

Terence Lee Bradshaw

Curriculum Vitae

Business Department of Plant and Soil Science, University of Vermont, Burlington, VT 05405
(802) 922-2591 terence.bradshaw@uvm.edu

Education B.S., Plant and Soil Science, University of Vermont, 1997.

M.S. Plant and Soil Science, University of Vermont. 2011.
Concentration: Sustainable Fruit Production.

Current Rank and Responsibilities:

Research Specialist. July 1999 to present. Dept of Plant and Soil Science, University of Vermont

Oversee and provide highly specialized technical assistance to include the development, design, and implementation of numerous field, laboratory, greenhouse, and storage research projects and activities in support of apple and grape horticulture and pest management programs with general/minimal supervision from designated supervisors. Specific projects have included:

- Development and implementation of multistate Organic Apple Research and Outreach Program initiated 2006;
- Development and implementation of research programs studying new winegrape cultivars for Vermont (NE 1020) and environmentally sound management practices (Achieving Adoption of Ecologically-Based IPM and Reducing Pesticide Risks in Cold Climate Winegrape Production in Northern New England, US EPA)
- Implementation of NE-183 Apple Cultivar and NC-140 Apple Rootstock evaluations, 1999-2009,
- Implementation of fruit quality monitoring program at commercial orchards and packing houses throughout Vermont.

Other responsibilities include:

- Provide technical support to research and extension professors including updating agrichemical use and registration files, regulatory compliance, and emerging research and implementation topics.
- Overall management of research orchards and vineyard including pruning and training trees and vines, pesticide application and recordkeeping, upkeep of irrigation and weather data collection equipment, maintenance of orchard and spray equipment, fertility management, and harvest.
- Development of operational budgets for research projects and order and maintain equipment and supplies.
- Collect, summarize, and analyze field data and prepare reports for publication and outreach.
- Perform grower outreach through industry meetings, site visits, and grower participation in research projects. Participate in public relations at events.
- Interact with and assist undergraduate and graduate students in applicable studies.
- Supervise seasonal, hourly, and student employees.

Assistant Director Horticulture Research Center. October 2005 to present. College of Agriculture and Life Science, University of Vermont

General daily management of 100-acre agricultural research facility in South Burlington, VT. This position reports to the Associate Director of the Vermont Agriculture Experiment Station. General duties include

- Oversight of the facility including grounds management, security issues, pest control, equipment maintenance and operation.
- Protocol planning and plot allocation with research users.
- Responding to general inquiries including public relations, interaction with the Friends of the Hort Farm and support for Common Ground Student Run Farm.
- Maintenance of crop and chemical records according to accepted research protocols and State and Federal Laws.
- General apple orchard management and sales.
- Assist undergraduate and graduate students in applicable studies.
- Supervise seasonal, hourly, and student employees.

Teaching Experience

Courses Taught

UVM PSS 195 Cold Climate Viticulture. Course developer and instructor. Summer 2012.

UVM PSS 195 Tree Fruit Culture. Course developer and instructor. Summer 2010.

UVM Master Gardeners' Basic Course. Fruit Trees in the Home Orchard. 2006-2008

Guest Lectures

UVM Farmer Apprentice Program, Introduction to Orchard Management (Walsh-Daloz). 2011.

UVM HCOL Agroecology in Food Systems (Costa). Sustainable Apple Production. 2011.

UVM PSS 010 Home and Garden Horticulture (Starrett). Introduction to apple and grape projects. 2010-2011.

UVM PSS 196 Organic Farm Planning (Chen). Field Equipment and Farm Operations; Farm Plan Project Evaluator. 2010-2011.

UVM PSS 21 Introduction to Agroecology (Waterman). Sustainable Orchard Systems. 2010.

UVM PSS 112 Weed Science and Ecology (Bosworth). Groundcover Management in Orchard Systems Field Lecture. 2005-2011.

Funded Projects

Modernization of Research Orchards at the UVM Horticultural Research Center. Specialty Crops Block Grant administered through Vermont Agency of Agriculture to Vermont Tree Fruit Growers Association. T. Bradshaw, President and Grantee. Dec 2009 – Oct 2012. \$19,950.

