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for

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Lawrence E. Steckel

A-2. Educational History and Employment History

A-2.1 Education History	2003	Ph.D.	Crop Sciences	University of Illinois
	1989	M.S.	Agronomy	University of Missouri
	1987	B.S.	Agronomy	Western Illinois University

A-2.2 Employment History

Professor Extension (75%)/Research (25%)	University of Tennessee Plant Sciences Department	2013 - Present
Associate Professor Extension (75%)/Research (25%)	University of Tennessee Plant Sciences Department	2008 - 2013
Assistant Professor Extension (75%)/Research (25%)	University of Tennessee Plant Sciences Department	2003 - 2008
Graduate Research/Teaching Assistant	University of Illinois Weed Science	2000 - 2003
Field Sales Agronomist	Pioneer Hi-Bred Intl. Southern Illinois	1989 - 1999
Graduate Research/Teaching Assistant	University of Missouri Weed Science	1987 - 1989
Technical Service Intern	Dow Corp. Agricultural Division, Iowa Territory	1986
Undergraduate Research Assistant	Western Illinois University Agronomy	1983 - 1987

A-3. Statement of Responsibility

My appointment is 75% Extension and 25% Tennessee Agricultural Experiment Station with responsibility for row crop weed management. Extension duties include providing weed management information and recommendations to county adult agricultural agents, growers, crop consultants, agribusiness organizations, state and federal agencies, commodity groups, the media, life sciences companies and the scientific community concerned with weed management issues.

Research duties include developing economically and environmentally sustainable weed management systems for major agronomic crops of Tennessee and disseminating information to appropriate clientele. To accomplish this goal, applied research is conducted to address current and potential weed management challenges of row crop producers.

B. Extension Ability and Effectiveness

B-3. Non-Credit Instruction (89 Total)

B-4. Extension Presentations (817Total) (>52,700 contacts at meetings since 2008)

B-5. Student Committees

Student	Department	Degree	Role	Dates
Lucas Owen	Plant Sciences	M.S.	Advisor	F2007-Sp2009
Evaluation of spring and fall burndown application timings on control of glyphosate-resistant horseweed in no-till cotton. Graduated Sp2009. (Current position: Agronomist Bayer Crop Science)				
Drew Ellis	Plant Sciences	Ph.D.	Member	Sp2006-Sp2009
Graduated Sp2009 (Current position: Technical Service Rep Dow Crop Science)				
Brock Waggoner	Plant Sciences	M.S.	Advisor	Sp2009-F2010
Control of glyphosate resistant horseweed (<i>Conyza canadensis</i>) with saflufenacil tank-mix partners. 2010. Graduated F2010 (Current position: Research Scientist Monsanto)				
Kelly Barnett	Plant Sciences	Ph.D.	Advisor	Sp2010-F2012
Giant ragweed (<i>Ambrosia trifida</i> L.) biology, competition and control in cotton (<i>Gossypium hirsutum</i> L.) Graduated F2012 (Current position: Technical Service Rep DuPont)				
C. Blake Edwards	Plant and Soil Sciences Mississippi State University	M.S.	Adjunct Member	Sp2011-Sp2013
Graduated Sp2013 (Current position: Research Scientist Monsanto)				
Brittany Gaban	Plant Sciences	M.S.	Member	Sp2011- Sp2013
Graduated F2012 (Current position: Research Scientist Monsanto)				
Mathew Wiggins	Plant Sciences	Ph.D.	Advisor	Sum2012-2014
Integration and management of winter-annual cover crops and herbicides to control glyphosate-resistant Palmer amaranth (<i>Amaranthus palmeri</i> S. Wats). Graduated F2014 (Current position: Research Scientist FMC)				
Whitney Crow	Plant Sciences	M.S.	Advisor	Sum2013-Present
Glyphosate resistant Palmer amaranth (<i>Amaranthus palmeri</i>) management late-season and POST-harvest in corn production systems. Graduated F2014 (Current position: Pursuing Ph.D in entomology at Mississippi State University)				
Garret Montgomery	Plant Sciences	Ph.D	Advisor	Sum2014-2016
Utilizing cover crops to improve sustainability of conventional weed management program. Graduated F2016 (Current position: Technical trait development Monsanto)				
Drake Copeland	Plant Sciences	Ph.D	Advisor	Sum2016-Present

B-5.1 Mentor for Junior Faculty

Faculty	Department	Role	Dates
Dr. Chris Main	Plant Sciences	Mentor	2006-2009
Dr. Dave Vebree	Plant Sciences	Mentor	2012-2014
Dr. Tyson Raper	Plant Sciences	Mentor	2014-present

C. Research, Creative Achievements, and Scholarship

C-2. Research and/or Scholarly Publications

C-2.1 Refereed Publications

Refereed articles (67) In Press ()

Steckel, L. E., M. S. DeFelice, and B. D. Sims. 1990. Integrating reduced rates of postemergence herbicides and cultivation for broadleaf weed control in soybeans (*Glycine max*). *Weed Sci.* 38:541-545.

Steckel, L. E., C. L. Sprague, and A. G. Hager. 2002. Common waterhemp (*Amaranthus rudis*) control in corn (*Zea mays*) with preemergence and sequential applications of residual herbicides. *Weed Technol.* 16:755-761.

Steckel, L. E., C. L. Sprague, A. G. Hager, F. W. Simmons, and G. Bollero. 2003. Effects of shading on common waterhemp (*Amaranthus rudis*) growth and development. *Weed Sci.* 51:898-903.

Steckel, L. E., F. W. Simmons, and C. L. Sprague. 2003. Soil factor effects on the tolerance of two corn (*Zea mays*) hybrids to isoxaflutole plus flufenacet. *Weed Technol.* 17:599-604.

Steckel, L. E. and C. L. Sprague. 2004. Late-season common waterhemp (*Amaranthus rudis*) interference in soybean (*Glycine max*). *Weed Technol.* 18:947-952.

Steckel, L. E. and C. L. Sprague. 2004. Common waterhemp (*Amaranthus rudis*) interference in corn (*Zea mays*). *Weed Sci.* 52:359-364.

Steckel, L. E., C. L. Sprague, E. W. Stoller, G. Bollero, and L. M. Wax. 2004. Temperature effects on germination of nine *Amaranthus* species. *Weed Sci.* 52:217-221.

Alford, J., R. M. Hayes, N. Rhodes, **L. E. Steckel** and T. C. Mueller. 2005. Broadleaf signalgrass (*Brachiaria platyphylla*) interference in corn. *Weed Sci.* 53:97-100.

Reiling, K. R., F. W. Simmons, D. E. Reichers and **L. E. Steckel**. 2006. Application timing and soil pH effects on sulfentrazone phytotoxicity to two soybean (*Glycine max* (L.) Merr.) cultivars. *J. of Crop Prot.* 25:230-234.

Mueller, T.C., M. A. Thompson, C. Main and **L. E. Steckel**. 2006. Comparisons of glyphosate salts (isopropylamine, diammonium and potassium) and calcium and magnesium concentrations on the control of various weeds. *Weed Technol.* 20:164-171.

Main, C. L., **L. E. Steckel**, R. M. Hayes and T. C. Mueller. 2006. Biotic and abiotic factors influence horseweed emergence. *Weed Sci.* 54:1101-1105.

Steckel, L. E., C. C. Craig and R. M. Hayes. 2006. Glyphosate-resistant horseweed (*Conyza canadensis*) control with glufosinate prior to planting no-till cotton. *Weed Technol.* 20:1047-1051.

Steckel, L. E. 2007. The Dioecious *Amaranth spp*: Here to stay. *Intriguing World of Weeds.* *Weed Technol.* 21:567-570.

Steckel, L. E., C. L. Sprague, E. W. Stoller, L. M. Wax and F. W. Simmons. 2007. Tillage, cropping system and soil depth effects on common waterhemp (*Amaranthus rudis*) seed bank persistence. *Weed Sci.* 55:235-239.

- Lins, R. D., C. M. Cole, R. P. Affeldt, F. B. Colquhoun, C. A. Mallory-Smith, R. A. Hines, **L. E. Steckel** and R. M. Hayes. 2007. Glyphosate application timing and rate for annual ryegrass (*Lolium multiflorum*) cover crop desiccation. *Weed Technol.* 21:602-605.
- Steckel, L. E.**, C. C. Craig, R. M. Hayes and D. K. Miller. 2007. Response of three nonglufosinate-resistant cotton varieties to reduced rates of glufosinate. *Weed Technol.* 21:780-784.
- Steckel, L. E.**, R. M. Hayes, R. F. Montgomery and T. C. Mueller. 2007. Evaluating glyphosate treatments on roundup ready alfalfa for crop injury and feed quality. Online. *Journal of Forage and Grazing lands* doi:10.1094/FG-2007-0201-01-RS.
- M. A. Thompson, **L. E. Steckel**, A. T. Ellis and T. C. Mueller. 2007. Soybean tolerance to early pre-plant applications of 2,4-D ester, 2,4-D amine and dicamba. *Weed Technol.* 21:882-885.
- D. Scroggs, D. K. Miller, J. L. Griffin, **L. E. Steckel**, D. C. Blouin, A. Stewart and P. R. Vidrine. 2007. Reduced input postemergence weed control with glyphosate and residual herbicides in second generation glyphosate-resistant cotton (*Gossypium hirsutum* L.). *Weed Technol.* 21:997-1001.
- Steckel, L. E.**, C. L. Main, A. Ellis and T. C. Mueller. 2008. Palmer amaranth (*Amaranthus palmeri* S. Wats) in Tennessee has low level glyphosate resistance. *Weed Technol.* 22:119-123.
- Gwathmey, C. O., **L. E. Steckel** and J. E. Larson. 2008. Solid and skip-row spacings for irrigated and non-irrigated upland cotton. *Agronomy Jour.* 100:672-680.
- Steckel, L. E.** and C. O. Gwathmey. 2009. Glyphosate-resistant horseweed (*Conyza canadensis*) interference in cotton (*Gossypium hirsutum*). *Weed Science.* 57:346-350.
- Steckel, L. E.**, M. A. Thompson and R. M. Hayes. 2009. Herbicide Options for Controlling Glyphosate-Tolerant Corn in a Corn Replant Situation. *Weed Technol.* 23:243-246.
- Larson, J. A., C. O. Gwathmey, D. F. Mooney, **L. E. Steckel**, R. K. Roberts. 2009. Does skip row planting configurations improve cotton net returns? *Agronomy Jour.* 101.4:738-746.
- Norsworthy, J. K., K. L. Smith, **L. E. Steckel** and C. H. Koger. 2009. Weed seed contamination of cotton gin trash. *Weed Technol.* 23:574-580.
- *Owen, L. N., **L. E. Steckel**, C. L. Main, C. H. Koger and T. C. Mueller. 2009. Evaluation of Spring and Fall Burndown Application Timings on Control of Glyphosate-Resistant Horseweed in No-till Cotton. *Weed Technol.* 23:335-339.
- Norsworthy, J. K., P. Jha, **L. E. Steckel** and R. C. Scott. 2010. Confirmation and control of glyphosate-resistant giant ragweed in Tennessee. *Weed Technol.* 24:64-70.
- Ellis, A. T., **L. E. Steckel**, C. L. Main, Marcel de Melo, D. R. West and T. C. Mueller. 2010. A survey for diclofop-methyl resistance in Italian ryegrass from Tennessee and how to manage resistance in wheat. *Weed Technol.* 24:303-309.
- Mueller, T. C., **L. E. Steckel** and M. Radosevich. 2010. Effect of soil pH and previous atrazine use history on atrazine degradation in a Tennessee field soil. *Weed Science.* 58:478-483.
- *Owen, L. N., , T. C. Mueller, C. L. Main, J. Bond and **L. E. Steckel**. 2011. Evaluating rates and application timings of saflufenacil for Control of Glyphosate-Resistant Horseweed (*Conyza*

