

CURRICULUM VITAE

NAME: Debbie Jeanette Swarthout

**Assistant Professor of Biology
Hope College
Holland, MI
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EDUCATION & PROFESSIONAL TRAINING

Bachelor of Science	Botany 1989	University of Cape Town
Bachelor of Science (Hons) (First Class)	Botany 1990	University of Cape Town
Master of Science	Botany 1993	University of Cape Town
Doctor of Philosophy	Botany 1999	University of Kansas

EMPLOYMENT & PROFESSIONAL TRAINING

2001-2007	Assistant Professor of Biology, Hope College
1999-2001	Postdoctoral Research Associate, University of Arkansas

GRANTS, FELLOWSHIPS & AWARDS

External Grants

2003-2006	NSF-MRI. Bultman, T. (PI), Swarthout, D. (Co-PI), G. Murray (Co-PI). Acquisition of Controlled Environment Chambers for Enhanced Research in the Plant Biology Program at Hope College. \$154085.
2003-2007	NSF-CRUI. Bultman, T. (PI), Swarthout, D. (Co-PI), Andersen, J. (Co-PI) and K. Brown (Co-PI). A Multidisciplinary Test of Mutualistic Benefits Fungal Endophytes Provide Their Host Plants. \$885773.
2005-2007	NSF. Murray, K.G. (PI), Swarthout, D. (Co-PI), Hansen, E.C. (Co-PI), Winnett-Murray (Co-PI), K., Bultman, T. (Co-PI). A Strategic Development Plan for the Hope College Field Station. \$18250.
2007	Pierce Cedar Creek Institute Summer Undergraduate Research Fellowship. Swarthout, D. and E. Schuiteman. Screening for drought tolerance in plant communities at Pierce Cedar Creek Institute. \$4527
2007	Pierce Cedar Creek Institute Summer Undergraduate Research Fellowship. Swarthout, D. and E. Weidenhaft. Mechanical stomatal diversity and rates of CO ₂ conductance in Pierce Cedar Creek plant communities. \$4899

Internal Grants

Swarthout, D. Hope College Faculty Development Award. The Willard C. Wichers Fund. Investigating increased drought tolerance in endophytic tall fescue grasses. (Summer 2003) \$3600

Swarthout, D., Brown, K., Evans, T. Hope College Science Division Howard Hughes Medical Institute Grant Award. Development of a Course on understanding the "Chemical Aspects of Ethnobotany". (June 2006-December 2007) \$9540.

Swarthout, D. Hope College Faculty Development Award. The Soeter Family Fund. Establishing New Research Connections in South Africa Travel Grant Award. (Summer 2006) \$2000.

FELLOWSHIPS

South Africa

1987-1989 House of Representatives Teaching Contract Fellowship (R12600)
1990 Foundation for Research and Development Honors Scholarship (R5000)
1991-1993 Council for Scientific and Industrial Research Masters Scholarship (R60000)
1994-1997 Council for Scientific and Industrial Research Ph.D. Contract Scholarship (R250000)

USA

1996-1998 Eugenia S. Polson Summer Scholarship (\$1630)
1997 Ida Hyde Women in Science Summer Scholarship (\$2 000)
1999 Dr. Obee Summer Scholarship (\$390)

AWARDS

2000 Arsersinger Dissertation Award (\$500)

PUBLICATIONS

Swarthout, D., *E. Harper, *S. Judd, *D. Gonthier, T. *Stowe, T. Bultman (in review with Environmental and Experimental Botany). Water-use efficiency and photosynthesis in drought-stressed endophyte-infected and non-infected Tall fescue grasses

Swarthout, Debbie. (2006). "Stomata." Encyclopedia of Earth. Eds. Daniel Robert Taub. (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment).
<http://www.eoearth.org/article/Stomata>>

Verburg, P., J.A. Arnone III, D. Obrist, D.E. Schorran, R.D. Evans, D. Le Roux-Swarthout, D.W. Johnson, Y. Luo, J.S. Coleman. (2004). Net ecosystem carbon exchange in two experimental grassland ecosystems. *Global Change Biology* 10: 498-508.

