

## Curriculum Vitae for Mary A. Topa

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**RESEARCH INTERESTS:** Stress physiology of trees, with an emphasis on shoot-root interactions and *in situ* root system function; genetic variation in carbon source/sink relationships and its relationship to tree growth; rhizosphere ecology and root system function.

**EDUCATION** Ph.D. in Plant Physiology, Duke University, School of Forestry and Environmental Studies, Durham, NC.  
B.A. in Biology, Case Western Reserve University, Cleveland, OH.

### RECENT EMPLOYMENT

2004-present Director of Science and Research, The Holden Arboretum, Kirtland, OH 44094  
2005-present Holden Professor of Biology, Case Western Reserve University, Biology Department, Cleveland, OH  
1998-2004 Associate Plant Physiologist, Boyce Thompson Institute for Plant Research, Tower Road, Ithaca, NY 14853-1801.  
1992-1998 Assistant Plant Physiologist, Boyce Thompson Institute for Plant Research, Tower Road, Ithaca, NY 14853-1801.

### PROFESSIONAL EXPERIENCE

2006 Member of Harvard University's Overseers' Committee to Visit the Arnold Arboretum.  
2005-present Member of Scientific Committee for the Fourth International Symposium "Dynamics of Physiological Processes in Woody Roots" in Bangor, Wales, September 16-19<sup>th</sup>, 2007.  
1995-2005 Chairperson, IUFRO (International Union of Forestry Research Organizations) Root Physiology and Symbiosis Working Party S2.01.13.  
1997-2004 Organizer/chair of the Cornell/USDA/BTI Mini-Symposium on Root-Soil Research in April.  
2001-2003 Member of Scientific Committee for the Third International Symposium "Dynamics of Physiological Processes in Woody Roots" in Perth, Australia, September 29-October 2, 2003.

- 1998-1999 Member of Scientific and Organizing Committees for the Second International Symposium “Dynamics of Physiological Processes in Woody Roots” in Nancy, France, September 26-30, 1999.
- 1998-1999 Organizer/moderator of Workshop “An evaluation of methods to assess the demographics and dynamics of tree roots”, the Second International Symposium “Dynamics of Physiological Processes in Woody Roots” in Nancy, France, September 26-30, 1999.
- 1996-1998 Member of Organizational and Scientific Committees for the International Symposium “The Supporting Roots: Structure and Function”, an IUFRO conference in Bordeaux, France, in 1998.
- Chair of Steering Committee for the Second International Symposium “Dynamics of Physiological Processes Woody Roots” in Nancy, France, in 1999.
- 1994-95 Chair of Organizing Committee for the International Symposium “Dynamics of Physiological Processes in Woody Roots”, Ithaca, NY, October 8-11, 1995.
- 1989-present Reviewer for Canadian Journal of Forest Research, Canadian Journal of Botany, Environmental and Experimental Botany, Functional Ecology, New Phytologist, Physiologia Plantarum, Plant and Soil, Tree Physiology, Trees Structure and Function, Kluwer Academic Publishers.
- Editorial Review Board: Tree Physiology
- Reviewer for USDA Competitive Grants: Plant Responses to the Environment, Forest Biology, Soils and Soil Biology, Managed Ecosystems.  
Panel member for USDA Managed Ecosystems.
- Reviewer for NSF Competitive Grants: Physiology and Behavior, Ecological and Evolutionary Physiology, Metabolic Biology.

## **AWARDS AND FUNDED RESEARCH PROJECTS**

- 2002-2004 Influence of host genotype and growth traits on mycorrhizal community structure in loblolly pine, NSF Ecology and Evolutionary Physiology (\$75,000, No. IBN-0212892, Topa PI).
- Assessing the effect of *Galerucella* spp. on carbon acquisition and partitioning in purple loosestrife, USDA Cooperative Agreement (\$60,000, Topa PI).
- 1997-2000 Assessing the significance of belowground carbon allocation of fast- and slow-growing families of loblolly pine, DOE Agenda 2020, Sustainable Forestry (\$712,840), Topa (PI).

