

KATHRYN S. ORVIS

POSITION Associate Professor
Department of Youth Development and Agricultural Education (75%, extension)
Department of Horticulture and Landscape Architecture (25%, teaching)
615 W. State St., West Lafayette, IN 47907-2053
Purdue University, Ph (765) 494-8439; Email: orvis@purdue.edu

PROFESSIONAL PREPARATION

Institution	Major	Degree & Year
Michigan State University	Botany	B.S., 1995
University of Wisconsin	Plant Breeding & Plant Genetics	M.S., 1997
University of Wisconsin	Plant Breeding & Plant Genetics	Ph.D., 2000

APPOINTMENTS

2006 Associate Professor, Department of Youth Development and Agricultural Education (75%), Department of Horticulture and Landscape Architecture (25%), Purdue Univ.
2000 Assistant Professor, Department of Youth Development and Agricultural Education (75%), Department of Horticulture and Landscape Architecture (25%), Purdue Univ.
1995-2000 Research Assistant, University of Wisconsin, Madison, WI

COURSES TAUGHT

Horticulture 101: Fundamentals of Horticulture. 3 cr. with lab, 120 students, Fall semester 2000-present
Introductory Horticulture course for majors and non-majors meeting science electives.
Incorporates a two (2) hour lab session weekly.
Horticulture 590G: Introduction to Ag. Biotechnology. 6-20 students, 3 cr, Summer sem. 2001-present
On-line graduate course designed to introduce teachers and Extension Educators to topics related to Agricultural Biotechnology. Students have included in-state, national and international (Canada).

RESPONSIBILITIES:

Dr. Orvis, an extension youth specialist in plant science and horticulture, focuses on science-based educational programming for 4-H. Her primary charge (as a member of the Department of Youth Development and Agricultural Education) is to innovate and initiate new directions in youth plant science education, while simultaneously strengthening and expanding established programs in that area. She is recognized as a leader nationally in instructional youth gardening and in the emerging area of biotechnology education. Her secondary charge (as part of the Department of Horticulture and Landscape Architecture) is to contribute to undergraduate education. She plays a major instructional role in HORT 101, Fundamentals of Horticulture, and is also directly responsible for training graduate students in Agriculture and Extension Education. Dr. Orvis brings her expertise and efforts in 4-H youth programming, horticulture, plant science, and biotechnology together into two focus areas—*agriculture biotechnology education* and *using plants to educate youth about science*.

AWARDS

2005 University Award for Excellence in Distance Education, for a credit granting course. Purdue University. For Hort590: Introduction to Agricultural Biotechnology.

GRANTS

Orvis, K. S. and Shelburne, C. *The Role of School Gardens in Influencing Attitudes of Students toward Agriculture, Science and the Environment while Fostering Academic Achievement in Classrooms*. USDA NC Region SARE, \$10,000, 2002-2003.

Apple Functional Genomics. Source: National Science Foundation. Total amount of award: \$1,659,708 (Amount responsible for: \$101,998 (Purdue)). Funded 9/01/03 through 8/31/06.
Project Location: Purdue University, University of Illinois, Cornell University

Improving Nutritional Quality of Food by Biotechnology Approaches. Source: USAID Awards for U.S.-Indian University Partnerships. Total Amount of Award: \$300,000. Funded 7/1/2004-6/30/2006. Project Location: Purdue University; Bangalore, India

Mission to Mars Professional Development Program. Source: Indiana Department of Education. Total Award Amount: \$88,132. Funded 1/1/05 – 9/30/06. Location of Project: Purdue University

PUBLICATIONS

Rothhaar, R., B. Pittendrigh, and K. Orvis. 2006. The Genomics Analogy Model for Educators (GAME): The Effectiveness of the Lego® Model in Teaching Gene Sequencing and Biotechnology in High School Classrooms. *J. Biol. Educ.* 40(3): 43-36.

Orvis, K. 2006. Utilizing Distance Education to Teach Emerging Topics in Horticulture Science: A Report on Four Years of Teaching Introduction to Agricultural Biotechnology. *HortScience* 40(4): 713. ASHS Annual Meeting, New Orleans, LO. (7/06)

Carroll, N., P. Goldsbrough, K. Orvis. Utilization of Computer Animation and Learning Modules to Visualize and Teach Complex Science Topics. *National Association of Biology Teachers (NABT) Annual Conference*. Albuquerque, NM. (10/06).

