CURRICULUM VITA

Tracy M. Sterling
Department Head and Professor
Land Resources and Environmental Sciences Department (LRES)
Montana State University
Bozeman, MT 59717
406-994-4605

EDUCATION:

- University of Wisconsin, Madison, WI, 1988
  - *Ph.D., Agronomy/Botany*
  - *Dissertation: Mechanisms of Herbicide Absorption and Metabolism*
- Michigan State University, East Lansing, MI, 1985
  - *M.S., Horticulture*
  - *Thesis: Phytotoxic Exudates from Glandular Trichomes of Weeds as Allelopathic Chemicals*
- University of Minnesota, St. Paul, MN, 1983
  - *B.S., Agronomy and Horticulture*

RESEARCH & PROFESSIONAL EXPERIENCE:

- Department Head and Professor, Montana State University — Aug09 - present
  Land Resources and Environmental Sciences Department
- Interim Director, Center for Invasive Species Management — 2013 - 2015
- Professor, New Mexico State University (NMSU) — 2001 - 2009
  Department of Entomology, Plant Pathology and Weed Science
- Program Director and PI, NSF-ADVANCE (50% position) — 2005 - 2009
  New Mexico State University
- Associate Professor, New Mexico State University — 1995 - 2001
  Department of Entomology, Plant Pathology and Weed Science
- Assistant Professor, New Mexico State University — 1989 -1995
  Department of Entomology, Plant Pathology and Weed Science
- Graduate Research Assistant, — 1986 - 1988
  University of Wisconsin, Department of Agronomy
- Graduate Research Assistant, — 1983 - 1985
  Michigan State University, Department of Horticulture
- Assistant Agronomist, Agri-growth Research Inc., Hollandale, MN — 1983

RESEARCH PROGRAM:

My research program in weed physiology centers on understanding how environmental, insect and herbicide stresses influence crop and weed productivity. Research interests include determining the role of oxidative stress tolerance in weed/crop interactions and responses to abiotic stress; the impact of the weedy plant genetic variability and physiology on their invasiveness and biological control; and mechanisms of herbicide action and resistance. Current research projects include determining the role of oxidative stress tolerance in protecting crops and weeds from abiotic stresses; alkaloid biosynthesis by locoweed and its endophyte; and physiological strategies used by African rue to invade under severe drought stress.

TEACHING PROGRAM:

- Plant Physiology, EPWS/BIOL 314/514: Undergraduate course integrating biophysical, biochemical, and whole plant processes to understand the mechanisms behind plant growth, development, and function (taught spring semesters, 1989 to 2009, 40 to 70 students per semester).
- Plant Physiology Laboratory, EPWS/BIOL 314/514: Undergraduate/Graduate laboratory course centered on application of methodologies to study plant physiology (taught spring semesters, 2001 to 2006, 5 to 9 students per semester).
- Plant Physiology: Metabolism, AGRO/BIOL/EPWS/HORT/MOLB 530: Graduate course on the biochemistry and physiology of major plant metabolic pathways (taught even spring semesters, 1990 to 2006, 5 to 15 students per semester).
- Environmental and Physiological Pesticide Science, EPWS 420/520 (co-taught with Dr. Schroeder): Undergraduate/Graduate course on the behavior of pesticides in plants and the environment (taught odd semesters, 1991 to 2005, 5 to 10 students per semester).
- Herbicide Physiology, PSPP 546 - co-taught with Drs. Dyer (Montana State University) and Nissen & Ward (Colorado State University), as a distance-delivered course (taught every Fall semester since 2006, 7 to 17 students per semester).
- *Science Distance Education Resources:* Developing award-winning animations and peer-reviewed lessons on herbicide mode of action and plant physiology in collaboration with University of Nebraska-Lincoln (UNL) at http://plantandsoil.unl.edu. These lessons are mirrored at http://www.wsweedscience.org/Lessons/lessons.asp.

PROGRAM ADMINISTRATION:

NSF-ADVANCE: INSTITUTIONAL TRANSFORMATION at NMSU – Served as Program Director and PI, 2005-2009. The goal of the program is Institutional Transformation through improving recruitment and retention of female faculty in Science, Technology, Engineering & Mathematics (STEM) disciplines. Major responsibilities include directing major programs (i.e. Mentoring, Visiting Professors, Faculty Development, Research Awards, ADVANCING Leaders) while facilitating their institutionalization and sustainability. Successfully obtained institutional funding to sustain the Associate Director position and key programs subsequent to the grant's termination in April 2009. The program is described at http://www.nmsu.edu/~advprog.

