

***Curriculum vitae***  
**Lawrence B. Smart**

Horticulture Section  
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**Academic Background:**

- 1992      **Doctor of Philosophy**, Genetics, Michigan State University, East Lansing, MI  
“Molecular analysis of the photosystem I reaction center in the cyanobacterium  
*Synechocystis* sp. PCC 6803”, Lee McIntosh, Ph.D. advisor.
- 1987      **Bachelor of Science with Distinction**, Biology, Cornell University, Ithaca, NY

**Professional Background:**

- April 2016 – *present*      **Professor of Plant Breeding and Genetics**  
Horticulture Section, School of Integrative Plant Science  
Joint Appointment: Plant Breeding and Genetics Section  
Cornell University, Cornell AgriTech, Geneva, NY
- Feb. 2018 – June 2021      **Associate Director, Cornell AgriTech, Geneva, NY**
- July 2016 – June 2019      **Program Leader, Horticulture Section, Cornell AgriTech**
- July 2009 – March 2016      **Associate Professor of Plant Breeding and Genetics**  
Horticulture Section, School of Integrative Plant Science  
Joint Appointment: Plant Breeding and Genetics Section  
Cornell University, Cornell AgriTech, Geneva, 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  
Cornell AgriTech, 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  
 Genetics Society of America  
 New York Biomass Energy Alliance  
 Short Rotation Woody Crops Operations Working Group  
 National Hemp Association  
 Hemp Industries Association

**Awards and Recognitions:**

Feb. 2021                                      Cannabis Scientist Power List – “Plant Science Pioneer”  
 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:**

Willow plant named ‘Preble’. U.S. PP24,537 issued June 10, 2014; European Community Plant Variety Right #43064 issued April 11, 2016; Canadian Plant Breeders Rights issued Sept. 11, 2017.  
 Fast-growing willow shrub named ‘Otisco’. U.S. PP17,997 issued Sept. 11, 2007.  
 Fast-growing willow shrub named ‘Tully Champion’. U.S. PP17,946 issued Aug. 28, 2007.  
 Fast-growing willow shrub named ‘Owasco’. U.S. PP17,845 issued July 3, 2007.  
 Fast-growing willow shrub named ‘Canastota’. U.S. PP17,724 issued May 15, 2007.  
 Fast-growing willow shrub named ‘Fish Creek’. U.S. PP17,710 issued May 8, 2007.

Fast-growing willow shrub named 'Oneida'. U.S. PP17,682 issued May 1, 2007.  
Fast-growing willow shrub named 'Millbrook'. U.S. PP17,646 issued April 24, 2007.

**Publications:** [ORCID 0000-0002-7812-7736](https://orcid.org/0000-0002-7812-7736)

***In preparation:***

**Petzoldt, J.E., Gouker, F.E., White, C., Loeb, G.M., and Smart, L.B.** Characterization of potato leafhopper (*Empoasca fabae*) resistance in *Salix* bioenergy crops. (*in prep*).

**Fabio, E.S., Carlson, C.H., Wilkerson, D.G., and Smart, L.B.** Experimental confirmation of a major QTL linked to chlorophyll content in an F<sub>2</sub> *Salix purpurea* mapping population (*in prep*).

**Carlson, C.H., Choi, Y., Chan, A.P., Town, C.D., and Smart, L.B.** Heterosis is correlated with nonadditive gene expression in interspecific triploid hybrids of willow (*Salix* spp.) (*in prep*).

**Wilkerson, D.G., Crowell, C.R., Carlson, C.H., McMullen, P., Mondo, S., Andreopoulos, W., Lipzen, A., Lail, K., Yan, M., Ng, V., Grigoriev, I., Smart, C.D., and Smart, L.B.** Comparative transcriptomics and eQTL mapping of response to leaf rust infection by *Melampsora americana* in selected *Salix purpurea* F<sub>2</sub> progeny. (*in prep*)

**Carlson, C.H., Stack, G.M., Jiang, Y., Cala, A.R., Toth, J.A., Philippe, G., Rose, J.K.C., Smart, C.D., and Smart, L.B.** Morphometric relationships and their contribution to biomass and cannabinoid profiles in F<sub>1</sub> hybrids of *Cannabis sativa* L. (*in prep*)

**Carlson, C.H. and Smart, L.B.** Heterosis for biomass-related traits in novel triploid hybrids of willow (*Salix* spp.) (*in review*).

**Toth, J.A., Smart, L.B., Smart, C.D., Stack, G.M., Cala, A.R., Carlson, C.H., Philippe, G., and Rose, J.K.C.** Stress treatments have little effect on cannabinoid profile in high-cannabinoid hemp (*Cannabis sativa* L.) (*in review*).

**Hyden, B., Carlson, C.H., Gouker, F.E., Schmutz, J., Barry, K., Lipzen, A., Sharma, A., Sandor, L., Yang, X., Tuskan, G.A., Feng, G., Olson, M.S., DiFazio, S.P., and Smart, L.B.** Integrative genomics reveals paths to sex dimorphism in *Salix purpurea* L. (*in review*).  
Pre-print: <https://www.biorxiv.org/content/10.1101/2021.03.09.434562v1>

***Refereed:***

**Gouker, F.E., Carlson, C.H., Zou, J., Evans, L.M., Smart, C.D., DiFazio, S.P., and Smart, L.B.** (2021) Sexual dimorphism in the dioecious willow *Salix purpurea*. *Amer. J. Bot.* (*in press*).

**Gouker, F.E., Fabio, E.S., Serapiglia, M.J., and Smart, L.B.** (2021) Yield and biomass quality of shrub willow hybrids in differing rotation lengths and spacing designs. *Biomass Bioenergy* 146, DOI: 10.1016/j.biombioe.2021.105977.

**Montes, F., Fabio, E.S., Smart, L.B., and Kemanian, A.** A (2021) A semi-commercial case study of willow biomass production in the northeastern USA. *Agronomy J.* DOI:

10.1002/agj2.20603.

- Stack, G.M., Toth, J.A., Carlson, C.H., Cala, A.R., Marrero-González, M.I., Wilk, R.L., Gentner, D.R., Crawford, J.L., Philippe, G., Rose, J.K.C., Viands, D.R., Smart, C.D., and Smart, L.B.** (2021) Season-long evaluation of 30 high-cannabinoid hemp (*Cannabis sativa* L.) cultivars reveals variation in cannabinoid accumulation, flowering time, and disease resistance. *GCB Bioenergy* 13:546-61. DOI: 10.1111/gcbb.12793.
- Mi, R., Taylor, A.G., Smart, L.B., and Mattson, N.S.** (2020) Developing production guidelines for baby leaf hemp (*Cannabis sativa* L.) as an edible salad green: cultivar, sowing density and seed size. *Agriculture* 10:617. DOI: 10.3390/agriculture10120617.
- Sanderson, B.J., Feng, G., Hu, N., Grady, J., Carlson, C.H., Smart, L.B., Keefover-Ring, K., Yin, T., Ma, T., Liu, J., DiFazio, S.P., Olson, M.S.** (2021) Sex determination through X-Y heterogamety in *Salix nigra*. *Heredity* DOI: 0.1038/s41437-020-00397-3.
- Yang, W., Wang, W., Li, Y., Zhang, Z., Tong, S., Li, M., Zhang, X., Zhang, L., Ren, L., Ma, X., Zhou, R., Sanderson, B.J., Keefover-Ring, K., Yin, T., Smart, L.B., Liu, J., DiFazio, S.P., Olson, M.S., Ma, T.** (2020) A general model for repeated turnovers of sex system in Salicaceae. *Molec. Biol. Evol.* msaa261, DOI: 10.1093/molbev/msaa261.
- Barnett, S.E., Cala, A.R., Hansen, J.L., Crawford, J., Viands, D.R., Smart, L.B., Smart, C.D., and Buckley, D.H.** (2020) Evaluating the microbiome of hemp. *Phytobiomes* 4:351-63. DOI: 10.1094/PBIOMES-06-20-0046-R.
- Crowell, C.R., Bekauri, M.M., Cala, A.R., McMullen, P., Smart, L.B., and Smart, C.D.** (2020) Differential susceptibility of diverse *Salix* spp. to *Melampsora americana* and *Melampsora paradoxa*. *Plant Dis.* 104:2949-57. DOI: 10.1094/PDIS-04-20-0718-RE.
- Wang, W., Carlson, C.H., Smart, L.B., and Carlson, J.E.** (2020) Transcriptome analysis of contrasting resistance to herbivory by *Empoasca fabae* in two shrub willow species and their hybrid progeny. *PLoS ONE* 15(7): e0236586. DOI: 10.1371/journal.pone.0236586.
- Muklada, H., Davidovich-Rikanati, R., Wilkerson, D.G., Klein, J., Deutch-Traubman, T., Zou, J., Awabdeh, S., Sweidan, R., Landau, S.Y., Schwartz, A., Lewinsohn, E., Smart, L.B.** (2020) Genotypic diversity in willow (*Salix* spp.) is associated with chemical and morphological polymorphism, suggesting human-assisted dissemination in the Eastern Mediterranean. *Biochem. System. Ecol.* 91:104081 DOI: 10.1016/j.bse.2020.104081.
- Fabio, E.S. and Smart, L.B.** (2020) Genetic and environmental influences on first-rotation shrub willow (*Salix* spp.) bark and wood elemental composition. *BioEnergy Res.* 13: 797 – 809. DOI: 10.1007/s12155-020-10122-x.
- Zhou, R., Macaya-Sanz, D., Carlson, C.H., Schmutz, J., Jenkins, J.W., Kudrna, D., Sharma, A., Sandor, L., Shu, S., Barry, K., Tuskan, G.A., Ma, T., Liu, J., Olson, M., Smart, L.B., DiFazio, S.P.** (2020) A willow sex chromosome reveals convergent evolution of complex palindromic repeats. *Genome Biol.* 21:38. DOI: 10.1186/s13059-020-1952-4.
- Toth J., Stack G., Cala A., Carlson C.H., Wilk R., Crawford J., Viands D., Philippe G., Smart**

