
Curriculum Vitae

David L. Dornbos Jr.

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EDUCATION

- 1988 Ph.D. in Crop Production and Physiology with Honors (Graduate Research Excellence Award)
Iowa State University, Department of Agronomy, Ames, IA
Dissertation: "Soybean seed yield, viability and vigor, and chemical composition resulting from drought and high temperature stress during seed fill."
- 1984 M.S. in Seed Physiology
The Ohio State University, Department of Agronomy, Columbus, OH
Thesis: "A study of the biochemical composition of developing soybean seeds (*Glycine max* (L.) Merr.)"
- 1981 B.S. in Biology
Calvin College, Grand Rapids, MI
Project: "Nitrate reductase activity in leaves of the Venus flytrap (*Dionea muscipula*)"

PROFESSIONAL EXPERIENCE AND KEY ACCOMPLISHMENTS

- 2009-Present Au Sable Institute of Environmental Studies Faculty
- May Term, Mancelona, MI
 - Biology 361: Field Natural History
- 2008 – Present Iowa State University Lecturer, Agronomy Department
- Developed a distance learning graduate course for Summer I Term
 - Agronomy 547: Seed Production
- 2004 – Present Associate Professor
Biology Department, Calvin College
- Teaching:
 - On-Campus: Biology 111 (Biological Science), Biology 123 (The Living World: Concepts and Connections), Biology 141L (Cell Biology laboratories), Biology 243 (Plant Biology), Biology 332 (Plant Physiology), Biology 354 (Investigations), Biology 364 (Global Health, Environment and Sustainability), Biology 390 (Independent Study), Biology 395 (Perspectives in Biology)
 - Calvin Off-Campus: January terms W14 (Cambodia: A Case Study of Hunger Issues & Solutions), Hawaiian Farms and Food Systems
 - Other Institutions Off-Campus: Au Sable Institute Biology 361 (Field Natural History) and Iowa State University Distance Learning Agronomy 547 (Seed Production)
 - Research emphases:
 - Control of invasive woody shrubs, especially glossy and common buckthorn
 - Physiological advantages and control of invasive shrubs compared with native shrubs in field conditions: Autumn olive, glossy and common buckthorn: photosynthesis and water use efficiency, chlorophyll content, and nitrogen fixation ability
 - Cellulosic ethanol and soil restoration potential of invasive woody shrubs: Comparison of Switchgrass and woody invasive shrubs for annual biomass yield, conversion efficiency of biomass to ethanol, and the potential to improve soil organic carbon content of degraded soils

- Carbon sequestration capacity assessment of various primary plant communities: Determination of light use efficiency, leaf area index, and plant canopy composition; calculation of the gross primary productivity of diverse landscapes as one component of carbon footprints
- While serving on the Advisory Board for the Genesis Community of Transformation's (GCT) Eden School of Agriculture (ESA) research farm in Cambodia. Part of an ongoing series of service-based off-campus interims focused on effective international rural development, where students and faculty (Leonard DeRooy and I) are supporting the development of a rural research education and development farm.
- Integrated Solutions Asia Cooperation (ISAC) was recently organized by Daravuth Seng in Cambodia. I am beginning to serve on the advisory board of this NGO to provide technical information about food production capacity and the adoption of GMO's.

- 2001-2004 Global Head, Seed Production Research (Syngenta Seeds, Inc., Golden Valley, MN)
- Managed an international team of eleven scientists to improve seed yield (achieved +154% in four years) and reliability (+/- 7% of target annually). Major factors contributing to increased yields were increased female density, reduced plant damage during detasseling, and quality planting instructions. These improvements resulting in increased NAFTA profitability of \$4-6M/year.
 - Developed an intranet web page to deliver and maintain a repository of project reports, planting instructions, and product specific production histories.
 - Screened and characterized hundreds of novel male and female lines released annually by plant breeders for male and female production traits, pathology and herbicidal sensitivity.
 - Organized collaborative research with academic scientists (Iowa State University) to evaluate the movement of adventitious pollen and to optimize the pollination of hybrids with males that varied in productive capacity.
- 1999-2001 Research Director, Production Systems & Agronomic Res. (Syngenta Seeds, Inc., Golden Valley, MN)
- Conducted research with new products to identify how productivity is optimized within production systems and train growers to optimize productivity
 - Designed and evaluated novel seed technologies – pesticide and micronutrient seed treatments
 - Managed 14 scientists, \$2.8M Budget
- 1993-1999 Director of Product Development (Syngenta Seeds, Inc., Golden Valley, MN & Bloomington, IL)
- Mentored annual advancement and commercial positioning of 70 corn hybrids, 50 soybean varieties.
 - Assessed grower and corporate value of novel agricultural biotechnology traits: Bt (events Bt176, Bt11), Roundup-Ready, and herbicide tolerance (glyphosate, glyphosinate, imidazolinone)
 - Developed and implemented “Challenge Days” to teach growers how to manage biotechnology products within the context of production systems.
 - Provided agronomic training and sales support
 - Managed 19 agronomists, \$4.3M Budget
- 1992-1993 Manager of Market Development (Ciba-Geigy Seed Division, Bloomington, IL)
- Organized the launch of focus products
 - Developed and implemented “Scouting Clinics” to teach growers how to identify crop production problems and employ Integrated Pest Management systems to react to those problems.
 - Provided agronomic training of sales personnel
 - Managed 4 agronomists, \$0.4M Budget
- 1989-1992 Product Development Agronomist (Ciba-Geigy Seed Division, Chandler, IN)
- Evaluated corn, soybean, and sorghum products.
 - Provided local agronomic training and support
- 1988-1989 Post-doctoral Research Scientist (USDA/ARS/NRRC – Bioactive Constituents Res. Unit, Peoria, IL)
- Developed assays to measure chemical phytotoxicity
 - Tested bioactive constituents for biological activity with plants
- 1984-1988 Research Assistant (Agronomy Department, Iowa State University, Ames, IA)
- 1982-1984 Teaching Assistant (Agronomy Department, The Ohio State University, Columbus, OH)