Canadensis) in No-till Cotton (*Gossypium hirsutum*). Weed Technol. 25:1-5.

Johnson, B., B. Young, J. Matthews, P. Marquardt, C. Slack, K. Bradley, A. York, S. Culpepper, A. Hager, K. Al-Khatib, **L. Steckel**, M. Moechnig, M. Loux, M. Barnards and R. Smeda. 2010. Weed control in dicamba-resistant soybeans. Crop Management. Published 20, September 2010.

Gwathmey, C. O., **L. E. Steckel**, Larson, J. A. and D. F. Mooney. 2011. Lower Limits of Cotton Seeding Rates in Alternative Row Widths and Patterns. Agronomy Jour. 103:584-592.

*Waggoner, L. N., , T. C. Mueller, C. L. Main, J. A. Bond and **L. E. Steckel**. 2011. Control of glyphosate-resistant horseweed (*Conyza Canadensis*) with saflufenacil tank-mixtures in no-till Cotton (*Gossypium hirsutum L.*). Weed Technol. 25:310-315.

Mueller, T. C. and **L. E. Steckel**. 2011. Efficacy and dissipation of pyroxasulfone and three chloroacetamides in a Tennessee field soil. Weed Technol. 59:574-579.

Mueller, T. C., K. A. Barnett, J. T. Brosnan and **L. E. Steckel**. 2011. Glyphosate-resistant goosegrass (*Eleusine indica*) confirmed in Tennessee. Weed Sci. 59:562-566.

Main, C. L., J. C. Faircloth, **L. E. Steckel**, A. S. Culpepper and A. C. York. 2012. Cotton tolerance to fomesafen applied preemergence. Cotton Sci. 16:80-87

Steckel, L. E., D. O. Stephenson, J. A. Bond, S. D. Stewart and K. A. Barnett. 2012. Tolerance of WideStrike cotton to over-the-top glufosinate tankmixtures. Cotton Sci. 16:88-95.

*Barnett, K. A., T. C. Mueller and **L. E. Steckel**. 2012. Glyphosate-resistant giant ragweed control in WideStrike Flex cotton. Weed Technol. 26:611-616.

Ward, S. M., T. M. Webster and **L. E. Steckel**. 2013. Palmer amaranth: a review. Weed Technol. 27:12-27. Invited review from Weed Technology editor.

Stewart, S. D., **L. E. Steckel** and S. J. Steckel. 2013. Evaluation of WideStrike cotton (*Gossypium hirsutum L.*) injury from early season herbicide and insecticide tank mixes. Cotton Sci. 17:219-226.

Riar, D. S., J. K. Norsworthy, **L. E. Steckel**, D. O. Stephenson, IV, T. W. Eubank and R. C. Scott. 2013. Assessment of weed management practices and problem weeds in the Midsouth United States – soybean: A consultant's perspective. Weed Technol. 27:612-622.

*Barnett, K. A., T. C. Mueller and **L. E. Steckel**. 2013. Glyphosate-resistant giant ragweed (*Ambrosia trifida L.*) control with glufosinate or fomesafen combined with growth regulator herbicides. Weed Technol. 27:454-458.

*Barnett, K. A., A. S. Culpepper, A. C. York and **L. E. Steckel**. 2013. Palmer amaranth (*Amaranthus palmeri*) control with glufosinate by fluometuron to WideStrike cotton. Weed Technol. 27:291-297.

*Barnett, K. A. and **L. E. Steckel**. 2013. Giant ragweed (*Ambrosia trifida L.*) competition in cotton (*Gossypium hirsutum L.*). Weed Sci. 61:543-548.

Riar, D. S., J. K. Norsworthy, **L. E. Steckel**, D. O. Stephenson, IV and J. Bond. 2013. Consultant perspectives on weed management needs in Midsouth United States cotton: a follow up survey. Weed Technol. 27:788-797.

Riar, D. S., J. K. Norsworthy, **L. E. Steckel**, D. O. Stephenson, IV, T. W. Eubank, J. Bond and

R. C. Scott. 2013. Adoption of best management practices for herbicide-resistant weeds in midsouthern United States cotton, rice and soybean. *Weed Technol.* 27:788-797.

Merchant, R. M., L. M. Sosnoskie, A. S. Culpepper, **L. E. Steckel**, A. C. York and B. Braxton. 2013. Weed response to 2,4-D Amine, 2,4-DB and dicamba applied alone or with glufosinate. *Cotton Sci.* 17:212-218.

*Barnett, K. A., A. S. Culpepper, A. C. York and **L. E. Steckel**. 2013. Evaluation of WideStrike cotton to repeated applications glufosinate at various application timings. *Weed Technol.* 27:778-787.

Steckel, L. E., S. D. Stewart and S. J. Steckel 2015. Corn injury with post-applied HPPD inhibiting based premix herbicides with foliar- and in-furrow insecticides. *Weed Technol.* 29:18-23.

Owen, M. D. K., H. J. Beckie, J. Y. Leeson, J. K. Norsworthy and **L. E. Steckel**. 2015. Integrated pest management and weed management in the US and Canada. *Pest Management Science.* 71:357-376.

Mueller, T. C., B. W. Boswell, S. S. Mueller and **L. E. Steckel**. 2014. Dissipation of fomesafen, saflufenacil, sulfentrazone and flumioxazin from a Tennessee soil under field conditions. *Weed Sci.* 62:664-671.

Price, A. J., C. D. Monks, A. S. Culpepper, L. M. Duzy, J. A. Kelton, M. W. Marshall, **L. E. Steckel**, L. M. Sosnoskie and R. L. Nichols. 2015. High residue cover crops alone or with strategic tillage to manage glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in Southeastern Cotton (*Gossypium hirsutum*). *Journal of soil and water conservation.* 71:1-11.

*Crow, W. D., **L. E. Steckel**, T. C. Mueller and R. M. Hayes. 2015. Management of large glyphosate resistant Palmer amaranth (***Amaranthus palmeri***) in corn. *Weed Technol*

*Crow, W. D., **L. E. Steckel**, T. C. Mueller and R. M. Hayes. 2015. Evaluation of POST-harvest herbicides applications for seed prevention of glyphosate resistant Palmer amaranth (***Amaranthus palmeri***). *Weed Technol* 29:405-411.

*Wiggins, M. S., A. T. McClure, R. M. Hayes and **L. E. Steckel**. 2015. Integrating cover crops and POST herbicides for glyphosate-resistant Palmer Amaranth (*Amaranthus palmeri*) control in corn. *Weed Technol* 29:412-418.

Huffman, J.L., C.W. Riggins, **L. E. Steckel** and P. J. Tranel. The EPSPS Pro106Ser substitution solely accounts for glyphosate resistance in a goosegrass (*Eleusine indica*) population from Tennessee, United States. *Journal of Integrative Agriculture.* *Journal of Integrative Agriculture* 15:1304-1312.

Schwartz, L.M., J.K. Norsworthy, B.G. Young, K.W. Bradley, G. Kruger, V. Davis, **L.E. Steckel** and M. Walsch. 2016. Waterhemp (*Amaranthus tuberculatus*) and Palmer amaranth (*Amaranthus Palmeri*) seed production retention at soybean (*Glycine max*) harvest. *Weed Technol* 30:280-283.

Butts, T.R., J. K. Norsworthy, G.R. Kruger, L.D. Sandell, B.G. Young, **L.E. Steckel**, M.M. Loux, K.W. Bradley, S.P. Conley, D.E. Stoltenberg, F.J. Arriaga and V.M. Davis. Management of pigweed (*Amaranthus spp.*) in glufosinate-resistant soybean in the Midwest and Midsouth. *Weed Technol* 30:355-365.

Meyer, C. J. J. K. Norsworthy, G.R. Kruger, M. M. Loux, B.G. Young, **L.E. Steckel**, M.M. Loux, K.W. Bradley, M. T. Bararpour and V.M. Davis. 2016. Early season palmer amaranth and

waterhemp control from preemergence programs utilizing HPPB-inhibiting and auxinic herbicides in soybean. *Weed Technol* 30: 67-75.

Farmer, J. A., K. W. Bradley, B. G. Young and L. E. Steckel. 2017. Influence of tillage method on management of Amaranthus species in soybean. *Weed Technol* 31:10-20.

Giacomini, D., A. Umphres, Nie, H., T. Mueller, L. Steckel, B. Young, R. Scott and P. Tranel. 2017. Two new PPX2 mutations associated with resistance, to PPO-inhibiting herbicides in *Amaranthus palmeri*. *Pest Management Sci.* 73:1559-1563.

Womac, A. R., G. V. Melnichenko, L. E. Steckel, G. Montgomery and R. M. Hayes. 2017. Spray tip configurations with pulse-width modulation for glufosinate-ammonium deposits in Palmer amaranth (*Amaranthus palmeri*). *Transactions of the ASABE*, 60(4):1223-1136.