*Courter, J. and Swarthout, D. (2003). The physiological response of Fraser fir seedlings to drought-related stress in weedy and non-weedy field locations of Michigan. *Michigan Christmas Tree Journal* 50(2):4-5.

Terwilliger, V.J., Kitajima, K., Le Roux-Swarthout, D.J., Mulkey, S. and Wright, S.J. (2001). Intrinsic water use efficiency and heterotrophic investment in leaf growth of two Neotropical pioneer tree species as estimated from $\delta^{13}\text{C}$ values. *New Phytologist* 152: 267-281.

Le Roux-Swarthout, D., Terwilliger, V., Martin, C.E. (2001). Deviation between $\delta^{13}\text{C}$ and leaf intercellular CO_2 concentrations in *Salix interior* cuttings developing under low light. *International Journal of Plant Science* 162:1017-1024.

- Le Roux-Swarthout, D., V. Terwilliger, M. C. Christianson, C. E. Martin, and S. Madhavan. (2001). Carbon isotopic ratios of atmospheric CO₂ affect the δ¹³C values of heterotrophic growth in *Nicotiana tabacum*. *Plant Science* 160:563-570.
- Terwilliger, V.J., Kitajima, K., Le Roux-Swarthout, D.J., Mulkey, S. and Wright, S.J. (2001). Influences of heterotrophic and autotrophic resource use on carbon and hydrogen isotopic compositions of tropical tree leaves. *Stable Isotopes in Health and Environmental Studies* 37:133-160.
- Le Roux-Swarthout, D., Terwilliger, V., Christianson, M., Martin, C. and Madhavan, S. (2000). Carbon isotope discrimination correlates with a range of ratios of phosphoenolpyruvate to total carboxylase activities found in two C₃ species. *Journal of Plant Physiology*, 157:489-493.
- Le Roux, D. J. (1999). Potential influence of carbon import and carboxylating enzymes on carbon isotopic ratios in C₃ Species. Ph.D. Dissertation. 161 pages. University of Kansas.
- Le Roux, D., Stock, W.D., Bond, W.J. and Maphanga, D. (1996). Dry mass allocation, water-use efficiency and d¹³C in clones of *Eucalyptus grandis*, *Eucalyptus grandis* X *camaldulensis* and *Eucalyptus grandis* X *nitens* under two irrigation regimes. *Tree Physiology* 16:497-502.
- February, Ed., C., Stock, W.D., Bond, W.J. and Le Roux, D.J. (1995). Relationship between water availability and selected vessel characteristics in *Eucalyptus grandis* and two hybrids. *IAWA Journal* 16(3):269-276.
- Le Roux, D.J. (1993). Growth, water use efficiency and stable carbon isotopes in commercial clones of *Eucalyptus*. MSc, Thesis. 115 pages.
- Stock, W.D., Le Roux, D. and van der Heyden, F. (1993). Regrowth and tannin production in woody succulent karoo shrubs in response to simulated browsing. *Oecologia* 96(4):562-568.
- Olbrich, B., Le Roux, D., Poulter, A.G., Bond, W.J. and Stock, W.D. (1993). Variation in water-use efficiency and d¹³C levels in *Eucalyptus grandis* clones. *Journal of Hydrology* 150:615-633.
- Stock, W.D., Bond, W.J. and Le Roux, D. (1993). Isotopic evidence from soil carbon to reconstruct vegetation history in the south western cape province, South Africa. *South African Journal of Science* 89:153-154.
- Bond, W.J., Le Roux, D. and Erntzen, R. (1990). Fire intensity and regeneration on myrmecochorous Proteaceae. *South African Journal of Botany* 56(3): 326-330.

* - undergraduate students

Manuscripts in preparation

Swarthout, D. E. Harper, N. Grand*, J. Fan, J. Hu, C. Young, M. Shipra, K. Kessler and D. Jones (in preparation). The use of ¹⁵N labeling and photosynthetic CO₂ response curves to measure photorespiration under drought conditions in Tall fescue grasses.

