Oral presentation.

Smart, L.B. and McIntosh, L. Regulation of genes encoding PS I and PS II proteins in *Synechocystis* PCC 6803. Annual Meeting of the American Society of Plant Physiologists; Indianapolis, IN; July 1990; Oral presentation.

Smart, L.B. and McIntosh, L. Molecular cloning and expression of the *psaA* and *psaB* genes from *Synechocystis* 6803. The Third Molecular Biology of Cyanobacteria Workshop; Toronto, Ontario, Canada; July 1989; Poster presentation.

Extension, Public Service, and Continuing Education Presentations:

March 7, 2013 – Smart met with NIFA Director Sonny Ramaswamy in discussion of Cornell involvement in NIFA projects

Feb. 7, 2013 – Conference call with Robert McDonough of Celtic Energy Farm to discuss collaboration and integration with NEWBio activities (Richard, Jacobson, Smart, Fabio, McDonough)

Feb. 6, 2013 – Smart met with representatives of Southern Tier Biomass to discuss collaboration on NYSERDA proposal to study emissions from grass and willow pellets burned in biomass boiler

Newspaper article in Cornell Daily Sun on Jan. 23: “Shrub Willow: Building a Better Biofuel” - <http://cornellsun.com/node/54709>

Willowpedia Workshop “Farming Wood for Heat and Biofuels”, Geneva, NY, Dec. 18, 2012, Organized and hosted workshop with six invited speakers and 71 registered attendees, including harvesting equipment demonstration and tour of willow chip barn and boiler facility, 5 hours.

Agroforestry Field Day, USDA-NRCS Big Flats Plant Materials Center, Nov. 16, 2012. Field day tour stop at willow yield trial, spoke to ~50 attendees for 0.5 hours.

Sukkot Willow Dealers, Geneva, NY, Nov. 8, 2012 – field tour and survey of willow germplasm collection with Charlie Schwab and David Taplin, Jewish Sukkot willow stem dealers, for 2 hours.

Jiangsu Academy of Forestry Willow Researchers, Geneva and Fredonia, NY, Nov 1-3, 2012 – oral presentation, field tours, discussions, and planning of cooperative research and commercialization projects with three willow researchers for 18 hours.

Crawford County Farm Planning Meeting, Meadville, PA, Oct. 25, 2012 – discussion with Crawford County (PA) Supervisors, Ohio State Cooperative Extension, Penn State Cooperative Extension, and Cornell Cooperative Extension to plan demo plantings of perennial bioenergy crops on County Farm, discussion and field tour with group of 12 professionals for 2 hours.

Rondout Valley High School Educators, Geneva, NY, Sept. 21, 2012 – field tour, discussion and planning of educational outreach projects with four educators for 0.5 hours.

Ag Progress Days, Pennsylvania Furnace, PA, Aug. 14-15, 2012. Presented a display with Penn State collaborators on willow bioenergy crops and breeding in the Natural Resources Barn for two days. Interacted with ~200 attendees over the course of 12 hours. Also spoke on field tour of yield trial at the site, 0.5 hour each day with total of 40 attendees.

Perennial Biofeedstock Field Days, USDA-NRCS Big Flats Plant Materials Center, Aug. 10, 2012. Field day tour stop at willow yield trial, spoke to ~110 attendees for 0.5 hours.

Empire Farm Days, Seneca Falls, NY, Aug. 7-9, 2012. Presented a display with my program staff and students on willow bioenergy crops and breeding in the Cornell CALS Barn for all three

days. Interacted with over 300 attendees over the course of 23 hours.

Smart, L.B. “Genetic Improvement of Perennial Bioenergy Crops for Marginal Land”, Northeast Biofuels and Bioproducts Teacher Training Workshop, Ithaca, NY, June 13, 2012.

Smart, L.B. “Breeding Shrub Willow as a Sustainable Feedstock for Renewable Heat and Biofuels”, Cornell University Board of Trustees Committee on Government Relations, Ithaca, NY, May 25, 2012, *Invited speaker*.

CALS Local Food and Energy Fair, Nov. 17, 2011 - Mann Library - presented a willow bioenergy display with my graduate student, interacted with ~100 members of Cornell community over the course of 4 hours.

Fun on the Farm – Sept. 24, 2011 - Ontario County Farm Bureau - Presented willow bioenergy exhibit to ~200 local youth and community members over the course of 6 hours.

New York State Fair, Syracuse, NY, Aug. 27-28, 2011, Presented a display table on willow bioenergy crops and willow breeding in the Horticulture Building together with post-doc Michelle Serapiglia and colleagues from SUNY-ESF. Interacted with ~100 members of the public over the course of 12 hours.

Empire Farm Days, Seneca Falls, NY, Aug. 9-11, 2011. Presented a display with my program staff and students on willow bioenergy crops and breeding in the Cornell CALS Barn for all three days. Interacted with over 300 attendees over the course of 23 hours.

Perennial Biofeedstock Field Days, USDA-NRCS Big Flats Plant Materials Center, Aug. 3, 2011. Field day tour stop at willow yield trial, spoke to ~125 attendees for 0.5 hours.

Smart, L.B. “Willows and bioenergy”, Cornell alumni breakfast, Geneva, NY, Discussion with invited Cornell alumni, Oct. 23, 2010, 10 attendees, 0.5 hour, 5 contact hours.