Wiggins, M. S., R. M. Hayes, R. L. Nichols and L. E. Steckel. 2017. Cover crop and postemergence herbicide integration for Palmer amaranth control in cotton. *Weed Technol* 31:348-355.

Loux, M. B., B. G. Young, W. Johnson, K. Bradley, A. Doobles, L. E. Steckel. 2017. Influence of cover crop on management of amaranthus sp. In glyphosate- and glufosinate- resistant soybean. *Weed Technol* 31:487-495.

Montgomery, G. B., J. A. Treadway and L. E. Steckel. 2017. Effect of time of day of application of 2,4-D, dicamba, glufosinate, paraquat and saflufenacil on horseweed (*Conyza Canadensis*) control. *Weed Technol* 31:550-556.

Vineyard, C.J., H. Kelly, L. Steckel and S. Stewart. 2017. Potential interaction of pre-emergence herbicides and the efficacy of insecticide and fungicide seed treatment in cotton. *Cotton Sci.* 21:284-295.

Umphres, A.M., L.E. Steckel and T. C. Mueller. 2018. Control of protoporphyrinogen oxidase inhibiting herbicides resistant and susceptible Palmer amaranth (*Amaranthus palmeri*) with soil-applied protoporphyrinogen oxidase-inhibiting herbicides. *Weed Technol* 32:95-100.

Nandula, V., G. Montgomery, D. A. Giacomini, M. Jugula, J. Ray, J. Bond, L. Steckel and P. Tranel. 2018. Glyphosate-resistant *Echinochloa colona* from Mississippi and Tennessee: confirmation and resistance mechanisms. *Weed Sci.* (In review).

Mueller, T. C., L. E. Steckel and J. D. Copeland. 2018. Dicamba emissions following application appear related to temperature, formulation and adding glyphosate to spray mixture. *J. of Pest Mgt. Sci.* (In review)

Copeland, J.D., D. A. Giacomini, P.J. Tranel, G. B. Montgomery and L. E. Steckel. 2018. Distribution of PPX2 mutations conferring PPO-inhibiting resistance in Palmer amaranth populations of Tennessee. *Weed Technol*: 32: (In review).

* Denotes graduate students under my direction.

Other Publications

Steckel, L.E. 2004. Cover pictures for *Journal of Weed Technology*, Volume 18, Number 4.

Steckel, L.E. 2011. Cover pictures for *Journal of Weed Science*, Volume 59, Number 4.

C-2.2 Book Chapters

Steckel, L. E., C. L. Main and T. C. Mueller. 2010. Glyphosate-Resistant Horseweed the United States. *In*. Nandula, V. K., ed. September 2010. *Glyphosate Resistance in Crops and Weeds*:

History, Development, and Management. p. 185-194. Hoboken, New Jersey: John Wiley and Sons, Inc.

C-2.3 Extension Publications

C-2.3.1 Special Publications (25 Total)

Steckel, L. E. and G. K. Breeden. 2003. 2004 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E., P. A. Brawley and T. C. Mueller. 2004. Weed Science Research 2004. SP:R11-2818-012-001-04.

Patrick, C. R., M. A. Thompson and **L. E. Steckel**. 2004. Controlling the alfalfa weevil in Tennessee. PB 1033.

Steckel, L. E., T. C. Mueller, M. A. Thompson, C. C. Craig, N. Rhodes, B. Brown, R. M. Hayes and B. D. Sims. 2004. 2005 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E., P. A. Brawley and T. C. Mueller. 2005. Weed Science Research 2005. SP:R11-2818-012-001-05.

Steckel, L. E., T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2005. 2006 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E., P. A. Brawley and T. C. Mueller. 2006. Weed Science Research 2006. SP:R11-2818-012-001-06.

Patrick, C. R., M. A. Thompson and **L. E. Steckel**. 2006. Controlling the alfalfa weevil in Tennessee. PB 1033.

Steckel, L. E. 2006. University row crop weed specialist has weed management tips for cotton producers. Monsanto Project Weed Tip Box. 27232-1.

Steckel, L. E., T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2006. 2007 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E. 2006. University row-crop specialist has weed management tips for cotton producers. Monsanto Special Publication 3E-9B-06-1886.

Mills, K., S. Culpepper, A. York, K. Smith and **L. Steckel**. 2006. Managing resistance to protect the value of Flex cotton. Syngenta Cotton Bulletin GS 406.51216. 12/06

Steckel, L. E., and P. A. Brawley. 2007. Weed Science Research 2007. SP:R11-2818-012-017-07.

Steckel, L. E., T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2007. 2008 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

C. D. Garland, G. E. Bates, C. D. Clark, D. A. Dalton, D. C. Gerloff, J. J. Goddard, K. J. Goddard, L. Howard, P. D. Keyser, M. A. Newman, D. R. Perrin, **L. E. Steckel**, F. Stribling, D.

- D. Tyler, M. D. Wilcox and J. B. Wills. 2007. Growing and harvesting switchgrass for ethanol production in Tennessee. SP701-A.
- Armel, G., G. N. Rhodes, W. Klingeman, **L. E. Steckel** and G. Breeden. 2008. Common commercial pre-packaged herbicide mixtures. PB 1775.
- Main, C. L., S. Stewart, **L. E. Steckel** and M. Newman. 2008. Wheat production in Tennessee. PB 576.
- Main, C. L., S. Stewart, **L. E. Steckel**. 2008 Cotton production in Tennessee. PB 1514.
- Main, C. L., M. Newman, S. Stewart and **L. E. Steckel**. 2009 Wheat production in Tennessee. PB 576.
- Nichols, R. L., M. G. Burton, A. S. Culpepper, C. L. Main, M. W. Marshall, T. C. Mueller, J. K. Norsworthy, R. C. Scott, K. L. Smith, **L. E. Steckel**, and A. C. York. 2008. Distribution and Impact of Glyphosate-Resistant Palmer amaranth (*Amaranthus palmeri*) in the Southern United States. U.S. Resistant Pest Management Newsletter 17(2) 8-9. Spring 2008.
- Nichols, R. L., J. Bond, A.S. Culpepper, D. Dodds, V. Nandula, C.L. Main, M.W. Marshall, T.C. Mueller, J.K. Norsworthy, A. Price, M. Patterson, R.C. Scott, K.L. Smith, **L.E. Steckel**, D. Stephenson, D. Wright and A.C. York. 2009. Glyphosate-Resistant Palmer Amaranth (*Amaranthus palmeri*) Spreads in the Southern United States (U.S.). Resistant Pest Management Newsletter 18 (2) (Spring 2009): 8-10.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2008. 2009 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2010. 2011 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2011. 2012 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2012. 2013 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and T. B. Raper. 2013. 2014 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2014. 2015 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and T. B. Raper. 2015. 2016 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.
- Steckel, L. E.**, T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and T. B. Raper. 2016. 2017 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E., T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and T. B. Raper. 2017. 2018 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580.

Steckel, L. E., and P. A. Brawley. 2012. Weed Science Research 2012. SP:R11-2818-012-001-12.

Steckel, L. E., and P. A. Brawley. 2013. Weed Science Research 2013. SP:R12-5110-184-010-13.

Steckel, L. E., and P. A. Brawley. 2014. Weed Science Research 2014. SP:R11-2615-590-015-14.

C-2.3.2 Web Publications (11 Total)

Steckel, L. E. 2004 - Present. Weeds Home Page on utcrops.com@ <http://www.utcrops.com/>

Steckel, L. E. and T. C. Mueller. 2005. Palmer Amaranth (*Amaranthus palmeri*) Showing Reduced Sensitivity to Glyphosate. <http://www.utextension.utk.edu/fieldCrops/weeds/Tolerant%20Palmer%20Update.htm>

Steckel, L. E., T. C. Mueller, M. A. Thompson, N. Rhodes, R. M. Hayes, B. Brown and B. D. Sims. 2007 Weed Control Manual for Tennessee Field Crops, Forage Crops, Farm Ponds and Harvest Aids. PB 1580. <http://weeds.utk.edu/rcmanual.htm>

Nichols, R. L., **L. E. Steckel**. 2008. Distribution and impact of glyphosate-resistant Palmer amaranth (*Amaranthus Palmeri*) in the southern United States. Resistant Pest Management Newsletter 17(2):8-9.

G. Armel, G. N. Rhodes, W. Klingeman, **L. E. Steckel** and G. Breeden. 2009. Common commercial pre-packaged herbicide mixtures. PB1755. <http://www.utextension.utk.edu/publications/pbfiles/PB1775.pdf>

Steckel, L. E. 2011. Identifying and managing resistant weeds Video <HTTP://WWW.YOUTUBE.COM/WATCH?V=GkP486q6LoU>

Steckel, L. E. 2012. Double edge sword of pre emergence herbicides. Cotton focus. Video <HTTP://WWW.YOUTUBE.COM/WATCH?V=4v2BHSnWCVo>

Steckel, L. E. 2013. Spray attention: Pre & Post-Emergence vs Post-Emergence. Video. 78 Views. <http://www.youtube.com/watch?v=wkrEKFwKKcg>

Steckel, L. E. 2013. Spray attention: Time of day application effect on Palmer control. Video 71 Views. <http://www.youtube.com/watch?v=zbydMk-bG7g>

Steckel, L. E. 2013. Spray attention: Population and row width effect on Palmer control. Video. 87 views. <http://www.youtube.com/watch?v=u6zeOsHGbyQ>

Steckel, L. E. 2013. Spray attention: Cover crop evaluation of Palmer amaranth control. Video. 77 views. <HTTP://WWW.YOUTUBE.COM/WATCH?V=MvBTH7cTXPK>

Loux, M., W. Johnson and **L. Steckel**. Palmer amaranth: a threat to crop production in Ohio and Indiana. Video. 821 views. <http://www.youtube.com/watch?v=5Cn5boOP4t8>

McClure, A. M., L. E. Steckel and B. Brown. 2014. Converting switchgrass fields into soybean production. W313.

