

**ANNUAL REPORT**  
**DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY /**  
**DEPARTMENT OF FOREST & NATURAL RESOURCES MANAGEMENT**

SUNY College of Environmental Science and Forestry  
(June 1, 2009 - May 31, 2010)

NAME: Lawrence P. Abrahamson

**I. INSTRUCTIONAL ACTIVITIES**

1. Regular Course Offerings

Course No.	Title	Credit Hrs.	No. Students	No. of Lab. Sections
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SUMMER: none

FALL: none

SPRING: none

2. Non-Scheduled Course Offerings (e.g., 496, 899, 999)

Course No.	Title	No. Students	Credit Hrs.
FCH 498	introduction to Research	1	6
ESF499	Honors Thesis Research	none this year	
EFB & FOR899	Masters Thesis Research	none this year	
EFB & FOR999	Doctoral Dissertation Research	none this year	

3. Continuing Education and Extension (Short courses, workshops, etc.)

4. Guest Lecture Activities

Course No.	Title	No. of Lectures
FOR 496/696	Bioproducts and Bioenergy Seminar	1
FOR 334	Silviculture	1

**II. STUDENT ADVISING AND COUNSELING**

A. Number of undergraduates for whom you are the student's official advisor. \_\_\_\_ and unofficial advisor 1.

B. Graduate Students - (Name, degree sought, starting date, month & year; if a degree was completed, please give date and full citation for the thesis or dissertation).

MAJOR PROFESSOR

CO-MAJOR PROFESSOR

MEMBER, STEERING COMMITTEE (other than those listed above)

1. Steve Letkowski, MS (EFB)
2. Kim Adams, PhD (EFB)

**CHAIRMAN OR READER ON THESIS EXAMS, ETC.**

1. Godfrey J. Ofezu, Examiner, PhD candidacy exam
2. Brendan Dutter, Chair, MS thesis defense
3. Yang Wang, Chair, MS thesis defense

C. High School Students -

1. none

D. Post-doctoral/Research Scientists -

E. Research Support Specialists -

1. Philip Castellano
2. Eric Fabio

**III. RESEARCH COMPLETED OR UNDERWAY**

A. Departmental Research (unsupported, boot-legged; title - % time spent)

Many small projects indirectly related to some of the funded research reported below

- B. 1. Grant-supported Research (source, subject, amount - total award and current year, award period starting and ending dates; list graduate research assistants supported by each grant)
1. Program for wood bioenergy farming research, development and technology transfer in New York (USDA – CSREES), \$130,000 - 200,000/yr 15 years (1996-2011)
  2. Support for willow biomass commercialization: Operations, \$380,000 (2/00-12/10), NYSERDA
  3. Support for willow biomass commercialization: Land restoration, \$398,000 (2/00-12/10) NYSERDA
  4. New York State Energy Research and Development Authority, “Reducing the cost of willow biomass by improving harvest system efficiency and reducing harvesting costs” T.A. Volk, PI; co-PI with L.B. Smart, Total award: \$126,688, Start date: 8/16/2006; End date: 12/31/2009.
  5. NYC Department of Environmental Protection award to SUNY-Delhi, “Center of Excellence in Watershed Application and Technology - Willow Biomass Project” T.A. Volk, PI; co-PI with L.B. Smart, Total award for task: \$384,615, Start date: 7/1/2006; End date: 6/30/2010
  6. Support for 9<sup>th</sup> ROW Conference in September, 2009, \$29,000 (various).
  7. Support for 10<sup>th</sup> ROW Conference in 2014, \$8,000 (various).
  8. Growing Willows as an Alternative Cover for the Solvay Wastebeds. Co-Principal Investigator with Dr. Tim Volk and Doug Daley (4/1/03 – 12/31/10, \$1,200,000). Honeywell Inc.