- C.D., Rose J.K.C., Smart L.B. (2020) Development and validation of genetic markers for sex and cannabinoid chemotype in *Cannabis sativa* L. *GCB Bioenergy* 12:213-222. DOI: 10.1111/gcbb.12667. **Most downloaded paper of 2020 in GCB Bioenergy with 8,119 downloads.**
- Feng, G., Sanderson, B.J., Liu, J., Ma, T., Smart, L.B., DiFazio, S.P., Olson, M.S. (2020) Pathways to sex determination in plants: How many roads lead to Rome? *Curr. Opin. Plant Biol.* 54:61-68 DOI: 10.1016/j.pbi.2020.01.004.
- Weldon, W.A., Ullrich, M.R., Smart, L.B., Smart, C.D., and Gadoury, D.M. (2020) Cross infectivity of powdery mildew isolates originating from hemp (*Cannabis sativa*) and Japanese Hop (*Humulus japonicus*) in New York. *Plant Health Prog.* 21:47-53, DOI: 10.1094/PHP-09-19-0067-RS.
- Nelson, N., Berguson, W.E., McMahon, B.G., Meilan, R., Smart, L.B., Gouker, F.E., Bloese, P., Miller, R., Volk, T.A., Cai, M., and Buchman, D. (2019) Discovery of geographically-robust hybrid poplar clones. *Silvae Genet.* 68: 101 – 110. DOI: 10.2478/sg-2019-0018
- Wang, M., Zhang, L., Zhang, Z., Li, M., Wang, D., Zhang, X., Xi, Z., Keefover-Ring, K., Smart, L.B., DiFazio, S.P., Olson, M.S., Yin, T., Liu, J., Ma, T. (2019) Extensive gene flow and abundant trans-specific polymorphism across the non-bifurcating diversification of the tree model genus *Populus*. *New Phytol.* 225: 1370–1382 DOI: 10.1111/nph.16215.
- Gouker, F.E., DiFazio, S.P., Bubner, B., Zander, M., and Smart, L.B. (2019) Genetic diversity and population structure of native, naturalized, and cultivated *Salix purpurea*. *Tree Genet. Genomes* 15: 47 DOI: 10.1007/s11295-019-1359-0.
- Fabio, E.S., Leary, C.J., and Smart, L.B. (2019) Tolerance of novel inter-specific shrub willow hybrids to water stress. *Trees* 33:1015–1026 DOI: 10.1007/s00468-019-01835-4.
- Carlson, C.H., Gouker, F.E., Crowell, C.R., Evans, L., DiFazio, S.P., Smart, C.D., and Smart, L.B. (2019) Joint linkage and association mapping of complex traits in shrub willow (*Salix purpurea* L.). *Ann. Bot.* 124: 701–715. DOI: 10.1093/aob/mcz047.
- Clifton-Brown J., Harfouche A., Casler M., Jones H. D., Macalpine W. J., Murphy-Bokern D., Smart L. B., Adler A., Ashman C., Awty-Carroll D., Bopper S., Botnari V., Chen Z., Cosentino S. L., Dalton S., Davey C., Dolstra O., Donnison I., Flavell R., Greef J., Hanley S., Hastings A., Hertzberg M., Hsu T., Huang L. S., Iurato A., Jensen E., Jin X., Jørgensen U., Kiesel A., Kim D., Liu J., McCalmont J., McMahon B., Mos M., Robson P., Sacks E., Sandu A., Scalici G., Schwarz K., Scordia D., Shafiei R., Shield I., Slavov G. T., Stanton B., Swaminathan K., Taylor G., Torres A. F., Trindade L. M., Tschaplinski T., Tuskan G. A., Yamada T., Yu C., Zalesny R., Zong J., and Lewandowski I. (2019) Breeding progress and preparedness for mass upscaling of perennial lignocellulosic biomass crops switchgrass, miscanthus, willow and poplar. *GCB Bioenergy* 11:118–151 DOI: 10.1111/gcbb.12566. **Most cited paper of 2020 in GCB Bioenergy with 17 citations.**
- Tuskan, G.A., Groover, A.T., Schmutz, J., DiFazio, S.P., Myburg, A., Grattapaglia, D., Smart, L., Yin, T., Aury, J.-M., Kremer, A., Leroy, T., Le Provost, G., Plomion, C., Carlson,

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- Zhou, R., Macaya-Sanz, D., Rodgers-Melnick, E., Carlson, C.H., Gouker, F.E., Evans, L.M., Schmutz, J., Jenkins, J.W., Yan, J., Tuskan, G.A., Smart, L.B., and DiFazio, S.P.** (2018) Characterization of a large sex determination region in *Salix purpurea* L. (Salicaceae). *Mol. Gen. Genomics* **293**:1437–1452. DOI: 10.1007/s00438-018-1473-y
- Fabio, E.S. and Smart, L.B.** (2018) Differential growth response to fertilization treatments of ten elite shrub willow (*Salix* spp.) bioenergy cultivars. *Trees*. **32**:1061–1072 DOI: 10.1007/s00468-018-1695-y
- Fabio, E.S. and Smart, L.B.** (2018) Effects of nitrogen fertilization in shrub willow short rotation coppice production – A quantitative review. *GCB Bioenergy* **10**:8 DOI: 10.1111/gcbb.12507
- Volk, T.A., B. Berguson, C. Daly, M. Halbleib, R. Miller, T. Rials, L.P. Abrahamson, D. Buchman, M. Cunningham, M. Eisenbies, E.S. Fabio, K. Hallen, J. Heavey, G. Johnson, Y. Kuzovkina, B. Liu, B. McMahan, R. Rousseau, S. Shi, R. Shuren, L.B. Smart, G. Stanosz, B. Stanton, B. Stokes, and J. Wright.** (2018) Poplar and shrub willow energy crops in the United States: Field trial results from the multiyear Regional Feedstock Partnership and yield potential maps based on the PRISM-ELM model. *GCB Bioenergy* **10**: 735–751 DOI: 10.1111/gcbb.12498.
- Carlson, C.H., Choi, Y., Chan, A., Serapiglia, M.J., Town, C.D., and Smart, L.B.** (2017) Dominance and sexual dimorphism pervade the *Salix purpurea* L. transcriptome. *Genome Biol. Evol.* **9**:2377-2394. DOI: 10.1093/gbe/evx174.
- Fabio, E.S., Volk, T.A., Miller, R.O., Serapiglia, M.J., Kemanian, A.R., Montes, F., Kuzovkina, J.A., Kling, G.J. and Smart, L.B.** (2017) Contributions of environment and genotype to variation in shrub willow biomass composition. *Indus. Crops Prod.* **108**:149-161. DOI: 10.1016/j.indcrop.2017.06.030.
- Fabio, E. S., Kemanian, A. R., Montes, F., Miller, R. O., Smart, L. B.** (2017) A mixed model approach for evaluating yield improvements in interspecific hybrids of shrub willow, a dedicated bioenergy crop. *Indus. Crops Prod.* **96**:57-70. DOI: 10.1016/j.indcrop.2016.11.019.
- Fabio, E.S., Volk, T.A., Montes, F., Miller, R., Johnson, G.A., Amichev, B.Y., Van Rees, K., Hangs, R.D., Labrecque, M., Kuzovkina, J., Ewy, R.G., Kling, G.J., and Smart, L.B.** (2017) Genotype x environment interactions analysis of North American shrub willow yield trials confirm superior performance of triploid hybrids. *GCB Bioenergy* **9**: 445-459. DOI: 10.1111/gcbb.12344.
- Carlson, C.H. and Smart, L.B.** (2016) Electrical capacitance as a predictor of root dry weight in shrub willow (*Salix*; Salicaceae) parents and progeny. *Appl. Plant Sci.* **4**: DOI: 10.3732/apps.1600031
- Serapiglia, M.J., Mullen, C.A., Smart, L.B., and Boateng, A.A.** (2015) Variability in pyrolysis

product yield from novel shrub willow genotypes. *Biomass Bioenergy* 72:74-84.  
DOI:10.1016/j.biombioe.2014.11.015.

**Stoof, C.R., Richards, B.K., Woodbury, P., Fabio, E.S., Brumbach, A., Cherney, J., Das, S., Geohring, L., Hornesky, J., Mayton, H., Mason, C., Ruestow, G., Smart, L.B., Volk, T.A., and Steenhuis, T.** (2015) Untapped potential: Opportunities and challenges for sustainable bioenergy production from marginal lands in New York and the Northeast USA. *BioEnergy Res.* 8:482-501. DOI: 10.1007/s12155-014-9515-8.

**Serapiglia, M.J., Gouker, F.E., Hart, J.F., Unda, F., Mansfield, S.D., Stipanovic, A.J., and Smart, L.B.** (2015) Ploidy level affects important biomass traits of novel shrub willow (*Salix*) hybrids. *BioEnergy Res.* 8: 259-269.

**He, X., Zheng, J., Serapiglia, M.J., Smart, L.B., Shi, S., and Wang, B.** (2014) Development, characterization and cross-amplification of eight EST-derived microsatellites in *Salix*. *Silvae Genet.* 63:113-16.

**Gan, H.Y., Gan, H.M., Savka, M.A., Triassi, A.J., Wheatley, M.S., Smart, L.B., Fabio, E.S., and Hudson, A.O.** (2014) Whole genome sequences of thirteen endophytic bacteria isolated from shrub willow (*Salix*) grown in Geneva, New York. *Genome Announc.* 2(3):e00288-14. doi:10.1128/genomeA.00288-14.

**Serapiglia, M.J., Gouker, F.E., and Smart, L.B.** (2014) Early selection of novel triploid hybrids of shrub willow with improved biomass yield relative to diploids. *BMC Plant Biol.* 14:74, DOI:10.1186/1471-2229-14-74.

**Kenaley, S.C., Smart, L.B., and Hudler, G.W.** (2014) Genetic evidence for three discrete taxa of *Melampsora* (Pucciniales) affecting willows (*Salix* spp.) in New York State. *Fungal Biol.* 118:704-20.

**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.** (2013) Yield and woody biomass traits of novel shrub willow hybrids at two contrasting sites. *BioEnergy Res.* 6:533-46.

**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: 775-88.

- 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.
- Gibbs, J.P., Smart, L.B., Newhouse, A.E., and Leopold, D.J.** (2012) 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.* **20**: 456-61.
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- 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.
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- 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.
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**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.