LEADERSHIP ROLES IN PROFESSIONAL SOCIETIES AND NON-PROFITS

- 2010- Chair of the C-4 (Seed Physiology, Production and Technology) Division of the Crop Science Society of America (an international society of the agronomic sciences)
- 2010-Present Advisory Board: Integrated Solutions Asia Cooperative (ISAC), Phnom Penh, Cambodia directed by Daravuth Seng
- 2009-Present Calvin College Faculty Senate
- 2009-Present Advisory Board: Genesis Community of Transformation (& Eden School of Agriculture), a faith-based NGO in Cambodia, Phnom Penh, Cambodia directed by Ms. Navy Chan
- 2009-Present Integrated Science Research Institute Advisory Board, Calvin College HHMI Grant
- 2009-Present Sectional Chair (Botany and Ecology) of the Michigan Academy of Sciences, Arts, and Letters
- 2007-2009 Elder Board: Covenant CRC, Cutlerville, MI
- 2006-Present Advisory Board for Research at the Pierce Cedar Creek Institute (PCCI), Hastings, MI

AWARDS & HONORS

- 2010 Kapp Award, MASAL Undergraduate Paper, 2009. "Characterization of the Physiological Competitiveness of Autumn Olive in Meadow and Forest Environments"
- 2010 Nagel Institute Fellowship, "Transforming Cambodia: Holistic Application of Sustainable Food Production Methods in Rural Cambodia"
- 2009 Faculty Mentor of the Year, Calvin Student Runners Club
- 1992 President's Council, Ciba-Geigy Seed Division
- 1992 Market Development Agronomist of-the-Year, Ciba-Geigy Seed Division
- 1992 Be the Best Award, Ciba-Geigy Seed Division
- 1991 Leadership Award, Ciba-Geigy Seed Division
- 1990 Progrower Award, Ciba-Geigy Seed Division
- 1988 Graduate Research Excellence Award, Iowa State University
- 1987 C.R. Weber Award for Excellence in Plant Science, Iowa State University

MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES

American Society of Agronomy (ASA)
Crop Science Society of Agronomy (CSSA)
American Society of Plant Physiologists (ASPP)
Sigma Xi Research Society
Phi Kappa Phi Honorary Society
Gamma Sigma Delta Honorary Society
American Scientific Affiliation (ASA)
Michigan Academy of Science, Arts and Letters (MASAL)
Midwest Invasive Plant Network (MIPN)
National Area Association (NAA)

CONSULTING

1. Dec 2004 – May 2005. Support the development of an integrated pest management information system by Global Knowledge Management (Syngenta Corp.), deliverable using internet technology, to identify the need for fungicide application on small grains to control leaf and head blight development using GIS tools to manage local climate, crop growth and development information. My role is to define model coupling points between pathogen and key crop growth stages.
2. Aug 2005 – Feb 2006. Support the development of an integrated pest management information system by Global Knowledge Management (Syngenta Corp.), deliverable using internet technology, to predict the growth and development of soybean using GIS tools to manage local climate, crop growth and development information. This information will assist assessment of grower value in using fungicides to control Asian rust of soybean.

TECHNICAL & COMMUNICATION SKILLS

- Accumulated a knowledge base in production systems, agronomy, and seed sales support
- Conducted or organized accurate and efficient field research:
 - Measured cultivar and technology value: hybrids, varieties, Bt, RR, LL, Proshield
 - Applied precision agriculture tools to production systems

- Related products and technologies to best management practices
- Managed and motivated strong teams of agronomists
- Applied Geographic Information Systems and precision agriculture tools to produce critical business information
- Acquired broad corporate experience in R&D, Supply Management, Marketing, and Sales
- Communicated extensively using verbal and written methods with scientific, media, grower, and business audiences
- Harmonized global product testing and portfolio management processes
- Participated with integration teams during company mergers to organize business structure and role responsibilities
- Developed personal skills:
 - Novartis Top Management
 - Executive General Business Management
 - Hostile Media Training
 - Targeted Selection candidate interviewing methods
 - Leadership Development: Challenging, Enabling, Encouraging, Inspiring, Modeling
 - American Society of Agronomy symposium organization
- Certified Decision Support System of Agricultural Technology, crop growth modeling system

