

CURRICULUM VITAE

NAME: Debbie Jeanette Swarthout

**Assistant Professor of Biology
Hope College
Holland, MI
Telephone (w) 616 3957355**

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

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)

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 CO₂ 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 Crop Science) Water-use efficiency and photosynthesis in drought-stressed endophyte-infected and non-infected K-31 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 CO_2 affect the $\delta^{13}\text{C}$ 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 C_3 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 C_3 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 d^{13}C 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 $d^{13}C$ 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. Hu, K. Kessler and D. Jones (in preparation for Plant, Cell and Environment). Variation in photosynthetic, photorespiratory and antioxidative metabolites under drought conditions in endophyte infected and uninfected tall fescue grasses.

#Swarthout, D. and N. Grand. (in preparation for New Phytologist) 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 manuscripts need to be written.

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 CO₂ 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.

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 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.

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
 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, 2006-2007	Committee member	Campus Life Board
2005	Committee member	Residential Board
2006-2007	Committee member	Communications and Media

SERVICE TO COMMUNITY (e.g., organizations & religious affiliation)

Attend Beechwood Reformed Church on a regular basis since June 2006.
 Participate in a ladies neighborhood Bible study since January 2006.