Establishment of On-Farm Weather Stations and IPM Modeling Systems for Vermont Orchards. Specialty Crops Block Grant administered through Vermont Agency of Agriculture to Vermont Tree Fruit Growers Association. T. Bradshaw, President and Grantee. Dec 2009 – Oct 2012. \$10,000.

Outreach Presentations

Bradshaw, T.L. IPM Challenges and Opportunities in Two Organic Apple Orchard Systems containing Ginger Gold, Honeycrisp, Liberty, Macoun, and Zestar!. 2011 New England Vegetable & Fruit Conference. Manchester, NH. 12/15/2011.

Berkett, L.P., Garcia, M.E., Bradshaw, T.L., and Moran, R. Discussion on Economics, Soil Health, and Viewpoints of Organic Apple Growers. 2011 New England Vegetable & Fruit Conference. Manchester, NH. 12/15/2011.

Bradshaw, T.L. Vermont Edition: The 2010 Apple Crop. Vermont Public Radio interview. 9/22/2011.

Bradshaw, T.L, Berkett L.P., Moran, R., Cromwell, M.L., and Kingsley-Richards, S.L. . Organic Orchard Tour for Centre of Expertise and Technology Transfer in Organic Agriculture and Local Food Systems, Victoriaville, PQ. 7/21/2011.

Bradshaw, T.L, Berkett L.P., Cromwell, M.L., and Kingsley-Richards, S.L. . Current Research in Organic Apples and Winegrapes at UVM. UVM Food Systems Symposium. 11/1/2010.

Bradshaw, T.L. Vermont Edition: Apple Season Arrives. Vermont Public Radio interview. 9/08/2010.

Bradshaw, T.L, Berkett L.P., Cromwell, M.L., and Kingsley-Richards, S.L. UVM Vineyard Open House. Presentations to 115 prospective and veteran grape growers. 8/20/2010.

Bradshaw, T.L. and L. Perry. The Proper Pruning of Your Fruit Trees. Across the Fence Television Segment, WCAX TV, Burlington, VT. 4/2/2010

Bradshaw, T.L. and L.P Berkett. Organic Apple Production - Lessons Learned To Date In The Organica Project. . 114th Annual Vermont Tree Fruit Grower's Annual Meeting. 2/18/2010

Bradshaw, T.L. Organic Apple Research at the UVM Hort Farm. Across the Fence Television Segment, WCAX TV, Burlington, VT. 10/21/2009

Bradshaw, T.L. The OrganicA Project: Organic Apple Production. Northeast Organic Farming Association of Vermont (NOFA-VT) grower workshop. Presentation of horticulture section and overview of current research on field assessment of kelp-based cytokinin compounds in and integrated organic orchard. 8/13/2009.

Bradshaw, T.L. How to Plant and Maintain a Small Organic Home Orchard. Friends of the UVM Horticulture Farm Workshop. 7/11/2009

Bradshaw, T.L. Cider and Vinegar Making on a Moderate Scale. NOFA-VT Annual Winter Conference. 2/16/2008.

Bradshaw, T.L. OrganicA: The Organic Apple Research, Teaching, and Demonstration Project. NOFA-VT Annual Winter Conference. 2/16/2008.

Bradshaw, T.L. The OrganicA Project: Organic Apple Production. Northeast Organic Farming Association of Vermont (NOFA-VT) grower workshop. Presentation of horticulture section. 8/17/2007.