NSF-ADVANCE - PAID (Partnerships for Adaptation, Implementation and Dissemination)
State-wide program: "Alliance for Faculty Diversity" - As PI from January 2007 to 2009,

directed program to disseminate NMSU's best practices for faculty recruitment, retention and advancement (Mentoring, Promotion & Tenure training and Department Head training through annual retreats) to other doctoral institutions in New Mexico, UNM and NMT, and to Los Alamos National Labs, as described at http://www.advance.nmsu.edu/PAID/index.html.

Regional program: "PROMOTE – Improving the promotion to full professor at western public universities" - As co-PI from 2008 to 2009, collaborated with partner land-grant institutions (Utah, Idaho, Kansas and Oregon State Universities) to understand the factors influencing the rate of transition from Associate to Full Professor and to adapt, implement, and disseminate a set of four key activities that have been identified as instrumental in dramatically increasing promotion rates.

AWARDS AND SCHOLARSHIPS:

2016 MSU Women's Faculty Caucus Distinguished Mentoring Award
2013 Western Extension and Research Directors Award of Excellence – W-2045 Multi-State project
2012,13,14 Nominated MSU President's Commission on the Status of University Women Award
2010 Fellow, Western Society of Weed Science
2008 Honorary Member for Faculty Development Initiatives – NMSU Teaching Academy
2007 NM YWCA REACH Award of Excellence – Post-Secondary Education Division
2005 NSF Visualization Challenge; Transpiration Animation; Science 309:1993 Interactive Media - Honorable mention
2005 Silver Award – Interactive Multimedia and Web Graphics category Transpiration Flash Animation with Agricultural Communications Dept. from the Association for Communication Excellence in Agriculture, Natural Resources, and Life and Human Sciences
2004 National Excellence in Distance Education Award – The American Distance Education Consortium (collaboration with Univ. Nebraska-Lincoln)
1997 Sam Steel Society Induction, NMSU
1994 El Paso Natural Gas Foundation Faculty Achievement Award, NMSU
1992 National Assoc. of Colleges and Teachers of Agriculture Teaching Award of Merit, NMSU
1988 D.C. Smith Outstanding Agronomy Graduate Student Award, Univ. of Wisconsin-Madison
1988 Outstanding Weed Science Graduate Student Award, University of Wisconsin

MEMBERSHIPS IN PROFESSIONAL SOCIETIES:

American Society of Plant Biologists
Gamma Sigma Delta
Sigma Xi
Weed Science Society of America
Western Society of Weed Science

REFEREED PUBLICATIONS:

Ray, I.M., Y. Han, L.E, C.D. Meenach, N. Santantonio, M.K. Sledge, C.A. Pierce, T.M. Sterling, R.K. Kersey, H.S. Bhandari, and M.J. Monteros. 2015. Identification of QTL for Alfalfa Forage Biomass Productivity during Drought Stress. Crop Science 55:2012-2033. (https://dl.sciencesocieties.org/publications/cs/articles/55/5/2012)

Bowen-O'Connor, C.A., D.M. VanLeeuwen, G. Bettmann, T.M. Sterling, and R. St. Hilaire. 2013. Variation in violaxanthin and lutein cycle components in two provenances of *Acer grandidentatum* L**.** exposed to short-term contrasting light**.** Acta Physiologiae Plantarum 35:541–548. (http://link.springer.com/article/10.1007%2Fs11738-012-1095-7#page-1)

Ratnayaka, H. H., W. T. Molin, and T. M. Sterling. 2012. Comparison of physiological and antioxidant responses of *Anoda cristata* and cotton under progressive drought. Weed Research 52:358-366. (http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3180.2012.00924.x/abstract)

Vallotton, A., K. J. Delaney, L. Murray and T. M. Sterling. 2012. Water deficit induces swainsonine in some locoweed taxa, but no swainsonine-growth trade off. Acta Oecologica 43:140-149. (http://www.sciencedirect.com/science/article/pii/S1146609X12000914)

Alkhatib, R., J. Maruthavanan, S. Ghoshroy, R. Steiner, and T.M. Sterling. 2012. Physiological and ultrastructural effects of lead on tobacco. Biologia Plantarum 56:711-714. (http://journals2.scholarsportal.info/details.xqy?uri=/00063134/v56i0004/711_paueolot.xml)