GRANTS FUNDED

- 2010: Pierce Cedar Creek Institute URGE Program. \$10,500 + Room/Board. Relationship between Nitrogen Fixation Rate, Apparent Photosynthesis Rate, and Chlorophyll Content of Autumn Olive and Potential Impacts on the Competitiveness of Cohabiting Native Plant Species.
- Integrative Science Research Institute. \$8,400. Potential for Woody Invasive Plants to Produce Biomass for Ethanol and Improve Soil Quality.
- Nagel Institute Fellowship. \$6000. Eden School of Agriculture project “Transforming Cambodia: Holistic Application of Sustainable Food Production Methods in Rural Cambodia”.
- 2009: Integrative Science Research Institute. \$4,200. Characterization of Woody Invasive Species as Potential Sources of Cellulosic Ethanol.
- Pierce Cedar Creek Institute URGE Program. \$10,500 + Room/Board. Assessment of the Quantity of CO₂ Absorbed by the Greenspace of Pierce Cedar Creek Institute.
- 2008: LI-COR Biosciences LEEF II. \$29,500. LI-COR 6400XTR Gas Exchange System.
- Pierce Cedar Creek Institute URGE Program. \$6,000 + Room/Board. Relationship between Chlorophyll Content and Gas Exchange Rate of Autumn Olive and Native Woody Species of Meadow and Mature Forest Environments.
- Howard Hughs Medical Institute. \$1.1M. Member of the team that developed a proposal for the Howard Hughes Medical Institute to create the Interdisciplinary Science Research Institute.
- 2007: Pierce Cedar Creek Institute URGE Program. \$6,000 + Room/Board. Comparison of the Photosynthetic Capacity of Autumn Olive and Four Native Species in a Mature Forest Canopy as a Function of Light Intensity.
- Calvin Student Summer Research Fellowships. \$8,400. Estimation Of Annual Carbon Sequestration Potential Of Plant Communities On The Calvin Campus.
- 2006: Pierce Cedar Creek Institute URGE Program. \$6,000 + Room/Board. Characterization of the Physiological Competitiveness of Autumn Olive.
- Calvin Student Summer Research Fellowship. \$4,200. Characterization of Photosynthesis Rates in a Managed Forest Ecosystem to Optimize CO₂ Sequestration Ability.
- Calvin Student Summer Research Fellowship. \$4,200. Light Characteristics of an Urban Forest Canopy.

2005: Calvin Student Summer Research Fellowship. \$4,200. Net Photosynthesis and Growth Rate of Buckthorn Seedlings and Eight Native Shrubs at Various Light Intensities.

Calvin Student Summer Research Fellowship. \$4,200. Efficacy of Glyphosate in the Control of Buckthorn Shrubs.

Calvin Research Fellowship. \$3000. Physiological Characterization of Two Invasive Shrubs, *Rhamnus cathartica* and *Rhamnus frangula*.

PEER REVIEWED PUBLICATIONS

1. Dornbos, D.L., M.R. Martzke, and R. Pruijm. Factors Optimizing the Control of Invasive Shrubs using Glyphosate on Cut Stumps. Submitted to Natural Areas Journal.
2. Dornbos, D.L. Sustainable Agriculture and the Impoverished: A Normative Approach to Development. Submitted to Perspectives on Science and Christian Faith.
3. Parish, N.L. (Executive Director). 2010. *Eating In Place*. Public Broadcasting System Documentary, Grand Rapids Humanities Council. Extensive speaking role as a technical expert. 60 minutes.
4. Fonseca, A.E, J.I. Lizaso, M.E. Westgate, L. Grass, and D.L. Dornbos Jr. 2004. Simulating Potential Kernel Set in Maize Hybrid Seed Production. *Crop Sci.* 44:1696-1709.
5. Fonseca, A.E., M.E. Westgate, L. Grass, and D.L. Dornbos. 2003. Tassel Morphology as an Indicator of Potential Pollen Production in Maize. *Crop Management*: 10.1094/CM-2003-0804-01-RS.
6. Dornbos, Jr., D. L. and R. E. Mullen. 1992. Soybean seed protein and oil contents and fatty acid composition adjustments by drought and temperature. *J. Am. Oil Chem. Soc.* 69(3):228-231.
7. Dornbos, Jr., D. L. and R. E. Mullen. 1991. Influence of stress during soybean seed fill on seed weight, germination, and seedling growth rate. *Can. J. Plant Sci.* 71:373-383.
8. Dornbos, Jr., D. L. and G. F. Spencer. 1990. Natural products phytotoxicity: A bioassay suitable for small quantities of slightly water-soluble compounds. *J. Chem. Ecology* 16:339-352.
9. Dornbos, Jr., D. L., G. F. Spencer, and R. W. Miller. 1990. Medicarpin delays alfalfa seed germination and seedling growth. *Crop Sci.* 30:162-166.
10. Gardner, H. W., D. L. Dornbos, Jr., and A. E. Desjardens. 1990. Hexanal, trans-2-hexenal, and trans-2-nonenal inhibit soybean, *Glycine max*, seed germination. *J. Agric. and Food Chem.* 38:1316-1320.
11. Petroski, R. J., D. L. Dornbos, Jr., and R. G. Powell. 1990. Germination and growth inhibition of annual ryegrass (*Lolium multiflorum* L.) and alfalfa (*Medicago sativa* L.) by loline alkaloids and synthetic N-acylloline derivatives. *J. Agric. and Food Chem.* 38:1716-1718.
12. Dornbos, Jr., D. L., R. E. Mullen, and E. G. Hammond. 1989. Phospholipids of environmentally stressed soybean seeds. *J. Am. Oil Chemists Soc.* 66:1371-1373.
13. Dornbos, Jr., D. L., R. E. Mullen, and R. M. Shibles. 1989. Drought stress effects during seed fill on soybean seed germination and vigor. *Crop Sci.* 29:476-480.
14. Dornbos, Jr., D. L. and R. E. Mullen. 1987. Soybean single-seed mass and conductivity resulting from environmental stress and pod position. *Iowa Seed Sci.* 9:11-13.
15. Dornbos, Jr., D. L. and R. E. Mullen. 1987. Effect of drought stress and high temperature during development on soybean seed quality. *Iowa Seed Sci.* 9:7-10.
16. Dornbos, Jr., D. L. and M. B. McDonald, Jr. 1986. Mass and composition of developing soybean seeds at five reproductive growth stages. *Crop Sci.* 26:624-630.
17. Dornbos, Jr., D. L. and R. E. Mullen. 1985. Soybean seed quality and drought stress intensity during development. *Iowa Seed Sci.* 7:9-11.