Field visit, Groveland, NY, Sept. 9, 2010. Visited a commercial willow field with the ag consultant responsible for its management to discuss a willow disease problem. 5 hours.

New York State Fair, Syracuse, NY, Aug. 27-28, 2010, Presented a display table on willow bioenergy crops and willow breeding in the Horticulture Building together with post-doc Michelle Serapiglia and colleagues from SUNY-ESF. Interacted with ~120 members of the public over the course of 8 hours.

Smart, L.B. “Potential of willow crops to meet NYS bioenergy needs”, New York State legislative staff visit, Geneva, NY, Aug. 31, 2010. 5 attendees, 0.5 hours.

Empire Farm Days, Seneca Falls, NY, Aug. 10-12, 2010. Presented a display on willow bioenergy crops and breeding in the Cornell CALS Barn for all three days, as well as assisting with the field display of nursery partner, Double A Willow on Potato Digger Avenue. Interacted with 100 attendees for 0.25 hour each.

Smart, L.B. “Growing willow biomass as an additional source of landowner income”, New York State Woodsman’s Field Days, Boonville, NY, Aug. 20, 2010. 25 attendees, 1 hour.

Perennial Biofeedstock Field Days, USDA-NRCS Big Flats Plant Materials Center, July 28, 2010. Field day tour stop at willow yield trial, spoke to 150 attendees for 0.5 hours.

Smart, L.B. “Research and Extension on Shrub Willow Bioenergy Crops”, Cornell Cooperative Extension “Heating with Woody Biomass Workshop”, CCE of Tompkins County, Ithaca, NY, July 23, 2010.

Video Production, Future Farmers of America, Vernon-Verona-Sherrill High School, July 1, 2010. Assisted Ag Teacher Keith Schiebel and VVS students in the shooting of a feature story video for national FFA meeting.

Smart, L.B. “Bioenergy Crop Research at the NYS Agricultural Experiment Station”, CCE System-wide Webinar. June 15, 2010.

Smart, L.B. “Breeding for Yield and Biomass Composition of Shrub Willow Bioenergy Crops” Presentation to Business Development Specialist – CCE of Seneca County and president of R-Cubed LLC. Geneva, NY, May 12, 2010.

Smart, L.B. “Breeding and commercialization of shrub willow bioenergy crops”, Cornell University College of Agriculture and Life Sciences Alumni Association Board of Directors Tour, Geneva, NY, April 30, 2010. 20 attendees

Smart, L.B. “Heating Up Interest in Shrub Willow Bioenergy Crops”, Polycom presentation to CCE Energy Team, March 30, 2010.

Smart, L.B. “Breeding improved varieties of shrub willow bioenergy crops”, Cobleskill Ag and Energy Day, SUNY Cobleskill/CCE of Schoharie County, Cobleskill, NY, March 6, 2010. 30 attendees

Smart, L.B. “Heating up interest in shrub willow bioenergy crops”, New York State Agricultural Experiment Station Director’s Advisory Council, Geneva, NY, Feb. 4, 2010. *Keynote dinner speaker.* 50 attendees

New York Woodsmans Field Days, Boonville, NY - “How to make money growing willow” - Aug. 22, 2009 - audience of 20 loggers and landowners

Empire Farm Days – provided outreach support at Double A Willow exhibit - August 11-13, 2009

Perennial Bioenergy Feedstock Day – Field tour presentation – USDA Big Flats Plant Material Center – July 29, 2009 - 115 attendees

Presentation to representatives of Fulton Boiler and KWB Boilers - June 3, 2009 - NYS Ag Experiment Station, Geneva, NY

Smart, L.B. “Development of Fast-Growing Shrub Willow Crops for Heat, Power, and Biofuels” New York State Maple Producer’s Winter Conference, Vernon-Verona-Sherrill High School, Verona, NY, January 10, 2009. *Invited session speaker.*

New York State Fair – outreach exhibit in Horticulture Building - August 23-24, 2008

Empire Farm Days – provided outreach support at Double A Willow exhibit - August 5-7, 2008

Perennial Bioenergy Feedstock Day – Field tour – USDA Big Flats Plant Material Center – July 29, 2008 - 105 guests

Interview with Terry Ettinger for “Weeder’s Digest” on WSYR radio - March 20, 2008

Geneva League of Women Voters - “Development of Willow as a Dedicated Energy Crop” - Geneva, NY - Feb 5, 2008 - lay audience of ~35

New York State Fair – outreach exhibit in Horticulture Building - August 25-26, 2007

Empire Farm Days – outreach exhibit - August 7-9, 2007

Geneva Renewable Energy Group “Development of High-Yielding Varieties of Shrub Willow as a Dedicated Energy Crop.” Geneva, NY, March 4, 2007 - 30 guests

Finger Lakes Forum “Development of High-Yielding Varieties of Shrub Willow as a Dedicated Energy Crop.” Geneva, NY, Feb. 19, 2007 - 60 guests

New York State Fair – outreach exhibit in Horticulture Building - gave away >600 rooted willow cuttings - August 25-26, 2006

Empire Farm Days – outreach exhibit - gave away >200 rooted willow cuttings - August 8-10, 2006

New York State Fair – outreach exhibit in Horticulture Building - gave away >600 rooted willow cuttings - August 27-28, 2005

New York State Fair – outreach exhibit in Horticulture Building - gave away >300 rooted willow cuttings - August 28-29, 2004

New York State Fair – outreach exhibit in Horticulture Building - August 23-24, 2003

Mechanisms of Herbicide Action: The Utility Perspective

Five lectures on plant physiology delivered at workshop on herbicides for utility right-of-way management, SUNY-ESF, March 11-13, 2002 – 120 registrants

Workshops Attended:

U.S. DOE-E.C. Workshop on Sustainability of Biomass Production for Bioenergy. Univ. of Illinois, Oct. 25-26, 2011.