C-2.3.3 Web Based FACT Sheets (25 Total)

Steckel, L. E. 2004. Pigweeds in Tennessee. W068.
<http://www.utextension.utk.edu/publications/wfiles/W068.pdf>

Steckel, L. E. 2004. Early season pigweed identification. W069.
<http://www.utextension.utk.edu/publications/wfiles/W069.pdf>

Steckel, L. E., C. C. Craig and M. A. Thompson. 2004. Cleaning plant growth regulator (PGR) herbicides out of field sprayers. W071.
<http://www.utextension.utk.edu/publications/wfiles/W071.pdf>

Steckel, L. E. 2004. Mature pigweed identification. W072.
<http://www.utextension.utk.edu/publications/wfiles/W072.pdf>

Steckel, L. E. 2005. Pokeweed. W105.
<http://www.utextension.utk.edu/publications/wfiles/W105.pdf>

Steckel, L. E. 2005. Horseweed. W106.
<http://www.utextension.utk.edu/publications/wfiles/W106.pdf>

Steckel, L. E. 2005. Broadleaf Signalgrass. W107.
<http://www.utextension.utk.edu/publications/wfiles/W107.pdf>

Steckel, L. E. 2005. Goosegrass. W116.
<http://www.utextension.utk.edu/publications/wfiles/W116.pdf>

Steckel, L. E. 2005. Johnsongrass. W117.
<http://www.utextension.utk.edu/publications/wfiles/W117.pdf>

Steckel, L. E. 2005. Hophornbeam Copperleaf. W120.
<http://www.utextension.utk.edu/publications/wfiles/W120.pdf>

Steckel, L. E. 2006. Pitted Morningglory. W124.
<http://www.utextension.utk.edu/publications/wfiles/W124.pdf>

Steckel, L. E. 2006. Sicklepod. W125.
<http://www.utextension.utk.edu/publications/wfiles/W125.pdf>

Steckel, L. E. and N. Rhodes. 2006. Perilla Mint. W135.
<http://www.utextension.utk.edu/publications/wfiles/W135.pdf>

Steckel, L. E. 2006. Yellow Nutsedge. W136.
<http://www.utextension.utk.edu/publications/wfiles/W136.pdf>

Steckel, L. E. 2007. Giant Ragweed. W119.
<http://www.utextension.utk.edu/publications/wfiles/W119.pdf>

Steckel, L. E. 2007. Wild Garlic. W157.
<http://www.utextension.utk.edu/publications/wfiles/W157.pdf>

Steckel, L. E. 2007. Purple Deadnettle and Henbit. W165.
<http://www.utextension.utk.edu/publications/wfiles/W165.pdf>

Steckel, L. E. 2007. Velvetleaf. W167.
<http://www.utextension.utk.edu/publications/wfiles/W167.pdf>

Steckel, L. E. and M. A. Thompson. 2007. Replanting corn in a failed Roundup Ready Corn

Stand. W164.

<http://www.utextension.utk.edu/publications/wfiles/W164.pdf>

Thompson, M. A., A. Wszelaki and **L. E. Steckel**. 2007. Using Accent herbicide for weed control in sweet corn. W166.

<http://www.utextension.utk.edu/publications/wfiles/W166.pdf>

Thompson, M. A. and **L. E. Steckel**. 2007. Controlling volunteer cotton in soybeans. W168.

<http://www.utextension.utk.edu/publications/wfiles/W168.pdf>

Steckel, L. E. 2008. Cutleaf Eveningprimrose. W209.

[HTTP://WWW.UTEXTENSION.UTK.EDU/PUBLICATIONS/WFILES/W209.PDF](http://www.utextension.utk.edu/publications/wfiles/W209.pdf)

Steckel, L. E., R. Scott, J. Kelley, C. L. Main and R. Williams 2009. Sencor tolerant ratings for selected wheat varieties. W213.

<http://www.utextension.utk.edu/publications/wfiles/W213.pdf>

J. Brosnan, **L. E. Steckel** and G. Armel. 2009. EPA decision on the use of organic arsenical herbicides for weed management. W222.

<http://www.utextension.utk.edu/publications/wfiles/W222.pdf>

Thompson, A and **L. E. Steckel**. 2009. Sunflower product for dove fields. W211.

<http://www.utextension.utk.edu/publications/wfiles/W211.pdf>

Brown, B., A. McClure and **L. Steckel**. 2014. Converting switchgrass fields into soybean production. W313.

C-2.3.4 Contributed to Newsletter Articles	Year	# of Articles	Downloaded-Mailed
Pioneer (Walking Your Fields)	1989-1999	120	---

C-2.3.5 News letter/blog publications (335 total)

Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2004	26	1,967*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2005	22	1,722*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2006	23	1,800*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2007	28	>2,000*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2008	26	>5,000*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2009	24	>5,000*
Integrated Pest Management Newsletter http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/newsletters/newsletters_archive.htm	2010	29	>5,000*

*estimate of Ag Fax plus UTCrops downloads, email and direct mail

UT Crops News Blog	2011	21	>20,000**
UT News News Blog	2012	28	>25,792**

UT News News Blog	2013	27	>24,865**
UT News News Blog	2014	24	>24,009**
UT News News Blog	2015	28	>26,109**
UT News News Blog	2016	32	>36,000**
UT News News Blog	2017	34	>38,000**

****number of hits from google metrics**

C-2.4 Participation in Seminars, Workshops and Experiment Station Field Days

C-2.4.1 Seminars and Workshops (36 Total)

Steckel, L. E. "Aspects of common waterhemp emergence, interference and management". Monsanto Inc. St. Louis, MO. April 24, 2003. (Invited paper)

Steckel, L. E. "Weed control update". Nashville, TN. Tennessee Agricultural Production Association Meeting. February 4, 2004. (Invited paper)

Steckel, L. E. and R. M. Hayes. "Impact of glyphosate-resistant horseweed on conservation tillage in the North Delta Region". Cotton Incorporated. Crop Management Seminar. Tunica, MS. November 10, 2004. (Invited paper)

Steckel, L. E. "Management of glyphosate-resistant horseweed in cotton". DuPont Inc. Memphis, TN. March 3, 2005. (Invited paper)

Steckel, L. E. "Burndown of glyphosate-resistant horseweed in cotton". Syngenta Corp. Memphis, TN. March 4, 2005. (Invited paper)

Steckel, L. E. "Management research update on Roundup Ready Flex" Monsanto Inc. Memphis, TN. July 27, 2005. (Invited paper)

Steckel, L. E. and J. Bradford. "Glyphosate-resistant horseweed, long term management" Regional Cotton Pest Management Workshop. Memphis, TN. November 1 and 2, 2005. (Invited paper)

Steckel, L. E. "Resistance weed issues in Roundup Ready cotton" Mississippi State University Cotton Short Course. Starkville, MS. November 30, 2005. (Invited paper)

Gwathmey, O. and **L. Steckel**. 2006. Producing cotton in 15- and 30-inch rows. Invited talk, Deere & Company Field Tour. Fullen Farms, August 16, 2006, Ashport TN. ~40 attendees.

Steckel, L. E. "Weed control in 15" row cotton" Deere & Company field tour. Fullen Farms. Ashport, TN. ~40 attendees August 16, 2006. (Invited)

Gwathmey, C.O. and **L.E. Steckel**. 2006. Producing cotton in 15- and 30-inch rows. Invited talk, National Cotton Council Leadership Class, Research & Education Center at Milan, September 27, 2006, Milan TN. ~25 attendees.

Steckel, L. E. "Identification and management of horseweed and Palmer amaranth" Monsanto Inc. Union City, TN. August 3, 2006. (Invited paper)

Steckel, L. E. “Glyphosate resistant horseweed management” Monsanto Inc. Union City, TN. August 4, 2006. (Invited paper)

Steckel, L. E. “Syngenta glyphosate-resistance workshop” October 9-11, 2006. (Lead a short presentation on resistance management and consulted with other faculty and industry personnel). (Invited)

Steckel, L. E. “Glyphosate-resistant horseweed and pigweed impact on cotton weed management and costs” Crop Management Seminar. Cotton Incorporated. Memphis, TN. November 1, 2006. (Invited paper)

Steckel, L. E. “Glyphosate-resistant weed management” Tennessee Farmers COOP Seminar. Nashville, TN. December 7, 2006. (Invited paper)

Steckel, L. E. “Management of glyphosate-resistant horseweed in cotton”. DuPont Inc. Memphis, TN. March 1, 2007. (Invited paper)

Steckel, L. E. “Management of glyphosate-resistant horseweed with Dicamba”. Oliver Inc. Memphis, TN. March 2, 2007. (Invited paper)

Culpepper, S., A, York and **L. E. Steckel.** “Status report on glyphosate-resistant weeds – southern cropping systems”. National glyphosate stewardship symposium. St. Louis, MO. March 20, 2007. (Invited paper).

Steckel, L. E. and R. Montgomery. “Management of dicamba and roundup tolerant soybeans”. Monsanto Inc. AgriCenter, Memphis, TN. July 19, 2007. (Invited)

Steckel, L. E. Managing glyphosate resistant Palmer amaranth roundtable. Little Rock, AR. December 17, 2008.

Steckel, L. E. “Glyphosate-resistant Palmer amaranth update”. Monsanto Inc. Union City, TN. August 7, 2008. (Invited)

Steckel, L. E. Orchestrate your opportunities. Weeds aspects of crop rotation. 2008. Beltwide Cotton Conference. Nashville, TN. January 10, 2008.

Steckel, L. E. and K. Smith. Glyphosate-resistant weed management in cotton. 2009. Beltwide Cotton Conference. San Antonio, TX. January 11, 2009.

Steckel, L. E. and K. Smith. Glyphosate-resistant weed management in cotton. 2010. Beltwide Cotton Conference. New Orleans, LA. January 9, 2010.

Steckel, L. E. and Ken Smith. 2011. Answers for your university weed scientists. Beltwide cotton conference. Invited presentation. Atlanta, GA. January 4, 2011. (Invited).

Steckel, L. E. University of Illinois weed resistance field day. “Glyphosate-resistant weed management in the south”. July 12, 2011. Invited presentation. Presented 6 times. About 200 attendees. (Invited).

Steckel, L. E. Oklahom State University No-till Conferece. “Glyphosate-resistant weeds: Lessons learned in Tennessee”. July 22, 2011. Invited presentation. About 400 attendees. (Invited).

Steckel, L. E. University of Missouri weed resistance field day. “Glyphosate-resistant weed management in the south”. August 2, 2011. Invited presentation. Presented 6 times. About 200

attendees. (Invited).

Steckel, L. E. Southern Illinois University weed resistance field day. "Glyphosate-resistant weed management in the south". August 9, 2011. Invited presentation. Presented 6 times. About 200 attendees. (Invited).

Steckel, L. E. 2011. Glyphosate-resistant weeds: Lessons learned in Tennessee. John Deere Weed Resistance Workshop. Kansas City, MO. Sept 19, 2011. (Invited).