BOOK CHAPTERS

1. Dornbos, Jr., D.L. 2007. "Food For Thought": A Case Study in Global Health, Environment, and Sustainability. In *The Teagle Report on Urban and Rural Development*.
2. Dornbos, Jr., D.L. 1998. GIS: A Strategic Product Information Management Tool. In *Proceedings of the 53rd Annual Corn and Sorghum Research Conference*, Pub. Number 53. American Seed Trade Association, Inc., Washington, D.C. p. 180-186.
3. Dornbos, Jr., D. L. 1995. Seed Vigor: Concept and Underlying Mechanisms, Chapter 2 in "Seed Quality: Basic mechanisms and agricultural implications" A.S. Basra, Editor. Haworth Press Inc., NY, NY. p. 45-80.

4. Dornbos, Jr., D. L. 1995. Production environment and seed quality, Chapter 4 in "Seed Quality: Basic mechanisms and agricultural implications" A.S. Basra, editor. Haworth Press Inc., NY, NY. p. 119-152.

INVITED PROFESSIONAL PRESENTATIONS

1. Dornbos, D.L. 2010. "Environment and Health". Micah Foundation, Hope Reformed Church.
2. Dornbos, D.L. 2010. "Why Should We Keep Our Community Clean?" Genesis Community of Transformation, Phnom Penh, Cambodia.
3. Dornbos, D.L. 2009. "Local Gardens as a Pedagogical Tool". Christian Educators Association.
4. Dornbos, D.L. 2008. "Physiological Competitiveness of Autumn Olive (*Elaeagnus umbellata*) in Meadow and Forest Environments of Southwest Michigan". Western Michigan Regional Undergraduate Research Conference.
5. Dornbos, D.L. 2008 and 2009. "Invasive Plant Biology". Pierce Cedar Creek Institute Modular Class.
6. Dornbos, D.L. 2008. "Factors to Consider BEFORE Restoring an Area Invaded by Woody Shrubs". The Stewardship Network, May Webcast.
7. Dornbos, D.L. 2000. "Biotechnology Traits and Adventitious Pollen in Corn Seed Production". Symposium Chair, American Society of Agronomy Annual Meeting.
8. Dornbos, Jr., D.L. 1998. "GIS: A Strategic Product Information Management Tool". American Seed Trade Association.
9. Dornbos, Jr., D. L. 1998. "Roots to profitability". Fargo, ND. The Corn Expo.
10. Dornbos, Jr., D. L. 1995. "Interaction between Integrated Pest Management and European Corn Borer Resistant corn." Report to the Environmental Protection Agency.
11. Dornbos, Jr., D. L. 1990-1993. "Challenge Days" events in Bloomington, IL and Hollandale, MN.

PUBLISHED ABSTRACTS & PRESENTATIONS TO SCIENTIFIC AUDIENCES (bolded names were Calvin College undergraduate students)

1. **Rentschler, S., Bouma, C.,** and D.L. Dornbos, Jr. 2011. Alterations in Soil Fertility by Autumn Olive May Temporarily Affect Native Shrubs. MASAL, Saginaw Valley
2. **Bouma, C., Rentschler, S.,** and D.L. Dornbos, Jr. 2011. Nitrogen Fixation In Autumn Olive As a Function of Root Nodule Content and Age. MASAL, Saginaw Valley.
3. **Adkins, A., Armistead, I.,** and D.L. Dornbos, Jr. 2011. Harvest Time of Michigan Woody Invasive Species is Important in Maximizing Ethanol Yield. MASAL, Saginaw Valley.
4. **Armistead, I., Adkins, A.,** and D.L. Dornbos, Jr. 2011. Feasibility of Utilizing Woody Invasive Plants in West Michigan as a Source of Locally Produced Ethanol. MASAL, Saginaw Valley.
5. Dornbos Jr., D.L. and **J. Heidmann.** 2010. Ethanol Conversion Efficiency of Biomass from Woody Invasive Shrubs Compared with Switchgrass. American Society of Agronomy Annual Meeting, Long Beach, CA.
6. **Wiersma, A.T.** and D.L. Dornbos, Jr. 2010. Comparison of Carbon Assimilation Capacity by Restored Prairie with Natural Plant Communities. American Society of Agronomy Annual Meeting, Long Beach, CA.
7. **Heidmann, J.** and D.L. Dornbos, Jr. 2010. Woody Invasive Plants as Potential Sources of Cellulosic Ethanol. MASAL, Calvin College.
8. **Boersma, S., Wiersma, A.T.,** and D.L. Dornbos, Jr. 2010. Land Management Implications of Carbon Assimilation Rate Differences among Plant Communities (I). MASAL, Calvin College.
9. **Wiersma, A.T., Boersma, S.,** and D.L. Dornbos, Jr. 2010. Land Management Implications of Carbon Assimilation Rate Differences among Plant Communities (II). MASAL, Calvin College.
10. **Heidmann, J.** and D.L. Dornbos, Jr. 2010. Woody Invasive Shrubs as Potential Sources of Cellulosic Ethanol. West Michigan Regional Undergraduate Science Research Conference, VAI.
11. **Boersma, S.** and D.L. Dornbos, Jr. 2009. Land Management Implications of Carbon Assimilation Rate Differences Among Plant Communities (I). West Michigan Regional Undergraduate Science Research Conference, VAI.
12. **Wiersma, A.** and D.L. Dornbos, Jr. 2009. Land Management Implications of Carbon Assimilation Rate Differences Among Plant Communities (II). West Michigan Regional Undergraduate Science Research Conference, VAI.
13. **VanEnk, J.** and D.L. Dornbos, Jr. 2009. Quantification of Assimilated Carbon by Calvin College Greenspaces and Its Relationship with Annual Emissions. MASAL, Wayne St. Univ.
14. **Hesselink, R.** and D.L. Dornbos, Jr. 2009. Physiological Competitiveness of Autumn Olive in Meadow and Forest Environments. MASAL, Wayne St. Univ. Michigan Academician 39(4): 262.
15. Dornbos Jr., D.L., **D. Moeller,** and R. Prium. 2009. Glyphosate Efficacy in the Control of Woody Invasive Shrubs. Michigan Stewardship Network Conference Poster Presentation, Michigan St. Univ.