9. NYSERDA. Reducing the Cost of Willow Biomass by Improving Harvester Efficiency – Phase II. Co-Principal Investigator with Dr. Tim Volk (06/01/2005 – 12/31/09, \$250,000).
10. \$85,000 from Case New Holland support for development and demonstration of a willow harvesting system (2005-2008 with continuing support through 2009-10 with donated use of an FX45 forage harvester for willow harvesting and a FR 9060 forage harvester with new header).
11. USDA Rural Development (USDA-DOE Biomass R&D Program), “Overcoming Barriers to Facilitate the Commercialization of Willow Biomass Crops as a Feedstock for Biofuels, Bioenergy, and Bioproducts” T.A. Volk, PI; Co-PI with L.B. Smart and E.H. White, Total award: \$813,415 (\$220,000 of subcontracts; \$324,000 for breeding tasks; current year ~\$100,000) Research Scientist: Kim Cameron, Start date: 11/8/2006; End date: 2/7/2010
12. Multiple sponsors, Total budget: \$60,000 plus (with T.A. Volk), Start date: 1/1/2005; End date: 12/31/2010
13. Multiple sponsors for harvesting willow, total budget \$8,000 (with T. Volk), start date 9/2009;
14. NY Farm Viability Institute, Inc, “Demonstrating Improved Yield and Encouraging Adoption of New Varieties of Fast-Growing Shrub Willow Bioenergy Crops” with co-PIs T.A. Volk and L.B. Smart, Total award: \$125,000; Current year: ~\$15,000; Research Scientist: Kim Cameron, Start date: 4/1/2008; End date: 9/30/09
15. NYS Department of Transportation, “Developing Living Snowfences in New York” co-PI with T. Volk, Total request: \$280,253, Start date: 9/1/2008; End date: 8/31/2011
16. USDA McIntire-Stennis Program, “Applying Genomic Approaches to the Improvement of Shrub Willow Bioenergy Crops” with co-PIs T.A. Volk, C.A. Maynard, and L.B. Smart, Total request: \$58,720, Start date: 8/15/2008; End date: 9/30/2010
17. NYSTAR – “Development of willow production and harvesting demonstration” with T. A. Volk and Catalyst Renewables, \$500,000, Start date: 1/1/09 – 3/30/11.
18. USDA Forest Service. The role of Glyeobius speciosus in sugar maple decline, with D. Allen (6/30/2006 – 4/30/2010) \$25,000.
19. USDA Forest Service. The economic effects of ambrosia beetles and round headed borers on black cherry blow down at the Kane Experimental Forest, with D. Allen (8/29/2006 – 12/31/2010) \$36,000.

2. Research Proposals pending (as in B.1., above)

1. A sustainable industrial biorefinery based on lignocellulosic biomass: A modular approach to renewable fuels, chemicals and biodegradable materials, \$7 million (DOE) with SUNY Center for sustainable and renewable energy.
2. Research and development of a distributed power generation system using biomass gasification and fuel cell system, \$5 million (DOE) with Alfred University, NYPA, NREL and others.

3. USDA/DOE. Improving Yield and Reducing Costs of Willow Biomass Crop. Co-Principal Investigator with Drs. Lawrence Smart, Art Stipanovic and Tim Volk (\$1,602,928).
4. USDOE. “Development and Deployment of a Short Rotation Woody Crops harvesting System Based on a Case New Holland Forage Harvester and SRC Crop Header” Co-Principal Investigator with. Tim Volk and Greenwood Resources, MESA, and Case New Holland (\$1,600,000). **AWARDED** but not signed off on yet.
5. U.S.D.A. - C.S.R.E.E.S. – Rural Development, “Willow Demonstration Farm” co-PI T.A. Volk Total Award: \$133,000, Start date: 5/1/10; End date: 7/31/11
6. Northeast SunGrant Initiative - Subcontract from Cornell University, “Assessing Productivity, Pest Impact, and Pest Management of Advanced Selections of Willow Bioenergy Crop Varieties” with PI Greg Loeb (Cornell University) and co-PI L. Smart, Total Request: \$125,000 (\$22,913 subcontract to ESF), Start date: 7/1/09; End date: 6/30/12 (re-applied)

**IV. PUBLICATIONS** (Full bibliographic citation, i.e., do not use "with Jones," or "Jones, et al."; please list only publications published, in press, or actually submitted during this reporting period --- **do not list manuscripts in preparation**).