- 1993-1997 Ozone-induced changes in seasonal growth and carbon allocation in sugar maple, USDA Plant Responses to the Environment (\$231,600, NRICGP No. 9302171, Topa PI).
- 1993-1995 Ozone-induced effects in sugar maple, US Environmental Protection Agency (\$595,041), MacLean (PI), Jacobson and Comstock. Co-PI on original grant, collaborator on project.
- 1987-1990 Carbon and phosphorus metabolisms of anaerobically-grown loblolly and pond pine seedlings, USDA Forest Biology with Dr. John Cheeseman, (\$168,800, AG-87-FSTY-9-0269).

### PROFESSIONAL PUBLICATIONS – PEER-REVIEWED

- Burke, D.J., Martin, K.J., Rygiewicz, P.T., & Topa, M.A. 2006. Relative abundance of ectomycorrhizas in a managed loblolly pine (*Pinus taeda* L.) genetics plantation as determined through terminal restriction fragment length polymorphism (TRFLP) profiles. *Canadian Journal of Botany* **84**: 924-932.
- Burke, D.J., Kretzer, A.M., Rygiewicz, P.T., & Topa, M.A. 2006. Soil bacterial diversity in a loblolly pine plantation: Influence of ectomycorrhizas and fertilization. *FEMS Microbiological Ecology* **57**: 409-419.
- Martin, T.A., Dougherty, P.M., Topa, M.A. & McKeand, S.E. 2005. Strategies and case studies for incorporating ecophysiology into southern pine tree improvement programs. *Southern Journal of Applied Forestry* **29**(2): 70-80.
- Burke, D.J., Martin, K.J., Rygiewicz, P.T., & Topa, M.A. 2005. Ectomycorrhizal fungi identification in single and pooled root samples: terminal restriction fragment length polymorphism (TRFLP) and morphotyping compared. *Soil Biology and Biochemistry* **37**: 1683-1694.
- Topa, M.A., McDermitt, D.J., Yun, S.-C. & King, P.S. 2004. Do elevated ozone and variable light alter carbon transport to roots in sugar maple? *New Phytologist* **162**: 173-186.
- Yang, W.Q., Murthy, R., King, P.S. & Topa, M.A. 2002. Diurnal changes in gas exchange and carbon partitioning in needles of fast- and slow-growing families of loblolly pine (*Pinus taeda*). *Tree Physiology* **22**: 489-498.
- Retzlaff, W.A., Blaisdell, G.K. & Topa, M.A. 2001a. Seasonal changes in water source of four families of loblolly pine (*Pinus taeda* L.). *Trees Structure and Function* **15**: 154-162.
- Retzlaff, W.A., Handest, J.A., O'Malley, D.M., McKeand, S.E. & Topa, M.A. 2001b. Whole-tree biomass and carbon allocation of juvenile trees of loblolly pine (*Pinus taeda* L.): influence of genetics and fertilization. *Canadian Journal of Forest Science* **31**: 960-970.