16. **Hesselink, R.** and D.L. Dornbos, Jr. 2009. Characterization of the Physiological Competitiveness of Autumn Olive in Meadow and Forest Environments. Michigan Stewardship Network Conference Poster Presentation, Michigan St. Univ.
17. **Prins, C.** and D.L. Dornbos, Jr., 2008. The First Steps to Sustainability: Characterizing the Plant Communities, Assessing the Rate of Carbon Sequestration, and Building a Model to Apply a Projection into Future Sustainability. American Scientific Affiliation Annual Meeting, Newberg, OR.
18. David L. Dornbos, Jr., Ph.D. 2008. Comparison of Developed Country Sustainable Agriculture with Subsistence Systems of Cambodia: Which Technology to Transfer? American Scientific Affiliation Annual Meeting, Newberg, OR.
19. **Kelly Edwards** and David L. Dornbos Jr. 2008. Physiological Competitiveness of Autumn Olive in a Mature Oak-Beech Forest. MASAL, Western Michigan Univ. Michigan Academician 39(2): 19.
20. **Christine Prins, Sara Vanden Branden,** and David L. Dornbos, Jr. 2008. Estimation of Annual Carbon Sequestration Potential of Calvin Campus Greenspace. MASAL, Western Michigan Univ.
21. Dornbos, Jr., D.L., **L. Holtrop, M. Ritsema, and E. VanderGaat.** 2007. Comparison of the photosynthetic capacity of three invasive shrubs with native woody species in meadow and woodland ecosystems of southwest Michigan. Natural Areas Association and Midwest Invasive Plant Network Annual Meeting, Cleveland, OH.
22. **Ritsema, M.** and D.L. Dornbos, Jr. 2007. Physiological characterization of autumn olive. MASAL, Big Rapids, MI. Michigan Academician 38(4): 17.
23. **Holtrop, L.** and D.L. Dornbos, Jr. 2007. CO₂ sequestration potential of understory species in Calvin's Fieldhouse woodlot. MASAL, Big Rapids, MI. Michigan Academician 38(4): 18.
24. **DeJong, G.** and D.L. Dornbos, Jr. 2007. Light characteristics of an urban forest canopy. MASAL, Big Rapids, MI. Michigan Academician 38(4): 17.
25. Dornbos, Jr., D.L. and **E. VanderGaat.** 2006. A physiological advantage of the invasive shrub buckthorn. American Society of Agronomy Annual Meeting, Indianapolis, IN.
26. Dornbos, Jr., D.L. 2006. Optimization of urban land as a resource to sequester carbon. American Society Affiliation Annual Meeting, Grand Rapids, MI
27. Dornbos, Jr., D.L. and **D.W. Moeller.** 2006. Efficacy of Glyphosate on the Control of Buckthorn Shrubs. MASAL, Oakland, MI. Michigan Academician 37(4): 22.
28. **VanderGaat, E.** and D.L. Dornbos, Jr. 2006. Shade requirements for the suppression of buckthorn seedling growth. Michigan Academy of Science, Arts, and Letters (MASAL), Oakland, MI. Michigan Academician 37(4): 21.
29. Dornbos Jr., D.L., B.A. Burger, and F. Marier. Bt Corn Hybrid Performance as an Assessment Tool of Yield Loss Risk Due to European Corn Borer Feeding Damage in the U.S. Midwest Between 1995 and 2004. 2005. American Society of Agronomy Annual Meeting.
30. Fonseca, A.E, J.I. Lizaso, M.E. Westgate, L. Grass, and D.L. Dornbos Jr. Modeling Potential Kernel Production in Maize Hybrid Seed Fields. 2003 American Society of Agronomy Annual Meeting.
31. Before 2003: Approximately fifteen abstracts have been published by the American Society of Agronomy, American Society of Plant Physiologists, or the Association of Official Seed Analysts.

PRESENTATIONS FOR GENERAL AUDIENCES

1. Dornbos, D.L., Zylstra, U., and D. Warners. 2010. Seeking Justice and Righteousness in a Filled Creation. World Communion of Reformed Churches conference presentation and panel session.
2. Dornbos, D.L. 2008. Health, Wealthy, Wise – Vegetable Gardening. Brookside CRC Gardening Series.
3. Dornbos, Jr., D. L. 2006. Grand Dialogue of Science and Religion. "Why Aren't More Christians Environmentalists?"
4. Dornbos, Jr., D. L. and Y.C. Chen. 2000. Proshield Technology. Special Technical Bulletin. Novartis Seeds.
5. Burger, B. and D. L. Dornbos, Jr. 1999. Yield maps. Special Technical Bulletin. Novartis Seeds.
6. Burger, B., D. Ritter, and D. L. Dornbos, Jr. 1999. Crop Safety and Good Weed Control Can Mix. Special Technical Bulletin. Novartis Seeds.
7. Dornbos, Jr., D. L. 1998. Successful Bt Corn Management in 1999. Special Technical Bulletin. Novartis Seeds.
8. Dornbos, Jr., D. L. 1998. Using seed profitably. Special Technical Bulletin., Novartis Seeds, and reprinted in Crop Decisions Magazine.