Steckel, L. E. 2011. Glyphosate-resistant weeds: Lessons learned in Tennessee. University of Minnesota Crop Pest Management Short Course. Minneapolis, MN. Dec 15, 2011. (Invited).

Steckel, L. E. 2012. The changing arsenal of weed control. Beltwide cotton conference. Invited presentation. Atlanta, GA. January 3, 2012. (Invited).

Steckel, L. E. 2012. The double edged sword of pre emergence herbicides. Beltwide cotton conference. Invited presentation. Atlanta, GA. January 4, 2012. (Invited).

Steckel, L. E. 2012. New Technologies on the Horizon. BASF Science Behind the Future of Weed Control. Nashville, TN. February, 29, 2012. (Invited).

Steckel, L. E. 2012. Glyphosate-resistant weeds: Lessons learned in Tennessee. Bayer Crop Science. Nashville, TN. February, 29, 2012. (Invited).

C-2.4.2 Experiment Station Field Day Presentations (95 Total)

Steckel, L. E. and J. Parker. July 22, 2004. Palmer pigweed control in corn and soybeans. 2004 Milan No-till Field Day Tour Report pg 21. (Twenty minute presentation on field day tour, presented 8 times during the field day).

Steckel, L. E. 2004 Weed Tour. June 17, 2004. (Provided 3 - overview tour of weed management research).

Steckel, L. E. 2005 Weed Tour. June 11, 2005. (Provided 3 - overview tour of weed management research).

Steckel, L. E. "18th Annual Summer Celebration" West Tennessee Research and Education Center. July 13, 2006. (Gave 3 overview tours of the West Tennessee Research and Education Center numerous times during the field day). Jackson, TN.

Steckel, L. E. and A. Kendig. July 27, 2006. Identification and management of pigweeds. 2006 Milan No-till Field Day Tour Report pg 11-12. (Twenty minute presentation on field day tour, presented 8 times during the field day).

Steckel, L. E. 2006 Weed Tour. June 12, 2006. (Provided 3 hour overview tour of weed management research).

Steckel L. E. 2006. Glyphosate-resistant horseweed management. Invited talk, National Cotton Council Leadership Class, Research & Education Center at Milan, 27 Sept. 2006, ~25 attendees. Milan TN.

Steckel, L. E. "19th Annual Summer Celebration" July 12, 2007. (Presented 1 overview tour of the West Tennessee Research and Education Center). Jackson, TN.

Steckel, L. E. and M. A. Thompson. . "19th Annual Summer Celebration" July 12, 2007. (Presented a 15 minute presentation on "Sprayers, spreaders and more" 3 times during the day).

Jackson, TN.

Steckel, L. E. 2007 Weed Tour. June 16, 2007. (Provided 3 hour overview tour of weed management research).

Steckel, L. E., R. Vidrine, D. Scroggs and D. Miller. 2007. "Weed competition and resistance issues". 6th Annual Dean Lee Research Station Field Day. Louisiana State AgCenter. Alexandria, LA. August 23, 2007. (Fifteen minute presentation on field day tour, presented 3 times during the field day). (Invited)

Steckel, L. E., R. Scott and R Hayes. July 24, 2008. New herbicide-resistant traits on the horizon: Liberty Link Soybeans and Dicamba/Roundup Tolerant Soybeans. 2008 Milan No-till Field Day Tour Report pg 12. (Twenty minute presentation on field day tour, presented 8 times during the field day).

Steckel, L. E. "20th Annual Summer Celebration" July 10, 2008. (Provided 3 overview tours of West Tennessee Research Station).

Steckel, L. E. 2008 Weed Tour. June 13, 2008. (Provided 3 hour overview tour of weed management research).

Steckel, L. E. "21th Annual Summer Celebration" July 11, 2009. (Provided 3 overview tours of West Tennessee Research Station).

Steckel, L. E. "22nd Annual Summer Celebration" July 8, 2010. (Provided 3 overview tours of West Tennessee Research Station).

Steckel, L.E. and R. Scott. July 22, 2008. New herbicide resistant traits on the horizon. 2008 Milan No-till Field Day Tour Report pg 23. Presented 8 times.

Waggoner, B., R. Hayes and **L. E. Steckel.** July 22, 2010. What was once old is now new again. 2010 Milan No-till Field Day Tour Report pg 21. Presented 6 times.

Steckel, L. E. "23rd Annual Summer Celebration" July 17, 2010. (Provided 2 overview tours of West Tennessee Research Station).

Steckel, L. E. "24nd Annual Summer Celebration" July 11, 2011. (Provided 4 overview tours of West Tennessee Research Station).

Steckel, L. E. "25nd Annual Summer Celebration" July 12, 2012. (Provided 2 overview tours of West Tennessee Research Station).

Steckel, L. E. "Glyphosate-resistant weed management: present and future" July 26, 2012. 2012 Milan No-till Field Day Tour Report pg 21. Presented 7 times.

Steckel, L. E. "Glyphosate-resistant Palmer amaranth Management in cotton" July 26, 2014. 2014 Milan No-till Field Day Tour Report pg 18. Presented 6 times.

Steckel, L. E. "Glyphosate-resistant Palmer amaranth Management in soybean" July 28, 2016. 2016 Milan No-till Field Day Tour Report pg 23. Presented 6 times.

C-2.4.3 Experiment Station Field Day Participation (12 Total)

Steckel, L. E. "16th Annual Summer Celebration". West Tennessee Research and Education Center. July 14, 2004. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "17th Annual Summer Celebration" West Tennessee Research and Education Center. July 14, 2005. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "18th Annual Summer Celebration" West Tennessee Research and Education Center. July 14, 2006. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Tyler, D., C. Walker and **L. E. Steckel**. July 27, 2006. Producing switchgrass: A summary of the findings from UT's research projects. Research & Education Center at Milan. 2006 Milan No-till Field Day Tour Report pg 3-4.

Mueller, T. C., A. Bailey and **L. E. Steckel**. July 27, 2006. Weed management in soybeans. 2006 Milan No-till Field Day Tour Report pg 11.

Gwathmey, O., **L. E. Steckel** and J. Parker. July 27, 2006. Producing Cotton in 15- and 30-inch Rows. Research & Education Center at Milan. 2006 Milan No-till Field Day Tour Report pg 6-7. Milan, TN.

Steckel, L. E. "19th Annual Summer Celebration" July 12, 2007. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "20th Annual Summer Celebration" July 10, 2008. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "21th Annual Summer Celebration" July 11, 2009. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "22th Annual Summer Celebration" July 8, 2010. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "23th Annual Summer Celebration" July 17, 2010. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "24nd Annual Summer Celebration" July 11, 2011. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "25nd Annual Summer Celebration" July 12, 2012. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "25nd Annual Summer Celebration" July 13, 2013. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "25nd Annual Summer Celebration" July 10, 2014. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "26nd Annual Summer Celebration" July 9, 2015. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

Steckel, L. E. "27nd Annual Summer Celebration" July 11, 2016. (Provided plant ID services in the plant diagnostic station). Jackson, TN.

C-2.5 Papers Presented at Technical Professional Meetings (188 Total)

(*denotes person making presentation)

***Steckel, L. E.**, M. S. DeFelice and W. B. Brown. 1987. Weed control in grain sorghum, corn, and soybeans with BAS-514. Proc. North Cent. Weed Sci. Soc. 42:54.

- ***Steckel, L. E.**, M. S. DeFelice and B. D. Sims. 1989. Integrating reduced rates of herbicides and management practices for weed control in soybeans. Proc. Southern Weed Sci. Soc. 42:39.
- ***Steckel, L. E.**, C. L. Sprague and A. G. Hager. 2000. Waterhemp control in corn with preemergence and split applications of soil-applied herbicides. Proc. North Cent. Weed Sci. Soc. 55:93.
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Post-harvest pigweed control could pay off next year. August 3, 2012.

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Managing corn, cotton and soybean replants. May 30, 2013.

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<http://southeastfarmpress.com/grains/two-pass-weed-control-programs-corn-providing-better-weed-control>

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Busy wheat harvest has allowed pigweed to thrive in cotton, soybeans. June 28, 2013.

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Tennessee weed control hampered by cool temperatures. July 7, 2013.

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Palmer amaranth regrowing from PPO herbicide application – now what? July 8, 2013.

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Small Palmer amaranth escapes causing problems in Tennessee soybeans. July 11, 2013
<http://southeastfarmpress.com/soybeans/small-palmer-amaranth-escapes-causing-problems-tennessee-soybeans>
Late-planted Tennessee cotton struggles to reach full potential. August, 8, 2013.
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Game plan to win against pigweed in southern soybeans. Dec 3. 2013.
<http://southeastfarmpress.com/soybeans/game-plan-win-against-pigweed-southern-soybeans?page=2>
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New herbicide technologies still require proven cultural practices. Jan 15, 2015.
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Southwest Farm Press

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Southern Farmer(4)

Resistant pigweeds spreads across south. October, 2005.
New switchgrass research studies production in south. April, 2007.
Turning on the switch for the future. March, 2008.
Less tillage conserves farm profit. April, 2008.

SoybeanSouth

Mapping out spring herbicides. March, 2009.
Scout, spray early. March, 2010.
http://www.ricefarming.com/home/Soybean_South/issues/2010-03/2010_MarScout.html

Thrive magazine

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The Grower

Adopt healthy herbicide habits to avoid a pigweed heart attack. March 19 2012.
<http://www.thegrower.com/news/Adopt-healthy-herbicide-habits-to-avoid-a-pigweed-heart-attack--142931635.html?ref=635>

The Jackson Sun

Local crops hanging on despite record rain. April 27, 2004.

The Milan Mirror

Getting a handle on stubborn mareetail. July 22, 2008.

The Business Journal

Tennessee researchers confirm glyphosate-resistant pigweed. September 24, 2005.

The Humboldt Chronicle

Young farmers host meeting. March 22, 2006.

The Sentinel

Area farmers warned to expect arrival of resistant waterhemp. Nov 20, 2011.

Thrive

Season-long control with residuals pays off in more ways than one. 1Q, 2011.

The weed doctors. 1Q/2012

Defend your yields. 1Q/2014

C-2.6.2 Radio/TV/Online/DVD Video (>50 Total)

HeartLand AgNetwork (Radio)

Changes in weed management. January 17, 2008.

Late burndown challenges in cotton and soybeans. April 24, 2008.