Delaney, K.J., N. Klypina, J. Maruthavanan, C. Lange, and T. M. Sterling. 2011. Locoweed nitrogen supplementation has dose response enhancement of growth and photosynthesis, but not of an alkaloid. Amer. J. Botany 98:1956-1965. (http://www.amjbot.org/content/98/12/1956.full)

Higbie, S.M., F. Wang, J. Stewart, T.M. Sterling, W. C. Lindemann, E. Hughs, and J. Zhang. 2010. Physiological Response to Salt (NaCl) Stress in Selected Cultivated Tetraploid Cottons. Intl. J. Agronomy 2010:1-12. (http://www.hindawi.com/journals/ija/2010/643475/)

Sterling, T.M. and D. Namuth. 2010. Cellular absorption of herbicides. J. Natl. Resources & Life Sci. Educ. 39:23. (http://croptechnology.unl.edu/pages/informationmodule.php?idinformationmodule=1130447094)

Davis, A. S., J. C. Hall, M. Jasieniuk, M. A. Locke, E. C. Luschei, D. A. Mortensen, D. E. Riechers, R. G. Smith, T. M. Sterling, and J. H. Westwood. 2009. Weed Science Research and Funding: A Call to Action. Weed Science 57:442-448.

Abbott, L. B., G. T. Bettmann, and T. M. Sterling. 2008. Physiology and recovery of African rue (*Peganum harmala*) seedlings under water deficit stress. Weed Science 56:52-57.

Bettmann, G. T., H. H. Ratnayaka, W. T. Molin, and T. M. Sterling. 2006. Effects of nitrogen deficiency on physiological and antioxidant stress responses of cotton (*Anoda cristata*) and spurred anoda (*Gossypium hirsutum* and *G. barbadense*). Weed Sci. 54:641-650.

Molin, W. T., J. A. Hugie, H. H. Ratnayaka and T. M. Sterling. 2006. Spurred anoda (*Anoda cristata*) competition in wide row and ultra-narrow row cotton (*Gossypium hirsutum* and *G. barbadense*) management systems. Weed Sci. 54:634-640.

Sterling, T. M., S. K. Nissen, and D. Namuth. 2006. Metabolism of Herbicides or Xenobiotics in Plants. J. Natl. Resources & Life Sci. Educ. 35:E01. http://croptechnology.unl.edu/pages/informationmodule.php?idinformationmodule=1016741032

Abbott, L. B. and T. M. Sterling. 2006. African rue (*Peganum harmala*) seedling response to herbicides applied under water-deficit stress. Weed Sci. 54:198-204.

Sterling, T.M. 2005. Transpiration – Water Movement through Plants. J. Natl. Resources & Life Sci. Educ. 34:E04-36W. (http://croptechnology.unl.edu/pages/informationmodule.php?idinformationmodule=1092853841)

