



ANNUAL REPORT: June 1, 2009 – May 31, 2010
(i.e., Summer 2009, AY 2009-2010)
DEPARTMENT OF ENVIRONMENTAL AND FOREST BIOLOGY
SUNY-ESF

NAME: William A. Powell

I. INSTRUCTIONAL ACTIVITIES

1. Regular Course Offerings

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>	<u>No. of Lab. Sections</u>
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SUMMER:

2 high school student internships, see #3 below

FALL:

EFB307	Principles of Genetics	3	214	
EFB307	Genetics Lab	1	198	9

SPRING:

BTC497	Research Dsgn & Prof Develop	1	20	
EFB401	Molecular Biology techniques	3	17	1
EFB601	Molecular Biology techniques	3	6	1

NOTE: PLEASE INDICATE WHICH COURSE(S) HAD A SERVICE-LEARNING COMPONENT AND BRIEFLY EXPLAIN THE NATURE OF THIS COMPONENT. For examples of service-learning in courses, see: <http://www.esf.edu/students/service/courses.htm>. Service-learning is a form of structured experiential education in which students engage with the community to be active learners, to enrich their sense of civic responsibility, and to explore practical application for course content. Faculty oversight, reflective thinking, and reciprocity are key components of service-learning. EFB courses currently listed with service-learning components include: 416/6/1, 486, 518, 521, 532, 446/646.

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

<u>Course No.</u>	<u>Title</u>	<u>Credit Hrs.</u>	<u>No. Students</u>
BTC420	Internships in Biotechnology	9	3
BTC498	Research Problems/Biotech	9	3
EFB495	Undergrad teaching experience	6	2
EFB898	Professional Experience	5	2
EFB899	Masters Thesis Research	12	3
EFB999	Dissertation Research	15	1
ESF499	Honors Thesis/Project	2	1

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

Forest Health Initiative workshop on early disease resistance screening, May 18 to 19, 2010 in Asheville, NC. Co-organizer and participant. A total of sixteen participants attended.

2 High School Internships: Elyce Buell and Janice Johnson from Skaneateles High School completed summer research projects to be submitted in regional science fairs. Outcomes unknown at this date.

4. Guest Lecture Activities

<u>Course No.</u>	<u>Title</u>	<u>No. of Lectures</u>
EFB 796	Grad Seminar: American chestnut research & restoration program	1
BTC 426	Plant Tissue Culture methods: American elm project	1

II. STUDENT ADVISING

A. Number of undergraduates for whom you are the student's official advisor 20 and unofficial advisor 58 (as coordinator of Biotechnology major)

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

- Kathleen Baier, MS, started August 2006, completed in Dec. 2009
Thesis: Interspecific suppressive subtractive hybridization identifies a differentially expressed Chinese chestnut (*Castanea mollissima*) laccase-like gene. (2009) 117 pp.
- Brittany Cronk, MPS in Plant Biotechnology, started January 2007, completed Dec. 2009
- Amelia Bo Zhang, PhD, started August 2006
- Katherine D'Amico, MS, started August 2008
- Dannielle Loranger, MS, started January 2009

CO-MAJOR PROFESSOR

- Allison Oakes, MS, (with Dr. Maynard), started May 2009

MEMBER, STEERING COMMITTEE (other than those listed above)

- Christina Quinn, MS, started F2007

2. Arnold Salazar, Ph.D., started 2007?
3. Marian Orlousky, MPS, started 2009

CHAIRMAN OR READER ON THESIS EXAMS, ETC.

1. Michelle Serapiglia (Ph.D. Dissertation Examiner)
2. Kathleen Pitcher (MS Thesis examiner)
3. Som Mukherjee (Dissertation Examiner – in progress)

III. RESEARCH COMPLETED OR UNDERWAY

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

Continuing research to develop DED and Elm Yellows resistant American elm. Currently unfunded. Approximately 3% of time.

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)

Six new grants received this year totaling \$1,104,000 in addition to the three continuing grants previously awarded (\$780,000).

1. **New.** Forest Health Initiative. First and second-generation transgenic American chestnut trees. \$900,000 (8/1/09 – 7/31/12). PI with Dr. Maynard as Co-PI. Currently supporting 2 MS students. This is our part of a multi-institutional grant totaling \$5.2 million. Opportunity to renew an additional three years if progress is sufficient.
2. **New.** Forest Health Initiative. Supplemental funding to examine early flowering genes in transgenic American chestnut. \$83,000 (6/1/10 – 5/31/12). PI with Dr. Maynard as Co-PI.
3. **New.** Consortium on Plant Biotechnology Research (CPBR). Collaborative research: Developing blight resistance in transgenic American chestnut for agroforestry and restoration. \$67,000 (5/1/10-4/30/11) PI with Dr. Maynard as co-PI. Will support one Ph.D. student
4. **New.** The New York Chapter of The American Chestnut Foundation. Supplemental grant for technician support for Chestnut research. \$20,000 (1/1/10-12/31/10). PI with Dr. Maynard as co-PI.
5. **New.** Vetlesen Foundation. Equipment grant for woody tissue grinder. \$14,000 (6/1/10-12/31/10). PI with Kathleen Baier as co-PI.
6. **New.** ArborGen LLC. Transformation of American chestnut with genes encoding transcription factors. \$20,000 (1/1/10-12/31/10) PI with Dr. Maynard as Co-PI. Last year of 9 years of support beginning in 2002 totaling \$480,000.
7. USDA-Biotechnology Risk Assessment Grant program (BRAG), Evaluating Environmental Impacts Of Transgenic American Chestnut Trees To Chestnut Trees Produced By Conventional Breeding. \$380,000