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**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.

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**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.

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#### **Web sites/Social Media:**

**Twitter feed:** @cornellwillow – 1198 followers as of 28 Feb. 2021.

#### **Cornell Hemp**

<http://hemp.cals.cornell.edu/> (last updated: 17 February 2021)

#### **Willowpedia: A Willow Energy Crop Information Resource at Cornell University**

<http://willow.cals.cornell.edu/> (last updated: 17 February 2021).

#### **Willowpedia YouTube Channel – 212 subscribers as of 28 Feb. 2021**

<http://www.youtube.com/user/Willowpedia?feature=watch> (last updated: 18 Feb 2020)

#### **Research Presentations:**

**Smart, L.B., George Stack, Craig Carlson, Jacob Toth, Rebecca Wilk, Deanna Gentner, Allison DeSario, Savanna Shelnett, Teagan Zingg, Ali Cala, Colin Day, Garrett Giles, Chris Smart, Jennifer Starr, Gary Bergstrom, Jamie Crawford, Julie Hansen, Don Viands, Stephen Snyder, Glenn Philippe, Joss Rose** “Genetic basis for key traits in CBD hemp” Canadian Hemp Regulators Working Group Meeting, Dec. 16, 2020. *Online oral presentation.*

**Smart, L.B., Craig Carlson, Dustin Wilkerson, Brennan Hyden, Fred Gouker, Chase Crowell, Chris Smart, Yongwook Choi, Agnes Chan, Chris Town, Ran Zhou, David Macaya Sanz, Steve DiFazio, Matt Olson, Ken Keefover-Ring, Jerry Jenkins, Jeremy Schmutz.** “Dissecting the genomic basis for sex and disease resistance in *Salix purpurea*” Institut de Recherche en Biologie Végétale, Jardin Botanique de Montréal. Nov. 20, 2020. *Invited online departmental seminar.*

**Smart, L.B., George Stack, Craig Carlson, Jacob Toth, Rebecca Wilk, Deanna Gentner, Allison DeSario, Savanna Shelnett, Teagan Zingg, Ali Cala, Colin Day, Garrett Giles, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Stephen Snyder, Glenn Philippe, Joss Rose** “Evaluation of hemp cultivars for Cannabinoid Production in New York State” Dept. of Biology, West Virginia State University, Oct. 12, 2020, *Invited online departmental seminar.*

**Smart, L.B., George Stack, Craig Carlson, Jacob Toth, Rebecca Wilk, Deanna Gentner, Allison DeSario, Savanna Shelnett, Teagan Zingg, Ali Cala, Colin Day, Garrett Giles, Chris Smart, Jennifer Starr, Gary Bergstrom, Jamie Crawford, Julie Hansen, Don Viands, Stephen Snyder, Glenn Philippe, Joss Rose** “Evaluation of hemp cultivars in New York State” Genetics and Genomics Program 50<sup>th</sup> Anniversary Symposium, Michigan State University, Oct. 1, 2020, *Invited online plenary oral presentation.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose, Ali Cala, Chris Smart,** “Genotypic and phenotypic characterization of hemp for grain and fiber production” Annual Meeting of the American Society for Horticultural Science, Aug. 11, 2020, *Online oral presentation.*

**Smart, L.B., George Stack, Craig Carlson, Jacob Toth, Ali Cala, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose** “Genetic and Environmental Regulation of Cannabinoid Production in Hemp” National Hemp Research and Education Conference, Breeding and Genetics Session, July 15, 2020. *Invited online oral presentation.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Rebecca Wilk, Deanna Gentner, Ali Cala, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose** “Taming the Wild West: Evaluation of hemp cultivars for cannabinoid production in New York” Univ. of Connecticut, Dept. of Plant Science and Landscape Architecture, Storrs, CT. Feb. 21, 2020. *Invited departmental seminar.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Rebecca Wilk, Deanna Gentner, Ali Cala, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose** “Taming the Wild West: Evaluation of hemp cultivars for cannabinoid production in New York” Univ. of Massachusetts – Amherst, Dept. of Plant Biology, Amherst, MA. Feb. 20, 2020. *Invited departmental seminar.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Rebecca Wilk, Deanna Gentner, Ali Cala, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose** “Genotypic and phenotypic evaluation of hemp cultivars for cannabinoid production in New York” Pyxus Hemp Consortium Annual Meeting, Jan. 27, 2020, *Online oral presentation.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Rebecca Wilk, Deanna Gentner, Ali Cala, Chris Smart, Jamie Crawford, Julie Hansen, Don Viands, Glenn Philippe, Joss Rose** “Genotypic and phenotypic evaluation of hemp cultivars for cannabinoid production in New York” International Plant and Animal Genome Conference (PAG-XXVIII), Jan. 14, 2020, San Diego, CA. *Invited oral presentation.*

**Smart, L.B., Craig Carlson, Fred Gouker, Dustin Wilkerson, Chase Crowell, Chris Smart, Yongwook Choi, Agnes Chan, Chris Town, Ran Zhou, Steve DiFazio.** “Dissecting the genomic basis for sex and disease resistance in *Salix purpurea*” Symposium on Willows Genetics and Genomics, Institute of Plant Genetics Polish Academy of Sciences, Poznan, Poland, Nov. 5, 2019. *Invited plenary talk.*

**Smart, L.B., Craig Carlson, Jacob Toth, George Stack, Jamie Crawford, Rebecca Wilk, Julie Hansen, Ali Cala, Chris Smart, Don Viands, Alan Taylor, Michael Loos, Trevor Yeats, Glenn Philippe, Joss Rose** “From grey area to gold rush: Establishing a comprehensive hemp research program”, Annual Meeting of the American Society of Horticultural Science, Las Vegas, NV, July 23, 2019. *Invited plenary talk.*

**Smart, L.B.** “From grey area to gold rush: Establishing a long-term breeding program for hemp”, Corteva Agriscience, 8<sup>th</sup> Annual Cornell University Plant Breeding Symposium – Common Plants for Uncommon Goals, Cornell University, Ithaca, NY, Apr. 12, 2019. *Invited talk.*

**Smart, L.B.** “From grey area to gold rush: Establishing a long-term breeding program for hemp”, The Ohio State University. Wooster, OH. Apr. 2 – 3, 2019. *Invited talk.*

**Smart, L.B., Jamie Crawford, Rebecca Wilk, George Stack, Julie Hansen, Chris Smart, Emilia Yoffie, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, Trevor Yeats, Joss Rose, and Elson Shields.** “Cornell University Industrial Hemp Research for New York State”, USDA NIFA S-1084 Multistate Project Annual Meeting, Cornell AgriTech, Geneva, NY, Dec. 4, 2018. *Invited talk.*

**Smart, L.B., Dustin Wilkerson, Bircan Taskiran, Craig Carlson, Joshua Klein, and Sami Awabdeh.** “Use of genome-wide markers for the analysis of genetic diversity of willows collected in Jordan and Israel”, National Agricultural Research Center, Amman, Jordan, Oct. 11, 2018, *Invited talk.*

**Smart, L.B., Dustin Wilkerson, Bircan Taskiran, Craig Carlson, Joshua Klein, and Sami Awabdeh.** “Use of genome-wide markers for the analysis of genetic diversity of willows collected in Jordan and Israel”, USAID MERC Project Meeting, Limmasol, Cyprus, Oct. 8, 2018, *Invited talk.*

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, Trevor Yeats, Joss Rose, Elson Shields.** “Breeding Industrial Hemp Cultivars for New York State”, National Industrial Hemp Regulatory Conference, Geneva, NY, July 18, 2018. *Invited talk.*

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, Trevor Yeats, Joss Rose, Elson Shields.** “Breeding Industrial Hemp Cultivars for New York State”, SUNY Research Foundation Hemp Roundtable, Albany, NY, June 6, 2018. *Invited talk.*

**Smart, L.B., Chris Smart, and Brian Nault.** “Summer Research and Extension Internships for Undergraduates at Cornell University’s New York State Agricultural Experiment Station” USDA NIFA Project Director’s Meeting, Washington, DC April 12, 2018. *Invited talk.*

**Smart, L.B., Craig Carlson, Fred Gouker, Dustin Wilkerson, Chase Crowell, Chris Smart, Yongwook Choi, Agnes Chan, Chris Town, Ran Zhou, Steve DiFazio.** “Dissecting the genomic basis for triploid heterosis and disease resistance in willow hybrids”, DOE Genomic Science Program Annual Meeting, Tyson’s Corners, VA, Feb. 27, 2018. *Invited plenary talk.*

**Smart, L.B., Craig Carlson, Eric Fabio, Michelle Serapiglia, Yongwook Choi, Agnes Chan, Chris Town, Ran Zhou, and Steve DiFazio.** “Transcriptome analysis of diploid and triploid species hybrids of shrub willow”, WATBio Conference, Oxford University, Oxford, UK, Sept. 25, 2017, *Invited speaker.*

**Smart, L.B., Eric S. Fabio, Fred E. Gouker, Craig H. Carlson.** “Breeding for hybrid vigor in shrub willow bioenergy crops”, Mid-Atlantic Biomass Conference and Expo, State College, PA, Sept. 14, 2017, *Symposium organizer and speaker.*

**Smart, L.B., Don Viands, Julie Hansen, Jamie Crawford, Chris Smart.** “Breeding Industrial Hemp Cultivars for New York”, Bast Fiber Research Institute, Chinese Academy of Agricultural Science, Changsha, China, Aug. 7, 2017, *Invited seminar.*

**Smart, L.B., Eric S. Fabio, Fred E. Gouker, Craig H. Carlson.** “Breeding for heterosis in triploid hybrid shrub willow bioenergy crops”, Sichuan University, Chengdu, China, Aug. 4, 2017, *Invited symposium seminar.*

**Smart, L.B., Eric S. Fabio, Fred E. Gouker, Craig H. Carlson.** “Breeding for heterosis in triploid hybrid shrub willow bioenergy crops”, Lanzhou University, Lanzhou, China, Aug. 3, 2017, *Invited symposium seminar.*