Ley, M., M. LaTour, and K. Orvis. 2005. Analysis of Virtual and Traditional Teaching Assistants Used in Introductory to Animal Science Courses. *NACTA Journal*. 49(3):47-50.

Dirks, A and K. S. Orvis. 2005. Evaluation of the Junior Master Gardener® Program in Indiana Third Grade Classrooms. *HortTechnology*, 15(3):443-447.

Ley, M., M. LaTour, and K. Orvis. 2005. Analysis of Virtual and Traditional Teaching Assistants Used in Introductory to Animal Science Courses. *North American Colleges and Teachers of Agriculture (NACTA) Annual Conference*. 29:72. Wooster, OH. (6/05).

Carroll, N., P. Goldsbrough, K. Orvis. Teaching Genomics: Utilization of Computer Animation and Learning Modules to Visualize and teach Complex Science Topics. *National Association of Biology Teachers (NABT) Annual Conference*. Milwaukee, WI. (10/05).

Carroll, N., P. Goldsbrough, K. Orvis. Utilization of computer animations to visualize & teach complex science topics. *IHETS/IPSE All-Partners Conference*. Indianapolis, IN. (4/05).

K. Gasic, D. O. Gonzales, M. Malnoy, J. Thimmapuram, L. O. Vodkin, L. Liu, H. S. Aldwinckle, N. Carroll, K. Orvis, P. Goldsbrough, S. Clifton, D. Pape, M. Dante, R. Meye, S. S. Korban. 2005. The Apple Genome Project. *International Plant and Animal Genomes XIII Conference*. San Diego, CA. (1/05).

S. S. Korban, L.O. Vodkin, L. Liu, H. S. Aldwinckle, G. Ksenija, D. O. Gonzales, M.Malnoy, J. Thimmapuram, N. J. Carroll, P. Goldsbrough, K. Orvis, S. Clifton, D. Pape, M. Martin, and R. Meyer.

2005. Large-Scale Analysis of EST Sequences in the Apple Genome. *International Plant and Animal Genomes XIII Conference*. San Diego, CA. (1/05)

J. Corn, K. S. Orvis, and B. Pittendrigh. 2004. Genomic Analogy Model for Educators (GAME): from jumping genes to alternative splicing. *J. Biol. Educ* 39:24-26.

Dirks, A. and K. S. Orvis. 2004. Case Study of the Mighty Morris Blooms: Quantitative and Qualitative Program Assessment of a Youth Gardening Program in a Third Grade Classroom. *HortScience* 39(4): 783. ASHS Annual Meeting, Austin, TX. (7/04)

S. S. Korban, L.O. Vodkin, L. Liu, H. S. Aldwinckle, N. Carroll, P. Goldsbrough, K. Orvis, and S. Clifton. 2004. Towards Apple Functional Genomics: The EST Project. *International Plant and Animal Genomes XII Conference*. San Diego, CA. (1/04)

Dirks, A. and K. S. Orvis. 2003. Using Gardening as a Teaching Tool for Science Achievement and Attitudes in Third Grade Classrooms. *HortScience* 38(6): 127

Rothhaar, R., B. Pittendrigh, and K.S. Orvis. 2003. The Genomic Analogy Model for Educators: A New Tool for Teaching Biotechnology. *Galaxy II – Exceeding Expectations through Teamwork*. Joint Council for Extension Professionals, a collaborative conference with NAE4-HA, ANREP, NEAFCS, Salt Lake City, UT (9/03)

G. Kirkpatrick, K.S. Orvis, and B. Pittendrigh. 2002. A teaching model for biotechnology and genomics education. *J. Biol. Educ.* 37(1): 31-35.

Zeller, M., T. Riordan, H. Zaleski, D. Herzfield, and K. Orvis. 2002. Edible Antibiotics in Food Crops. In: G. Comstock (Ed.), *Life Science Ethics*. Iowa State Press; Ames, Iowa. Excerpts found at: http://www.bioethics.iastate.edu/classroom/case_studies.html

K. S. Orvis, I. L. Goldman and P. Barak. 2001. Excess Sulfate Supply and Onion-Induced Human Antiplatelet Activity. *J. Plant Nutr. Soil Sci.* 164: 457-462.