(10/1/08-9/30/11). PI with co-PIs, Dr. Maynard, Dr. Horton, Dr. Parry, and Dr. Leopold. Supported one technician this year but will support 5 summer graduate stipends in the last two years..

8. The New York Chapter of The American Chestnut Foundation. Testing Transgenic Events for Gene Copy Number, Gene Expression, and Blight Resistance. \$100,000 (5/08-6/10). PI with Dr. Maynard as co-PI. Supports summer graduate student in my lab and a technician.
9. The New York Chapter of The American Chestnut Foundation. Regenerating Transformation Events into Whole Plants and Expansion of Field Trials. \$300,000 (5/08-6/11). Co-PI with Dr. Maynard, PI. This is in addition to the grant above. It will support a technician in Dr. Maynard's lab, a summer graduate student in my lab, and hourly undergraduate students for field research.

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

Forest Health Initiative. Supplemental funding to develop an early blight resistance screening assay for American chestnut. \$80,000 (7/1/10 – 6/30/12). PI with Dr. Maynard as Co-PI.

3. Research Proposals submitted, but rejected (include information as in B.1., above)

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

Sisco, P.H., Sederoff, R.R., Tomkins, J.P., Carlson, J.E., Kubisiak, T.L., Staton, M.E., Hebard, F.V., Anagnostakis, S.L., Powell, W.A. and Smith, C.P. 2009. The United States National Science Foundation project on developing tools for the study of the Fagaceae: *Castanea*, *Quercus*, and *Fagus*. Acta Hort. (ISHS) 844:267-274

(note: this year's writing has been more focused on grants (see previous section) but we have several papers in various stages of preparation)

B. Non-refereed Publications

Article on transgenic trees in the Daily Orange.

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

Progress on transgenic chestnut research. 9/24 – 9/26/09, Annual NE1033 chestnut researchers meeting, Ocean Grove, NJ

The American chestnut Research & Restoration Program. 10/1 -10/4/09, Society of American Foresters (SAF) annual meeting, Orlando, FL

Update on American chestnut research. 10/16 – 10/17/09, Annual meeting of the New York chapter of The American Chestnut Foundation.

Update on American chestnut research. 10/23 – 10/24/09, the national annual meeting of The American Chestnut Foundation, Pittsburg, PA

Three talks on gene discovery, vector design, and chestnut transformation. 11/9 -11/10/09, Forest Health Initiative (FHI) workshop on vectors, Raleigh, NC

Transgenic events in American chestnut. 11/10 – 11/13/09, NSF sponsored conference Genomics of forest and ecosystem health in the *Fagaceae* (Beech Family), Raleigh, NC (I was chair of the Symposium on transgenic research in *Fagaceae*.)

Update on gene selection, vector construction, and producing transgenic American chestnut trees, 3/30 – 3/31/10, Forest Health Initiative (FHI) Annual Meeting, Washington, DC

Developing an early screening assay for chestnut blight, 5/17 – 5/19/10, FHI early screening assay workshop, Asheville, NC (Co-organizer also)

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

Going Green, The American chestnut, interview with Terry Ettinger (<http://www.esf.edu/center/goinggreen/chestnut.htm>) Sumer 2009

Going Green, Saving Heritage trees, interview with Terry Ettinger (<http://www.esf.edu/center/goinggreen/savingtrees.htm>) Fall Semester, 2009.

V. PUBLIC SERVICE

A. Funded Service (include consulting activities)

1. Government Agencies (Federal, State, Local):
2. Industrial and Commercial Groups, etc.

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

Advisor to the NY chapter of The American Chestnut Foundation

Science advisory board member of the national American Chestnut Foundation

Reviewed two USDA APHIS BRS applications: Flowering field trails of cold tolerant transgenic eucalyptus and deregulation of virus resistant transgenic plum.

VI. PROFESSIONAL DEVELOPMENT

A. Professional Honors and Awards (for teaching, research, outreach, etc.)

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

I was the Chairman of the Symposium on transgenic research in *Fagaceae*. This is part of a meeting (Nov. 10-13, 2009) entitled, "Genomics of forest and ecosystem health in the *Fagaceae* (Beech Family) held at the Research Triangle park in NC. Approximately 40 attended.