**Smart, L.B., Eric S. Fabio, Fred E. Gouker, Craig H. Carlson.** “Breeding for heterosis in triploid hybrid shrub willow bioenergy crops”, Nanjing Forestry University, Nanjing, China, July 31, 2017, *Invited symposium seminar.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Eric S. Fabio, Michelle J. Serapiglia, Agnes Chan, Yongwook Choi, Chris D. Town, Eli Rodgers-Melnick, Luke Evans, Steve DiFazio.** “Breeding for heterosis in shrub willow bioenergy crops” Plant Pathology and Plant-Microbe Biology Section, SIPS, Cornell University, Geneva, NY. Nov. 15, 2016. *Invited departmental seminar.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Eric S. Fabio, Michelle J. Serapiglia, Agnes Chan, Yongwook Choi, Chris D. Town, Eli Rodgers-Melnick, Luke Evans, Steve**

**DiFazio.** “Breeding for heterosis in shrub willow bioenergy crops” Dept. of Plant Biology, Rutgers University, East Rutherford, NJ. Nov. 4, 2016. *Invited departmental seminar.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Eric S. Fabio, Chase R. Crowell, Christine D. Smart, Ran Zhou, Felipe R. Montes, John E. Carlson, Armen R. Kemanian, and Stephen DiFazio** “Breeding and sustainability of shrub willow for marginal lands in the Northeast US” 8<sup>th</sup> Annual New York State Biotechnology Symposium, Syracuse, NY. May 19, 2016. *Invited oral presentation.*

**Smart, L.B., Fred E. Gouker, and Craig H. Carlson** “Molecular phylogeny of *Salix*” NSF Dimensions in Biodiversity Project Annual Meeting, Madison, WI. April 16, 2016. *Oral presentation.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Chase Crowell, Chris D. Smart, Ran Zhou, Stephen DiFazio, Agnes Chan, Chris D. Town, and Gerald A. Tuskan** “Molecular breeding of shrub willow for production of bioenergy”, MERC Project Annual Meeting, Madaba, Jordan, April 1, 2016. *Invited oral presentation.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Eric S. Fabio, Chase R. Crowell, Christine D. Smart, Ran Zhou, Felipe R. Montes, John E. Carlson, Armen R. Kemanian, and Stephen DiFazio** “Breeding and sustainability of shrub willow for marginal lands in the Northeast US” International Plant and Animal Genome Conference (PAG-XXIV), Jan. 9, 2016, San Diego, CA. *Invited oral presentation.*

**Carlson, C.H., Chase R. Crowell, Fred E. Gouker, Mariami M. Bekauri, Christine D. Smart Lawrence B. Smart** “Genomics-assisted breeding for leaf rust (*Melampsora*) resistance in shrub willow (*Salix*) bioenergy crops. USDA-DOE Plant Feedstock Genomics for Bioenergy PI Meeting, San Diego, CA. Jan. 8, 2016. *Poster presentation.*

**Smart, L.B.** “Genomics assisted breeding of triploid hybrids of shrub willow for bioenergy”, Horticulture Section, School of Integrative Plant Science, Cornell University, March 16, 2015, Geneva, NY. *Departmental seminar.*

**Smart, L.B.** “Genomics assisted breeding of triploid hybrids of shrub willow”, Willow Research Symposium, Oct. 30, 2014, Swedish Agricultural University (SLU), Alnarp, Sweden, *Invited oral presentation.*

**Smart, L.B.** “Breeding of triploid hybrids of shrub willow”, Presentation to plant breeders and willow crop management team, Lantmännen Lantbruk and SalixEnergi Europa, Oct. 29, 2014, Svalöv, Sweden. *Invited oral presentation.*

**Smart, L.B., Fred E. Gouker, Craig H. Carlson, Michelle J. Serapiglia, Christopher D. Town, Haibao Tang, Vivek Krishnakumar, Stephen P. DiFazio, Eli Rodgers-Melnick, Ran Zhou, Shengqiang Shu, David M. Goodstein, Kerrie W. Barry, Erika A. Lindquist, Jeremy Schmutz, and Gerald A. Tuskan** “Genomic approaches to improve yield and biofuels conversion efficiency of shrub willow”, International Poplar Symposium VI, July 20-24, 2014, Vancouver, BC, *Invited oral presentation.*

- Smart, L.B., Gouker, F.E., Serapiglia, M.J., Fabio, E.S., Carlson, C.H.** “Breeding triploid hybrids of shrub willow with improved yield and biomass composition”, Short-Rotation Woody Crops Operation Working Group Biannual Meeting, July 17-19, 2014, Seattle WA. *Oral presentation.*
- Smart, L.B.** “Breeding to improve yield and sustainability of shrub willow bioenergy crops”, Ninth International Conference on Biomass for Energy, Ukraine Bioenergy Association, Kiev, Ukraine, Sept. 25, 2013. *Oral presentation.*
- Smart, L.B., 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”, 8<sup>th</sup> 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”, 8<sup>th</sup> 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”, 8<sup>th</sup> 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”, 8<sup>th</sup> 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”, 8<sup>th</sup> 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.” 19<sup>th</sup> 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.” 29<sup>th</sup> 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 2<sup>nd</sup> 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 7<sup>th</sup> 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. 28<sup>th</sup> 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, Enkoping, 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. 22<sup>nd</sup> 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<sup>+</sup>-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<sup>+</sup>-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 and Meetings:**

**Smart, L.B.** “Characterization of hemp cultivars for CBD and CBG” Southern Oregon Hemp Coop Golden Grow Awards Virtual Conference, Jan. 30, 2021. 45 min virtual presentation for 120 attendees = 90 contact hours.

**Smart, L.B.** “Characterization of hemp cultivars for CBD and CBG” Long Island Agricultural Forum Virtual Conference, Jan. 5, 2021. 30 min virtual presentation for 45 attendees = 23 contact hours.

**Smart, L.B.** “Genetic Basis for Key Traits in CBD Hemp” American Seed Trade Association Annual Conference – Hemp Seed Working Group Session. Dec. 15, 2020. Virtual presentation of 30 min to 51 attendees = 25 contact hours.

**Smart, L.B.** “Hemp market overview” Virtual Grow NY Conference. Nov. 17, 2020. Virtual presentation of 15 min to 364 attendees = 91 contact hours.

**CBS News Saturday Morning** Broadcast interview on sustainable agriculture and hemp on national television. Televised Nov. 14, 2020.

**Hemp Breeding and Seed Production Course. UC Davis, Davis, CA.** “Crossing, cycling, markers, and phenotyping.” Oct. 12, 2020. 1 hour virtual presentation for 8 attendees. = 80 contact hours

**Smart, L.B.** “Evaluation hemp cultivars in NYS” Hemp Science and Technology Virtual Cannabis Technology Conference. Oct. 29, 2020. Virtual presentation of 30 min to 120 attendees = 60 contact hours.

**2020 Virtual Cornell Hemp Field Day.** Organized speakers and managed presentations online for 3 hours for 359 participants from 9 countries: US, Canada, Germany, South Africa, Netherlands, Thailand, Costa Rica, Mexico, and United Kingdom. 1,077 contact hours.

**Smart, L.B.** “Evaluation hemp cultivars in NYS” Hemp Grower Magazine Virtual Conference. June 23, 2020. Virtual presentation of 15 min to 50 attendees = 50 contact hours.

**Smart, L.B.** “Evaluation hemp cultivars in NYS” NY Hemp Industries Association Hemp History Week Webinar. June 4, 2020. Virtual presentation of 1 hour to 50 attendees = 50 contact hours.

**Smart, L.B.** “Evaluation hemp cultivars in NYS” HempLab Monthly Industry Roundtable. May 28,

2020. Virtual presentation of 1 hour to 60 attendees = 60 contact hours.

**Smart, L.B.** “Evaluation hemp cultivars in NYS” Annual Training for NYS Dept. of Ag and Markets Horticultural Inspectors. March 6, 2020. Virtual presentation of 1 hour to 40 attendees = 40 contact hours.

**Digital Hackathon Participants.** Tour of hemp research facilities and Q&A for 30 students and advisors from A5 ag universities. Feb. 26, 2020. 30 min for 30 attendees = 15 contact hours.

**Stefan Fleming, Empire State Development.** Tour of hemp research and processing facilities. Feb. 19, 2020. One attendee for 2 hours = 2 contact hours.

**Smart, L.B.** “Evaluation hemp cultivars in NYS” 2020 Hemp Producers Conference, Broome County CCE, Binghamton, NY. 60 min for 130 attendees = 130 contact hours.

**Smart, L.B.** “Evaluation and breeding of CBD hemp cultivars in NYS: Genetics vs. Environment” Annual Conference of Ohio Agribusiness Association, Columbus, OH, Jan. 31, 2020. 30 min for 85 attendees = 43 contact hours.

**Smart, L.B.** “Evaluation and breeding of CBD hemp cultivars in NYS: Genetics vs. Environment” Empire State Producers Expo, Syracuse, NY. Jan. 16, 2020. 30 min for 150 attendees = 75 contact hours.

**Smart, L.B.** “Evaluation and breeding of CBD hemp cultivars in NYS: Genetics vs. Environment” Long Island Agricultural Forum, Suffolk CCC, Riverhead, NY. Jan. 8, 2020. 60 min for 200 attendees = 200 contact hours.

**Smart, L.B.** “Evaluation and breeding of CBD hemp cultivars in NYS” Industrial Hemp Roundtable Summit. SUNY Morrisville, Morrisville, NY. Jan. 7, 2020. 50 min for 80 attendees. = 67 contact hours

**Rochester Institute of Technology and Cornell AgriTech Faculty Visit.** Overview of Cornell AgriTech and tour of facilities. Cornell AgriTech. Geneva, NY. Dec. 11, 2019. 80 min for 20 attendees. = 27 contact hours

**Smart, L.B.** “Taming the Wild West – Evaluation of CBD Hemp Cultivars in NYS”. 81<sup>st</sup> Cornell Seed School. Geneva, NY. Dec. 5, 2019. 30 min for 75 attendees. = 37 contact hours

**Executive Chamber, Empire State Development Corporation, and Ag & Markets visit to Cornell AgriTech.** Overview of Cornell AgriTech with a focus on economic development. Cornell AgriTech. Geneva, NY. Nov. 8, 2019. 55 min for 10 attendees. = 9 contact hours

**Smart, L.B.** “Market Explosion or a Bursting Bubble – What are the Long-Term Opportunities for Hemp?” Grow-NY Food & Ag Summit. Rochester, NY. Nov. 12 -13, 2019. 1.25 hours for 100 attendees. = 125 contact hours

**Hemp Breeding and Seed Production Course. UC Davis. Davis, CA.** “Access to germplasm, genetic diversity, zygosity.” “Selection strategies, cycling generations, marker development and application.” Oct. 29 – 30, 2019. 2.5 hours for 160 attendees. = 400 contact hours

**Cornell AgriTech Advisory Council Meeting.** Cornell AgriTech. Geneva, NY. Oct. 24, 2019. 2 hours for 40 attendees = 80 contact hours.