SEMINARS AND ADULT EDUCATION PROGRAMS

1. "Sustainability / Stewardship" (2 week series). Caledonia CRC. 2011.
2. "Food Choices" (4 week series). Woodlawn CRC, 2010-2011.
3. "Sustainability of Our Food Systems" (2 week series). Third Reformed RCA, 2010.
4. "Market, Costco, or Meijer?" Mad Farmers Food Festival, Calvin College, 2010.

5. "Environmental Health and Food Systems". Christ Church PCA, 2010.
6. "Sustainability and Stewardship" (2 week series). First Byron CRC, 2010.
7. "Food, Justice, and Faith" (3 week series). Hope Reformed RCA, 2009.
8. "Michigan Invasive Species". Pierce Cedar Creek Institute Modular Course, 2008 and 2009.
9. "Sustainability and Stewardship". Madison Square CRC, 2008.
10. "Food, Justice, and Faith" (4 week series). Central Reformed RCA, 2008.
11. "Global Warming and Christian Stewardship". Brookside CRC, 2008.
12. "Food, Justice, and Faith" (3 week series). Graafschap CRC, 2007.
13. "Sustainability or stewardship?" (3 week series). Central Reformed RCA, 2007.
14. "Sustainability or stewardship?" Ivanrest CRC, 2007.
15. "2007 Farm Bill". Calvin College Social Justice Committee Panel, 2007.
16. "Global Warming: Implications and Food", Calvin College ESC, 2007.
17. "The Great Warming" Panel. Wealthy Street Theatre, 2006.
18. "Stem cells: Must Life Require a Death?" Graafschap CRC, 2006
19. "Sustainability or stewardship?" (2 week series). Graafschap CRC, 2006.

STUDENT RESEARCH PROJECT MENTORING

1. Isaac Armistead and Andrew Atkins, 2010.
 - Integrative Science Research Institute (HHMI)
 - Title: Potential for Woody Invasive Plants to Produce Biomass for Ethanol and Improve Soil Quality.
2. Stephanie Rentschler and Christopher Bouma, 2010.
 - Pierce Cedar Creek Institute "Undergraduate Research Grants for the Environment"
 - Title: Relationship between Nitrogen Fixation Rate, Apparent Photosynthesis Rate, and Chlorophyll Content of Autumn Olive and Potential Impacts on the Competitiveness of Cohabiting Native Plant Species
3. Andrew Wiersma and Susan Boersma, 2009.
 - Pierce Cedar Creek Institute "Undergraduate Research Grants for the Environment"
 - Title: Assessment of the Quantity of CO₂ Absorbed by the Greenspace of Pierce Cedar Creek Institute
4. Jennie Heidmann, 2009.
 - Integrative Science Research Institute (HHMI)
 - Title: Characterization of Woody Invasive Species as Potential Sources of Cellulosic Ethanol
5. Juliana VanEnk, 2008.
 - Calvin Research Fellowship
 - Title: Modeling Annual Carbon Assimilation Potential of the Calvin Campus Greenspace
6. Rachel Hesselink, 2008.
 - Pierce Cedar Creek Institute "Undergraduate Research Grants for the Environment"
 - Title: Physiological Competitiveness of Autumn Olive
7. Kelly Edwards, 2007.
 - Pierce Cedar Creek Institute "Undergraduate Research Grants for the Environment"
 - Comparison of the Photosynthetic Capacity of Autumn Olive and Four Native Species in a Mature Forest Canopy as a Function of Light Intensity
8. Christine Prins and Sara VandenBranden, 2007.
 - Calvin Research Fellowships (2)
 - Estimation of Annual Carbon Sequestration Potential of Plant Communities on the Calvin Campus
9. Michele Ritsema, 2006

- Pierce Cedar Creek Institute “Undergraduate Research Grants for the Environment”
 - Characterization of the Physiological Competitiveness of Autumn Olive in Meadow and Forest Ecosystems
10. Laura Holtrop, 2006
- Calvin Summer Research Fellowship
 - CO₂ sequestration potential of understory species in Calvin’s Fieldhouse woodlot
11. Gabe DeYoung, 2006
- Calvin Summer Research Fellowship
 - Light characteristics of an urban forest canopy
12. Erica Vander Gaast, 2005
- Calvin Summer Research Fellowship
 - Shade requirement to suppress buckthorn (*Rhamnus* spp.) seedling growth
 - Net Photosynthesis and Growth Rate of buckthorn Seedlings and Eight Native Shrubs at Various Light Intensities”
13. Drew Moeller, 2005
- Calvin Summer Research Fellowship
 - Fate of Glyphosate in Buckthorn (*Rhamnus* spp.) Seedlings Following Stumps in Different Environments
 - Efficacy of Glyphosate on the Control of Buckthorn Shrubs

COURSES TAUGHT

Biology 111 Biological Science (Spring 2005, 2006, 2009, 2010)

- Course includes lecture and laboratory components and fulfills the “Living Science” core for non-majors.
- Learning Objectives
 - Recognize the relevance of biology in our world by engaging the spectrum of key biological concepts (genetics, evolutionary process, cell function, ecology) in the context of issues all face as individuals and societal citizens.
 - Gain experience in “doing” biology and “interpreting” results.
 - Broaden (and maybe, deepen) faith by understanding intricacies of God’s design *AND* by grappling with difficult questions derived from biological applications.