Identification of glyphosate-resistant weeds. May 12, 2008.

Managing weeds with herbicides in short supply. June 16, 2008.

Causes and management of weed escapes. July 31, 2008.

Glyphosate-resistant Palmer update. Dec 3, 2008.

Resistant Pigweed-Tennessee Research. Oct 8, 2009.

<http://deltafarmpress.com/management/resistant-pigweed-tennessee-research>

Resistant weeds cost Tennessee growers \$200 million. Aug 9, 2011.

<http://deltafarmpress.com/management/2011-late-season-report-tennessee-weed-control>

KWKZ Charleston, MO (Radio)

Glyphosate-resistant weeds. Feb 26, 2011.

Weed management March 2, 2012

Rural Routes (Radio)

Agriculture and glyphosate resistant weed issues. July 7, 2011.

KWKZ Portageville (Radio)

Louisiana Agri-News Network (Radio)

Glyphosate-resistant horseweed management. August 3, 2006.

Cost of managing glyphosate-resistant weeds August 23, 2007.

Educational (DVD)

Liberty Link Soybeans and Ignite herbicide DVD March, 9, 2009.

Weed Resistance National Cotton Council DVD mailed to 1000 cotton growers. May 13, 2009.

Bayer: Pan America Weed Resistance Symposia. video. January, 2010.

<http://www.bayercropscience.us/news/respect-the-rotation#/VIDEOS/14>

Ag Web (Web Video Interview)

Manage weeds 30 days ahead of planting corn. Jan 20, 2012.

http://www.agweb.com/article/manage_weeds_30_days_ahead_of_planting_corn/

Palmer amaranth gains ground in the midwest. July 18, 2012.

http://www.agweb.com/farmjournal/farm_journal_corn_college/article/palmer_amaranth_gains_ground_in_the_midwest/

Ag Day (TV)

Weed management tips for Roundup Ready Flex cotton. November 6, 2006.

Grain conference report on glyphosate resistant Palmer amaranth. February 11, 2009.

Weed Resistance National Cotton Council DVD mailed to 1000 cotton growers. May 13, 2009.

Glyphosate-resistant Palmer pigweed. Several times in 2010.

Glyphosate-resistant weed update. Several times in summer of 2010.

Weed Resistance management. Several times in spring of 2011.

Weed warriors. April 20, 2011. <http://www.agweb.com/farmjournal/multimedia/focus-on-weed-research/>

Follow up on Weed Warriors. December 6, 2011.

ABC Channel 7 (TV)

Glyphosate-resistant Palmer amaranth in West Tennessee. On at 5:00 and 6:00 pm August 13, 2009 and 6:00 am August 14, 2009.

Cotton 24/7 (TV)

Resistance management. Jan 2010.

Market to Market (Iowa Public Television)

Farmers battle new enemies in the war on weeds.

http://www.iptv.org/mtom/story.cfm/feature/9155/mtom_20120223_3726/video

Webinar (Online/telephone)

Glyphosate - weed resistance status in southern cropping systems. March, 29, 2007.

Glyphosate - weed resistance status in southern cropping systems. February 26, 2008.

Glyphosate - weed resistance status in southern cropping systems. March, 11, 2008.

Glyphosate - weed resistance status in southern cropping systems. February 25, 2009.

Glyphosate - weed resistance status in southern cropping systems. March, 3, 2009.

Liberty Link Soybean Management. Online Educational module. May 15, 2009.

Sharpen – weed resistance management in southern cropping systems. December 15, 2009

Sharpen – weed resistance management in southern cropping systems. January 23, 2010

Glyphosate - weed resistance status in southern cropping systems. December 10, 2010.

Glyphosate - weed resistance status in southern cropping systems. December 15 am, 2010.

Glyphosate - weed resistance status in southern cropping systems. December 15 pm, 2010.

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Glyphosate - weed resistance status in southern cropping systems. February 3 pm, 2011.

Glyphosate - weed resistance status in southern cropping systems. February 10 pm, 2011

Glyphosate - weed resistance status in southern cropping systems. February 10 pm, 2012

Progressive farmer

A helping hand tackling resistance. Winter issue 2018

[http://dtnpf-digital.com/publication/?i=461828&p=64#{"page":62,"issue_id":461828}](http://dtnpf-digital.com/publication/?i=461828&p=64#{)

Farm Journal (Online)

Interview on glyphosate resistant weed status. March 26, 2009.

<http://www.youtube.com/watch?v=Aau-tFsrR28>

AR Extension (Online)

New technology and future of pigweed control. Jan 6, 2011.

http://www.youtube.com/watch?v=2_iJhIGtOJM

National Cotton Council (Online)

Field Day with Larry Steckel. March 5, 2011.

<http://www.cotton.org/tech/pest/steckel-field-day-video.cfm>

AgWired (Online)

<HTTP://WWW.ZIMMCOMM.BIZ/BASF/CC12-BASF-STECKEL.MP3>

C-2.7 Articles Appearing in In-House Publications

Third Thursday

UT confirms resistant pigweed in Tennessee. Oct, 2005.

Tennessee Land Life & Science

Resistant Weeds – Problems in the field in West Tennessee Oct, 2007.

Tennessee Land Life & Science
Palmer pigweed headaches. Oct, 2012.

C-2.8 Research Reports/Summaries (152 Total Written and Verbal)

C-3. Projects, Grants, Commissions, and Contracts

**(\$5,230,735 Total Funded Grants, Gifts, Contracts, In-kind Support to Dr. Steckels Program)
(\$11,464,312 Total with cooperators)**

C-3.1 Grants (\$1,729,228 Directly to Dr. Steckels Program) (\$7,962,805 Total with cooperators)

Sprague, C. L. and **L. E. Steckel**. "Competitiveness of late emerging waterhemp in corn and soybeans". Funded by Illinois Council of Food and Agricultural Research 2000-2003. (\$86,000; lead PI)*. Completed.

Hayes, R. M. and **L. E. Steckel**. "Weed management systems in cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2004. (\$25,000; lead PI). Completed.

Mueller, T. C. and **L. E. Steckel**. "Weed control systems in soybeans". Funded by Tennessee State Soybean Promotion Board. 2004. (\$15,000; lead PI). Completed.

Steckel, L. E., T. C. Mueller and R. Hayes. "Evaluation of late-season emerging Palmer Amaranth interference potential and control in soybeans". Funded by Tennessee State Soybean Board. 2004. (\$10,000; lead PI). Completed.

Steckel, L. E., M. A. Thompson and T. C. Mueller. "2,4-D Formulation and burndown application timing evaluation in soybeans". Funded by Tennessee State Soybean Promotion Board. 2004. (\$5,000; lead PI). Completed.

Steckel, L. E., T. C. Mueller and M. A. Thompson. "Comparison of Clarity, 2,4-D Amine and 2,4-D ester formulations for soybean safety while controlling horseweed." Funded by Tennessee State Soybean Promotion Board. 2005. (\$9,464; lead PI). Completed.

English, B. C., D. D. Tyler, C. D. Garland, K. J. Goddard, D. C. Gerloff, M. Walsh, R. K. Roberts and **L. E. Steckel**. "Switchgrass weed control research". Part of a (\$990,000) grant funded by the United States Department of Energy. 2005. My part: (\$30,000; conducted the weed research). Completed.

Mueller, T. C. and **L. E. Steckel**. "Weed control systems in soybeans". Funded by Tennessee State Soybean Promotion Board. 2005. (\$17,660; lead PI). Completed.

Steckel, L. E. and R. M. Hayes. "Weed management systems in cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2005. (\$24,800; lead PI). Completed.

Gwathmey, C. O. and **L. E. Steckel**. "Solid and skip row spacings for cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2005. (\$11,500; collaborated with the weed management research). Completed.

Thompson, M. A. and **L. E. Steckel**. "Improving harvest quality of indeterminate soybeans with harvest aids." Funded by Tennessee State Soybean Promotion Board. 2006. (\$3,000; collaborator) Completed.

Gwathmey, C. O. and **L. E. Steckel**. "Optimum plant densities for 15- and 30-inch picker cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2006. (\$11,334 collaborated with the weed management research). Completed.

Steckel, L. E. and R. M. Hayes. "Weed management systems in cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2006. (\$25,000; Lead PI). Completed.

Steckel, L. E., T. C. Mueller and M. A. Thompson. "Management of glyphosate resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2006. (\$12,926; Lead PI). Completed.

Gwathmey, C. O. and **L. E. Steckel**. "Optimum plant densities for 15- and 30-inch picker cotton". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$11,350; Conducted weed control ratings and writing of manuscript). Completed.

Steckel, L. E. "Cotton focus support". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$5,000). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$26,000). Completed.

Steckel, L. E., T. C. Mueller and M. A. Thompson. "Management of glyphosate resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2007. (\$12,926; Lead PI). Completed.

Mueller, T. C. and **L. E. Steckel**. "Giant ragweed management in no-till soybeans and confirmation of herbicide resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2007. (\$5,000; Lead PI). Completed.

Steckel, L. E. and M. A. Thompson. "Evaluating the competitive ability of glyphosate-resistant horseweed in soybeans." Funded by Tennessee State Soybean Promotion Board. 2007. (\$4,500; Lead PI). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$26,000). Completed.

Main, C. L. and **L. E. Steckel**. "Cotton focus support". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$5,000; Lead PI). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2007. (\$26,000). Completed.

Steckel, L. E. and K. Smith. "Glyphosate-resistant Palmer amaranth screen in Arkansas and Tennessee". The Cotton Foundation Grant Program. May 2007. \$20,000 (\$10,000; Lead PI). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2008. (\$26,000). Completed.

Steckel, L. E. and K. Smith. "Glyphosate-resistant Palmer amaranth screen in Arkansas and Tennessee". The Cotton Foundation Grant Program. Aug, 2008. \$20,000 (\$10,000 Lead PI). Completed.

Steckel, L. E., T. C. Mueller and M. A. Thompson. "Management of glyphosate resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2008. (\$8,500; Lead PI). Completed.

Mueller, T. C. and **L. E. Steckel**. "Giant ragweed management in no-till soybeans and confirmation of herbicide resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2008. (\$5,000; Lead PI). Completed.

Mueller, T. C. and **L. E. Steckel**. "Giant ragweed management in no-till soybeans and confirmation of herbicide resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2009. (\$5,000; Lead PI). Completed.