Cornell University College of Agriculture and Life Sciences Faculty Leadership Program, Trumansburg, NY, June 21-25, 2010.

Willow Identification Workshop, Dr. George Argus and New York Flora Association, Canton, NY, June 10-11, 2005.

Training Workshop “Measuring Photosynthesis Using the LI-6400” held at LI-COR, Inc., Lincoln, NE, April 9-10, 2002

Northeast Regional Workshop on USDA-CSREES Competitive Grants Program
Hotel Syracuse, Syracuse, NY, October 18, 2001

Grant Awards:

T.L. Richard, D.E. Ciolkosz, M. Jacobson, A. Kemanian, L.B. Smart, T.A. Volk, J. Wang, and others

“NEWBio: The Northeast Woody/Warm-season Biomass Consortium”
USDA-NIFA Sustainable Bioenergy Coordinated Agricultural Project
Total award: \$9.9 M (\$433,596 to Smart); Start date: 8/1/12; End date: 7/31/17

L.B. Smart, C.D. Town

“The Genomic Basis for Heterosis in High-Yielding Triploid Hybrids of Willow (*Salix* spp.)
Bioenergy Crops”
U.S. Dept. of Energy - Genomics of Plant Feedstocks for Bioenergy
Total award: \$1,365,673; Start date: 8/1/2012; End date: 7/31/2015

L.B. Smart, L.P. Abrahamson, J. Carlson, S. DiFazio, M. Jacobson, A. Kemanian, R. Miller, T. Richard, and T.A. Volk

“Genetic Improvement for Yield and Establishment of Short Rotation Woody Biomass Crops on Marginal Lands”
Northeast Sun Grant Institute - USDA-AFRI Regional Technology Partnership
Total award: \$946,412; Start date: 8/1/11; End date: 7/30/14

L.B. Smart

“Willow Biomass Boiler System”
New York Farm Viability Institute
Total award: \$15,000 (costshare for NYSERDA award of \$405,232 to T. Burr); Start date: 1/1/2011; End date: 3/31/2012

L.B. Smart, D.J. Aneshansley

“Evaluation and Optimization of a Small-Scale Harvesting System for Short-Rotation Willow Crops”
U.S.D.A. Hatch and Smith-Lever Programs
Total Award: \$73,500; Start date: 10/1/2010; End date: 9/30/2013

L.B. Smart, A. Stipanovic, S. Corgié, D. Hogsett

“Influence of Varietal Differences in Shrub Willow Crop Biomass Composition on Biochemical Conversion Yield”
Northeast Sun Grant Initiative
Total award: \$149,932; Start date: 6/15/2010; End date: 6/30/2012

L.B. Smart, L.P. Abrahamson, D. Rak

“Improved Establishment & Weed Management for Shrub Willow Bioenergy Crops”
New York Farm Viability Institute

Total award: \$50,000; Start date: 10/1/2009; End date: 9/30/2011 – FUNDING WITHDRAWN

L.B. Smart

“Regional Biomass Feedstock Partnership - Willow”

U.S. Dept. of Energy (subcontract from S.D. State University to Cornell University)

Total award: \$114,169; Start date: 7/1/2009; End date: 9/30/2013

T.A. Volk, L.P. Abrahamson, K.D. Cameron, and L.B. Smart

“Regional Biomass Feedstock Partnership - Willow”

U.S. Dept. of Energy (subcontract from S.D. State University to SUNY-ESF)

Total award: \$80,000; Start date: 1/1/2009; End date: 9/30/2010 (my task subcontracted to Cornell on 7/1/2009)

T.A. Volk, T.E. Amidon, C. Baier, T. Buchholz, R.H. Germain, M. Kelleher, V. Luzadis, R.W. Malmshemer, L.B. Smart

“Renewable Fuels Roadmap and Sustainable Biomass Feedstock Supply for New York”

New York State Energy Research and Development Authority (subcontract from Pace University)

Total award: \$110,007; Start date: 12/1/2008; End date: 11/30/2009

L.B. Smart, L.P. Abrahamson, C.A. Maynard, and T.A. Volk

“Applying Genomic Approaches to the Improvement of Shrub Willow Bioenergy Crops”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$58,720 (direct costs only), Start date: 8/15/2008; End date: 9/30/2010

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Developing Living Snowfences in New York”

New York State Department of Transportation

Total award: \$280,254, Start date: 8/1/2008; End date: 12/31/2011

A.J. Stipanovic, L.B. Smart, and W.T. Winter

“Purchase of a New Thermogravimetric Analyzer for Biomass Characterization”

U.S.D.A.-C.S.R.E.E.S. - National Research Initiative Competitive Grants Program

Total Award: \$50,000, Start date: 8/1/2008; End date: 7/31/2009

L.P. Abrahamson, L.B. Smart, and T.A. Volk

“Wood Biomass as an Alternative Farm Product”

U.S.D.A.-C.S.R.E.E.S.