- Topa, M.A., Vanderklein, D.W. Corbin & Corbin, A.T. 2001. Effects of elevated ozone and low light on diurnal and seasonal carbon gain in sugar maple (*Acer saccharum* Marsh.). *Plant Cell and Environment* **24**: 663-677.
- Bäck, J., Vanderklein, D.W. & Topa, M.A. 1999. Effects of elevated ozone on CO<sub>2</sub> uptake and leaf structure in sugar maple under two light environments. *Plant, Cell and Environment* **22**: 137-147.
- Ayling, S.M. & Topa, M.A. 1998. Phosphorus compartmentation in *Pinus serotina* Michx. (Pond pine): Observations from *in vivo* nuclear magnetic resonance spectroscopy. *Plant, Cell & Environment* **21**: 723-730.
- Kuehny, J. & Topa, M.A. 1998. Diurnal changes in allocation and partitioning of recently-assimilated carbon in loblolly pine seedlings. *Physiologia Plantarum* **104**: 317-328.
- Topa, M.A. & Sisak, C.L. 1997. Characterization of phosphorus uptake in slow- and fast-growing southern pine seedlings grown in solution culture. *Plant and Soil* **190**: 317-329.
- Topa, M.A. 1996. Seed source variation in <sup>32</sup>P uptake and transport in *Pinus taeda* L. seedlings: A possible regulatory role for efflux. *Plant and Soil* **182**: 259-265.
- Topa, M.A. & Cheeseman, J.M. 1994. Maintenance of <sup>32</sup>P uptake and transport in *Pinus serotina* seedlings under hypoxic growth conditions. *Physiologia Plantarum* **92**: 171-180.
- Topa, M.A. & Cheeseman, J.M. 1993. <sup>32</sup>P uptake and transport to shoots of *Pinus serotina* seedlings under aerobic and hypoxic growth conditions. *Physiologia Plantarum* **87**: 125-133.
- Topa, M.A. & Cheeseman, J.M. 1992a. Carbon and phosphorus partitioning in *Pinus serotina* seedlings growing under hypoxic and low-phosphorus conditions. *Tree Physiology* **10**: 195-207.
- Topa, M.A. & Cheeseman, J.M. 1992b. Effects of root hypoxia and a low P supply on relative growth, carbon dioxide exchange rates and carbon partitioning in *Pinus serotina* seedlings. *Physiology Plantarum* **86**: 136-144.
- Topa, M.A. & Jackson, W.A. 1988. Influence of ambient ammonium on net potassium uptake by decapitated maize seedlings. *New Phytologist* **110**: 135-141.
- Topa, M.A. & McLeod, K.W. 1988. Promotion of aerenchyma formation in *Pinus serotina* seedlings by ethylene. *Canadian Journal of Forest Research* **18**: 276-280.
- Topa, M.A. & McLeod, K.W. 1986a. Aerenchyma and lenticel formation in pine seedlings: A possible avoidance mechanism to anaerobic growth conditions. *Physiologia Plantarum* **68**: 540-550.

Topa, M.A. & McLeod, K.W. 1986b. Effects of anaerobic growth conditions on P tissue concentrations and absorption rates of southern pine seedlings. *Tree Physiology* **2**: 327-340.

Topa, M.A. & McLeod, K.W. 1986c. Responses of *Pinus clausa*, *Pinus serotina* and *Pinus taeda* seedlings to anaerobic solution culture. I. Changes in growth and root morphology. *Physiology Plantarum* **68**: 523-531.

Topa, M.A. & McLeod, K.W. 1986d. Responses of *Pinus clausa*, *Pinus serotina* and *Pinus taeda* seedlings to anaerobic solution culture. II. Changes in tissue nutrient concentration and net acquisition. *Physiologia Plantarum* **68**: 532-539.

### **OTHER PROFESSIONAL PUBLICATIONS**

Topa, M.A. 2004. Tree Physiology: Root System Physiology. *In*: The Encyclopedia of Forest Sciences, (J. Burley, J.Evans and J. Youngquist, eds.). Elsevier Science Ltd., London, UK. pp. 1606-1616.

Botton, B., Chalot, M., Dizengremel, P., LeTacon, F., Rygiewicz, P. & Topa, M. (eds.) 2001. Dynamics of Physiological Processes in Woody Roots. *Tree Physiology* Vol. **21**: 71-200, Heron Publishing, Victoria Canada.