**Smart, L.B.** “From grey area to gold rush: Establishing a comprehensive hemp research program.” Cornell Alumni Affairs and Development. Lecture and Dinner. New York, NY. Oct. 21, 2019. 40 min for 35 attendees. = 23 contact hours

**Empire State Forest Products Association 2019 Regional Meeting.** Cortland, NY. Sept. 23, 2019. 15 min for 25 attendees. = 6 contact hours

**RCAS Tour.** Hemp Research. McCarthy Farm. Cornell AgriTech. Geneva, NY. Sept. 10, 2019. 30 min for 70 attendees. = 35 contact hours

**Cornell AgriTech Hemp Tour.** Sunrise Genetics. Geneva and Ithaca, NY. Sept. 9 -10, 2019. 8 hours for 1 attendee. = 480 contact hours

**Orange County Cornell Cooperative Extension Hemp Field Meeting,** Field trial exhibition and oral research presentation. Two locations: Hudson Valley Research Lab, Highland, NY and Fields of Brian Pawelski & Bruce Ludovicu, Goshen, NY. Two 2-hour presentations with 120 attendees. = 480 contact hours. Met with New York Farm Viability Institute Board members 30 min for 20 attendees. = 10 contact hours

**Cornell Hemp Research Team Field Day.** Hemp research field day with tours of field trials. Cornell AgriTech, Geneva, NY. Aug. 13, 2019. 4-hour event with 225 attendees. = 562 contact hours

**Empire Farm Days.** Presentation on “Growing hemp for food, fiber, and natural products”. Empire Farm Days. Seneca Falls, NY. August 6 and 8, 2019. Interacted with over 150 attendees for 60 min each. = 300 contact hours

**Plant Science Day, Long Island Horticultural Research and Extension Center.** Tours and demonstrations. Riverhead, NY. July 31, 2019. 30 min tour for 35 attendees = 17 contact hours.

**Ag Assessor Training.** Advanced Agricultural Valuation. Cornell University, Ithaca, NY. July 15, 2019. 1 hour seminar for 30 attendees = 30 contact hours.

**Cornell AgriTech Tour.** Cornell Cooperative Extension and New York Farm Bureau. Field tour and presentation. Cornell AgriTech, Geneva, NY. July 11, 2019. 20 min for 20 attendees. = 7 contact hours

**CALS Department Administrative Managers Meeting.** Bus tour of field plots. Cornell AgriTech, Geneva, NY. June 26, 2019. 45 min for 30 attendees. = 22.5 contact hours

**Smart, L.B.** “Evaluation of CBD hemp production in New York”. Eastern US Hemp Conference and Expo. General Session: Research Advances in CBD Hemp. Albany Capital Center, Albany, NY. June 2-4, 2019.

**Smart, L.B. “Developing the hemp industry in New York.”** Cornell CEA Advisory/Stakeholder Meeting. Cornell AgriTech, Geneva, NY. Apr. 26, 2019. 25 min for 130 attendees. = 54 contact hours

**Hemp Research Update and Information Session.** Broome County Cornell Cooperative Extension, Binghamton, NY. Mar. 13, 2019. 100 min for 110 attendees. = 183 contact hours

**FLX Food Meeting.** Wegmans, Rochester, NY. Discussion on hemp research. Mar. 11, 2019. 25 min for 55 attendees. = 23 contact hours

**Smart, L.B. “Growing Hemp in NYS.”** LEAF Workshop. Chautauqua County Cornell Cooperative Extension. Jamestown, NY. Mar. 2, 2019. 100 min for 100 attendees. = 167 contact hours

**Smart, L.B. “Growing Industrial Hemp – An Update on Growers’ and Processors’ Experiences.”** Orange County IDA Hemp Round Table Discussion. New Windsor, NY. Feb. 27, 2019. 100 min for 120 attendees. = 200 contact hours

**Cornell Cooperative Extension Webinar on Hemp Training.** Welcome and introduction to hemp and state-wide resources. Cornell AgriTech, Geneva, NY. Feb. 25, 2019. 80 min for 75 attendees. = 100 contact hours

**Montgomery County Soil and Water Conservation District.** Industrial Hemp Meeting. Industrial Hemp Research Update. Fonda, NY. Feb. 22, 2019. 100 min for 120 attendees. = 200 contact hours

**Albany County Cornell Cooperative Extension Industrial Hemp Workshop.** Industrial Hemp Research Update. Vorheesville, NY. Jan 17, 2019. 100 min for 80 attendees. = 133 contact hours

**New York State Ag and Markets Horticultural Inspector Training Session.** Industrial Hemp NY Research. Cornell University, Ithaca, NY. Jan. 9, 2019. 40 min for 50 attendees. = 33 contact hours

**Industrial Hemp Roundtable Summit.** SUNY Morrisville, Morrisville, NY. Jan. 7, 2019. 50 min for 80 attendees. = 67 contact hours

**Smart, L.B. “Industrial hemp production.”** Oneida County Crop Congress. Clinton, NY. Jan. 4, 2019. 30 min for 40 attendees. = 20 contact hours

**National Public Radio “Science Friday”** Broadcast interview with Ira Flatow on legalization of hemp on national syndicated radio. Broadcast Dec. 7, 2018.

**Northeast Hop Alliance Conference.** Cornell AgriTech overview. Geneva, NY. Dec. 1, 2018. 20 min for 80 attendees. = 26 contact hours

**Cornell Cooperative Extension Ag In-Service.** Hemp research workshop. Cornell University, Ithaca, NY. Nov. 13, 2018. Organizer of 1.5 hour session with 35 attendees. = 52 contact hours

**New York State Association of County Agricultural Agents.** Cornell AgriTech overview. Geneva, NY. Oct. 3, 2018. 20 min for 30 attendees. = 10 contact hours

**Plant Science Day, Long Island Horticultural Research and Extension Center.** Field tour stop at hemp field trial. 20 min for 30 people. Riverhead, NY Sept. 7, 2018. = 10 contact hours

**Orange County “Farm Talk” Radio Show on WTBQ.** 30 minute radio show interview on Cornell Hemp research. Sept. 5, 2018. = 1 contact hour

**New York State Ag and Markets Hemp Inspectors Training Session.** Training on hemp regulatory sampling. Cornell AgriTech, Geneva, NY. Aug. 21, 2018. 2 hour training for 8 people. = 16 contact hours

**Cornell Hemp Research Team Field Day.** Hemp research field day with tours of field trials. Cornell AgriTech, Geneva, NY. Aug. 14, 2018. 2 hour event with in 135 attendance. = 270 contact hours

**Cornell AgriTech Facilities Tour – Cornell University President Marth Pollack and staff.** Tour of field, pilot plant, and lab facilities for Cornell University leadership. Cornell AgriTech, Geneva, NY. Aug. 13, 2018. 1.5 hour tour for 6 people. = 9 contact hours

**Empire Farm Days,** Presented a display with my program staff and students on willow bioenergy crops and hemp breeding in the Cornell CALS Barn for all three days. Seneca Falls, NY, Aug. 7-9, 2018. Interacted with over 300 attendees for 10 min each. = 50 contact hours

**Cornell AgriTech Facilities Tour – Cornell University Vice-President for Facilities Rick Burgess and staff.** Tour of field, pilot plant, and lab facilities for Cornell University leadership with willow research field stop. Cornell AgriTech, Geneva, NY. Aug. 7, 2018. 3.5 hour tour for 6 people. = 21 contact hours

**Empire State Development Corporation Public Hearing.** Ithaca City Hall, Ithaca, NY. Public testimony describing Cornell Hemp Breeding Program. July 26, 2018. 5 min for audience of three people. = 0.25 contact hours

**Smart, L.B., Eric Fabio, Fred Gouker, Craig Carlson, Dustin Wilkerson.** “Breeding for hybrid vigor in shrub willow bioenergy crops”, Research forum with NYS DEC and NYSEDA staff, Cornell University, Ithaca, NY. July 23, 2018. 20 min talk with 30 in attendance. = 10 contact hours

**Master Gardeners Tour of Cornell AgriTech.** Field tour stop of hemp research trials and drone imaging research. Cornell AgriTech, Geneva, NY, July 19, 2018. Four 1 hour talks to 25 people each. = 100 contact hours

**National Industrial Hemp Regulatory Conference Field Tour.** Cornell Hemp Research Trial tour. Cornell AgriTech, Geneva, NY. July 17, 2018. 2 hour tour for 60 people. = 120 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Don Viands, Trevor Yeats, and Joss Rose.** “Breeding Industrial Hemp Cultivars for New York State”, Eastern

US Hemp Growers Conference and Expo, Albany, NY, June 5, 2018. 20 min talk with 275 in attendance. = 91 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Don Viands, Trevor Yeats, and Joss Rose.** “Breeding Industrial Hemp Cultivars for New York State”, Hemp Forum for Legislators and Executive Staff, New York State Capital, Albany, NY, May 22, 2018. 15 min talk with 50 in attendance. = 13 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, Trevor Yeats, Joss Rose, and Elson Shields.** “Cornell’s Role in Hemp Research: Breeding Industrial Hemp for New York State”, New York State Bar Association, Legislative Developments in Medical Marijuana and Industrial Hemp in New York, Albany, NY, May 22, 2018, 30 min talk with 50 in attendance. = 25 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Rebecca Wilk, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, Trevor Yeats, Joss Rose, and Elson Shields.** “Industrial Hemp Breeding and Natural Products” Research Forum with International Flavors and Fragrances, Cornell University, Ithaca, NY. May 22, 2018. 30 min talk with 40 people in attendance. = 20 contact hours