A. Refereed Publications

**Volk, T.A., T. Verwijst, P.J. Tharakan, L.P. Abrahamson, and E.H. White.** (in Press). Are Short-Rotation Woody Crops Sustainable? 2<sup>nd</sup> World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. May 10 – 14, Rome, Italy.

**Volk, T.A., L.P. Abrahamson and E.H. White.** (in Press). Integration of Cover Crops During the Establishment of Short-Rotation Woody Crops. 2<sup>nd</sup> World Conference and Technology Exhibition on Biomass for Energy, Industry and Climate Protection. May 10 – 14, Rome, Italy.

**Kiernan, B.D., T.A. Volk, J. Gingerich, L.P. Abrahamson, and E.H. White.** (Submitted). An evaluation of chips from willow shrubs (*Salix* spp.) grown in short-rotation intensive culture as a carbon source for composting layer manure. *Bioresource Technology*.

**Abrahamson, L.P., S. Liu, and T.E. Amidon,** (in press) editors of special edition of Biomass & Bioenergy on “International Biorefinery Conference IBC 09, October 8&9, 2009, Syracuse, NY”

B. Non-refereed Publications

**Willow Economic Model Fact Sheet - authored by T. Buchholz, T. A. Volk, L. P. Abrahamson, and L. B. Smart** Fact sheet: “EcoWillow v 1.0 (Beta) – An Economic Analysis Tool for Willow Short-Rotation Coppice for Wood Chip Production” - published 5/2008 with a new version in 2009-10

C. Papers Presented at Science Meetings (give title, date, occasion, and location)

1. E.H. White, L.P. Abrahamson, T.A. Volk, R.H. Germain and P.J. Castellano, Current State of Forest Inventory in New York, The Forest Biomass Discovery Workshop, Queen's University, Kingston, On, March 7, 2009.
2. Volk, T.A., L.P. Abrahamson, T. Amidon, T. Buchholz, P. Castellano, L. Smart, and E. White. 2009. Woody Biomass: Sources, Sustainability and Status of Markets. NY Society of American Foresters, Syracuse, NY, January 28 – 30.
3. White, E.H., L.P. Abrahamson, T.A. Volk, L.B. Smart and T.E. Amidon, The Salix Program in the Northeast. 14<sup>th</sup> Annual Ethanol Conference, San Antonio, TX, February 22 – 26, 2009.
4. Volk, T.A., L.P. Abrahamson, T. Amidon, D. Aneshansley, K. D. Cameron, G. Johnson, J. Posselius, D. Rak, L.B. Smart, E. Spomer, E.H. White. 2009. Developing Willow Biomass Crops for Bioenergy and Bioproducts in the Northeastern and Midwestern United States. Sun Grant Energy Conference Washington, DC, March 10 – 13.
5. Volk, T.A., L.P. Abrahamson, T. Amidon, D. Aneshansley, T. Buchholz, K. D. Cameron, G. Johnson, J. Mirck, J. Posselius, D. Rak, L.B. Smart, E. Spomer, E.H. White. 2009. Willow Crops: Research Update and Opportunity, Saskatoon, SK March 17 – 18.
6. Volk, T.A., T. Buchholz, P. Castellano, L. Abrahamson, and L. Smart. 2009. Heating the Northeast. Nashua, NH, April 29 – 30.
7. Moderator of three sessions during the “Ninth International Symposium on Environmental Concerns in Rights-of-Way Management” in Portland, OR September 27-30, 2009.