Orvis, K. S. and I.L. Goldman. 2000. Genetic Evaluation of Onion-Induced Antiplatelet Activity and Soluble Solids of F3 Families Derived from a Mild by Pungent Onion (*Allium cepa*) Cross. Poster, ASHS 2000 Annual Meeting, Orlando, FL. Hortscience. 37:782. (7/00)

PUBLICATIONS SUBMITTED, IN REVIEW:

Butler, C.R., Bello, J., York, A., Orvis, K.A., and B.R. Pittendrigh. 20xx Genomics analogy model for educators (GAME): fuzzy DNA model to enable the learning of gene sequencing for visually impaired and blind students. *In review, Submitted to Journal of Biological Education*.

Bello, J., Butler, C.R., Radavich, R., York, A., Oseto, C., Orvis, K.S., and B.R. Pittendrigh. 20xx Genomics Analogy Model for Educators(GAME): VELCRO® analogy model to enable the learning of DNA arrays for visually impaired and blind students. *In review, Submitted to Journal of Biological Education*

Orvis, K. S., Carroll, N., and P. Goldsbrough. Teaching Genomics with Computer Simulations. *The Science Teacher*. Submitted Sept. 2006

EXTENSION PUBLICATIONS:

- 4-H Club Alfalfa Project Outline (revised 6/01) 4-H-39-W (1p)
- Suggested 4-H Garden Exhibits (revised 5/03) 4-H-970-W (10p)
- 4-H Weed Identification & Control - Know Your Weeds! (rev. 2/04; 1/07) 4-H 247-W (17p)
- 4-H Floriculture (new 3/05)
 - 4-H-966 (40p) Level A
 - 4-H-967 (49p) Level B
 - 4-H-968 (72p) Level C
 - 4-H-969 (44p) Level D
 - CD-4-H-989 Supplemental CD
- Junior Master Gardener Workshop Training Manual (adapted) (85+p) available www.four-h.purdue.edu/jmg
- Junior Master Gardener Frequently Asked Questions (adapted) (6p) available www.four-h.purdue.edu/jmg
- Junior Master Gardener Academic Standards for Group Activities (Shelburne and Orvis, 2002-2004) available www.four-h.purdue.edu/jmg
 - Grade 3 (11p)
 - Grade 4 (11p)
 - Grade 5 (11p)
 - Grade 6 (4 p)
 - Grade 7 (4 p)
 - Grade 8 (4 p)
- Junior Master Gardener Academic Standards for Individual Activities Grade 3 (Shelburne and Orvis, 2002-2004) (9p) available www.four-h.purdue.edu/jmg
- Junior Master Gardener Registration and Completion Forms (adapted) (4p) available www.four-h.purdue.edu/jmg

WEBSITES DEVELOPED:

APPLE GENOMICS PROJECT: www.four-h.purdue.edu/apple_genomics

GENOMICS MODEL FOR EDUCATORS (GAME):
<http://www.entm.purdue.edu/extensiongenomics/GAME/>

POPULAR PRESS:

- Press release on revised release of GAME website (9/05)
- JMG press release describing the upcoming training workshop in Indiana (3/05)
- Indiana Flower and Patio Show – program description and press release related to display at show 3-04
- Purdue Press release – announcing spring Junior Master Gardener Training Workshops (2/04)
- Purdue Exponent - article on HORT 590G: Intro to Ag Biotech course (July 2003)
- Purdue Press release announcing the offering of the 2001 Intro to Ag Biotech (HORT 590) course (5-01, 5-02, 5-03, 5-04)
- Home and Family Cable Show – Interview about the Junior Master Gardener program in Indiana, 3-03.
- JMG Kids national press release describing Dr. Orvis role in writing a gardening column for the Children’s Better Health Institute, Indianapolis IN (9/02)
- Purdue News release announcing the new JMG® Level II curriculum (8/02).
- Indianapolis Monthly, an article on youth and family gardening (7/02)