Total award: \$133,459, Start date: 5/29/2008; End date: 5/1/2009

L.B. Smart, L.P. Abrahamson, and T.A. Volk

“Demonstrating Improved Yield and Encouraging Adoption of New Varieties of Fast-Growing Shrub Willow Bioenergy Crops”

New York Farm Viability Institute

Total award: \$125,000; Start date: 4/1/2008; End date: 9/30/2009

T.A. Volk, L.P. Abrahamson, L.B. Smart, and E.H. White

“Overcoming Barriers to Facilitate the Commercialization of Willow Biomass Crops as a Feedstock for Biofuels, Bioenergy, and Bioproducts”

U.S.D.A. Rural Development (U.S.D.A.-D.O.E. Joint Biomass Research & Development Program)

Total award: \$813,415, Start date: 11/8/2006; End date: 2/7/2010

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Reducing the cost of willow biomass by improving harvest system efficiency and reducing harvesting costs”

New York State Energy Research and Development Authority

Total award: \$126,688, Start date: 8/16/2006; End date: 6/30/2009

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Center of Excellence in Watershed Application and Technology - Willow Biomass Project”

New York City Department of Environmental Protection (subcontract from SUNY-Delhi)

Willow Biomass Task: \$384,615, Start date: 7/1/2006; End date: 6/30/2009

L.B. Smart, L.P. Abrahamson, and T.A. Volk

“Establishing a Commercial Willow Biomass Crop Nursery in New York State”

New York State Energy Research and Development Authority

I submitted proposals to PON737 (\$250,000) and PON936 (\$40,000) in cooperation with Double A Vineyards, Inc. NYSERDA awarded \$290,000 to Double A Vineyards with a subcontract to ESF.

Total subcontract award: \$80,000 Start date: 5/25/2006; End date: 5/24/2007

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Growing Willow Biomass Crops in the Tug Hill Region”

New York State Department of Agriculture and Markets

Total award: \$60,000, Start date: 5/8/2006, End date: 11/7/2007

J.P. Gibbs and L.B. Smart

“Bog Turtle Dispersal and Population Monitoring”

N.Y.S. Department of Environmental Conservation - Endangered Species Unit

Total award: \$155,000, Start date: 4/1/2006; End date: 3/31/2009

L.B. Smart, L.P. Abrahamson, and T.A. Volk

“Expanding Markets for Fast-growing Varieties of Shrub Willow”

New York State Office of Science, Technology, and Academic Research (NYSTAR)

Total award: \$200,000, Start date: 3/1/2006, End date: 8/31/2008

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Biomass Crops as a Source of Locally Produced Renewable Fuel in Northern New York”

New York State Energy Research and Development Authority (NYSERDA)

Total award: \$191,013, Start date: 1/11/2006, End date: 12/31/2008

J.P. Gibbs, D.J. Leopold, and L.B. Smart

“Determination of Lupine Variability and Implications for the Karner Blue Butterfly Management”

N.Y.S. Department of Environmental Conservation - Endangered Species Unit

Total award: \$80,000, Start date: 1/1/2006, End date: 12/31/2008

A.J. Stipanovic, K.D. Cameron, and L.B. Smart

“NMR and TGA Methods for Rapid Selection of Willow Varieties with Optimum Wood Properties”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$52,000 (direct costs only), Start date: 9/1/2005, End date: 8/31/2007

T.A. Volk, L.P. Abrahamson, and L.B. Smart

“Establishing a Willow Clone-Site Trial”

Jefferson Community College (subcontract of New York State grant)

Total award: \$25,955, Start date: 5/1/2005, End date: 4/30/2007

L.B. Smart, T.R. Horton, and T.A. Volk

“Breeding of Willow and Characterization of Microbial Associations for the Remediation of Contaminated Soils”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$75,169 (direct costs only), Start date: 8/30/2004, End date: 9/30/2007

L.B. Smart, L.P. Abrahamson and T.A. Volk

“Establishing Commercial Willow Biomass Crop Nurseries in New York State”

New York State Energy Research and Development Authority (NYSERDA)

Total award: \$40,000, Start date: 7/26/2004, End date: 7/31/2005

L.B. Smart, L.P. Abrahamson, and T.A. Volk

“Genetic Improvement of Willow”

U.S. Department of the Interior / U.S. Forest Service

Total award: \$210,000, Start date: 4/1/2004, End date: 3/31/2007

L.B. Smart

“Acquisition of a Quantitative, Real-Time PCR System to Study Expression of Guard-Cell-Specific Genes and for Quantitative Sequence Detection”

U.S.D.A.-C.S.R.E.E.S. National Research Initiative Competitive Grants Program

Total award: \$23,152, Start date: 8/1/2003, End date: 7/31/2004

L.B. Smart

“Characterization of Genes Associated with Differentiation and Function of Guard Cells”

U.S.D.A.-C.S.R.E.E.S. National Research Initiative Competitive Grants Program

Total award: \$128,450, Start date: 9/1/2002, End date: 8/31/2005

L.B. Smart

“Training in the use of the LI-COR LI-6400 for measurement of photosynthesis”

N.Y.S./United University Professionals Professional Development-Quality of Worklife-Individual Development Awards

Total award: \$275, Start date: 4/8/2002, End date: 4/11/2002

M.A. Teece and L.B. Smart

“Stable Isotope and Chemical Analysis of Leaf Properties Associated with Drought Tolerance in Willow Clones”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$76,440 (direct costs only), Start date: 10/1/2001, End date: 9/30/2004

L.B. Smart and J.P. Gibbs

“Assessment of the Genetic Diversity and Heterozygosity of Potential Sources of Biomass Willow Stock in the Northeast and Northcentral United States”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$76,540 (direct costs only), Start date: 10/1/2000, End date: 9/30/2004

L.B. Smart, L.P. Abrahamson, R.F. Kopp, and C.A. Maynard

“Willow Crop Development Center for the Northeast and North-central U.S.”