*First draft of manuscript is available.

#Swarthout, D., Fernandez, L., Grand, N. and Miedema, T. (in preparation) Uptake and translocation of ^{15}N NH_4NO_3 in endophyte infected and uninfected tall fescue grasses.

#Note, data have been collected. Data need to be analyzed and manuscript needs to be written.

INVITED TALKS

- Nov 2007 Swarthout, D. Photosynthesis and Photorespiration in plants: where do all the light energy, water and nitrogen go? Oral presentation. Hope College Biology Seminar Series, Holland, MI.
- Dec 2007 Gas exchange measurements, what can they tell us about the underlying limitations to photosynthesis in tall fescue grasses. Oral presentation. Noble Foundation, Ardmore, OK.

PAPERS PRESENTED (2002-2007)

- Mar. 2003 Swarthout, D. and Courter, J. The physiological response of Fraser fir seedlings to drought related stress in weedy and non-weedy field locations. Michigan Academy of Science Meeting. Hope College.
- May 2003 Swarthout, D. From flowers to seed and all that goes with it. HASP spring horticultural series. Hope College.
- Aug. 2005 Swarthout, D., Bode, R. Gonthier, D. and Bultman, T. Effect of aphids on stomatal conductance and photosynthesis in tall fescue grass. Ecological Society of America Annual Meeting, Montreal, Canada.
- Aug. 2006 Swarthout D., Harper, E., Judd, S., Gonthier, D., Stowe, T. and Bultman, T. An endophyte facilitates homeostatic control of water-use efficiency in a cool season grass: Are these associations lurking in the fynbos? Oral presentation. Fynbos Forum, Rawsonville, South Africa.
- Mar. 2007 Swarthout, D., Harper, E., Judd, S. Gonthier, D., Stowe, T. and Bultman, T. Water-use efficiency and photosynthesis in drought-stressed endophyte-infected and non-infected K-31 Tall fescue grasses. American Society of Plant Biologists Midwest regional meeting. Michigan State University, East Lansing.

POSTERS PRESENTED

- August 2004 Swarthout, D. and Yamaoka, J. Endophytic tall fescue grasses show greater stomatal responses to changes in CO_2 in intact leaves. American Society of Plant Biologists National Meeting, Orlando, Florida.

STUDENT PRESENTATIONS (2002-2007)

Oral

- Nov 2004 Gonthier, D., Thomson, M., Harper, E. and Swarthout, D. Impact of drought on stomatal conductance, photosynthesis and regrowth in endophytic meadow fescue. Oral presentation. PEW Midstates Consortium Research Symposium. University of Chicago.
- Nov 2006 Harper, E. and Swarthout, D. Water-use efficiency of endophytic versus non-endophytic tall fescue grasses during dehydration. Oral presentation. PEW

Midstates Consortium Research Symposium. University of Chicago.