**Minister of Agriculture and Director, National Science Foundation, Kazakhstan.** Astana, Kazakhstan. Discussion of Cornell apple and hemp research projects in international research forum with USDA ARS leaders. April 24, 2018. 15 min talk with 25 in attendance. = 6 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, and Elson Shields.** “Breeding Industrial Hemp Cultivars for New York State” NOFA-NY Dairy and Field Crop Conference, Syracuse, NY. March 6, 2018. 60 min talk with 15 in attendance. = 15 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, and Elson Shields.** “Breeding Industrial Hemp Cultivars for New York State” Industrial Hemp Research Forum, Cornell University, Ithaca, NY. Feb. 28, 2018. 15 min talk with 125 in attendance. = 31 contact hours

**Smart, L.B., Jamie Crawford, Julie Hansen, Emilia Yoffie, Chris Smart, Don Viands, Gary Bergstrom, Jaime Cummings, Kevin Myers, Alan Taylor, Michael Loos, and Elson Shields.** “Breeding Industrial Hemp Cultivars for New York State” Future of Hemp Workshop, New York Farm Show, Syracuse, NY. Feb. 23, 2018. 30 min talk with 75 in attendance. = 38 contact hours

**New York State Agricultural Society,** Poster exhibit on hemp research. Syracuse, NY, Jan. 4, 2018. Discussions with ~100 attendees for 5 min each = 8 contact hours

**Smart, L.B.** Seeding Economic Development Through Agricultural Technology. 79<sup>th</sup> Annual Cornell Seed Conference, Geneva, NY, Dec. 12, 2017. Invited seminar with 90 in attendance.

**Smart, L.B., Jamie Crawford, Julie Hansen, Chris Smart, Don Viands** “Breeding industrial hemp cultivars for New York State”, Northeast Region Certified Crop Advisor training, Syracuse NY, Nov. 28, 2017, Invited seminars given twice with ~80 total attendance.

**Columbia County Cornell Cooperative Extension Hemp Technical Workshop**, Oral presentation and question/answer session. Greenwich, NY, Oct. 24, 2017. 90 minute presentation with ~110 in attendance.

**Orange County Cornell Cooperative Extension Hemp Field Day**, Field trial exhibition and oral research presentation. Warwick, NY. Sept. 21, 2017. Two one-hour presentations with ~60 total attendance.

**NYS Sen. John Flanagan Visit**, Presented table exhibit on industrial hemp research for 10 minutes to Sen. Flanagan and staff. Geneva, NY Aug. 22, 2017.

**Geneva Hemp Field Day**, Field trial exhibition and oral research presentation. Geneva, NY. Aug. 15, 2017. 105 in attendance for 1.5 hours.

**Empire Farm Days**, Presented a display with my program staff and students on willow bioenergy crops and hemp breeding in the Cornell CALS Barn for all three days. Seneca Falls, NY, Aug. 8-10, 2017. Interacted with over 300 attendees over the course of 23 hours.

**Cornell Hemp Summit** – Table exhibit at meeting with Lt. Gov. Kathy Hochul announcing industrial hemp research program. Ithaca, NY. April 18, 2017. ~200 attending.

**Eric Deeble, Aide to Sen. Gillibrand** – Meeting to discuss bioenergy research policy and Federal funding. Geneva, NY. Aug. 12, 2016.

**Empire Farm Days**, Presented a display with my program staff and students on willow bioenergy crops and breeding in the Cornell CALS Barn for all three days. Seneca Falls, NY, Aug. 9-11, 2016. Interacted with over 300 attendees over the course of 23 hours.

**Iowa Farm Bureau Field Tour** – Field tour and presentation for farmers organized by Iowa Farm Bureau. 120 participants. Geneva, NY. June 24, 2016.

**New York Farm Bureau Media Tour** – Field tour and presentation for farmers and writers organized by NYFB. 30 participants. Geneva, NY. Oct. 16, 2015.

**Ontario County Fun on the Farm** – Organized by Ontario County Farm Bureau – Presented willow bioenergy exhibit to ~100 local youth and community members (thousands in attendance) over the course of 5 hours at Black Brook Farm in Shortsville, NY. Sept. 26, 2015.

**NYS Ag Experiment Station Retirees Association**, Gave research update to retired faculty and staff at their annual meeting. Geneva, NY, Sept. 17, 2015, 40 attendees, 0.5 hour.

**Board of Directors, NY Farm Viability Institute,** Presented status of research projects funded by NYFVI and lead a field tour at their annual meeting. Geneva, NY, Aug. 19, 2015. 12 attendees, 1 hour.

**Empire Farm Days,** Presented a display with my program staff and students on willow bioenergy crops and breeding in the Cornell CALS Barn for all three days. Seneca Falls, NY, Aug. 11-13, 2015. Interacted with over 300 attendees over the course of 23 hours.

**Town of Geneva Green Fair.** Presented an exhibit on willow bioenergy crops at the Geneva Green Fair. Geneva, NY. June 6, 2015 30 attendees, 5 hours.

**Envirothon Educators Tour.** Hosted a field tour for high school educators involved in coaching Environthon teams. Geneva, NY. May 28, 2015. 12 attendees, 30 min.

**Cornell Financial Services Tour.** Hosted tour of willow fields for staff of Cornell Division of Financial Affairs. Geneva, NY, Sept. 18, 2014, 24 attendees.

**Empire Farm Days,** Presented a display with my program staff and students on willow bioenergy crops and breeding in the Cornell CALS Barn for all three days. Seneca Falls, NY, Aug. 5-7, 2014. Interacted with over 300 attendees over the course of 23 hours.

**NEWBio Annual Meeting,** Hosted the annual meeting of the USDA-NIFA NEWBio Northeast Bioenergy Coordinated Ag Project. Geneva, NY, July 30-Aug. 1, 2014. 80 attendees.

**Agrinetix and Trimble Precision Ag Team.** Hosted tour of willow fields and biomass boiler for engineers and sales professionals from Agrinetix and Trimble. Geneva, NY, July 8, 2014, 6 attendees.

**Cornell Energy & Sustainability Team Tour.** Hosted tour of biomass boiler and chip drying barn facility for Cornell Facilities staff. Geneva, NY, July 8, 2014, 6 attendees.

**Geneva Community Garden Committee.** Served on a city-wide committee overseeing the installation and management of a community garden. Prepared site by rototilling, installed fencing, helped construct storage barn, and rototilled garden after the season. April through October, 2014. 6 attendees involved, total time in hours=24, total contact hours=144.

**Genesee Valley Market Authority Board of Directors.** Greenhouse and growth chamber tour to Board members as a part of funding site visit. Geneva, NY, March 21, 2014, 12 attendees.

**Smart, L.B.** “Genetic improvement of shrub willow bioenergy crops for marginal land” Tour group of Oregon ag and horticulture professionals, Geneva, NY, March 20, 2014, 24 attendees

**Smart, L.B.** “Genetic improvement of shrub willow bioenergy crops in the Northeast” Annual Meeting of the Northern New York Ag Development Program (eastern region), Miner Institute, Chazy, NY, Feb. 28, 2014, 28 attendees

**Smart, L.B.** “Genetic improvement of shrub willow bioenergy crops in the Northeast” Annual Meeting of the Northern New York Ag Development Program (western region), Watertown,

NY, Jan. 31, 2014, 50 attendees.

**Willow BCAP Stakeholders Meeting.** Meeting with representatives of Celtic Energy Farm, Cato Analytics, SUNY-ESF, and Penn State to discuss agronomic practices and economic modeling of willow crops in northern NY. Nov. 26, 2013 – 20 attendees, 2 hours.

**Smart, L.B.** “The NEWBio Project: Expanding commercial deployment of bioenergy crops in the Northeast” Cornell Cooperative Extension In Service Training, Ithaca, NY, Nov. 20, 2013, 25 attendees.

**Ukraine and Poland Willow Bioenergy Companies and Researchers** – met with representatives of SalixEnergy, Ecosolum Group, and researchers at National University of Life and Environmental Sciences of Ukraine in Kiev, Ukraine (Sept. 22-25, 2013) and representatives of the Poland Bioenergy Association and European Willow Breeding AB in Posnan and Warsaw, Poland (Sept. 26-29, 2013).

**Ag Progress Days,** Pennsylvania Furnace, PA, Aug. 13-15, 2013. Presented a display with Penn State collaborators on willow bioenergy crops and breeding in the Natural Resources Barn for all three days. Interacted with ~300 attendees over the course of 18 hours. Also spoke on field tour of yield trial at the site, 0.5 hour each day with total of 40 attendees. Also presented a 20 min talk entitled “Genetic Improvement of Shrub Willow Bioenergy Crops for Marginal Land” to 10 attendees.

**Empire Farm Days,** Seneca Falls, NY, Aug. 6-8, 2013. 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 Education Program, Cornell Dept. of Biological and Environmental Engineering, Ithaca, NY, June 19, 2013, 25 attendees.

**NY Forest Owners Association** – Smart presented field tour stop at Loomis Yield Trial to leaders of NY Forest Owners Association, June 14, 2013. 6 attendees, 30 min.

**NIFA Director Sonny Ramaswamy** – Smart was in group of Cornell faculty who met with NIFA Director Sonny Ramaswamy in discussion of Cornell involvement in NIFA projects, March 7, 2013.

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

**Southern Tier Biomass**– 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, Feb. 6, 2013.

**Cornell Daily Sun** – 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

**Fulton Boiler and KWB Boilers** 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

**WSYR radio** 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:**

**L.B. Smart, C.D. Smart, C. Watkins** “Optimizing Industrial Hemp Production for CBD in New York”

New York Farm Viability Institute

Total Award: \$124,298; Start date: Dec. 1, 2019, End date: 5/31/21

**L.B. Smart** “Research & Extension for Unmanned Aircraft Systems (UAS) Applications in US Agriculture & Natural Resources”

U.S.D.A. Hatch Federal Capacity Funds Program

Total Award: \$70,000; Start date: 10/1/2019; End date: 9/30/2021

**L.B. Smart, C.D. Smart, D. Viands, N. Mattson, W. Miller, A. Taylor, C. Watkins, G. Bergstrom, E. Shields**

“Optimizing Industrial Hemp Production in New York”

Empire State Development Corp.