New York State Energy Research and Development Authority (NYSERDA)

Total award: \$50,000, Start date: 6/20/2000, End date: 6/19/2003

L.B. Smart, L.P. Abrahamson, R.F. Kopp, and C.A. Maynard

“Willow Crop Development Center for the Northeast and North-central U.S.”

U.S. Dept. of Energy - Oak Ridge National Lab, Bioenergy Feedstock Development Program

Total award: \$215,156, Start date: 6/15/2000, End date: 3/15/2003

L.B. Smart

“Cloning of guard cell specific genes by enhancer trap tagging”

U.S.D.A.-C.S.R.E.E.S. National Research Initiative Competitive Grants Program

Total award: \$50,000, Start date: 9/15/1999, End date: 9/14/2002

L.B. Smart

“Development of digital images for teaching and research in physiology”

N.Y.S./United University Professionals Professional Development-Quality of Worklife-Individual Development Awards

Total award: \$300.00, Start date: 8/24/1998, End date: 5/15/1999

L.B. Smart

“Characterization of Facilitated Water Flux Across Guard Cell Membranes: Analysis of Cell-Specific Patterns of Aquaporin Gene Expression”

N.Y.S./United University Professionals Professional Development-Quality of Worklife-Individual Development Awards

Total award: \$800, Start date: 5/18/1998, End date: 8/15/1998

L.B. Smart and W.A. Powell

“Engineering Increased Cuticle Deposition in Transgenic Hybrid Poplar”

U.S.D.A.-C.S.R.E.E.S. McIntire-Stennis Program

Total award: \$78,131 (direct costs only), Start date: 6/1/1997, End date: 9/30/2001

Student/Scientist Training:

Post-Doctoral Researchers:

Michelle Serapiglia, Ph.D. Post-doctoral Associate - Cornell University (Jan. 2010 - *present*)

Kimberly Cameron, Ph.D. Research Associate - Cornell University (July 2009 - March 2011)
Sr. Research Scientist - SUNY-ESF (April 2004 - June 2009)

Richard Kopp, Ph.D. Research Scientist - SUNY-ESF (Nov. 2000 - June 2002)
current position: Research Associate, SUNY Upstate Medical University, Syracuse, NY

Graduate Students (Cornell University):

Eric Fabio Ph.D. candidate, Field of Horticulture, started Jan. 2013.

Fred Gouker Ph.D. candidate, Field of Plant Breeding, started Aug. 2010.

Graduate Students (Graduated - SUNY-ESF):

Michelle Serapiglia Ph.D. Nov. 2009 (co-major professor with Art Stipanovic)
“Variation in Biomass Composition and Regulation of Lignocellulosic
Deposition in Shrub Willow (*Salix* spp.) Bioenergy Crops”
current position: Post-doctoral Associate, Cornell University, Dept. of
Horticulture, New York State Agricultural Experiment Station, Geneva, NY

Emily Pulley M.S., July 2008
“Molecular Basis for Differential Uptake and Sensitivity to Arsenic Among
Clones of Shrub Willow”
current position: Ph.D. Student, Univ. of Missouri – Columbia

Dongqing Yan M.P.S., Aug. 2007
current position: Ph.D. student, Upstate Medical University, Syracuse, NY

Jason Purdy M.S., July 2006
“Assessing the Potential of Shrub Willow (*Salix* spp.) and the Role of Fungal
Symbioses in Phytoremediation Applications”
current position: Environmental Scientist, Loureiro Engineering Associates,
Inc., Plainville, CT

Juan Lin Ph.D., June 2006
“Molecular Analysis and Assessment of the Genetic Diversity of Native and
Naturalized Shrub Willows”
current position: Research Associate, Department of Epidemiology &
Population Health, Albert Einstein College of Medicine, Bronx, NY

Todd Polanowicz M.P.S., May 2005
current position: Product Development Program Manager, Philips, Andover,
MA

Ingrid Phillips M.S., Dec. 2002 (Co-major professor with C. Maynard)
“Quantitative Genetics of Traits Predictive of Biomass Yield in First- and
Second-Generation *Salix eriocephala*”
current position: Research Support Specialist, Cornell University

William Moskal, Jr. M.S., July 2002
“Isolation of Guard-Cell-Specific Genes by Enhancer Trap Tagging in
Arabidopsis thaliana”
current position: Research Associate, Dow AgroSciences, Indianapolis, IN

Kimberly Cameron Ph.D., June 2001

“Chemical Analysis of Epicuticular Wax and the Role of Lipid Transfer Protein in Wax Deposition”

current position: educational consultant, Tully, NY

Richard Kopp Ph.D., Nov. 2000 (Co-major professor with L. Abrahamson)
“Genetic Improvement of *Salix* Using Traditional Breeding and AFLP Fingerprinting”
current position: Research Associate, SUNY Upstate Medical University, Syracuse, NY

Eriko Motegi M.S., Aug. 2000 (Co-major professor with J. Gibbs)
“Genetic Diversity of Sugar Maple (*Acer saccharum*) Populations in Relation to Stand Disturbance History”
current position: Instructor, Corning Community College, Corning, NY

Nobutaka Kato M.P.S., Sept. 1999 (Co-major professor with T. Donovan)
current position: Postdoctoral Fellow, Scripps Research Inst., LaJolla, CA

I have served on the graduate steering committees of over 25 other SUNY-ESF and Syracuse University students since 1996.