Sterling, T. M., D. C. Thompson, and L. A. Abbott. 2004. Implications of invasive plant variation for weed management. Weed Technology 18:1319-1324.
Kulshreshtha, S., R. Creamer, and T. M. Sterling. 2004. Phylogenetic relationships among New Mexico *Astragalus mollissimus* varieties and *Oxytropis* species by restriction fragment analysis. Weed Sci. 52:984-988.
Gibbs, L. A. and T. M. Sterling. 2004. Seasonal variation of picloram metabolism in broom and threadleaf snakeweed populations in a common garden. Weed Sci. 54:206-212.
Sterling, T. M. and D. Namuth. 2004. Auxinic Herbicide Mechanism(s) of Action - Part 1 – Introduction. J. Natl. Resources & Life Sci. Educ. 33:E03-9W. http://croptechnology.unl.edu/pages/informationmodule.php?idinformationmodule=1022008824
Sterling, T. M., and D. Namuth. 2004. Auxinic Herbicide Mechanism(s) of Action - Part 2 – Advanced. J. Natl. Resources & Life Sci. Educ. 33:E03-10W. http://croptechnology.unl.edu/pages/informationmodule.php?idinformationmodule=998688536
Sabba, R. P., I. M. Ray, N. Lownds, and T. M. Sterling. 2003. Inheritance of resistance to clopyralid and picloram in yellow starthistle (*Centaurea solstitialis* L.) is controlled by a single nuclear recessive gene. J. Heredity 94(6):523-527. http://jhered.oxfordjournals.org/content/94/6/523.full.pdf
Ratnayaka, H. H., W. T. Molin and T. M. Sterling. 2003. Physiological and antioxidant responses of cotton and spurred anoda under interference and mild drought. J. Exper. Bot. 54:2293-2305.
Valenzuela-Valenzuela, J. M., N. K. Lownds and T. M. Sterling. 2002. Ethylene plays no role in clopyralid action in yellow starthistle (*Centaurea solstitialis* L.). Pestic. Biochem. Physiol. 72:142-152.
Valenzuela-Valenzuela, J. M., N. K. Lownds and T. M. Sterling. 2001. Clopyralid uptake, translocation, metabolism and ethylene induction in picloram-resistant yellow starthistle (*Centaurea solstitialis* L.). Pestic. Biochem. Physiol. 71:11-19.
Sterling, T. M., N. K. Lownds and L. W. Murray. 2001. Similar competitive ability between *Centaurea solstitialis* accessions resistant or susceptible to picloram. Weed Sci. 49:42-47.
Sterling, T. M., L. W. Murray and Y. Hou. 2000. Morphological variation among broom snakeweed (*Gutierrezia sarothrae*) populations. Weed Sci. 48:356-365.
Sabba, R.P., T.M. Sterling and N.K. Lownds. 1998. Effect of picloram on resistant and susceptible yellow starthistle: The role of ethylene. Weed Sci. 46:297-300.
Sterling, T. M. and Y. Hou. 1997. Genetic diversity of broom snakeweed (*Gutierrezia sarothrae*) and threadleaf snakeweed (*G. microcephala*) populations. Weed Sci. 45:674-680.
Fuerst, E. P., T. M. Sterling, M. A. Norman, T. S. Prather, G. P. Irzyk, Y. Wu, N. K. Lownds and R. H. Callihan. 1996. Physiological characterization of picloram resistance in yellow starthistle. Pestic. Biochem. Physiol. 56:149-161.
Waldrop, M. P., T. M. Sterling, R. A. Khan and W. T. Molin. 1996. Fate of prometryn in prometryn-tolerant and -susceptible cotton cultivars. Pestic. Biochem. Physiol. 56:111-122.
Sterling, T. M., N. K. Lownds, and L. W. Murray. 1996. Picloram uptake and picloram-induced ethylene production by broom snakeweed as influenced by environment. J. Range Man. 49:245-250.
Thompson, D. C., J. L. Knight, T. M. Sterling and L. W. Murray. 1995. Preference for specific varieties of woolly locoweed by a specialist weevil, *Cleonidius trivittatus* (Say). Southwestern Entomologist 20:325-333.
Hou, Y. and T. M. Sterling. 1995. Isozyme variation in broom snakeweed (*Gutierrezia sarothrae*). Weed Sci. 43:156-162.
Sterling, T. M. and H. J. Jochem. 1995. Uptake, translocation and metabolism of picloram and metsulfuron by two genera of locoweed. Weed Sci. 43:13-17.

Morrison, R. G., N. K. Lownds and T. M. Sterling. 1995. Picloram uptake, translocation and efficacy in relation to water status in Russian knapweed (*Centaurea repens* L.). Weed Sci. 43:34-39.

Sterling, T.M. 1994. Mechanisms of herbicide absorption across plant membranes and accumulation in plant cells. Weed Sci. 42:263-276.

Sterling, T.M. and N.K. Lownds. 1992. Picloram absorption by broom snakeweed (*Gutierrezia sarothrae*) leaf tissue. Weed Sci. 40:390-394.

Sterling, T.M. and N.E. Balke. 1990. Bentazon uptake and metabolism by cultured plant cells in the presence of monooxygenase inhibitors and cinnamic acid. Pestic. Biochem. Physiol. 38:66-75.

Sterling, T.M., N.E. Balke, and D.S. Silverman. 1990. Uptake and accumulation of the herbicide bentazon by cultured plant cells. Plant Phys. 92:1121-1127.

Sterling, T.M. and N.E. Balke. 1989. Differential bentazon metabolism and retention of bentazon metabolites by plant cell cultures. Pestic. Biochem. Physiol. 34:39-48.

Sterling, T.M. and N.E. Balke. 1988. Use of soybean (*Glycine max*) and velvetleaf (*Abutilon theophrasti*) suspension-cultured cells to study bentazon metabolism. Weed Sci. 36:558-565.

Sterling, T.M. and A.R. Putnam. 1987. Possible role of glandular trichome exudates in interference by velvetleaf (*Abutilon theophrasti*). Weed Sci. 35:308-314.

Sterling, T.M., R.L. Houtz, and A.R. Putnam. 1987. Phytotoxic exudates from velvetleaf (*Abutilon theophrasti*) glandular trichomes. Amer. J. Bot. 74:543-550.