Bradshaw, T.L. Topgrafting Apple Trees: Our Experience. 111th Annual Vermont Tree Fruit Grower's Annual Meeting. 2/08/2007

Bradshaw, T.L. Pruning Large Apple Trees. Friends of the UVM Horticulture Farm Workshop. 3/16/06

Bradshaw, T.L. and N. Meyers. Cider Making Time. Friends of the UVM Horticulture Farm Workshop. 10/22/2005

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2005. Non-Target Impacts of Surround®: Horticulture. Vermont Tree Fruit Growers Association 109th Annual Meeting. 2/17/2005

Bradshaw, T.L. 2004. Cider Hard and Sweet. Friends of the Morrill Homestead 19th Century Apple Harvest. 10/10/04

Bradshaw, T.L. and N. Meyers. 2004. Planting and Maintaining Your Home Orchard. Friends of the UVM Horticulture Farm Workshop. 3/6/2004

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2004. Apple Industry and Apple Team Research Update. Vermont Tree Fruit Growers Association 108th Annual Meeting. 2/9/2004

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2003. Does Surround® Have Non-target Impacts on New England Orchards? January 2003 New England Fruit Meetings. 1/8/2003

Bradshaw, T.L and A. Wheeler, 2003. Grafting Fruit Trees at the Justin Smith Morrill Homestead. 5/03/2003

Bradshaw, T.L., Garcia, M. E., and L.P Berkett. 2002. The Electronic New England Apple Pest Management Guide and Survey. Vermont Tree Fruit Growers' 106th Annual Meeting. 2/21/2002

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2002. Surround®: First Year Results of the Impact of a Novel Pest Management Technology on Apple Fruit Quality. Vermont Tree Fruit Growers' 106th Annual Meeting. 2/21/2002

Bradshaw, T.L. 2001. Orchard Replanting at the Justin Smith Morrill Homestead. 5/13/2001

Garcia M. E., and T. Bradshaw. 2001. Pruning and Topworking Apple Trees. UVM Horticulture Research Center. 04/04/2001

Bradshaw, T.L. and M. E Garcia. 2000. Fruit Quality Assessment for Growers and Packers. Vermont Tree Fruit Growers Fruit Quality Workshop. 1/20/2000

Professional Extension Technical Publications:

[Because of the financial, legal, and the human and environmental safety issues associated with pest management and pesticide use, these publications must be scientifically and technically sound and legally accurate for their professional clientele. It is a federal violation if pesticides are used improperly.]

UVM Apple Orchard, <http://orchard.uvm.edu> : The UVM Apple Orchard is the commercial apple growers' internet connection to the UVM Apple Research and Extension program. The web site is frequently updated to reflect current research-generated horticultural and IPM information.

UVM Cold Climate Viticulture Website, <http://pss.uvm.edu/grape>. The CCV website serves as a source of tested production information serving the needs of the winegrape industries in Vermont and other northern tier states.

Cooley, D. (Ed.). 2007-2011. Organic Tree Fruit Production in New England. New England Tree Fruit Production Guide. Coop. Extension of Systems of CT, ME, MA, NH, RI, and Vermont.

Bradshaw, T. L. and L.P. Berkett. 2010. Considerations for Starting a Commercial Winegrape Vineyard in Vermont. <http://pss.uvm.edu/grape/ConsiderationsForStartingACommercialVineyardInVermont.pdf>

Autio, W., T.L. Robinson, B. Black, T. Bradshaw, J.A. Cline, R.M. Crassweller, C.G. Embree, E.E. Hoover, K. Kosola, J. Masabni, M.L. Parker, R.L. Perry, G.L. Reighard, J.R. Schupp, and M. Warmund. 2008. 1999 NC-140 Fuji and McIntosh dwarf apple rootstock trials: An update after eight growing seasons. Compact Fruit Tree 41(1): 23-25.

Autio, W., T.L. Robinson, B. Black, T. Bradshaw, J.A. Cline, R.M. Crassweller, C.G. Embree, E.E. Hoover, K. Kosola, J. Masabni, M.L. Parker, R.L. Perry, G.L. Reighard, J.R. Schupp, and Warmund, M. 2008. 1999 NC-140 Fuji and McIntosh semidwarf apple rootstock trials: An update after eight growing seasons. Compact Fruit Tree 41(1): 26-28.