Topa, M.A., Rygiewicz, P.T. & Cumming, J.R. (eds.) 1996. Dynamics of Physiological Processes in Woody Roots. *Tree Physiology*. Vol. **16**: 877-1046, Heron Publishing, Victoria Canada,

Topa, M.A. 1984. Effects of anaerobic growth conditions on biomass accumulation, root morphology and efficiencies of nutrient uptake and utilization in seedlings of some southern Coastal Plain pine species. Ph.D. thesis, Duke University, Durham, NC. Diss. Abstr. No. DA 8516858

Lang, G. & Topa, M.A. 1982. Solution chemistry of stream and surface waters in Cranesville Swamp. *In* Proc. of Symposium on Wetlands of the Unglaciaded Appalachian Region. (B.R. McDonald, ed.) WV Dept. of Natural Resources, Elkins, WV. pp 55-62.

## PAPERS PRESENTED AT SCIENTIFIC MEETINGS

- Burke, D.J., Topa, M.A. & Kretzer, A.M. “Bacterial diversity in soil associated with ectomycorrhizal root tips of loblolly pine: effects of long-term fertilization”, Ecological Society of America Annual Meeting, Montreal, Quebec, August 7-11, 2005 (talk).
- Topa, M.A., Chapin, C. and D.J. Burke. 2005. “Biocontrol of purple loosestrife by the leaf feeding beetle *Galerucella*: Potential cumulative effects on whole-plant carbon budgets, Ecological Society of America Annual Meeting, Montreal, Quebec, August 7-11, 2005 (poster).
- Burke, D.J., Martin, K.J., Rygiewicz, P.T. & Topa, M.A. “Ectomycorrhizal diversity in a loblolly pine plantation”, Ecological Society of America Annual Meeting, Portland, Oregon, August 2-6, 2004 (poster).
- Burke, D.J., Martin, K.J., Rygiewicz, P.T. & Topa, M.A. “Utilization of T-RFLP (terminal restriction fragment length polymorphism) to characterize mixed ectomycorrhizal fungal communities”, Third International Symposium Dynamics of Physiological Processes of Woody Roots, Perth, Australia, September 29-October 3, 2003 (poster).
- Sheppard, P.R. & Topa, M.A. “Physico-chemical pretreatment of wood for measuring tree-ring nitrogen”, 6<sup>th</sup> International Conference on Dendrochronology, Environmental Change and Human History, Quebec City, August 22-27, 2002 (talk).
- Burke, D., Martin, K., Rygiewicz, P. & Topa, M. “Ectomycorrhizal community composition in loblolly pine ecotypes as determined by terminal restriction fragment length comparisons”, Ithaca, NY, Mini-symposium on Root-Soil Research, Boyce Thompson Institute at Cornell University, April 24, 2002 (talk).
- Topa, M.A. & McDermitt, D. “Ozone and low light effects on allocation and partitioning of recently-assimilated carbon in sugar maple”, Ecological Society of America Annual Meeting, Madison, Wisconsin, August 5-10, 2001 (poster).
- Yang, W.Q., Phillips, R.P., Dunbar-Wallis, A.K. & Topa, M.A. “Seasonal <sup>15</sup>N acquisition and allocation in slow- and fast-growing families of loblolly pine (*Pinus taeda* L.), Ecological Society of America Annual Meeting, Madison, Wisconsin, August 5-10, 2001 (poster).
- Phillips, R.P., Yang, W.Q. & Topa, M.A. “Differences between rhizosphere and bulk soil in a nutrient-poor loblolly pine (*Pinus taeda* L.) plantations”, Ecological Society of America Annual Meeting, Madison, Wisconsin, August 5-10, 2001 (poster).
- Retzlaff, W.A. & Topa, M.A. “Use of hydrogen isotope analysis to identify source water of loblolly pine (*Pinus taeda* L.), Ecological Society of America Annual Meeting, Madison, Wisconsin, August 5-10, 2001 (poster).