- Sept 2007 Weidenhaft, E., Schuiteman, E. and Swarthout, D. The Effects of Stomatal Diversity on Water Use Efficiency in *Elymus repens* (Quack Grass), *Solidago altissima* (Tall Goldenrod), and *Andropogon scoparis* (Big Bluestem). Pierce Cedar Creek Institute Summer Undergraduate Research Grants Symposium. Hastings, MI.
- Poster**
- July 2007 Weidenhaft, E. and Schuiteman, E. The effect of light intensity and vapor pressure deficit on water-use efficiency in *Solidago altissima*, *Andropogon gerardi* and *Agropyron repens*. American Society of Plant Biologists Joint Congress Meeting. Chicago.
- July 2007 Grand, N. and Harper, E. Gaining a mechanistic understanding of early stomatal closure and protection of photosynthetic machinery during dehydration. American Society of Plant Biologists Joint Congress Meeting. Chicago.
- Nov 2006 Marra, N., Swarthout, D. and Bultman, T. Effect of aphid feeding on gas exchange in *Lolium arundinaceum*. PEW Midstates Consortium Research Symposium. University of Chicago.
- Nov 2006 Grand, N., Swarthout, D. Uptake kinetics of ammonium in *Lolium arundinaceum*. PEW Midstates Consortium Research Symposium. University of Chicago.
- Nov 2006 Fernandez, L., Miedema, T. and Swarthout, D. Uptake of glycine and glutamate in endophytic and non endophytic grasses. PEW Midstates Consortium Research Symposium. University of Chicago.
- Nov 2004 Thomson, M. and Swarthout, D. Impact of Drought and Photosynthesis on Regrowth in Meadow Fescue. PEW Midstates Consortium Research Symposium. University of Chicago. PEW Midstates Consortium Research Symposium. University of Chicago.
- Nov 2004 Harper, E., Gonthier, D. and Swarthout, D. Water preserving strategies for drought stressed meadow fescue infected with a fungal endophyte.
- Oct 2003 Yamaoka, J. and Swarthout, D. The effects of a fungus on the carbon-gaining capacity of a grass under varying nutrient and water availability. PEW Midstates Research Symposium. Washington University.
- Oct 2002 Courter, J. and Swarthout, D. The physiological response of Fraser fir seedlings to drought related stress in weedy and non-weedy field locations. PEW Midstates Research Symposium, University of Chicago.
- Oct 2002 Yamaoka, J., Webb, S. and Swarthout, D. Does PEP carboxylase influence drought

tolerance in symbiotic tall fescue grasses? PEW Midstates Research Symposium. University of Chicago.

TEACHING Primary: Plant Physiology
FIELDS Secondary: Introductory Plant Biology

COURSES TAUGHT:

Biology, Unity and Diversity (Bio 150)
Organismal Biology (Bio 260)
Cells and Genetics Labs (Bio 240)
Plant Physiology (Bio 320)
Plant-Animal Interactions Journal Club (Biology 495)
First Year Seminar: What does it mean to love someone or something? (IDS 100-20)
Chemical Aspects of Ethnobotany: To be taught for the first time in spring 2008

PROFESSIONAL ACTIVITIES

Reviewer of research proposals for the National Research Foundation, South Africa.
Reviewer of manuscripts for Tree Physiology and Oecologia.

PROFESSIONAL MEMBERSHIPS

American Society of Plant Biologists
Crop Science Society of America
American Association for the Advancement of Science
Council for Undergraduate Research
Sigma Xi

SERVICE TO COLLEGE AND DEPARTMENT (e.g., Board & Committee assignments & other College assignments)

Dates	Role	Committee
2001- present	Committee member	Greenhouse
2003, 2006-2008	Committee member	Campus Life Board
2005	Committee member	Residential Board
2006-2008	Committee member	Communications and Media
2005-2007	Cells and Genetics Lab Coordinator	
2007-2008	Committee member	Advisory Board Member Pierce Cedar Creek Institute for Ecological education

SERVICE AT THE REGIONAL LEVEL

Dates	Role	
2003	PEW faculty panelist	Hope College
2004, 2005	Career choices panelist	Notre Dame University
2006	Career choices panelist	Michigan State University

SERVICE AT THE NATIONAL LEVEL

Dates	Role
2004	NCSI workshop attendance at Monmouth College, Monmouth, IL. “Incorporating Computational Science Tools and Techniques Into Undergraduate Courses”
	PKAL workshop attendance at University of Colorado, Boulder, CO. “Investing in the future: Building Institutional Leadership For National Science Communities”
2007	Lab leadership workshop attendance at American Society of Plant Biologists Joint Annual Congress in Chicago, IL.

REFERENCES

1. Professor Christopher Barney
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2. Associate Professor Timothy Evans
Biology Department
Hope College
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Tel: 616-395-7460
Email: evanst@hope.edu
3. Associate Professor Virginia McDonough
Biology Department
Hope College
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Tel: 616-395-7715
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