Moran, R.E., Garcia, M.E., Berkett, L.P., Bradshaw, T.L., Kingsley-Richards, S., Darby, H.M., Hayden, J.P. and R.L. Parsons. 2007. Pictorial Guide to Planting an Orchard. OrganicA Website. <http://www.uvm.edu/~organica/OrganicOrchardInformation/Horticulture/howtoplant.html>

Garcia, M.E., Moran, R.E., Berkett, L.P., Bradshaw, T.L., Kingsley-Richards, S., Darby, H.M., Parsons, R.L., Hayden, J.P., and M.L. Cromwell. 2007. Pictorial Guide to Top-Grafting an Orchard. OrganicA website. <http://www.uvm.edu/~organica/OrganicOrchardInformation/Horticulture/howtotopgraft.html>

Berkett, L.P., Bradshaw, T.L. and C. Benedict. 2004. IPM 'Quick' Summary for Monitoring Apple Arthropod Pests. UVM Extension Program. <http://orchard.uvm.edu/uvmapple/pest/2004IPMQuickSummaryForMonitoring.pdf>

Berkett, L.P., Garcia, M. E., and T. Bradshaw. 2004. Relative Susceptibility of New Apple Cultivars to Insects and Diseases in Vermont. UVM Extension Program. <http://orchard.uvm.edu/uvmapple/pest/1995NE183DiseaseAndInsect2000&2001.pdf>

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2003. Does Surround® Have Non-target Impacts on New England Orchards? Proceedings of the 2003 New England Fruit School. Mass Fruit Growers Association. Vol 109. <http://www.massfruitgrowers.org/nefrmtmtg/proc--2002-03/a03.pdf>

Berkett, L., Bradshaw, T., Cooley, D., and A. Tuttle. 1996-2005. Update to the annual New England Apple Pest Management Guide. Disease Management. Coop. Extension Systems of the Universities of CT, ME, MA, NH, RI, and VT.

Scientific Publications - Journal Articles and Proceedings

Garcia, M.E., L. P. Berkett, T. Bradshaw, S. Kingsley-Richards, R. Moran and B. Parsons. 2010. Horticultural options when starting an organic orchard. *Acta Hort* 873. pp. 277-282. http://www.actahort.org/books/873/873_30.htm

Berkett, L.P., T. L. Bradshaw, S. L. Kingsley-Richards, and M. L. Cromwell. 2008. Grape bud survival on eight winegrape cultivars in Vermont. Proceedings of the 2nd Annual National Viticulture Research Conference. Univ. of California, Davis. pp. 10-11. <http://groups.ucanr.org/nvrc/files/55209.pdf>

Berkett, L.P., M. E. Garcia, R. E. Moran, R. L. Parsons, H. M. Darby, J. P. Hayden, T. L. Bradshaw, S. L. Kingsley-Richards, and M. L. Cromwell. 2008. Apple cultivar disease evaluation under organic management in Vermont, 2006. *Plant Disease Management Reports*. No. 2:PF049. <http://www.plantmanagementnetwork.org/pub/trial/pdmr/reports/2008/PF049.pdf>

Cromwell, M.L., L. P. Berkett, T. Ashikaga, H. Darby, T. Bradshaw, and S. Kingsley-Richards. 2008. Evaluation of alternative fungicides for organic apple production in Vermont, 2007. *Plant Disease Management Reports*. No. <http://www.plantmanagementnetwork.org/pub/trial/pdmr/reports/2008/PF048.pdf>

Berkett, L.P., Garcia, M. E., Eddy, M.E., Kingsley-Richards, S.L. and T.L. Bradshaw. 2007. Relative Susceptibility of Cold-Hardy Winegrape Cultivars to Powdery Mildew in Vermont, USA. Proceedings of the First Annual National Viticulture Research Conference. Davis, California. 18-19.

Berkett, L.P., Garcia, M.E., Eddy, M.E., Kingsley-Richards, S.L., and T.L. Bradshaw. 2005. Evaluation of disease susceptibility of two 'new' cold-hardy wine grapes. *Biological and Cultural Tests for Control of Plant Disease*. Vol. 20: N002. <http://www.plantmanagementnetwork.org/pub/trial/bctests/Vol20/>

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2005. Preliminary results on the application of Surround WP on apple productivity and fruit quality. *HortScience* 39(4): 876.