Biology 123 (Fall 2009, 2010)

- The first course in the new core for Biology majors and minors. Taught for the first time during Fall 2009, this course employs a learner-centered approach in which a broad range of biological issues are engaged from a systems perspective.
- Learning Objectives
 - Students will be able to articulate the global challenges facing contemporary biology, diagram system interrelations of these challenges, and be motivated to explore their educational and vocational implications.
 - Students will be able to explain the key concepts of evolution via natural selection and biodiversity, system interrelationships between biodiversity, ecosystem functions, climate change, evolution, and ecosystem thresholds/resilience, and how scientific certainty about complex adaptive systems rest upon a “preponderance of evidence”.
 - Students will be able to explain the key structural and functional features that distinguish food components and the importance of a nutritionally balanced diet, system interrelationships between food and fuel policies, production strategies, and implications for human and environmental health, and how sustainability rests upon confirming human activities to the long-term viability of complex adaptive natural systems.
 - Students will be able to explain key distinctions between bacteria and viruses, antibodies and antibiotics, how our immune system functions to maintain health, how computational modeling aids understanding, prevention and treatment of infectious disease outbreaks, how key concepts of genetics and cell biology

relate to prospects and challenges for personalized predictive and regenerative medicine, and system interrelationships that affect personal and public health.

Biology 243 Plant Biology (Fall, 2004-2009)

- Course includes multiple lecture and laboratory components.
- Learning Objectives
 - Distinguish among C3, C4, and CAM plant leaves from the perspectives of carbon fixation processes and ecological adaptation.
 - Describe how features of soils and plants couple with transport and partitioning of assimilate, water and nutrients.
 - Distinguish among and describe environmental responses to hormonal-mediated growth, photoperiodism, plant movements, and circadian rhythms.
 - Predict plant growth or metabolic reactions to key environmental stimuli and relate human behavioral impacts on plants to key sustainability issues as genetic manipulation, soil and water quality, and energy balance.
 - Engage in thoughtful reflection about the concept of sustainable living from a stewardship perspective, including personal behavioral implications. Understand that a healthy human community is dependent on the support of a healthy natural community.
 - Demonstrate proficiency in basic laboratory skills used routinely by plant biologists.

Biology 332 Plant Physiology (Spring, 2007, 2009, 2011)

- Course includes lecture and laboratory components.
- Learning Objectives
 - Describe physiological function of plants across the range of molecular, cellular, organismal, and canopy levels.
 - Understand physiological processes of plants, their mechanisms and regulation: water and solute transport in xylem and phloem, photosynthesis and respiration, nutrient assimilation, vegetative growth and development, photoperiodism, flowering and reproductive development, hormonal regulation of development
 - Relate physiological processes with plant structure (morphology, anatomy).
 - Model the impact of major environmental factors on plant growth, development, and yield; focusing on ways in which plants adapt or respond to stress.
 - Use methods of plant physiologists in investigative process: gas exchange, water potential measurement, fluorometry, porometry, and modeling of growth and development.

Biology 354 Investigations in the Physiological Ecology of Invasive Plants (Spring 2008)

- Developed an “investigations” course
 - Emulating research conducted in the context of a research group
 - Centered on the topic of invasive plant management and source of competitive advantage
- Learning Objectives:
 - Identify invasive plants and use them as a context in which to gain experience in physiological ecology.
 - Search, read, and critically evaluate the scientific literature.
 - Practice using various research tools used by physiological ecologists.
 - Design and complete experiments to evaluate how invasive plants compete and how they might be controlled.
 - Gain experience in the management, analysis, and interpretation of data as part of the investigative process.
 - Practice the communication of scientific results by developing a poster, scientific paper, and by presenting an oral report.

Biology 364 Global Health, Environment, and Sustainability (Fall, 2006-2010 & Spring 2009)

- Co-developed and taught this new course with Dr. Keith Grasman
- Learning Objectives:
 - Identify major global health concerns and the biological and social processes that contribute to health and disease.
 - Use food as a central theme to exemplify the complex relationships between human and environmental health by considering three dimensions of sustainability: environment, economy, and community.
 - Describe the opportunities and challenges of globalization in human and environmental health, especially as these relate to bioscience and technology concerns in the global “bioeconomy”.

- Integrate the study of global health and the environment with other academic disciplines and Christian perspectives as a means to practice prudent discernment.
- Demonstrate skills for effective problem-solving of issues and applications in community and international development with an eye towards improving resilience and sustainability.

Biology 395 (Spring 2010, 2011)

- Taught this course for the first time during Spring, 2010.
- Learning Objectives
 - Become more proficient in collaborative learning through active participation in group and class activities.
 - Find, read, and critically evaluate primary scientific research papers.
 - Connect the broad concepts among biological topics and between biology and a wide variety of disciplines.
 - Produce a significant paper demonstrating a deep grasp of a biological topic or issue of personal interest.
 - Integrate scientific knowledge with ethical reasoning in the context of a reformed Christian worldview.