- McKeand, S.E., Topa, M.A., O'Malley, D.M. & Allen, H.L. "Responsiveness of diverse families of loblolly pine to fertilization: Six-year results from SETRES-2, Southern Forest Science Conference, November 26-28, 2001 (talk).
- Phillips, R., Yang, W.Q., Dunbar-Wallis, A. & Topa, M.A. "Differences in root biomass and carbon partitioning in fast- and slow-growing families of loblolly pine in response to fertilization", Mini-symposium on Root-Soil Research, Boyce Thompson Institute at Cornell University, Ithaca, NY, April 13, 2000 (talk).
- Yang, W.Q., Dunbar-Wallis, A. & Topa, M.A. "Fine root turnover and ectomycorrhizal morphotypes in loblolly pine", Mini-symposium on Root-Soil Research, Boyce Thompson Institute at Cornell University, Ithaca, NY, April 13, 2000 (talk).
- Yang, W.Q., Dunbar-Wallis, A. & Topa, M.A. "Fine root turnover and mycorrhizal morphotypes in loblolly pine (*Pinus taeda* L.)", American Society for Horticultural Science Annual Meeting, Lake Buena Vista, FL, July 24-26, 2000 (poster).
- Yang, W.Q., Dunbar-Wallis, A.K. & Topa, M.A. "Fine root turnover and mycorrhizal morphotypes in loblolly pine (*Pinus taeda* L.)", Ecological Society of America Annual Meeting, Snowbird, UT, August 6-10, 2000 (poster).
- Topa, M.A., Yang, W.Q., King, P.S. & Phillips, R.P. "Carbon acquisition and partitioning strategies of slow- and fast-growing families of loblolly pine", Ecological Society of America Annual Meeting, Snowbird, UT, August 6-10, 2000 (poster).
- Retzlaff, W.A. & Topa, M.A. "Use of hydrogen isotope analysis to identify source water of diverse provenances of loblolly pine (*Pinus taeda* L.)", Second International Symposium "Dynamics of Physiological Processes of Woody Roots" in Nancy, France, September 26-30, 1999 (poster).
- Retzlaff, W.A., G.K. Blaisdell & M.A. Topa. "Seasonal water source of diverse provenances of loblolly pine (*Pinus taeda* L.)", Toward the Application of Process Models to Sustainable Management of Southern Pine Forests Symposium, Asheville, NC, June 8-11, 1999 (talk).
- Retzlaff, W.A., G.K. Blaisdell & M.A. Topa. "Water source of four families from two diverse provenances of loblolly pine (*Pinus taeda* L.)", Ecological Society of America Annual Meeting, Spokane, Washington, August 8-12, 1999 (poster).
- Retzlaff, W.A., G.K. Blaisdell & M.A. Topa. "Water sources of diverse provenances of loblolly pine", Minisymposium on Root-Soil Interactions, Boyce Thompson Institute at Cornell University, Ithaca, NY, April 15, 1999 (talk).
- Retzlaff, W.A., Blaisdell, G.K. & Topa, M.A. "Belowground carbon allocation of fast- and slow-growing families of loblolly pine", International Symposium The Supporting Roots: Structure and Function, Bordeaux, France, July 20-24, 1998 (talk).