Berkett, L.P., Garcia, M.E., Eddy, M.E., Kingsley-Richards, S.L., and T.L. Bradshaw. 2005. Evaluation of disease susceptibility of two 'new' cold-hardy wine grapes. *Biological and Cultural Tests for Control of Plant Disease*. Vol. 20: N002. <http://www.plantmanagementnetwork.org/pub/trial/bctests/Vol20/>

Garcia, M.E., Berkett, L.P. and Bradshaw, T. 2004. First year results of the impact of a novel pest management technology on apple fruit quality. *Acta Hort*. (ISHS) 638:85-88

Berkett, L.P., Garcia, M.E., Bradshaw, T.L. and C. Benedict. 2003. Green pug moth management. *Arthropod management tests*. Entomological Society of America. Vol. 28: A2. <http://www.entsoc.org/Protected/AMT/AMT28/>

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2003. Preliminary results of non-target impacts of surround® on New England orchards. Proceedings Second National Tree Fruit Research Symposium. Grand Junction, CO.: 19-22

Berkett, L., MacHardy, W.E., Sutton, D.K, Neff, G. and T. Bradshaw. 1997. "Whole farm" apple scab IPM project. New England fruit meetings. N. Engl. fruit meet. 1997. v. 103

Published Abstracts

Autio, W., T. Robinson, T. Bradshaw, J. Cline, R. Crassweller, C. Embree, E. Hoover, G. Lang, J. Masabni, M. Parker, G. Reighard, J. Schupp and M. Warmund. 2008 . Performance of several dwarfing rootstocks with Fuji and McIntosh as scion cultivars in the 1999 NC-140 dwarf apple rootstock trials. ISHS 9th International Symposium on Integrating Canopy, Rootstock and Environmental Physiology in Orchard Systems. Geneva, NY. Page 128.

L. Berkett, M. Garcia, R. Moran, H. Darby, R. Parsons, J. Hayden, T. Bradshaw, S. Kingsley-Richards and M. Cromwell. 2008. The OrganicA Project: Organic Disease Management in Orchards with 'Newer' Cultivars. VII International Conference on integrated Fruit Production. Avignon, France. October 2008.

Garcia, M.E., R.E. Moran, T.L. Bradshaw, L.P. Berkett, H.M. Darby, R.L. Parsons, J.P. Hayden, S.L. Kingsley-Richards, and M.L. Cromwell. 2007. The OrganicA Project: Preliminary "Top-Grafting" Results in a Transitional Organic Apple Orchard. Proceedings of 4th International Organic Tree Fruit Research Symposium, Kellogg Center, East Lansing, Michigan, March 3-6, 2007.

Berkett, L.P., M.E. Garcia, H.M. Darby, R.L. Parsons, J.P. Hayden, R.E. Moran, T.L. Bradshaw, S.L. Kingsley-Richards and M.L. Cromwell. 2007. The OrganicA Project: An Integrated Apple Research, Education, and Extension Project. Proceedings of 4th International Organic Tree Fruit Research Symposium, Kellogg Center, East Lansing, Michigan, March 3-6, 2007.

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2005. Preliminary results on the application of Surround WP on apple productivity and fruit quality. HortScience 39(4): 876.

Berkett, L.P., Garcia, M. E., and T. Bradshaw. 2005. Evaluation of potential non-target impacts of kaolin on apple disease incidence. Phytopathology 95: 8.

Berkett, L.P., Garcia, M.E., Eddy, M., Kingsley-Richards, S., and T. Bradshaw. 2005. Comparison of disease susceptibility of two 'new' cold-hardy wine grape cultivars with two standard wine grape cultivars. Phytopathology 95: 8.

Garcia, M. E., Berkett, L.P., and T. Bradshaw. 2004. Preliminary results on the application of Surround WP on apple productivity and fruit quality. HortScience 39(4): 876.

Berkett, L.P., Garcia, M.E., and T.L. Bradshaw. 2003. IPM Alternatives: Investigating potential non-target impacts of an organic biopesticide in apple production. Proceedings of 4th National Integrated Pest Management Symposium. Indianapolis: 84.