DCM: World Hunger and Sustainable Development (January 2006, 2009)

- When not leading groups on the off-campus interim Transforming Cambodia, I have led a DCM built upon the comparable theme of identifying the root cause(s) of hunger, in developed and developing countries, in the context of the creation, fall, redemption theme of DCM.
- Learning Objectives
 - Students identify the root causes of global hunger and its linkage with environmental health, economic health, and social justice issues from a reformed Christian worldview perspective.
 - After developing a clearer understanding of our local food system through farm, processor, and food pantry visits, students evaluate the sustainability issues of our current system on environmental, nutritional, and social health.
 - Inspection how a variety of “non-governmental organizations”, for example the Christian Reformed World Relief Committee (CRWRC), Research Development International (RDI), or the United Nations Food and Agricultural Organization (UN-FAO) seek to empower people.
 - Investigate ways students can serve as intentional and effective agents of redemption both today and in the development of their vocational plans

IDIS W16 Transforming Cambodia (January 2007, 2008, 2010)

- Led January term classes to Cambodia for a one-month period, now on three occasions.
- Learning Objectives:
 - Experience cross-cultural experience with Khmer and Korean people.
 - Visit landmarks and people reflecting ancient, recent, and current societies in Cambodia.
 - Engage the question of “what looks like good development?” by visiting and working at a variety of Non-Governmental Organizations addressing various key issues of rural Cambodian society: water quality and sustainable agriculture (United Nations – Food and Agriculture Organization, Research Development International and International Development Enterprises), community transformation (Christian Reformed World Relief Committee), elementary education (NIBC Grade School), and health (Russian Hospital of Phnom Penh and Children’s Hospital of Angkor Wat).

Agronomy 547 Seed Production (Iowa State University, Summer, 2008, 2011)

- Developed and taught a new graduate level distance learning course for “Seed Technology and Business” in support of a Masters Degree program.
- Learning Objectives:
 - Survey the seed production process from both agronomic and business contexts.
 - Relate key stages of monocot and dicot plant development to primary issues associated with the production optimum yields of quality seed.
 - Describe key activities fundamental to achieving the goal of being a reliable supplier of high quality seed: quality stand establishment, male delay, female emasculation, harvest, conditioning, drying, and storage.
 - Create a vision of the most basic goal(s) of a seed production operation as they relate to , relating scale, quality, and cost objectives with technology requirements.
 - Describe the unique issues of producing cereal, oil seed, grass, forage legume, vegetable and flower seeds.

Biology 361 Field Natural History (Au Sable Institute, Mancelona, MI, Summer 2009, 2010, 2011)

- Developed and taught a natural history course intended primarily for secondary education students.
- Learning Objectives:
 - Provide an overview and 'hands on' experience with the flora and fauna characteristic of the spring season.
 - Identify wildflowers and trees, birds, mammals, amphibians and reptiles and be able to describe their ecological interrelationships within the natural communities of northern Michigan.
 - Evaluate the sustainability and stewardship (creation care) roles reformed Christians should play in using and taking care of these ecosystems.
 - Practice doing field natural history by conducting a broad literature review on another place (home, vacation area, or some area of personal interest).

DEPARTMENTAL AND COLLEGE SERVICE

2009-10:

- Letters of reference - 59
- Faculty Senate Representative for the Biology Department
- Laboratory Curriculum Committee Chair, Biology Department
- Research Committee, Biology Department
- Institutional Biosafety Committee, Science Division
- Institutional Review Board, Science Division
- Interdisciplinary Research Science Institute Advisory Board

2008-9:

- Letters of reference - 66
- Strategic Planning Committee, Biology Department, Chair
- Institutional Biosafety Committee, Science Division
- Institutional Review Board, Science Division
- Search Committee for Research Dean
- Interdisciplinary Research Science Institute Advisory Board

2006-8:

- Letters of reference for students and colleagues - 58
- Strategic Planning Committee, Biology Department, Chair
- Institutional Biosafety Committee, Science Division, Chair
- Biology Department Research and Scholarship Committee, Chair
- Search Committee for Administrative Assistants
- Science Division Research and Scholarship
- Institutional Review Board, Science Division

2005-6:

- Letters of reference for students – 46
- College Institutional Review Board
- Science Division Research and Scholarship
- Biology Department Research and Scholarship (chair): Achieved departmental approval of a Research and Scholarship Statement, annual evaluation process with a departmental mentor, and a professional plan template.
- Biology Department Assessment

2004-5:

Letters of reference - 16

PROFESSIONAL & COMMUNITY SERVICE

2009-10:

- Scientific paper peer reviewer
- Co-chair the Botany and Plant Ecology Section of the Michigan Academy of Sciences, Arts, and Letters
- Chair-Elect C-4 (Seed Physiology, Production and Technology) Division of the Crop Science Society of America
- InSpirit Church Praise Team
- Manage Covenant CRC food pantry vegetable garden for Spectrum Health referrals
- Faculty mentor for Calvin Student Runners and the Pre-Vet Clubs

2008-9:

- Co-chair the Botany and Plant Ecology Section of the Michigan Academy of Sciences, Arts, and Letters
- Co-developed and taught a novel high school level catechism curriculum
- Covenant CRC Praise Team
- Elder on the church board
- Started and maintained a vegetable garden for church food pantry
- Faculty mentor for Calvin Student Runners and the Pre-Vet Clubs

2007-8:

- Co-developed and taught a novel high school level catechism curriculum
- Covenant CRC Praise Team
- Elder on the church board
- Started and maintained a vegetable garden for church food pantry

2005-2007:

- Covenant CRC Praise Team
- 10th grade catechism instructor
- Elder on the church board

CEAP:

- Poster: Student engagement in the restoration of Calvin's natural places: Relationship between CEAP, Service Learning, and biology 111 and 243. By D.L. Dornbos, Jr. and D. Warners.
- Participant in the annual CEAP workshops.

Service Learning: Organized participation of most to all students in service learning for Biology 111 and 243.