BOOK CHAPTERS:

McDaniel, K., T. Sterling, and S. Ivey. 2007. Herbicidal control of locoweed. In K. E. Panter, T. L. Wierenga, and J. A. Pfister (editors), Poisonous Plants: Global Research and Solutions, CABI Publishing, CAB International, Oxford, pp. 353-358.

Vallotton, A. D. and T. M. Sterling. 2007. Water deficit effects on *Astragalus mollissimus* and *Oxytropis sericea* swainsonine content, physiology, and growth. In K. E. Panter, T. L .Wierenga, and J. A. Pfister (editors), Poisonous Plants: Global Research and Solutions, CABI Publishing, CAB International, Oxford, pp. 372-376.

Sterling, T. M. and J. C. Hall. 1997. Mechanism of action of natural auxins and the auxinic herbicides. In R. M. Roe, J. D. Burton and R. J. Kuhr (editors), Herbicide Activity: Toxicology, Biochemistry, and Molecular Biology, I. O. S. Press, Inc., Amsterdam, pages 205-263.

Sterling, T. M., D.C. Thompson and K.C. McDaniel. 1999. Perennial Snakeweeds. In R. L. Sheley and J. K. Petroff , Eds., Biology and Management of Noxious Rangeland Weeds, Oregon State University Press, Corvallis, pages 323-335.

OUTREACH PUBLICATIONS:

Ashigh, J. and T. M. Sterling. 2010. Herbicide Resistance: Development and Management. New Mexico State University Cooperative Extension Service Guide A-616 (http://aces.nmsu.edu/pubs/_a/A-616.pdf).

Sterling, T. M. and D. C. Thompson, editors. 1999. Locoweed Research: Updates and Highlights. New Mexico State Univ., Res. Rep. 730. 88 pages.

- Campanella, M. C., T. M. Sterling, and D. C. Thompson. 1999. *Walshia miscecolorella* caterpillars may alter swainsonine levels in white locoweed. *In* Locoweed Research: Updates and Highlights. Sterling, T. M. and D. C. Thompson, eds., New Mexico State Univ., Res. Rep. 730, pp. 36-37.
- Sterling, T. M. and H. S. Jochem. 1999. Understanding why white locoweed is more sensitive to herbicides than woolly locoweed. *In* Locoweed Research: Updates and Highlights. Sterling, T.

M. and D. C. Thompson, eds., New Mexico State Univ., Res. Rep. 730, pp. 46-47.

- Sterling, T. M. and H. S. Jochem. 1999. Do differences in locoweed leaf surfaces affect herbicide uptake? *In* Locoweed Research: Updates and Highlights. Sterling, T. M. and D. C. Thompson, eds., New Mexico State Univ., Res. Rep. 730, pp. 55-56.
- Thompson, D. C., J. L. Knight, T. M. Sterling, and K. T. Gardner. 1999. Locoweed weevils prefer certain varieties of locoweed. *In* Locoweed Research: Updates and Highlights. Sterling, T. M. and D. C. Thompson, eds., New Mexico State Univ., Res. Rep. 730, 48-49.

Sterling, T.M. and N.K. Lownds. 1996. Factors affecting herbicide activity in snakeweed and locoweed. In Locoweed & Broom Snakeweed Research Update, NMSU Ag. Expt. Sta., Clayton, NM, February 9, pp. 16-17.

Sterling, T. M. and D. C. Thompson, editors. 1993. Snakeweed Research: Highlights and Updates, Ag. Expt. Sta. Res. Rep. 674, NMSU, Las Cruces, NM, 54 pages.

- Hou, Y. and T.M. Sterling. 1993. Genetic variability in broom snakeweed. In Sterling, T.M. and D.C. Thompson, editors, Snakeweed Research: Highlights and Updates, Ag. Expt. Sta. Res. Rep. 674, NMSU, pp. 4-5.
- Hou, Y. and T.M. Sterling. 1993. Water stress and picloram alter carbohydrate content in broom snakeweed. In Sterling, T.M. and D.C. Thompson, editors, Snakeweed Research: Highlights and Updates, Ag. Expt. Sta. Res. Rep. 674, NMSU, Las Cruces, NM, pp. 30-31.
- Lownds, N.K. and T.M. Sterling. 1993. Herbicide-induced responses in broom snakeweed. In Sterling, T.M. and D.C. Thompson, editors, Snakeweed Research: Highlights and Updates, AES Res. Rep. 674, NMSU, p. 34-35.
- Sterling, T.M. and N.K. Lownds. 1993. Herbicide absorption by broom snakeweed leaves. In Sterling, T.M. and D.C. Thompson, editors, Snakeweed Research: Highlights and Updates, Ag. Expt. Sta. Res. Rep. 674, NMSU, Las Cruces, NM, pp. 32-33.
- Thompson, D.C. and T.M. Sterling. 1993. Snakeweed species influence a biological control agent differently. In Sterling, T.M. and D.C. Thompson, editors, Snakeweed Research: Highlights and Updates, Ag. Expt. Sta. Res. Rep. 674, NMSU, Las Cruces, NM, pp. 20-21.