- Ayling, S.M. & Topa, M.A. “Phosphorus storage in *Pinus serotina* Michx. (Pond pine)”, International Symposium The Supporting Roots: Structure and Function, Bordeaux, France, July 20-24, 1998 (poster).
- Topa, M.A., McDermitt, D.J. & Crisfield, S.K. “Ozone-induced patchiness on CO<sub>2</sub> uptake in sugar maple”, Ecological Society of America Annual Meeting, Albuquerque, NM, August 10-14 (poster).
- Topa, M.A. “Phosphorus uptake in southern pines: A possible regulatory role for efflux”, Cornell/USDA/BTI Mini-symposium on Root-Soil Research, Ithaca, NY, April 1996 (talk).
- Bäck, J., Vanderklein D.W. & Topa, M.A. “Effects of elevated ozone on CO<sub>2</sub> uptake and carbohydrate allocation in sugar maple”, Critical Levels for Ozone in Europe: Testing and Finalizing the Concepts, UN-ECE Workshop, in Kuopio, Finland, April 15-17, 1996 (talk).
- Bäck, J., Vanderklein D.W. & Topa, M.A. “CO<sub>2</sub> uptake and short-term carbohydrate allocation in sugar maple (*Acer saccharum* Marsh.) in two light levels under elevated ozone”, Stress Factors and Air Pollution, 17th International Meeting for Specialists in Air Pollution Effects on Forest Ecosystems, IUFRO, Firenze, Italy, September 14-19, 1996 (talk).
- Topa, M.A. “Regulation of phosphorus uptake in a slow- and fast-growing southern pine”, Topa, Fifth Symposium, International Society of Root Research, Clemson, South Carolina, July 14-18, 1996 (poster).
- Vanderklein D.W., Corbin, A. & Topa, M.A. “Carbon acquisition and allocation in sugar maple seedlings after two years of ozone exposure”, Fifth Symposium, International Society of Root Research, Clemson, South Carolina, July 14-18, 1996 (poster).
- Topa, M.A. “<sup>32</sup>P uptake and utilization in *Pinus serotina* seedlings grown under low-P conditions”, International Symposium Dynamics of Physiological Processes in Woody Roots, Ithaca, NY, October 8-11, 1995 (poster).
- Vanderklein D.W., Corbin, A. & Topa, M.A. “Root and shoot responses to ozone and light treatments in one-year-old sugar maple seedlings”, International Symposium Dynamics of Physiological Processes in Woody Roots, Ithaca, NY, October 8-11, 1995 (poster).
- Ayling, S.M. & Topa, M.A. “Phosphorus compartmentation in *Pinus serotina*: Observations from *in vivo* <sup>31</sup>P nuclear magnetic resonance”, International Symposium Dynamics of Physiological Processes in Woody Roots, Ithaca, NY, October 8-11, 1995 (talk).
- Topa, M.A. “Phosphorus uptake strategies of slow- and fast-growing southern pines”, Ecological Society of America Annual Meeting, Knoxville, TN, August 7-11, 1994 (poster).
- Kuehny, J. & Topa, M.A. “Diurnal changes in <sup>14</sup>C assimilation, allocation and partitioning in loblolly pine seedlings”, Annual Ecological Society of America Meeting, Knoxville, TN, August 7-11, 1994 (poster).