Professional Staff/Interns/Visiting Scholar:

Jun-Ya Wei Visiting Scholar, Chinese Academy of Tropical Agricultural Science, Danzhou City, China - April 2013 - March 2014

Jane Lam Northeast Biofuels and Bioproducts Educational Intern - (Middle School Science Teacher, David A. Boody Intermediate School, Brooklyn, NY) - Summer 2012

James Capron Temp Research Support Specialist - April 2011 - May 2012

Erich Sussin Northeast Biofuels and Bioproducts Educational Intern - (Biology and Environmental Science Teacher, Ward-Melville High School) - Summer 2011

Chul-Woo Kim Visiting Scholar (SUNY-ESF), Ph.D. candidate, Kangwon National University, Chuncheon, S. Korea – Jan – Feb 2007

Undergraduate Student Researchers:

Undergraduate Honors Program (SUNY-ESF):

Alyssa DeLeon Honors Thesis May 2009
“Molecular Analysis of Genes Related to Arsenic Uptake and Detoxification in Sensitive and Tolerant Varieties of Shrub Willow (*Salix* spp.)”
current position: Ph.D. student, Purdue University

Laura Wayne Honors Thesis May 2006
“Isolation and Characterization of a Guard-Cell-Associated Enhancer Trap Line of *Arabidopsis thaliana*”

current position: Research Scientist, Dow Agrosciences

Independent Researchers, Undergraduate Interns, College Work-Study Employees, and paid Research Project Aides

Cornell University

Lauren Fraizer - 2013 Cornell Cooperative Extension Intern (Cornell, class of 2015)
Kavya Krishnan - 2013 NEWBio Summer Research Scholar (SUNY-ESF, class of 2014)
Jon Mahoney - 2013 Summer Research Scholar (Iowa State, class of 2104)
Aaron Palmieri - 2013 summer research aide
Rebecca Chase - Winter session 2013 Research Intern, 2013 summer research aide (Keuka College, class of 2016)
Andrew TenEyck – 2013 winter break and summer research aide (SUNY Brockport, class of 2014)
Cody Lafler - 2012 summer research aide (SUNY-ESF, class of 2014)
Jane Petzoldt - 2012 Summer Research Scholar, 2013 summer research aide (Wesleyan College, class of 2013)
Kayleigh Hogan - 2009 and 2010 summer research aide, 2012 Summer Research Scholar (Univ. of Rochester, class of 2012)
Jeffrey Springmeier - 2010, 2012, and 2013 summer research aide, 2011 Summer Research Scholar (Penn State Univ., class of 2013)
Michael Rosato - Academic year 2011-2012 - Research aide (Finger Lakes Comm. College, class of 2012; Hobart College, class of 2014)
Casey Call - 2011 Summer Research Scholar and Ag Sciences Intern (Cornell University, class of 2012)
Cullen White - 2009 HWS Rickey Scholar, 2010 and 2011 summer research aide (Hobart College, class of 2011)
Samantha Fuller - 2010 summer research intern, 2010-11 Independent Research Project (Cornell University, class of 2012)
Roxanne Li - 2010 summer CCE intern, 2010-2011 research aide (Cornell University, class of 2012)
Peter Purdy - 2009 summer research aide (SUNY Morrisville College, class of 2010)

SUNY-ESF

Gabe Kellman, class of 2011	Steve Letkowski, M.S. 2009
Mark Jackling, class of 2011	Derek Proulx, B.S. 2009
Andrew Dimezza, class of 2010	Hajime Akada, B.S. 2008
Amy Fox, class of 2010	Charles Curry, B.S. 2008
Samantha Holcomb, class of 2010	Celia Dubin, B.S. 2008
Leticia Izquierdo, class of 2010	Shaunna Escobar, B.S. 2008
Jason Maurer, class of 2010	Charles Fouch, B.S. 2008
Matthew Oliver, class of 2010	Adam Robadee, B.S. 2008
Molly Payne, class of 2010	Edward Rowe, B.S. 2008
Chelsea Sheridan, class of 2010	Andrew Schneider, B.S. 2008
Craig Tompkins, class of 2010	Thomas Burchhardt, B.S. 2007
Susan Carlton, B.S. 2009	Kathleen Pitcher, B.S. 2007
Robert Collignon, B.S. 2009	Irony Sade, B.S. 2007
Alyssa DeLeon, B.S. 2009	Jon Tarasiewicz, B.S. 2007
<i>ASPB SURF Awardee</i>	Maxwell Wightman, B.S. 2007
Lindsay Gedacht, B.S. 2009	Michael Fenton, B.S. 2006
Saeko Hamada, B.S. 2009	Jason Oliver, B.S. 2006

Michael Johnson, B.S. 2006
Laura Wayne, B.S. 2006
 ASPB SURF Awardee
Steven McElwain
Robert Justin Wright
Howard Fung
Jeffrey Villari, B.S. 2005
Daniel Clune, B.S. 2003
Norman Dart, B.S. 2003
William Shaw, B.S. 2003
Jeremy Bovay, B.S. 2002
Jason Brant, B.S. 2002
Jason Corwin, B.S. 2002
Michelle Decker, B.S. 2002
Kathleen Deyle, B.S. 2002
Caron Gala, B.S. 2002