Liddell, C.M., D.C. Thompson, T.M. Sterling, D.B. Richman, and C.J. DeLoach. 1990. Biological control of broom snakeweed in New Mexico, In Snakeweed: Problems and Perspective Proceedings, Ag. Expt. Sta. Bull. 751, NMSU, Las Cruces, NM, pp. l63-167.

Sterling, T.M. 1990. Physiology of broom snakeweed in relation to chemical control, In Snakeweed:Problems and Perspectives Proceedings, Ag. Expt. Sta. Bull. 751, NMSU, Las Cruces, NM pp. 51-60.

Sterling, T.M. 1990. Physiology and biochemistry of broom snakeweed in relation to biological control, In Snakeweed:Problems and Perspectives Proceedings, Ag. Expt. Sta. Bull. 751, NMSU, Las Cruces, NM pp. 169-177.

NON-REFEREED PUBLICATIONS:

Sterling, T. M. 2008. Celebrating NSF ADVANCE Program's Accomplishments. NMSU Research News – Newsletter of Vice President for Research, Graduate School and International Programs. Vol. 2 (3), pp. 9-12, at http://research.nmsu.edu/nl/ovprgi_newsletter_dec2008.pdf

Murray, L., T. M. Sterling, and J. Schroeder. 1999. My View. Weed Sci. 47:367-368.

Hatzios, K. K., B. Auxier, M. R. Blumhorst, J. M. Campbell, J. M. DiTomaso, W. E. Dyer, R. J. Ehr, S. Harper, M. V. Hickman, R. E. Hoagland, R. S. McAllister, C. A. Nord, R. L. Ratliff, W. F. Simmons, T. M. Sterling and J. B. Weber. 1998. Herbicide Handbook. Supplement to the Seventh Edition. Weed Science Society of America, Lawrence, KS. 104 pp.

Sterling, T.M. 1996. Structure-activity relationships: Approaches to Herbicide Design. Weed Sci. 44:717.

Ahrens, W. H., C. D. Anderson, J. M. Campbell, S. Clay, J. M. DiTomaso, W. E. Dyer, M. T. Edwards, R. J. Ehr, J. R. Frank, M. V. Hickman, E. R. Hill, A. R. Isensee, W. C. Koskinen, W. J. McAvoy, L. W. Mitich, R. L. Ratliff, and T. M. Sterling. 1994. Herbicide Handbook. Seventh Edition. Weed Sci. Soc. Amer., Champaign, IL, 352 pp.

EDUCATIONAL MATERIALS:

Video

Payne, J. and T. M. Sterling. 1997. Water Potential in Plants. NMSU. 30 min.

Proceedings:

Vallotton, Ulery, and Sterling. 2006. Using Plant Stress Experiments to Teach Across Disciplines in Plant Physiology and Soil Chemistry. Presented at the NMSU College of Engineering and NM Space Grant Consortium's Science, Engineering and Technology Education Conference - http://spacegrant.nmsu.edu/NMSU/2006/vallotton.pdf

Boren, A., S. Fritz, C. Speth, D. Namuth, T. Sterling and D. Lee. 2005. A Tale of Two Constructs: Distance Students' Learning Approaches and Motivations. 3rd Annual Hawaii International Conference on Education, February 2005.

Namuth, D. M., D. Lee, A. Guru, S. J. Nissen, and T. M. Sterling. 2003. Development of an Electronic Library of Lessons for Multi-Institutional Use. NMSU College of Engineering and NM Space Grant Consortium's Science, Engineering and Technology Education Conference - http://spacegrant.nmsu.edu/NMSU/2003/index.html

Vallotton, A. D., A. Ulery, and T. M. Sterling. 2006. Using Plant Stress Experiments to Teach Across Disciplines in Plant Physiology & Soil Chemistry. NMSU College of Engineering and NM Space Grant Consortium's Science, Engineering & Technology Education Conference- http://spacegrant.nmsu.edu/NMSU/2006/index.html.