Berkett, L.P., Garcia, M.E., and T.L. Bradshaw. 2003. Non-target impact of an organic alternative in apple disease management. Phytopathology 93: 8.

Garcia, M., Berkett, L., and T. Bradshaw. 2002. First year results of the impact of a novel pest management technology on apple fruit quality. XXVI International Horticultural Congress. Toronto, Canada. Proceedings: 277.

Berkett, L.P., MacHardy, W.E., Sutton, S., Neff, G., and T. Bradshaw. 1997. 'Whole farm' apple scab IPM project. Phytopathology 87: 8.

Berkett, L.P., Costante, J.F., Gotlieb, A., Clements, J., Schmitt, D., Heleba, D., Bergdahl, J., Bradshaw, T. and G. Neff. 1996 Vermont apple IPM program: Integration of research & extension produces innovation and success. Proceedings of the Third National IPM Symposium/Workshop. Washington, D.C., 225-226.

Professional Associations

President, Vermont Tree Fruit Growers Association, 2009-
Member, International Society of Horticultural Scientists, 2009-
Member, American Society of Horticultural Scientists, 2010-
Member, North American Fruit Explorers, 2001- .

Licensure and Training

Food Safety for the Cider Industry, Michigan State University. September 2009.

Cider Making – Principles and Practice. Mitchell F&D, Peter Mitchell Inst. August 2009, July 2010.

Microinjection Technology Application for the Tree Industry. Mauget, Inc. March 2008.

HACCP for the Juice Industry, University of Connecticut, July 2004.

Vermont State Pesticide Applicator's License, 1995 to present.

- Commercial categories include 1A) plant and 10) research and demonstration.
- Private categories include 2) tree fruit and 3) vegetables and small fruit. Regularly attend extension and grower meetings to maintain licensing credits.

Academic Awards

Department of Plant and Soil Science, University of Vermont:

- 1996 recipient, W.H. Darrow Horticultural Prize. Presented to a student who has shown interest in and done original horticultural research.
- 1997 recipient, C. Lyman Callahan Award. Presented to a student who has shown outstanding interest in commercial horticulture.

Previous Experience and Responsibilities

Proprietor, Lost Meadow Orchard and Cider Mill. Calais, VT. Fall 2006 to present.

Owner-operator of a seasonal, home-based commercial retail orchard and cider mill. We specialize in fresh, unpasteurized apple juice as well as stock intended hard cidemakers made from apple varieties suited to and grown for fermenting.

Manager, Golden Apple Orchard. Charlotte, VT. January 1998 to November 1999.

Sole employee responsible for production, harvest, and sale of commercial apple crop at a pick-your-own and small wholesale operation. Duties included pruning, planting, and training of trees, fertility management, monitoring of orchard pests, groundcover management, and harvest, packing, storing, marketing, and delivery of crop. Pest management role involved pesticide selection, application, recordkeeping, and regulatory compliance. Work involved operation and maintenance of agricultural equipment including tractors, sprayers, and mowers. Continuing education in industry practices expected and maintained.

Proprietor, Pomona Tree Fruit Service. Chelsea, VT, January 1998 to March 2000.

Operation of a complete fruit tree care business. Pruning, fertility management, custom grafting and planting, consultation and site analysis services were offered.

Field Supervisor, Tougas Family Farm, Northboro, MA. April 1997 to December 1997.

Carried out day-to-day production operations of a large pick-your-own and retail farm specializing in apples, peaches, and small fruits. Involved in all aspects including field and orchard work as well as customer assistance and employee supervision. Work involved operation of agricultural equipment including backhoe, tractors, sprayers, and mowers. Continuing education in industry practices expected and maintained.

Intern, University of Vermont Apple Team. May 1995 to April 1997.

Duties included maintenance of University orchards, upkeep of pest and weather monitoring programs, and experimental data collection.

Butternut Acres Farm, Chelsea, VT. 1977-1992.

Raised on small family-owned, multi-generational dairy farm.