- Topa, M.A. “Phosphorus uptake strategies of fast- and slow-growing southern pines”, Cornell Mini-symposium on Root-Soil Research, Ithaca, NY, April 14, 1994 (talk).
- Kuehny, J. & Topa, M.A. “Carbon allocation patterns in roots of loblolly pine”, Cornell Mini-symposium on Root-Soil Research, in Ithaca, NY, April 14, 1994 (talk).
- Topa, M.A. “Co-regulation of plant growth and P acquisition in a southern pine”, Cornell Mini-symposium on Root-Soil Research, in Ithaca, NY, April, 1993 (talk).
- Topa, M.A. & Cheeseman, J.M. “Coregulation of plant growth and P acquisition in *Pinus serotina* seedlings under hypoxic solution conditions”, 12th North American Forest Biology Workshop, The Role of Physiology and Genetics in Forest Ecosystem Research and Monitoring, Saulte Ste. Marie, Ontario, Aug. 17-20, 1992 (talk).
- Topa, M.A. & Cheeseman, J.M. “Root aerenchyma maintains  $^{32}\text{P}$  uptake in anaerobically-grown pond pine”, American Society of Plant Physiology Annual Meeting, in Albuquerque, NM, 1991 (poster).
- Topa, M.A. & Cheeseman, J.M. “ $^{32}\text{P}$  uptake and partitioning by *Pinus serotina* seedlings under hypoxic growth conditions”, American Society of Plant Physiology Annual Meeting, in Indianapolis, IN, 1990 (poster).
- Topa, M.A. & Cheeseman, J.M. “Assimilate partitioning in *Pinus serotina* under low P and hypoxic root conditions”, American Society of Plant Physiology Annual Meeting, in Toronto, 1989 (poster).
- Topa, M.A. & Cheeseman, J.M. “Source/sink regulation of photoassimilate partitioning in *Pinus serotina*”, IUFRO Ecophysiology Symposium, in Rhinelander, WI, 1989 (poster).
- Topa, M.A. & Cheeseman, J.M. “Root-shoot partitioning in *Pinus serotina* under low P and anaerobic conditions”, Ecological Society of America Annual Meeting, in Davis, CA, 1988 (poster).
- Topa, M.A. & Jackson, W.A. “Influence of ambient  $\text{NH}_4^+$  on net  $\text{K}^+$  uptake in corn”, Annual American Society for Plant Physiology meeting, Reno, NV, 1988 (poster).
- Topa, M.A. & McLeod, K.W. “Aerenchyma and lenticel formation in anaerobically-grown southern pine seedlings”, Intl. Society of Anaerobiosis, Wetland Symposium, Charleston, SC, 1986 (poster).
- Topa, M.A. & McLeod, K.W. “Effects of anaerobic growth conditions on the efficiencies of P uptake and utilization in southern pine seedlings”, IUFRO Symposium on Woody Plant Physiology, Knoxville, TN, 1985.

Topa, M.A. & McLeod, K.W. “The effects of soil anaerobiosis on the efficiency of P uptake and utilization in four southern coastal pines”, Ecological Society of America Annual Meeting, 1984 (talk).

Topa, M.A. & McLeod, K.W. “Responses of southern coastal pine seedlings to anaerobic conditions in solution culture”, Ecological Society of America Annual Meeting, in Grand Forks, ND, 1983 (talk).

Lang, G. & Topa, M.A. “Solution chemistry of stream and surface water in Cranesville Swamp”, Symposium on Wetlands of the Unglaciated Appalachian Region, in Morgantown, WV, 1982 (talk).

### **INVITED TALKS**

Topa, M.A. “Tree root structure and function”, Ohio Tree Care Conference and Trade Show, Columbus, OH, February 14, 2006.

Topa, M.A. “The root-microbe-soil continuum”, Ohio Tree Care Conference and Trade Show, Columbus, OH, February 14, 2006.

Topa, M.A. “Genetic x environmental interactions in root system response to environmental stress”, COSTE38: Woody Root Processes: Revealing the Hidden Half, Sede Boqer, Israel, February 4-8, 2006.

Topa, M.A. “Sugar maple decline in the northeastern USA: A causal link between ozone and whole-tree carbon source-sink relationships”, Department of Biology, Case Western Reserve University, Cleveland, OH, March 3, 2005.

Topa, M.A. “How roots adapt to different soil environments”, Ohio Chapter of the International Society for Arborists Annual Meeting: Dirt the Final Frontier, Kirtland, OH, September 25, 2005.

Topa, M.A. “Carbon transport to roots in sugar maple: Evidence suggesting shared control”, Third International Symposium Dynamics of Physiological Processes of Woody Roots, Perth, Australia, September 29-October 3, 2003.

Topa, M.A. “Carbon acquisition and allocation strategies in trees: A role for carbon in the defense against stress”, USDA ARS Plant Protection Research Unit, Ithaca, NY, March 19, 2003.

Dougherty, P., Martin, T., Topa, M. & McKeand, S. “Can a better understanding of ecophysiology help in selecting and developing improved genotypes?”, Silviculture and Genetic Impacts on Productivity of Southern Pine Forests, Wrightsville Beach, NC, September 17-19, 2002.