- Wallace's Farmer, an article "Little Green Thumbs" on the JMG® program in Indiana that is partnered with Texas A&M (11/01)
- August 2001- December 2002. Children's Better Health Institute national bi-monthly children's magazines, gardening column 'Ask the Plant Doctor'
- Purdue Agriculture Magazine, Fall 2001 an article on JMG® in Indiana (8/01)
- Radio interview with Skip Davis (Ag Show – FM 105.3) about the new JMG® program in Indiana, (aired 5-15-01, second interview 5/03)
- AP news release describing the new JMG® program in Indiana (5-11-01)
- Purdue Ag News release describing Intro to Ag Biotech (HORT 590) on-line course (Feb-March, 2001)

GRADUATE STUDENT EDUCATION, ADVISING & RESEARCH

Major Professor for:

Pandora Woodward (Summer 2005-present) Major: Agriculture & Extension Educ.
 - presently advising, thesis project on Eight Essential Elements of 4-H. Research proposal and literature review are underway. Expected completion date summer 2007.

Heather Light (Spring 2005-present) Major: Agriculture & Extension Educ.
 - presently advising, thesis project involving evaluation of the 'JMG Health and Nutrition from the Garden' curriculum. Research proposal and literature review are underway. Expected completion date December 2007.

Macon Fish Sept. 2003-Aug. 2005 Major: Agricultural & Extension Education
 Degree: M. S. August 2005

Thesis Title: Mission to Mars: An Evaluation of a Nine-Week Science Program.
 - Research evaluated utilization of the Mission to Mars program in formal classroom and informal after-school programs for students in grades third through eighth.
 - Currently employed full-time as outreach coordinator for the NASA-funded ALS/NSCORT Center.

Mary C. Ley Jan. 2003-Aug. 2004 Major: Agricultural & Extension Education
 Degree: M.S. August 2004

Thesis Title: Analysis of Student Perceptions of Teaching Assistants When Comparing a Traditional Campus-Based Animal Science Course Versus the Same Online Virtual-Based Animal Science Course
 - Currently employed Ag & Natural Resources Extension Educator, Tipton County, IN.

Amy Robinson Dirks Aug. 2002-Mar.2004 Major: Agricultural & Extension Education
 Degree: M.S. May 2004

Thesis title: An Evaluation of the Junior Master Gardener® Program in Indiana 3rd Grade Classrooms.
 - Currently employed in landscape and garden industry, Indianapolis, IN

Rebecca Rothhaar Oct. 2001-July 2003 Major: Agricultural & Extension Education

Degree: M.S. August 2003

Thesis title: The Genomics Analogy Model for Educators (GAME): The Effectiveness of the Lego® Model in Teaching Gene Sequencing & Biotechnology in High School Classrooms.

- Currently employed as County Extension Educator, New York state.

Gretchen Kirkpatrick Dec. 2000-Dec. 2001 Major: Agricultural & Extension Education
Degree: M.S. Dec. 2001

Non-thesis option:

- Gretchen's work focused primarily on the educational genomics project (GAME). She developed a literature collection covering research in teaching genetics, biotechnology, and the impact of that education. Under Dr. Orvis's guidance, she also assisted in the start-up of the Junior Master Gardener program in Indiana and in planning and operating the 4-H Plant Science Workshop in 2001.
- Currently employed as vocational horticulture teacher at Seeger H.S., West. Lebanon, IN.

Christy Shelburne August 2001-Dec. 2002 Major: Agricultural & Extension Educ.
Degree: M.S. Dec. 2002

Non-thesis option:

- Christy investigated the effectiveness of the Junior Master Gardener program on science achievement and attitudes in the classroom. Under Dr. Orvis's guidance, she completed a literature review, a research proposal, a survey of existing school gardens across the state, and alignment of Indiana Academic Standards with all activities contained in the JMG program; this work resulted in several Extension publications (see page 7). She also successfully wrote and was awarded a North Central Region SARE graduate student grant of \$10,000.
- Currently employed as gardener for San Diego Zoo, San Diego, CA.

Committee Member or Advisor for:

Janet Beagle (Summer 2006-present) Major: Agriculture & Extension Educ.
- serving on Doctoral committee (Balschweid, chair)

Nicole Retzner (Fall 2005 – Dec. 2006) Major: Horticulture & L.A.
- served on Horticulture non-thesis master committee (Joly, advisor)

Andrew Westfall (Fall 2005 – Dec. 2006) Major: Agriculture & Extension Educ.
- served on non-thesis masters committee, focus on environmental education (Carroll, advisor)