Total award: \$400,000; Start date: 7/24/19; End date: 7/23/21

**L.B. Smart** “High Throughput Phenotyping Equipment for Specialty Crop Research”

Empire State Development Corp.

Total award: \$1,050,000; Start date: 1/4/19; End date: 12/31/24

**L.B. Smart, C.D. Smart, J.K.C. Rose, J. Hansen, D. Viands** “Grower’s Guide & Best Management Practices for Hemp – Evaluating CBD Hemp Cultivars & Cannabinoid Production”  
Pyxus International

Total award: \$551,013; Start date: 7/1/19; End date: 5/31/21

**L.B. Smart, J. Hansen, O. Padilla-Zakour, D. Viands, C.B. Watkins** “Filling the Knowledge Gaps in Farm-to-Market Supply Chains for Industrial Hemp in New York”

Empire State Development Corp.

Total award: \$350,000; Start date: 1/1/18; End date: 6/30/19

**L.B. Smart, D. Viands, C.D. Smart** “Catalyzing NY’s Emerging Industrial Hemp Industry: A Plant Breeding and Commercialization Strategy”

Empire State Development Corp.

Total award: \$2,000,000; Start date: 1/1/18; End date: 12/31/21

**L.B. Smart, A. Kemanian, S. Wurzbacher, T. Volk, and J. Heavey**

“Development of UAS Imaging to Complement Genomics-Assisted Breeding of Shrub Willow for Improved Yield and Pest Resistance”

USDA NIFA AFRI,

Total award \$1,000,000; Start date: 4/15/18, End date: 4/14/22

**C.D. Smart, D. Viands, L.B. Smart, A. Taylor, C. Watkins, G. Bergstrom, E. Shields, J. Hansen**

“Optimizing Industrial Hemp Production in New York”

New York State Dept. of Agriculture and Markets

Total award: \$400,000; Start date: 4/1/17; End date: 3/31/19.

**L.B. Smart, C.D. Smart, B. Nault, and M. Fuchs** “Agricultural Research Internship Opportunities for Undergraduates: An Interdisciplinary Summer Research Scholars Program at Cornell University’s New York State Agricultural Experiment Station”

U.S.D.A. Hatch Federal Capacity Funds Program

Total Award: \$90,000; Start date: 10/1/2017; End date: 9/30/2020

**L.B. Smart** “Expanding Hemp Cultivation in NYS Through Grower Participation Research Trials with Cornell University”

Empire State Development Corp.

Total award: \$900,000; Start date: 6/16/17; End date: 6/30/18

**L.B. Smart, B. Richards, and A. Kemanian** “Optimizing Nutrient Uptake in Shrub Willow and Switchgrass to Provide Multiple Ecosystem Services”

NE Sun Grant (USDA NIFA)

Total award: \$299,988; Start date: 4/30/17; End date: 3/31/19

**L.B. Smart** “Expanding the Planting & Harvesting Seasons for Shrub Willow Bioenergy Crops”

U.S.D.A. Hatch Program

Total Award: \$120,000; Start date: 10/1/2016; End date: 9/30/2019

**C.D. Smart, B.A. Nault, and L.B. Smart**

“Summer Research and Extension Internships for Undergraduates at Cornell University’s New York State Agricultural Experiment Station”

U.S.D.A.-N.I.F.A.

Total award: \$266,895; Start date: Feb. 1, 2016; End date: Jan. 31, 2019

**M. Olson, S.P. DiFazio, K. Keefover-Ring, and L.B. Smart**

“Dimensions US-China: Collaborative Research: Allosomes and dioecy in plants as drivers of multi-level biodiversity”

N.S.F. Dimensions in Biodiversity

Total award \$1,945,827 (\$398,065 to Smart); Start date: 3/1/16; End date: 2/29/21

**L.B. Smart and C.D. Smart**

“Genomics-Assisted Breeding for Leaf Rust (*Melampsora*) Resistance in Shrub Willow (*Salix*) Bioenergy Crops”

U.S.D.A. N.I.F.A. Feedstock Genomics Program

Total award \$1,000,000; Start date: 9/1/15; End date: 8/31/19

**J.D. Klein, S.Y. Landau, A. Markovics, H.A. Azaizeh, S. Awabdeh, A. Albalawnee, S. Naoom, M. Tadros, and L.B. Smart**

“Willow (*Salix* spp.): a new forage resource for semi-arid zones”

U.S. A.I.D. Middle East Regional Cooperation Program

Total Award: \$605,245; Start date: 1/1/2015; End date: 12/31/2019

**C.D. Smart, B. Nault, R. Worobo, and L.B. Smart**

“Agriculture and Food Production Summer Internship Opportunities for Undergraduates: A Cross-Departmental Summer Scholars Program at Cornell University’s New York State Agricultural Experiment Station”

U.S.D.A. Hatch Program

Total Award: \$120,000; Start date: 10/1/2014; End date: 9/30/2017

**J. Lyons and L.B. Smart**

“Testing the feasibility of *Stropharia rugoso-annulata* mushroom cultivation in community gardens on shrub willow (*Salix* spp.) and ash (*Fraxinus* spp.) wood chips.”

Cornell University – Toward Sustainability Foundation  
Total Award: \$8,000; Start date: 1/1/14; End date: 12/31/14

**D.J. Aneshansley and L.B. Smart**

“Drying and Storage Techniques and their Strategies for Wood Chips”

U.S.D.A. McIntire-Stennis Program

Total Award: \$90,000; Start date: 10/1/2013; End date: 9/30/2016

**L.B. Smart, S. Reiners, M. Ryan, T. Bates**

“Improving the sustainable establishment and production of shrub willow bioenergy crops”

U.S.D.A. Hatch Program

Total Award: \$75,000; Start date: 10/1/2013; End date: 9/30/2016

**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: 7/31/2016

**L.B. Smart**

“Willow Biomass Crop Feedstock Development Plan for the Northeast and Midwest”

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

Total award: \$220,670; Start date: 7/1/2009; End date: 9/30/2016

**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: 8/31/14

**L.B. Smart**

“Willow Biomass Boiler System”

New York Farm Viability Institute

Total award: \$15,000 (costshare for NYSEDA award of \$405,232 to T. Burr); Start date: 1/1/2011; End date: 3/31/2012

**C.D. Smart, B. Nault, R. Worobo, and L.B. Smart**

“Research and Extension Summer Internship Opportunities for Undergraduates: A Cross-Departmental Summer Scholars Program at Cornell University’s New York State Agricultural Experiment Station”

U.S.D.A. Hatch Program

Total Award: \$90,000; Start date: 10/1/2011; End date: 9/30/2014

**G. Hudler, L.B. Smart**

“Willow leaf rust – Etiology and impact on biofuels feedstock”

USDA Hatch Program

Total award: \$86,400; Start date: 10/1/2011; End date: 9/30/2014

**G. Hudler, G. Bergstrom, L.B. Smart, K. Hodge, S. Kenaley, M. Hayes**

“A Multi-disciplinary Approach to Development of Ecologically-Sustainable Disease Management Solutions for Emerging Bioenergy Crops”

Cornell University Atkinson Center for a Sustainable Future

Total Award: \$72,075; Start date: 7/1/2011; End date: 6/30/2013

**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

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

“Willow Biomass Crop Feedstock Development Plan for the Northeast and Midwest”

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

**T.A. Volk, T.E. Amidon, C. Baier, T. Buchholz, R.H. Germain, M. Kelleher, V. Luzadis, R.W. Malsheimer, 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. NYSEDA 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, 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:***

Hussein Muklada	Post-doctoral Associate/Visiting BARD Fellow – Cornell University (Nov. 2019 – <i>present</i> )
Craig Carlson, Ph.D.	Post-doctoral Associate – Cornell University (Sept. 2018 – <i>present</i> )
Eric Fabio, Ph.D.	Post-doctoral Associate – Cornell University (Aug. 2017 – Jan. 2021)
Michelle Serapiglia, Ph.D.	Post-doctoral Associate – Cornell University (Jan. 2010 – Jan. 2014)
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) <i>current position:</i> Research Associate, SUNY Upstate Medical University, Syracuse, NY

***Graduate Students (Cornell University):***

Savanna Shelnett	Ph.D. student, Field of Horticulture, started Jan. 2021
George Stack	Ph.D. student, Field of Plant Breeding, started Aug. 2019
Jacob Toth	Ph.D. student, Field of Plant Breeding, started Aug. 2018
Brennan Hyden	Ph.D. student, Field of Plant Breeding, started Jan. 2018
Dustin Wilkerson	Ph.D. student, Field of Plant Breeding, started Jan. 2017

***Graduate Students (Graduated – Cornell University):***

Ann Tate	M.P.S., Dec. 2020, Field of Horticulture <i>current position:</i> Lab technician, Genomics Lab, Inst. for Biotechnology, Cornell University, Ithaca, NY
Craig Carlson	Ph.D., Sept. 2018, Field of Plant Breeding “The genomic basis of heterosis in high-yielding triploid hybrids of willow

(*Salix* spp.) bioenergy crops”  
*current position*: Post-doctoral Associate, Horticulture Section, SIPS, Cornell University, Geneva, NY

Eric Fabio Ph.D. Aug. 2017, Field of Horticulture.  
“Environmental & management factors influencing shrub willow biomass yield and quality”  
*current position*: Agronomist, USDA Natural Resources Conservation Service, Big Flats, NY

Fred E. Gouker Ph.D. Jan. 2017, Field of Plant Breeding.  
“Dissection of genotypic and phenotypic variation in shrub willow (*Salix purpurea* L.)”  
*current position*: Geneticist, National Arboretum, USDA Agriculture Research Service, Beltsville, MD

***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*: Asst. Professor, Biology Dept., Alvernia University, Reading, PA

Emily Puckett M.S., July 2008  
“Molecular Basis for Differential Uptake and Sensitivity to Arsenic Among Clones of Shrub Willow”  
*current position*: Assistant Professor, Dept. of Biology, Memphis State University, Memphis, TN

Dongqing Yan M.P.S., Aug. 2007  
*current position*: Post-doctoral Research Associate, Huntsman Cancer Inst., University of Utah, Salt Lake City, UT

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*: Post-doctoral 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*: Self-employed farmer, 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*: Post-doctoral 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, Broad Institute, Cambridge, MA

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

***Professional Staff/Interns/Visiting Scholars:***

- Allison DeSario Lab/Field Technician II – October 2019 – *present*
- Deanna Gentner Lab/Field Technician II – June 2019 – *present*
- Lauren Carlson Lab/Field Technician II – Oct. 2014 – *present*
- Savanna Shelnutt Lab/Field Technician II – October 2019 – Jan. 2021
- Teagan Zingg Lab/Field Technician II – September 2019 – Dec. 2020
- Bulbul Ahmed Visiting Post-doc – Jan. 2020-Mar. 2020
- Junzhu Zou Visiting Ph.D. Student, Chinese Academy of Forestry, Beijing, China – Sept.