- Topa, M.A. "Assessing the significance of belowground carbon allocation of fast- and slow-growing families of loblolly pine", DOE Agenda 2020 Meeting, July 2001.
- McKeand, S.E., Topa, M.A., O'Malley, D.M. & Allen, H.L. "Responsiveness of diverse families of loblolly pine to fertilization: Six-year results from SETRES-2", Southern Forest Science Conference, November 26-28, 2001.
- Topa, M.A. "Root system carbon demands in trees: the "poor relations" or major carbon sink?", Syracuse University, Department of Biology, December 3, 1999.
- Topa, M.A. "Modeling belowground processes: Current gaps in experimental research", Toward the Application of Process Models to Sustainable Management of Southern Pine Forests, Symposium, Asheville, NC, June 8-11, 1999.
- Retzlaff, W.A. & Topa, M.A. "Use of hydrogen isotope analysis to identify source water of diverse provenances of loblolly pine (*Pinus taeda* L.)", Second International Symposium Dynamics of Physiological Processes of Woody Roots in Nancy, France, September 26-30, 1999.
- Retzlaff, W.A., G.K. Blaisdell & Topa, M.A. "Seasonal water source of diverse provenances of loblolly pine (*Pinus taeda* L.)", Toward the Application of Process Models to Sustainable Management of Southern Pine Forests Symposium, Asheville, NC, June 8-11, 1999.
- Topa, M.A. "Functional differences between woody and fine roots: Inferences from seedling studies", International Symposium The Supporting Roots: Structure and Function, Bordeaux, France, July 20-24, 1998.
- Topa, M.A. "Assessing the significance of belowground carbon allocation of fast- and slow-growing families of loblolly pine", SETRES 1997 meeting, North Carolina State University, Raleigh, NC, November.
- Topa, M.A. "Characterizing phosphorus uptake in fast- and slow-growing southern pines", Agricultural Experimental Station in Geneva in Plant Pathology, October, 1996.
- Topa, M.A. "Phosphorus uptake and utilization strategies of fast- and slow-growing southern pines", Dept. of Forestry, North Carolina State University, Raleigh, NC, July, 1995.
- Topa, M.A. "Characterization of phosphorus uptake in a southern pine", Plant Biology Seminar Series, Cornell University, Ithaca, NY, November, 1995.
- Topa, M.A. "Coregulation of plant growth and P acquisition in southern pine: Fact or fiction", EPA Lab in Corvallis, OR, March, 1993.
- Topa, M.A. "Soil flooding and phosphorus availability: Getting to the root of the problem", Boyce Thompson Institute for Plant Research, Ithaca, NY, October, 1992.

Topa, M.A. “Flooding tolerance in woody plants”, Department of Forestry, University of Illinois, Urbana, IL, March, 1991.

Topa, M.A. “Adaptations of southern pines to flooding”, Department of Forestry, University of Illinois, Urbana, IL, October, 1989.

### **MEMBERSHIP IN SCIENTIFIC SOCIETIES**

Ecological Society of America, International Union of Forestry Research, Gamma Sigma Delta.

### **POSTDOCTORAL AND RESEARCH ASSOCIATES TRAINED:**

1992-2004: Dr. Dirk Vanderklein, Associate Professor, Department of Biology and Molecular Biology, Montclair State University, NJ.  
Dr. Jeff Kuehny, Associate Professor, Department of Horticulture, Louisiana State University, LA.  
Dr. Sarah Ayling, Veterinary Pathology, Infections and Immunity, University of Bristol.  
Dr. Jaana Bäck, Researcher, Department of Forest Ecology, University of Helsinki, Finland.  
Dr. William Retzlaff, Associate Professor, Chair of Biological Sciences Department, Southern Illinois University at Edwardsville.  
Dr. Wei Qiang Yang, Associate Professor, North Willamette Research and Extension Center, OR.  
Dr. David Burke, Assistant Scientist, The Holden Arboretum, Cleveland, OH.