COMPETITIVE GRANTS:

2011-14 Conservation Approaches to Invasive Plant Management in the Missouri River Watershed: From Invasive Species Prevention and Control, to Biomass Utilization and Bioenergy Generation, PI: Galli-Noble, Co-PI: Sterling; NRCS CIG, $1,000,000

2011-16 Student Technology Transfer Research Internship Program (STTRIP), Co-PIs: Sing and Sterling; USFS, $28,500.

2010-12 Physiological and Ecological Evaluation of Metabolism-based Herbicide Resistance in *Avena fatua* (Wild oats), PI: Dyer, Co-PIs: Menalled, Burrows, Sterling and Jha; EPA Region 8 Strategic Agric Init Program, $56,573.

2010-11 Communities of Learning for an Established Learning Object Library, PI: Namuth, Co-PIs: Mamo and Speth, Collaborators: Renan, Sterling. NSF - $149,953

2008-11 PROMOTE – Improving the promotion to full professor at western public universities, PI: K. Sullivan, USU; Co-PIs: Austin (USU), Britton (KSU), Montelone (KSU), & Sterling (NMSU); NSF-ADVANCE-PAID: Partnering for Adaptation, Implementation and Dissemination, $441,994.

2007-09 Alliance for Faculty Diversity, PI: T. M. Sterling; Co-PIs from NMSU, New Mexico Tech, University of New Mexico, & Los Alamos National Lab, NSF-ADVANCE-PAID: Partnering for Adaptation, Implementation and Dissemination, $500,000.

2006-09 Drought Responsive Genes and Physiological Traits as Enriched Sources of Markers for

Improving Alfalfa Drought Tolerance, Co-principal investigators: I. Ray and T.M. Sterling, USDA-NRICGP – Agricultural Plants and Environmental Adaptation; $375,000

2004-06 Candidate Gene Markers and Traits for Drought Tolerance QTL in Alfalfa; Co-principal investigators: I. Ray and T. M. Sterling; Southwest Consortium on Plant Genetics and Water Resources; $80,000.

2004 Oxidative Stress Tolerance Mechanisms in Plants; Principal Investigator: T. M. Sterling, NSF-ADVANCE Institutional Transformation Award; $21,420.

2003-04 Learning to Think Like a Plant Scientist; Co-principal investigators: D. Lee, R. Gaussoin, T. M. Sterling and K. Todd; American Distance Education Consortium; $35,000.

2003 Spray Chamber for Weed Science Programs; Principle Investigator: T.M. Sterling, National Research Initiative Competitive Grants Program – Equipment Grant; $26,440.

2002 Visiting Professor Award– NSF-ADVANCE Institutional Transformation Awards; $4,500.

2002 Travel Award – NSF-ADVANCE Institutional Transformation Awards; $4,688.

2001-04 Development of Decision Support Tools for Water Conservation in the Rio Grande Valley; Co-principal investigators: R. Sanderson, D. Miller, M. Bleissweiss, T. M. Sterling, T. Sammis, and E. A. Herrera; USDA/CSREES, Efficient Irrigation for Water Conservation in the Rio Grande Basin; $284,505.

2001 HPLC for weed physiology research; Principal investigator: T. M. Sterling, National Research Initiative Competitive Grants Program - Equipment Grant; $60,000.

2001-02 Weed Science Electronic Library Modules; Co-principal investigators: D. Namuth, S. Nissen, and T. M. Sterling; American Distance Education Consortium; $50,000.

1999-03 The role of oxidative stress tolerance in crop/weed interactions; Co-principal investigators: T. M. Sterling and W. T. Molin; National Research Initiative Competitive Grants Program - Weeds; $250,000.

1997 Mechanism(s) of auxinic herbicide resistance in important agricultural and rangeland weeds of the western United States; Co-principal investigators: W. T. Dyer and T. M. Sterling; Montana Weed Trust Fund; $21,000

1997 Mechanism of picloram resistance; Co-principal investigators: T. M. Sterling and W. T. Dyer; DowElanco, $5,000.

1996 Spectrophotometer for weed physiology research; Principal investigator: T. M. Sterling, National Research Initiative Competitive Grants Program - Equipment Grant; $25,000.