D. Public Service Presentations (lectures, seminars, etc. to and for the public; give group or occasion, date(s), and attendance)

- Presentation on willow production to a NYDOT training session on living snowfences held at Tully (Heiberg Forest), May 26, 2009.
- Presentation on willow biomass program at SUNY-ESF to Expert Workshop – Initiating a Short Rotation Forestry Strategy for Eastern Ontario – Mar 10, 2009 Kemptville, Ontario.
- Meet with University of Chile visitors to talk about growing willow energy crops in Chile, Mar 18, 2009.
- Presentation on willow project at SUNY-ESF to the Central and Western Industry Liaison Group on campus Mar 19, 2009.
- Presentation on Renewable/Sustainable Energy – Energy 101 to SUNY system VP's of student Life on campus Mar 19, 2009.
- Oral presentation to landowners in Upper Michigan who are interested in growing willow biomass crops at KI Sawyer in Michigan July, 9, 2009.
- Meet with Michigan State Field station personnel to discuss willow crops for growing in Northern Michigan at Escanaba, MI July 13, 2009.
- Toured willow crop fields with John Gee of NYSTAR to discuss willow crops and how they are harvested at Auburn, NY July 17, 2009
- Presented talk on insect and weed pests and how to control them at the CTFANY Summer Meeting at Endecott, NY July 25, 2009.
- Attended Cornell energy crop meeting at Big Flats, NY to discuss willow crops on the field tour July 29, 2009.
- Empire Farm Days with Larry Smart and Double A Willow Nursery at Senec Falls, NY to answer questions about willow crops and the harvester on display, August 11-13, 2009.
- Provided talk on willow crops to US Forest Service visitors and provided tour of willow crops at Tully NY, August 16, 2009.
- Provided talk on willow crops and answered question on willow at Canadian SRWC biomass informal meeting in Kemptville, ON; December, 8, 2009.

- Part of the discussions for the GLSEC Bi-National (USA & Canada) meeting in Syracuse, NY March 12, 2010.
- Represented SUNY-ESF and the Willow Program at the NYSTAR meeting with Canada in Albany, NY March 15, 2010.
- Provided talk on willow crops and field tour of willow research at Tully, NY for Michigan State University on March 30, 2010.

#### E. Patents

Invention No. 1649-550, “Ornamental Varieties of Willow”

Submitted for plant patent (10/2008) willow varieties ‘Sunny Twist’ and ‘Green Sparkle’ with co-inventors Richard Kopp, Kimberly Cameron, and Lawrence Smart.

### V. PUBLIC SERVICE

#### A. Funded Service (include consulting activities)

##### 1. Government Agencies (Federal, State, Local):

##### 4. Industrial and Commercial Groups, etc.

- Niagara Mohawk/ National Grid, Provide advice on herbicide use on ROW in New York State.
- Environmental Consultants, Inc., Provide advice on herbicide use on ROW in the Northeast.
- Syracuse Environmental Research Associates, Inc., Provide advice on insecticide and herbicide use on forest and ROW areas.
- Christmas Tree Judge for New York State Fair

#### B. Unfunded Service to Governmental Agencies, Public Interest Groups, etc.

- Answered numerous questions and inquiries from business people, landowners, students, and reporters regarding use of willow as a bioenergy crops and in production and use of biofuels throughout the year.
- Exhibit on renewable energy and willow biomass project manned for ~16 hours at Empire Farm Days, Aug. 11-13, 2009, Seneca Falls, NY.
- Member of the NYS Planning Committee for Survey and Management of Pests.
- Member of Renewable Resources Extension Advisory Committee (RRER) at Cornell Cooperative Extension.
- Member DOE Short Rotation Woody Crops Operations Group Steering Committee
  - Co-chair (with Tim Volk) of 8<sup>th</sup> biennial meeting to be held in October, 2010 in Syracuse, NY.
- Member NYS Dept. Agric. Markets Plant Industry Advisory Committee.
- Provide advice for the CTFANY New York State Fair booth and Exhibit (2-3 days)
- Member Steering Committee for Ninth Symposium on Environmental Concerns in ROW Management
- Member Steering Committee for Tenth Symposium on Environmental Concerns in ROW Management
- Many inquiries handled on insect and disease problems related to government agencies
- Provided training on pesticide use and environmental effects to Syracuse University personnel at their training sessions.