Steckel, L. E., T. C. Mueller and M. A. Thompson. "Management of glyphosate resistant weeds." Funded by Tennessee State Soybean Promotion Board. 2009. (\$21,500; Lead PI). Completed.

Steckel, L. E. "Weed manual printing support." Funded by Tennessee State Soybean Promotion Board. 2009. (\$3000). Completed.

Monks, D., C. Burmester, M. Patterson, A. Price S. Culpepper, **L. E. Steckel**, C. L. Main, M. Marshall, R. Nichols. 2009. Demonstrating Use of High-Residue, Cover-Crop Conservation-Tillage Systems to Control Glyphosate-Resistant Palmer Amaranth. United States Department of Agriculture-Natural Resource Conservation Service. Conservation Innovation Program. July, 2009. \$186,275.98 (my program \$21,928.78; Conducted TN location of this research) Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2009. (\$26,000). Completed.

McClure, A. M., S. D. Stewart, **L. E. Steckel**, C. L. Main and M. Newman. "2010 Row Crops Information Training for Agricultural Extension Agents in Tennessee". ARRA Innovative Extension Program. 2009. (\$4,000; collaborator). Completed.

McClure, A. M., S. D. Stewart, **L. E. Steckel**, C. L. Main and M. Newman. "2011 Row Crops Information Training for Agricultural Extension Agents in Tennessee". ARRA Innovative Extension Program. 2009. (\$4,000; collaborator). Completed.

Stewart, S. D., **L. E. Steckel**, A. M. McClure, E. Webster and M. Newman. "Row crop scout schools". ARRA Innovative Extension Program. 2009. (\$9,500; collaborator). Completed.

Steckel, L. E., N. Rhodes, G. Armel and J. Brosnan. In-service weed management in forages, turf, horticulture/right of ways and row crops. 2009. ARRA Innovative Extension. 2009. (\$10,500; collaborator). Completed.

Stewart, S. D., **L. E. Steckel**, C. L. Main, A. Catchot and G. Lorenz. 2008. Impact of early burndown timings on incidence of early season spider mites. The Cotton Foundation Grant Program. May 2007. (\$9,500; collaborator). Completed.

Steckel, L. E. and M. A. McClure. 2010 "Research and Extension Support for Management of Glyphosate-Resistant Weeds." Funded by Tennessee State Soybean Promotion Board. 2010. (\$37,700; Lead PI). Completed.

McClure, M. A., S. Stewart, R. Williams, M. Newman, S. Danehower and **L. E. Steckel**. 2010 "GoBeans- A soybean verification program for Tennessee." Funded by Tennessee State Soybean Promotion Board. 2009. \$17,000 (collaborator). Completed.

Steckel, L. E. and T. C. Mueller. 2010. "Support to purchase equipment to monitor off-target movement of dicamba and 2,4-D." Funded by Tennessee State Soybean Promotion Board. (\$16,800; Lead PI). Completed.

Steckel, L. E. and A. S. Culpepper. 2010. "Evaluation of Ignite Based Systems in Controlling Glyphosate Resistant Palmer Amaranth in Cotton." The Cotton Foundation Grant Program. Aug, 2010 \$20,000 (\$10,000; Lead PI). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2010. (\$22,334). Completed.

Steckel, L. E. and M. A. McClure. 2011. "Research and Extension Support for Management of Glyphosate-Resistant Weeds." Funded by Tennessee State Soybean Promotion Board. 2011. (\$50,000; Lead PI). Completed.

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2011. (\$22,348). Funded for 2012.

Steckel, L. E. and A. S. Culpepper. 2011. "Evaluation of Palmer amaranth competition on cotton yield and fiber quality." The Cotton Foundation Grant Program. Aug, 2012 \$20,000 \$10,000; Lead PI). Completed.

Steckel, L. E. T. C. Mueller and M. A. McClure. 2012. "Research and Extension Support for Management of Glyphosate-Resistant Weeds." Funded by Tennessee State Soybean Promotion Board. 2012. (\$50,000; Lead PI). Completed.

Steckel, L. E. M. Wiggins and D. Tyler. 2012. "Weed management with cover crops". Tennessee Association of Conservation Districts. (\$30,000; Lead PI). In progress.

Steckel, L. E. and M. Wiggins. 2012. "Demonstrate and Evaluate cover crop efficacy on Palmer amaranth." Cotton Incorporated Core Grant Program. April, 2012 (\$10,000; Lead PI). 2012

Steckel, L. E. "Glyphosate resistant horseweed and Palmer amaranth management". Funded by Cotton Incorporated Tennessee State Support Committee. 2012. (\$22,348). Funded for 2013.

Norsworthy, J. **Steckel, L. E.**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2012. \$710,000 (\$90,000). Funded for 2013.

Stewart, S. D., K. Vail, M. Newman, **L. E. Steckel**, A. McClure and C. Main. 2012. EIPM coordination and support program. \$185,962 (\$4,000). Funded for 2013.

Johnson, W., K. Smith, **Steckel, L. E.**, K. Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2012. \$420,000 (\$30,000). Funded for 2013.

Johnson, W., K. Smith, **L. E. Steckel**, K. Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2013. \$420,000 (\$30,000). Funded for 2014.

Norsworthy, J. **L. E. Steckel**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2013. \$710,000 (\$90,000). Funded for 2014.

Steckel, L. E. “Glyphosate resistant horseweed and Palmer amaranth management”. Funded by Cotton Incorporated Tennessee State Support Committee. 2012. (\$23,000). Funded for 2013.

Steckel, L. E. T. C. Mueller and M. A. McClure. 2013. “Research and Extension Support for Management of Glyphosate-Resistant Weeds.” Funded by Tennessee State Soybean Promotion Board. 2013. (\$50,000; Lead PI). In progress.

Steckel, L. E. “Tennessee cotton variety testing program”. Funded by Cotton Incorporated Tennessee State Support Committee. 2013. (\$25,000). Funded for 2014.

Steckel, L. E. “Glyphosate-resistant weed management”. Funded by Cotton Incorporated Tennessee State Support Committee. 2013. (\$23,000). Funded for 2014.

Stewart, S. D., K. Vail, H. M. Kelly, **L. E. Steckel**, A. McClure and C. Main. 2013. EIPM coordination and support program. \$125,000 (\$10,000). Funded for 2014.

Yin, Frank, D. Tyler, A. McClure, **L. E. Steckel**, M. Essington and L. Jaehoon. Long-term impacts of cover crops, crop rotations and conservation tillage systems on soil properties, nutrient cycling, soil water availability and crop productivity. \$213,469/year (\$634,000 3 year total) (\$31,722 3 yr total). Funded for 2014-2016.

Steckel, L. E. T. C. Mueller and M. A. McClure. 2014. “Research and Extension Support for Management of Glyphosate-Resistant Weeds.” Funded by Tennessee State Soybean Promotion Board. 2014. (\$50,000; Lead PI). In progress.

Bagavathiannan, M., J. Norsworthy and **L. E. Steckel**. 2014. “Developing and implementing a bio-economic decision-support tool for guiding integrated management of palmer amaranth. USDA-NIFA crop protection and pest management grants. (\$30,022). Funded for 2014-2015

Steckel, L. E. “Glyphosate resistant horseweed and Palmer amaranth management”. Funded by Cotton Incorporated Tennessee State Support Committee. 2013. (\$23,000). Funded for 2014.

Norsworthy, J. **L. E. Steckel**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2014. \$710,000 (\$90,000). Funded for 2015.

Johnson, W., K. Smith, **L. E. Steckel**, K. Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2014. \$420,000 (\$30,000). Funded for 2015.

Steckel, L. E. T. C. Mueller and M. A. McClure. 2014. “Research and Extension Support for Management of Glyphosate-Resistant Weeds.” Funded by Tennessee State Soybean Promotion Board. 2014. (\$50,000; Lead PI). In progress.

Stewart, S. D., K. Vail, H. M. Kelly, **L. E. Steckel**, A. McClure and T. Raper. 2014. EIPM coordination and support program. \$125,000 (\$10,000). Funded for 2015.

McClure, M. A., S. Stewart, R. Williams, H. Kelly, S. Danehower and **L. E. Steckel**. 2014 “GoBeans- A soybean verification program for Tennessee.” Funded by Tennessee State Soybean Promotion Board. 2014. \$18,000 (collaborator). On going.

McClure, M. A. and **L. E. Steckel**. 2014 “Support for technician” Funded by Tennessee State Soybean Promotion Board. 2014. \$15,000 (collaborator). On going.

Stewart, S. and **L. E. Steckel**. 2014 “Soybean scout school support” Funded by Tennessee State Soybean Promotion Board. 2014. \$6,681 (collaborator).

Buschermohl, M, L. Duncan. and **L. E. Steckel**. 2014 “ Funded by Tennessee State Soybean Promotion Board. 2014. \$19,500 (collaborator). On going.

Buschermohl, M, L. Duncan. and **L. E. Steckel**. 2014 “ Funded by Tennessee State Soybean Promotion Board. 2014. \$21,500 (collaborator).

Stewart, S, D, K. M. Vail, M. A. McClure, D. D. Hensley, H. M. Kelly, T. Raper, and **L. E. Steckel**. 2015 “IPM programs for agronomic crops, schools and pesticide applicators in Tennessee.” \$84,000. On going. (collaborator). (Funding that went to my program)*.

Johnson, W., K. Smith, **L. E. Steckel**, K, Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2015. \$420,000 (\$30,000).

Norsworthy, J. **L. E. Steckel**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2015. \$710,000 (\$90,000).

Norsworthy, J. **L. E. Steckel**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2015. \$372,000 (\$62,000).

Steckel, L. E. T. C. Mueller and M. A. McClure. 2015. “Research and Extension Support for Management of Glyphosate-Resistant Weeds.” Funded by Tennessee State Soybean Promotion Board. (\$88,000; Lead PI).

Steckel, L. E. “Glyphosate resistant horseweed and Palmer amaranth management”. Funded by Cotton Incorporated Tennessee State Support Committee. 2014. (\$23,000). Funded for 2015.

Bagavathiannan, M., J. Norsworthy and **L. E. Steckel**. 2014. “Developing and implementing a bio-economic decision-support tool for guiding integrated management of palmer amaranth. USDA-NIFA crop protection and pest management grants. (\$30,022).

Stewart, S. and **L. E. Steckel**. 2015 “Soybean scout school support” Funded by Tennessee State Soybean Promotion Board. 2014. \$6,000(collaborator).