2018 – Sept. 2019

- Rebecca Wilk Lab/Field Technician III – May 2016 – July 2019
- Dawn Fishback Part-time Lab/Field Technician – Oct. 2014 – May 2019
- Brent Radke Lab Field Technician II – March 2019 – May 2019
- Steve Brind'Amour Part-time Lab Technician – Oct. 2018 – Jan. 2019
- Bircan Taskiran Visiting Ph.D. Student, Middle-Eastern Technical University, Ankara, Turkey – Sept. 2017 – Sept. 2018
- Jane Petzoldt Lab/Field Technician II – Sept. 2016 – May 2019
- Sam Knopka Part-time Lab/Field Technician – Spring 2012, 2013, 2016, 2017
- Curt Carter Lab/Field Technician I – June 2014 – March 2016
- Okray Orel Visiting Ph.D. Student, Ankara University, Ankara, Turkey – Oct. 2014 – Sept. 2015
- Brian DeGasperis Lab/Field Technician II – Feb. 2014 – Oct. 2014
- Jeffrey Teague Field Assistant I – Jan. 2014 – April 2014
- HyunSeok Lee Visiting Ph.D. student, Kangwon National University, Chuncheon, S. Korea – Feb 2014 to April 2014
- Jun-Ya Wei Visiting Scholar, Chinese Academy of Tropical Agricultural Science, Danzhou City, China – April 2013 to March 2014
- Aaron Palmieri Temporary Service Technician – April 2013 to Jan. 2014
- Jane Lam Northeast Biofuels and Bioproducts Educational Intern – (Middle School Science Teacher, David A. Boody Intermediate School, Brooklyn, NY) – Summer 2012
- James Capron Temporary Service Technician – 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. 2007 to 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*: Lab technician, 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 Agrosiences

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

Cornell University

Ben DeMoras – 2018 – *present* Research Aide and Webmaster (Cornell Univ, Class of 2022)

Reagan Reed – 2019 Summer Research Aide (Vassar College, Class of 2020)

Jonathan Berlinger – 2019 Summer Research Scholar (Cornell Univ. Dec. 2019)

Diego Hernandez – 2019 Summer Research Scholar (Univ of the Andes, Colombia – class of 2020)

Mariana Marrero – 2019 Summer Research Scholar (Univ of Puerto Rico class of 2020)

George Stack – 2018 Summer Research Scholar (Cornell Univ. class of 2019)

Cirui Qui – 2018 Summer Research Scholar (Univ. of Arkansas, Class of 2019)

Jeremy Feinstein – 2018 Summer Research Scholar (Oberlin College, Class of 2019)

Jennifer Myers – 2017 Summer Research Scholar (Univ. of Nebraska, class of 2018)

Jubilee Park – 2017 Summer Research Scholar (Emory University, class of 2018)

Brianna Moore – 2017 NSF Summer Research Scholar (William Smith, class of 2018)

Anna Agloro – 2016 Summer Research Scholar (St. Martin’s Univ, class of 2017)

Carlie Leary – 2016 Summer Research Scholar (New School, class of 2017)

Jeremy Pardo – 2015 Summer Research Scholar (Cornell Univ, class of 2017)

Brenden Armstrong – 2014 Summer Research Scholar (Kansas State, class of 2014)

Nicholas Durnin – 2014 Summer Research Aide (Alfred State, class of 2015)

Alison Lamb – 2014 Summer Research Aide (Geneva High School, class of 2016)

Lindsey Mattick – 2014 Summer Research Aide (Univ of Buffalo, class of 2015)

McKenzie Schessl – 2014 Summer Research Aide (St. Lawrence Univ, class of 2015)

Lauren Frazier – 2013 Cornell Cooperative Extension Intern (Cornell Univ, 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 2014)

Rebecca Chase – Winter session 2013 Research Intern, 2013 summer research aide (Keuka College, class of 2016)

Michael Rosato – Academic year 2011-2012, 2014 summer research aide (Finger Lakes Comm. College, class of 2012; Hobart College, class of 2014)

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)

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

Mark Jackling, class of 2011

Andrew Dimezza, class of 2010

Amy Fox, class of 2010

Samantha Holcomb, class of 2010

Leticia Izquierdo, class of 2010

Jacquelyn Lillis, class of 2010

Jason Maurer, class of 2010

Matthew Oliver, class of 2010

Molly Payne, class of 2010

Chelsea Sheridan, class of 2010

Craig Tompkins, class of 2010

Susan Carlton, B.S. 2009

Robert Collignon, B.S. 2009

Alyssa DeLeon, B.S. 2009

*ASPB SURF Awardee*

Lindsay Gedacht, B.S. 2009

Saeko Hamada, B.S. 2009

Steve Letkowski, M.S. 2009

Derek Proulx, B.S. 2009

Hajime Akada, B.S. 2008

Charles Curry, B.S. 2008

Celia Dubin, B.S. 2008

Shaunna Escobar, B.S. 2008

Charles Fouch, B.S. 2008

Adam Robadee, B.S. 2008

Edward Rowe, B.S. 2008

Andrew Schneider, B.S. 2008

Thomas Burchhardt, B.S. 2007

Kathleen Pitcher, B.S. 2007

Irony Sade, B.S. 2007

Jon Tarasiewicz, B.S. 2007

Maxwell Wightman, B.S. 2007

Michael Fenton, B.S. 2006

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

Emily McFadden, Geneva High School, Class of 2021

Sara Wright, Geneva High School, class of 2019

Benedict DeMoras, Penn Yan High School, class of 2018

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):***

Spring 2021 – *present* PLSCI5030 Hemp Breeding and Genetics (1 credit, avg. enrollment=12)

Fall 2010 to 2017 PLBR4030 Genetic Improvement of Crop Plants (3 credits, avg. enrollment=25)

***Regular course instruction (SUNY-ESF):***

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

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:***

Spring 2011 to 2016 Guest lecturer  
HORT1115 The Nature of Plants

Fall 2010 to 2017 Guest lecturer  
PLBR2010 Plants, Genes, and Global Food Production

Fall 2009 to 2019 Guest lecturer  
PLBR4060 Methods of Plant Breeding Laboratory

Spring 2012 to 2015 Guest lecturer  
BEE6940 Bioenergy Production on Marginal Lands

Fall 2014, 2015 Guest lecturer  
PLPA4990 Willow

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 2011	Guest lecturer NTRES4940 Solid Biofuels and Sustainability Options for Cornell
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 to 2001 Fall 2004 to 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, College, and Professional Service:**

Mar. 2020 – <i>present</i>	American Organization of Seed Certifying Agencies (AOSCA) – Hemp Variety Review Board.
Nov. 2017 – <i>present</i>	Advisory Council, Institute for Food Safety, Cornell AgriTech
July 2017 – <i>present</i>	New York State Industrial Hemp Task Force and CBD Working Group
Feb. 2013 – <i>present</i>	Cornell AgriTech Field Research Unit Advisory Committee, Cornell University
Jan. 2013 – <i>present</i>	Subject Editor, <i>Global Change Biology-Bioenergy</i>
Feb. 2010 – <i>present</i>	Summer Research Scholars Program, NYS Agricultural Experiment Station, Cornell University (Director: Oct. 2015 – May 2019)
Oct. 2018 – Sept. 2020	Chair, USDA NIFA Hatch S-1084 Multistate Research Project “Industrial Hemp Production, Processing, and Marketing in the U.S.”
July 2016 – June 2019	Geneva Program Leader, Horticulture Section, SIPS, Cornell University
Oct. 2018 – May 2019	Search Committee Chair, Research Asst Professor in Systems Engineering for Specialty Crops, Cornell AgriTech
Sept. 2016 – May 2017	CALS Branding and Marketing Advisory Committee
Feb. 2016 – July 2016	CALS Structure Task Force
Sept. 2015 – April 2016	Search Committee, Fruit Disease Resistance Pathologist, Plant Pathology Section, SIPS, Cornell University
May 2012 – Dec. 2015	Scientific Advisory Board, GenoRem, Genome Canada/Genome Québec Research Project, University of Montréal
April 2012 – March 2015	Executive Committee, Northeast Section, American Society of Plant Biologists
Nov. 2010 – Oct. 2014	Executive Committee, Dept. of Horticulture, Cornell University
Aug. 2013 – Jan. 2016	Co-chair, Forest Tree Workshop, Plant and Animal Genome Conference and Coordinator, IUFRO Working Party 2.10.04
May 2012 – June 2014	Plant Sciences Reorganization Special Committee, CALS, Cornell University
April 2013	Grant Review Panel, USDA-DOE Feedstock Genomics Program
April 2010 – April 2013	Cornell Cooperative Extension Energy and Climate Change Team
Dec. 2007 – Dec. 2012	Editorial Board, <i>BioEnergy Research</i>
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 – 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 <sup>3</sup> ) 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 <sup>3</sup> ) 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 State University
Sept. 1989 – Sept. 1991	Admissions Committee, Genetics Program, Michigan State University
Sept. 1988 – Sept. 1989	Seminar Committee, D.O.E.-Plant Research Lab, Michigan State University

**Departmental Administrative Service (SUNY-ESF):**

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

**Reviewer for:**

US Dept. of Energy Office of Science  
National Science Foundation  
USDA Hatch Program  
USDA McIntire-Stennis Program  
USDA NIFA AFRI Competitive Grants Program  
*and over 25 scientific journals.*