1994-96 Mechanism of auxin-like herbicide resistance and cross-resistance in yellow starthistle; Co-principal investigators: T. M. Sterling and N.K. Lownds; National Research Initiative Competitive Grants Program; $100,000.

1994-95 Improvement of cotton tolerance to herbicides; Co-principal investigators: W. T. Molin (U. Arizona) and T. M. Sterling; SW Consortium on Plant Genetics & Water Resources; $46,000.

1993-94 Picloram resistance in yellow starthistle; Co-principal investigators: T. M. Sterling, N. K. Lownds, and E. P. Fuerst (Washington State Univ.); Western Regional Pesticide Impact Assessment Program; $19,564.

1993-94 Improvement of cotton tolerance to herbicides; Co-principal investigators: W. T. Molin (University of Arizona) and T. M. Sterling; Southwest Consortium on Plant Genetics and Water Resources; $50,000.

1992-94 Mechanism of auxin-like herbicide resistance in yellow starthistle; Co-principal investigators: T. M. Sterling and N.K. Lownds; National Research Initiative Competitive Grants Program (NRICGP); $50,000.

1992-93 Picloram resistance in yellow starthistle; Co-principal investigators: T. M. Sterling, N. K.

Lownds, and E. P. Fuerst (Washington State Univ.); Western Regional Pesticide Impact Assessment Program; $16,948.

1991-92 Reducing herbicide use rates for Russian knapweed control: II. Effect of Environment; Co-principal investigators: T. M. Sterling and N. K. Lownds; Western Regional Pesticide Impact Assessment Program; $14,227.

1991-92 Picloram resistance in yellow starthistle; Co-principal investigators: T. M. Sterling, N. K. Lownds, and E. P. Fuerst (Washington State Univ.); Western Regional Pesticide Impact Assessment Program (WRPIAP); $16,447.

1990-91 Reducing herbicide use rates for Russian knapweed control: I. Effect of surfactants on uptake; Co-principal investigators: T. M. Sterling and N. K. Lownds; Western Regional Pesticide Impact Assessment Program; $9,000.

GRADUATE ADVISING:

Post-docs advised:

Barb Keith (2010-present)
Ryan Bixenmann (2010-2013) – AAAS Fellow, Washington DC
Janakiraman Maruthavanan (2006-2009) – Pharmaceutical Analyst, Chicago IL
Fathima Nalim (2007-2008) – Adjunct Faculty, New Mexico State University
Harish Ratnayaka (2000-2003) - Professor, Xavier University of Louisiana
Sanjeev Kulshreshthna (1999-2001) – Researcher, University of Arizona-Tucson
Robert Sabba (1996-1998) - Faculty, North Dakota State University
Tushini deSoyza (1992-1994) - Researcher, George Washington University

Ph.D. students:

Ismael Hernandez-Rios, 2004, Mechanisms of oxidative stress tolerance to herbicide and salinity stress in cotton (*Gossypium* sp.), Crop science faculty, Colegios de Postgraduados, SLP, Mexico

Juan Valenzuela-Valenzuela, 1998, Physiological studies into the cross-resistance of picloram-resistant yellow starthistle (*Centaurea solstitialis* L.) to the auxinic herbicide clopyralid, Vegetable crops researcher, CIANO-INIFAP, Mexico

Yanglin Hou, 1994, Phenotypic and genetic variability in broom snakeweed (*Gutierrezia sarothrae*) and its genotype response to picloram, Grower manager, Mid-American Growers, IL

M.Sc. students:

Evelyn Konigsberg, 2014, Factors involved in the Success and Establishment of the Field Bindweed Gall Mite *Aceria malherbae* Nuzzaci (Acari:Eriophyidae)

Greg Bettmann, 2007, Oxidative stress and photosynthesis response during drought in African rue

Kevin Branum, 2006, Influence of drought stress on African rue (*Peganum harmala*) physiology and management

Amber Vallotton, 2005, Genetic and environmental variation in swainsonine production by locoweed species

David Johnson, 2004, Prediction of water deficit stress in pecans (*Carya illinoensis*) with remotely sensed hyper-spectral data

Asuncion Rios-Torres, 1997, Effects of three acetolactate synthase (ALS) herbicides in soils and nutrient solutions at different pHs and water potentials

Marianne Pedersen, 1995, Auxin binding in picloram-susceptible and -resistant yellow starthistle (*Centaurea solstitialis* L.)

Robert Morrison, 1992, Picloram uptake, translocation and picloram-induced ethylene production in relation to water status of Russian knapweed (*Centaurea repens* L.)