Peter Greeno, B.S. 2002
Emily Mooney, B.S. 2002
Justin Lind, B.S. 2002
Leif Lovig, B.S. 2002
Nick Boyea, B.S. 2001
Rita Parsons, B.S. 2001
Jessica Carrero, B.S. 2000
Edward Ditommaso, B.S. 2000
William Moskal, B.S. 2000
Samantha Callender, B.S. 1999
Todd Castoe, B.S. 1999
Steve Desimone, B.S. 1999
Christina Thompson, B.S. 1999
Nicole Nall, B.S. 1998
Jeffrey Roth, B.S. 1998
Nicole Werner, B.S. 1998

High School Student Researchers:

Cornell University

Nicholas Kochan, Skaneateles H.S., class of 2013

SUNY-ESF

Alyson Waring, Sandy Creek H.S., class of 2008
Amanda Clark, Skaneateles H.S., class of 2007
Andrew Middleton, Skaneateles H.S., class of 2007
Kay Leopold, Christian Brothers Academy, class of 2004
Kaitlin Corona, Skaneateles H.S., class of 2003
Laura Wayne, Skaneateles H.S., class of 2003
Jennifer Musial, Oneida H.S., class of 1999
Deepa Popuri, Oneida H.S., class of 1998

Teaching Experience:

Regular course instruction (Cornell University):

Fall 2010-12 PLBR4030 Genetic Improvement of Crop Plants (3 credits, enrollment=19-24)

Regular course instruction (SUNY-ESF):

Fall 1997-2002 EFB325 Cell Physiology (3 credits, avg. enrollment = 95)
and Fall 2004-2008

Spring 1997-2009 EFB530 Plant Physiology Lecture (3 credits, avg. enrollment = 20)
 EFB531 Plant Physiology Lab (2 credits, avg. enrollment = 8)

Spring 2004-2009 BTC499 Senior Synthesis in Biotechnology (1 credit, avg. enrollment = 15)

Periodic course instruction:

Summer 2012	Guest lecturer/field trip leader PLPA 4190/ENTOM 4190 Agricultural Application of Plant Health Concepts: Diseases and Pests of New York Crops
Spring 2012	Guest lecturer AGSCI4010 Ag Sciences Seminar
Spring 2012, 2013	Guest lecturer BEE6940 Bioenergy Production on Marginal Lands
Spring 2012, 2013	Guest lecturer BEE6940 Bioenergy Production on Marginal Lands
Spring 2011-2013	Guest lecturer HORT1115 The Nature of Plants
Spring 2011	Guest lecturer NTRES4940 Solid Biofuels and Sustainability Options for Cornell
Fall 2010-2012	Guest lecturer PLBR2010 Plants, Genes, and Global Food Production
Fall 2009-2012	Guest lecturer PLBR4060 Methods of Plant Breeding Laboratory, Cornell University
Fall 2006	Instructor BTC132 Orientation to Biotechnology, SUNY-ESF
Fall 1997, 2000, and 2007	Instructor EFB797 Graduate Seminar in Plant Physiology & Genetics, SUNY-ESF
Spring 2000	Guest lecturer EFB427/627 Plant Developmental Biology, SUNY-ESF
Fall 1998-2001 Fall 2004-2005	Guest lecturer EFB132 Orientation Seminar, SUNY-ESF
Spring 1998-2000 Fall 2001, Spr 2005	Instructor EFB733 Techniques in Plant Physiology, SUNY-ESF
Spring 1998	Instructor EFB496 Undergraduate Research Seminar, SUNY-ESF
Fall 1996	Instructor (team taught) EFB325 Cell Physiology, SUNY-ESF
Spring 1990	Graduate Teaching Assistant

Intro Plant Physiology, Michigan State University

Fall 1989 Graduate Teaching Assistant
General Genetics, Michigan State University

Spring 1986 Undergraduate Teaching Assistant
Intro Plant Breeding, Cornell University

Undergraduate Teaching Assistants Supervised (SUNY-ESF, EFB325 Cell Physiology, EFB530/531 Plant Physiology):

Jennifer Lillie (Fall 2008)
Tyler Hoffman (Fall 2007)
Nickolas Kohl (Fall 2006)
Lisa Krause (Fall 2005)
Christina Hazard (Fall 2002)
Alena Marr (Spring 2002)
Leif Lovig (Fall 2001)
Benjamin Gillen (Fall 2001)
Jessica Veeder (Fall 2000)
Scott Lewins (Fall 1999)
Nicole Nall (Fall 1998)
Jeffrey Roth (Fall 1997)

Departmental Administrative Service (SUNY-ESF):

2002 - 2009 Supervisor of Ms. Bridget McMaster, Instructional Support Specialist, Environmental and Forest Biology, SUNY-ESF

Departmental, College, and Professional Service:

Jan. 2013 - *present* Subject Editor, *Global Change Biology-Bioenergy*
Feb. 2013 - *present* NYSAES Field Research Unit Advisory Committee, Cornell University
Nov. 2010 - *present* Executive Committee, Dept. of Horticulture, Cornell University
May 2012 - *present* Plant Sciences Reorganization Special Committee, CALS, Cornell University
Dec. 2007 – Dec. 2012 Editorial Board, *BioEnergy Research*
May 2011 - Aug. 2011 Ad hoc Committee on Sustaining Applied Research and Extension in CALS, Cornell University
Feb. 2011 Advisory Selection Committee, USDA-ARS Research Geneticist Position, Grape Genetics Research Unit, Geneva, NY
July 2010 - Nov. 2010 Strategic Curriculum Planning Committee, Dept. of Plant Breeding and Genetics, Cornell University
April 2010 Grant Review Panel, USDA-DOE Feedstock Genomics Program
Feb. 2010 - June 2010 Undergraduate Research Program Committee, NYS Agricultural Experiment Station, Cornell University
Feb. 2010 - Apr. 2010 Dept. of Horticulture Merger Planning Committee, Cornell University
Oct. 2009 - May 2010 Steering Committee, Environmental Pollution Conference, Univ.

	of Massachusetts-Amherst
Oct. 2006 - Sept. 2009	Executive Committee and Membership Committee (Northeast Section Representative), American Society of Plant Biologists
June 2003 - Sept. 2009	Executive Committee, Northeast Section, American Society of Plant Biologists (<i>Chair and Annual Meeting host in 2007</i>)
Aug. 1999 - May 2009	Institutional Biosafety Committee, SUNY-ESF
Jan. 1997 - May 2009	Lowe-Wilcox Scholarship Selection Committee (<i>Chair 1999-2009</i>), EFB, SUNY-ESF
Sept. 1997 - May 2009	Radiation Safety Committee, SUNY-ESF
Sept. 2007 - Feb. 2009	Curriculum & Course Assessment Committee, EFB, SUNY-ESF
Nov. 2006 - May 2007	Search Committee (Chair), Asst. Professor in Diseases of Fish and Wildlife, SUNY-ESF
July 2004 - June 2007	Faculty Committee on Instruction, SUNY-ESF (Chair, July 2005 - June 2007)
June 2005 - June 2006	Executive Committee, Structural Biology, Biochemistry, and Biophysics (SB ³) Program, SUNY-ESF/Syracuse University/SUNY Upstate Medical University
Dec. 2003 - Jan. 2005	Search Committee, Asst. Professor of Biochemistry, Chemistry, SUNY-ESF
Oct. 2002 - Dec. 2002	Ad Hoc Positions Committee (Chair), EFB, SUNY-ESF
April 2002 - Sept. 2002	Biotechnology Research Center Building Planning Committee, SUNY-ESF/SUNY Upstate Medical University
Jan. 2002 - May 2005	Graduate Admissions Committee, Structural Biology, Biochemistry, and Biophysics (SB ³) Program, SUNY-ESF/Syracuse University/SUNY Upstate Medical University
Oct. 2001 - May 2006	Building and Equipment Advisory Team (Chair), EFB, SUNY-ESF
Oct. 2000 - June 2005	Initiative on Research and Graduate Strategy Committee, SUNY-ESF
Oct. 2000 - May 2001	Middle States Association Accreditation Subcommittee on Faculty, Administration and Staff, and the Board of Trustees, SUNY-ESF
Aug. 2000 - Oct. 2000	Information Technology Instruction Task Force, SUNY-ESF
Jan. 2000 - June 2000	Search Committee, Assistant for Instructional Resources, Instructional Development, Evaluation, and Services, SUNY-ESF
April 1999 - April 2001	Executive Committee, Northeast Section, American Society of Plant Biologists
Sept. 1998 - Mar. 1999	Search Committee, Asst. Professor of Plant Developmental Biology, EFB, SUNY-ESF
Jan. 1998 - July 1998	Search Committee, Asst. Professor of Fisheries Biology, EFB, SUNY-ESF
Oct. 1997 - March 1998	Search Committee (Chair), Instructional Support Specialist (Electronics Tech), Analytical and Technical Services, SUNY-ESF
Sept. 1997 - May 2002	Curriculum & Course Assessment Committee, EFB, SUNY-ESF
Sept. 1997 - May 2000	Faculty Advisor, Graduate Student Association, SUNY-ESF
Sept. 1997 - May 1999	Faculty Committee on Research, SUNY-ESF
Sept. 1991 - Sept. 1992	Faculty Committee Representative, D.O.E.-Plant Research Lab, Michigan State University
Sept. 1990 - Sept. 1991	Admissions Committee, D.O.E.-Plant Research Lab, Michigan

Sept. 1989 - Sept. 1991 State University
Admissions Committee, Genetics Program, Michigan State
University
Sept. 1988 - Sept. 1989 Seminar Committee, D.O.E.-Plant Research Lab, Michigan State
University

Periodic Reviewer for:

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BARD Program
BioEnergy Research
Biomass and Bioenergy
BMC Plant Biology
Consortium for Plant Biotechnology Research
Crop Science
Environmental Pollution
Functional Plant Biology
Global Change Biology-Bioenergy
Industrial Crops and Products
International Journal of Plant Science
Journal of Experimental Botany
Journal of Hazardous Materials
Journal of the Torrey Botanical Society
Journal of Plant Pathology
Journal of Plant Physiology
Murdock Trust
National Science Foundation
New Phytologist
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Plant Molecular Biology
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Tree Genetics and Genomes
Tree Physiology
Trends in Plant Science
USDA Hatch Program
USDA McIntire-Stennis Program
USDA-NRI Competitive Grants Program