2. Professional Society Membership

American Phytopathological Society

American Association for the Advancement of Science

3. Other Professional Activities

a. Editorial activity

Journal (s)

Responsibility

Other (books, symposia, etc.)

b. Reviewer

Journal(s)

No. of manuscripts

American Journal of Enology and Viticulture

1

Plant Cell Reports

1

Agency

No. of proposals

Other

c. Participation (workshops, symposia, etc.)

Name of workshop, etc.

Date

Place

Forest Health Initiative Vector Workshop

11/9 -11/10/09

Raleigh, NC

Forest Health Initiative Early Screening Assay Workshop

5/17 – 5/19/10

Asheville, NC

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

D. Foreign Travel (Where, When, Purpose)

VII. ADMINISTRATIVE AND SERVICE RESPONSIBILITIES (include committee participation)

A. Department-level

Chair of the search committee for Molecular & Cellular Biology Faculty position.

Search was successful with the hire of Dr. Lee Newman

Faculty representative on ARB building Committee

Coordinator for the undergraduate Biotechnology major

Actively involved in development of assessment tools among other duties.

Acting Chair when needed

B. College-level

Executive chair of Faculty Governance

Director of the Council on Biotechnology in Forestry

IBC (Institutional Biosafety Committee) member

C. University-wide, including Research Foundation

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. One paragraph on each of the following would be most helpful: this past year, what have you done for our students, department/college, and self professionally? NOTE: The information in this section (along with the supporting specific information elsewhere in this report) should be your strongest case for being considered for a discretionary raise, which I'll continue to award based on your contributions to the department and college this reporting period.

Highlights of what I have done for our students:

In addition to serving as the biotechnology coordinator, teaching one of the larger courses in EFB (Principles of genetics with 214 students), voluntarily filling the vacancy to teach the graduate and undergraduate Molecular Biology Techniques course (23 students), and teaching one of the core biotechnology major courses BTC497 (20 students), I continue to offer both graduate and undergraduate research projects in my lab. In addition, I have taught two high school students over the summer. I can only do this because of my success at attracting research grants that provides the supplies and equipment for these projects (see section IIIB). I have always believed that a hands-on learning experience, in addition to course work, is needed by all our students and I am committed to offer these experiences as I am able.

Highlights of what I have done for our department and college:

For our department, I chaired a successful faculty search to replace Larry Smart and Annette Kretzer, and more recently George Bachand, with an exciting new faculty member, Dr. Lee Newman. I have participated wherever is needed by standing in as Chair, participating in open houses and award ceremonies, taking photos of these events,, giving seminars to freshmen and graduate students, etc. I have also recently been assigned to represent faculty on the Academic Research Building committee. For our college, I stepped in as the executive chair of faculty governance at a time when this organization appeared to be collapsing. Over the past year, attendance at campus faculty meetings had nearly doubled since I took the position and we have accomplished many things, including fixing the "R" grade. There is still much to do, but I believe I did make significant progress in faculty governance during my two-year term. Lastly, by involving the public in our research plantings of transgenic American chestnut trees, by participating in alumni tours of our labs and greenhouse, and being active with outreach, I believe our chestnut project is helping with our college's public image. This should help with attracting students and also donations to the ESF College Foundation (example the recent, possible million dollar donor interested in American chestnut who two years ago donated ~\$90,000 to buy our growth chambers).

Highlights of what I have done for myself professionally:

I believe what I do for ESF is closely linked to what I do for myself. Each benefits the other. The big thing this year is the expansion of our American chestnut research. Through much work, I have become a co-PI on a 5.2 million dollar, multi-institutional research project. ESF will be receiving approximately one million of these funds, with the rest going to collaborators at Penn state, University of Georgia, NC State, Clemson, and the US Forest Service. The goal of this Forest Health Initiative is to use American chestnut as a model for the use of biotechnology tools for improving the

health of our forests. With this increase in funding, over a very good previous year in grant awards, the progress to develop a blight resistant tree will be greatly accelerated. My plans for next spring and summer is to tour the country and give talks on the progress we expect to make, thereby promoting our college and the chestnut project.

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)

B. PROJECTED ACTIVITIES FOR NEXT YEAR

1. Summer 2009

a. Course(s) to be offered

I will continue to offer research projects at the graduate, undergraduate, and high school internship levels.

Due to the large size of y fall genetics course, I will be working this summer to incorporate a clicker system into the lectures to better encourage students to participate in class.

b. Proposed research activity

I will continue mainly with the chestnut research but also finish some of our elm field trials.

c. University, professional society, and public service

Same high standards as before.

2. Fall Semester 2009

a. Course(s) to be offered

Principles of Genetics & Genetics Lab

Graduate Seminar on plant pathogen resistance genes and their expression.

Guest lectures as before.

b. Proposed research activity

Same high standards as before focusing on chestnut.

c. University, Professional society, and public service

Same high standards as before.

3. Spring Semester 2010 – **Sabbatical leave**

a. Course(s) to be offered

none due to sabbatical leave

b. Proposed research activity

Even though I will be on sabbatical leave, I will continue all my research

c. University, professional society, and public service
none due to sabbatical leave