- Member of the Greenhouse Gas Expert Panel of the Council on Sustainable Biomass Production for the meridian Institute for 2010 and 2011. Provide expertise on conference calls 4-6 times a year on sustainable energy crops.

## VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)  
none

B. 1. Activities in Professional Organizations (Offices held, service as chairman, member, participant or consultant)

- Co-Chair, IUFRO group on short-rotation forestry (2008-2011).
- Participated and Moderated in the NY Christmas Tree Grower's Association Winter Convention; January 29-30, 2010.
- Participated in the 9<sup>th</sup> International Biorefinery Conference as special editor of publication in Biomass & Bioenergy; October 6-7, 2009.
- Participated in the NE SunGrant Meeting held in Syracuse, NY, May 24-26, 2010.
- Member, Christmas Tree Farmers Association of NY (CTFANY) Winter and Summer Meeting Program Committees.
- Member, Christmas Tree Farmers Association of NY (CTFANY) Board, 2008-2010.
- Member, Steering Committee of the Short-Rotation Woody Crops Operations Working Group.
- Member, Steering Committee, 9<sup>th</sup> International Symposium on Environmental Concerns in Rights-of-Way Management held September 27- October 1, 2009.
- Member, Steering Committee, 10<sup>th</sup> International Symposium on Environmental Concerns in Rights-of-Way Management to be held in 2014.

### 2. Professional Society Membership

- Society of American Foresters
- Entomological Society of America
- Entomological Society of Canada
- Weed Science Society of America
- Northeastern Forest Pest Council
- Poplar Council of the United States
- Gypsy Moth Annual Review board
- Northeastern Weed Science Society
- Council for Agricultural Science and Technology (CAST)
- Christmas Tree Farmers Association of NY, Inc. (CTFANY).

### 3. Other Professional Activities

a. Editorial activity

Journal(s)

Responsibility

- Arthropod Management Tests Section editor, Forest & Shade trees (Published by Ent. Soc. of America).
  - Biomass and Bioenergy - Member International Editorial Board
- Other (books, symposia, etc.)
- Environmental Concerns in Rights-of-Way Management; 8<sup>th</sup> International Symposium Editor with John Goodrich-Mahoney and Kevin McLoughlin

b. Reviewer

<u>Journal(s)</u>	<u>No. of manuscripts</u>
Biomass & Bioenergy	4

<u>Agency</u>	<u>No. of proposals</u>
State of California	1
USDA small business grants	2

Other

c. Participation (workshops, symposia, etc.)

<u>Name of workshop, etc.</u>	<u>Date</u>	<u>Place</u>
NYDOT workshop on living Snowfences	5/26-27/09	Tully, NY
NYDOT workshop on living Snowfences	5/12-13/10	Buffalo, NY

C. Further Education/Re-training Undertaken, Leaves, Workshops, etc.

D. Foreign Travel (Where, When, Purpose)

Singapore, Jan 28-Feb 8, 2009, mostly vacation, visited Botanical Gardens and talked about willow crops to faculty at Nanging Technical University.

**VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)**

A. Department-level

- Continuing Education and Extension Coordinator for Faculty of Environmental and Forest Biology.

B. College-level

- Member, Human Subjects Committee (Institutional Review Board (IRB)) for Syracuse University and SUNY-ESF.
- Pesticide Use Advisor for College
- Member/Chair, College UUP Promotion Review Panel
- Sergeant.-at-Arms, Faculty Governance



C. University-wide, including Research Foundation

- Member, Human Subjects Committee (Institutional Review Board (IRB)) for SUNY-RF representing SUNY-ESF.

**VIII. SUMMARY OF SIGNIFICANT ACTIVITIES AND ACCOMPLISHMENTS DURING THIS REPORTING PERIOD, ESPECIALLY THOSE MOST NOTEWORTHY AND RELATIVE TO THE COLLEGE'S AND DEPARTMENT'S MISSION.**

*What I have done for our students*

Since I do not have direct contact with the students in class most of my contact is with them on an individual basis. In this presence I have given advice to both undergraduates and graduates on courses and options in the environmental and forestry fields the after leaving SUNY-ESF. I am active on graduate committees and provide advice to grad students on various aspects of woody energy crops and pesticide application and effects. I have provided many job opportunities for both undergrads and graduate students while attending SUNY-ESF working on various aspects of my funded research projects.

*What I have done for the department/college*

I served as the Continuing Education and Extension Coordinator for the Department of Environmental and Forest Biology. In this role I supervise Kim Adams in her role as Extension specialist for the Department and College. I have not been active in this role at the Department level as I assume some of the responsibilities have been taken over by other individuals. I am a member of the Human Subjects Committee (Institutional Review Board (IRB)) for Syracuse University and SUNY-ESF. I am also a member of the SUNY wide Human Subjects Committee (Institutional Review Board (IRB)) for the Research Foundation. As the Pesticide Use advisor to the College I work with the grounds people and John Wasiel, environmental Health and Safety Officer on a case by case basis. I remain involved in Faculty governance by attending the college meetings and serving as Sergeant-at-Arms for the Faculty Governance. I have dedicated a great deal of effort to outreach and tech transfer associated with the willow program. Much of this effort has been directed at educating legislators, the press, and the public and has positively impacted the reputation and notoriety of ESF. While all of the seven plant patent applications for new willow varieties have now been issued by the U.S. Patent and Trademark Office, a new plant patent application for at two new ornamental varieties has been submitted (Invention No. 1649-550, "Ornamental Varieties of Willows". I have been promoting the willow crop enterprise, including the publication of Willow Fact Sheets, a revised willow planting manual (in works) and presenting outreach exhibits at Empire Farm Days, the New York State Fair, etc. Together with Larry Smart and Research Foundation, I also worked to develop new licensing partners for our willow varieties. These efforts have now resulted in the third year of commercial sale of willow cuttings and whips of varieties developed in our breeding program that is generating a royalty stream to the inventors and to the College.

*What I have done for myself professionally*

I continue to take part in and travel to professional meetings, presenting papers and cooperating with fellow researchers, which has lead to invitations to give additional presentations. I continue to work well with Tim Volk (and Larry Smart @ Cornell) to develop the willow enterprise system in not only New York but the rest of the Northeast US and Canada. I am working to keep my international contacts in place so that our willow research can be developed for use in Europe (Sweden, UK, Ireland, Poland, etc.), New Zealand, China and Chile. I am actively involved in the International Symposium on Environmental Concerns in Rights-of-Way Management, as co-chair of the 8<sup>th</sup> Symposium and on the steering Committee with the 9<sup>th</sup> Symposium held in Portland, OR September 27 through October 1 2009 and the 10<sup>th</sup> Symposium to be held in 2014. I collaborate with Tim Volk on a number of funded projects that will expand our willow research, demonstration and outreach efforts.

**IX. A. FUTURE PLANS, AMBITIONS, AND POTENTIAL CONTRIBUTIONS FOR YOUR OWN**

**PROFESSIONAL DEVELOPMENT AND THE ENHANCEMENT OF THE PROGRAM IN ENVIRONMENTAL AND FOREST BIOLOGY (brief summary)**

Continue work in the applied research aspects of willow biomass as an energy crop as well as in the fields of forest entomology and pathology, silvicultural management through use of herbicide and/or fire, in forest tree nursery pest management and in vegetation management of rights-of-way

In order to work in all the above fields, I need to cooperate with other professionals as part of research teams to solve problems in these many fields. In order to do significant research in the above applied fields a team approach is usually the fastest and least expensive way to get answers that mean something to the people who use the results (the people making decision and working in the field).

The Department should give its complete support to applied research as well as basic research. In this day of tight money, applied research contracts can help support basic research when applied research is presented as a team approach.

**B. PROJECTED ACTIVITIES FOR NEXT YEAR.**

See attached NTP Performance Program for 6/1/10 to 5/31/11