Steckel, L. E. T. C. Mueller and M. A. McClure. 2016. “Research and Extension Support for Management of Glyphosate-Resistant Weeds.” Funded by Tennessee State Soybean Promotion Board. (\$115,000; Lead PI).

Steckel, L. E. “Glyphosate resistant horseweed and Palmer amaranth management”. Funded by Cotton Incorporated Tennessee State Support Committee. 2016. (\$23,000).

Johnson, W., K. Smith, **Steckel, L. E.**, K, Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2016. \$420,000 (\$25,000).

Johnson, W., K. Smith, **Steckel, L. E.**, K, Bradley, M. Owen, B. Hartzler, R. Zollinger, S. Knezevic, D. Peterson, M. Moechnig, J. Green, M. Loux, A. Hager, J. Gonand, J. Martin. Glyphosate-resistant weed management. United Soybean Board. 2017. \$420,000 (\$25,000).

Steckel, L. E. “Glyphosate resistant horseweed and Palmer amaranth management”. Funded

by Cotton Incorporated Tennessee State Support Committee. 2016. (\$23,000).

Norsworthy, J. **L. E. Steckel**, B. Young, W. Johnson, K. Bradley, R. Smeida, and M. Krutz. Glyphosate-resistant weed management. United Soybean Board. 2015. \$780,000 (\$42,000).

C-3.3 Contracts (\$977,697 Total Contracts)

Steckel, L. E. "Experimental herbicide trial". Funded by Monsanto. 2003. (\$6,300). Completed.

Steckel, L. E. and R. M. Hayes. "Roundup Ready alfalfa research". Funded by Monsanto. 2003. (\$9,000 Lead PI). Completed.

Steckel, L. E. and R. M. Hayes . "Weed control in Roundup Ready Flex cotton". Funded by Monsanto. 2003. (\$5,000 Lead PI). Completed.

Steckel, L. E. and R. M. Hayes. "Roundup Ready alfalfa research". Funded by Monsanto. 2004. (\$9,000 Lead PI). Completed.

Steckel, L. E. "Weed control in Roundup Ready Flex cotton". Funded by Monsanto. 2004. (\$5,000). Completed.

Steckel, L. E. "Management of glyphosate-resistant Palmer amaranth". Funded by Monsanto. 2005. (\$4,250). Completed.

Steckel, L. E. and R. M. Hayes. "Roundup Ready alfalfa research". Funded by Monsanto. 2005. (\$9,000 Lead PI). Completed.

Steckel, L. E. "Weed control in Roundup Ready Flex cotton". Funded by Monsanto. 2005. (\$5,000). Completed.

Steckel, L. E. and C. C. Craig. "Agronomic factors impacting 15" cotton production systems". Project 84. Funded by Deere and Company. 2005-2006. (\$9,000 Lead PI). Completed.

Steckel, L. E. "New herbicide research". Funded by BASF. 2007. (\$6,300). Completed.

Steckel, L. E. "Dicamba tolerant soybean research". Funded by Monsanto. 2007. (\$4,000). Completed.

Steckel, L. E. "Dicamba tolerant soybean research". Funded by Monsanto. 2008. (\$6,000). Completed.

Thompson, M. A. and **L. E. Steckel**. "GAT corn research" Funded by Pioneer HiBred. 2008. (\$10,000 calibrator). Complete.

Steckel, L. E. "Dicamba tolerant soybean research". Funded by Monsanto. 2009. (\$6,000). Completed.

Steckel, L. E. and C. L. Main "Dicamba/Ignite tolerant cotton research". Funded by Monsanto. 2009. (\$29,700 Lead PI). Completed.

Steckel, L. E. "New herbicide research". Funded by BASF. 2009. (\$22,000). Completed.

Steckel, L. E. "Acetochlor formulation over soybean". Funded by Monsanto. 2009. (\$10,400). Completed.

Steckel, L. E. "BAS 800 herbicide research". Funded by BASF. 2009. (\$11,200). Completed.

Steckel, L. E. "GAT soybean research" Funded by Pioneer HiBred. 2009. (\$13,000). Completed.

Steckel, L. E. "Dicamba tolerant soybean research". Funded by Monsanto. 2010. (\$8,000). Completed..

Steckel, L. E. and C. L. Main "Dicamba/Ignite tolerant cotton research". Funded by Monsanto. 2010. (\$12,000 Lead PI). Completed.

Steckel, L. E. and C. L. Main "Dicamba/Ignite tolerant cotton research". Funded by Monsanto. 2011. (\$11,000 Lead PI). Completed.

Steckel, L. E. "Dicamba tolerant soybean research". Funded by Monsanto. 2011. (\$5,000). Completed.

Steckel, L. E. "Inzen grain sorghum research". Funded by DuPont. 2011. (\$3,000). Completed.

Steckel, L. E. "GAT soybean research". Funded by DuPont. 2011. (\$3,000). Completed.

Steckel, L. E. "Hppd tolerant soybean research". Funded by Syngenta. 2012. (\$14,000). On going.

Steckel, L. E. "Dicamba drift research". Funded by Monsanto. 2012. (\$16,000). On going.

Steckel, L. E. "Dicamba-tolerant cotton research." Funded by Monsanto. 2012 (\$17,571). On going.

Steckel, L. E. "Dicamba-tolerant soybean research". Funded by Monsanto. 2012. (\$13,063). On going.

Steckel, L. E. "Examination of warrant herbicide". Funded by Monsanto. 2012. (\$4,000). On going.

Steckel, L. E. "Examination of warrant herbicide". Funded by Monsanto. 2012. (\$4,000). On going.

Steckel, L. E. "Evaluation of MIG tolerant soybean". Funded by Syngenta. 2013. 13-0922 (\$10,000). On going.

Steckel, L. E. "Evaluation experimental herbicides in corn". Funded by Syngenta. 2013. 13-0714 (\$10,000). On going.

Steckel, L. E. and M. Wiggins. "Evaluate cover crop efficacy on Palmer amaranth." Funded by Monsanto. 2013. (\$35,000). On going.

Steckel, L. E. "Evaluate cover crop efficacy on Palmer amaranth." Funded by Monsanto. 2013. (\$22,988). On going.

Steckel, L. E. "Herbicide trait research". Funded by Dow. 2013. (\$53,540). On going.

Steckel, L. E. "Weed control research". Funded by Cheminova. 2013. (\$15,500). On going.

Steckel, L. E. "Weed control research". Funded by BASF. 2013. (\$12,000). On going.

Steckel, L. E. "Weed control research". Funded by Bayer. 2013. (\$21,000). On going.

Steckel, L. E. "Weed control research". Funded by DuPont. 2013. (\$37,500). On going.

Steckel, L. E. "Weed control research". Funded by Novasource. 2013. (\$3,000). On going.

Steckel, L. E. "Weed control research". Funded by LeHigh. 2013. (\$3,000). On going.

Steckel, L. E. "Weed control research". Funded by Novasource. 2013. (\$1,800). On going.

Steckel, L. E. "Weed control research". Funded by Exacto. 2013. (\$4,550). On going.

Steckel, L. E. "Weed control research". Funded by MANA. 2013. (\$4,500). On going.

Steckel, L. E. "Weed control research". Funded by Loveland. 2013. (\$4,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2014. (\$33,900). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by BASF. 2014. (\$44,750). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Dow. 2014. (\$20,400). On going.

Steckel, L. E. "Weed control research". Funded by Valent. 2014. (\$10,500). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Syngenta. 2014. (\$12,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2014. (\$70,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2014. (\$10,112). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2014. (\$12,800). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2015. (\$6,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2015. (\$5,120). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2015. (\$10,240). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2015. (\$7500). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2015. (\$13,130). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by DuPont. 2015. (\$19,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Syngenta. 2015. (\$9,500). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2016. (\$77,660). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2016. (\$20,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2016. (\$30,500). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Syngenta. 2017. (\$20,625). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Monsanto. 2017. (\$72,000). On going.

Steckel, L. E. "New herbicide trait evaluation." Funded by Syngenta. 2017. (\$38,500). On going.

C-3.4 Unrestricted Gifts/Non Exchange (\$2,086,932 Total Gifts)

(\$29,850) 2003. Life science company herbicide evaluation trials.

(\$60,450) 2004. Life science company herbicide evaluation trials.

(\$3,000) 2004. "Desiccation of annual ryegrass cover crop with glyphosate". Funded through Oregon Ryegrass Growers Seed Commission in a cooperative effort with Oregon State University.

(\$3,000) 2005. "Desiccation of annual ryegrass cover crop with glyphosate." Funded through Oregon Ryegrass Growers Seed Commission in a cooperative effort with Oregon State University.

(\$105,000). 2005. Life science company herbicide evaluation trials.

(\$139,175). 2006. Life science company herbicide evaluation trials.

(\$157,325). 2007. Life science company herbicide evaluation trials.

(\$3,500) 2007. Tennessee Farmers Cooperative to support printing of the Weed Control Manual.

(\$1,500) 2007. Jimmy Sanders Farm Supply to support printing of the Weed Control Manual.

(\$2,500) 2007. Helena Chemical Company to support printing of the Weed Control Manual.

(\$2,500) 2007. United Agri Products to support printing of the Weed Control Manual.

(\$169,000). 2008. Life science company herbicide evaluation trials.

(\$3,500) 2008. Tennessee Farmers Cooperative to support printing of the Weed Control Manual.

(\$1,500) 2008. Jimmy Sanders Farm Supply to support printing of the Weed Control Manual.

(\$3,500) 2009. Tennessee Farmers Cooperative to support printing of the Weed Control Manual.

(\$1,500) 2009. Jimmy Sanders Farm Supply to support printing of the Weed Control Manual.

(\$189,491). 2009. Life science company weed management trials.

(\$168,450). 2010. Life science company weed management trials.

(\$236,700). 2011. Life science company weed management trials.

(\$206,400). 2012. Life science company weed management trials.

(\$258,781). 2013 NEXT Contracts. Life science company weed management trials

(\$18,500). 2013 gifts for weed manual etc...

(\$39,000). 2014 NEXT Contracts. Life science company weed management trials

(\$250) 2014. Support for refreshments weed tour

(\$3,500) 2014. Support for next year.

(\$5,000) 2014. Support for printing weed manual

(\$2,500) 2014. Support for printing weed manual

(\$90,300). 2014 NEXT Contracts. Life Science Company weed management trials

(\$155,200) 2015 NEXT Contracts. Life Science Company weed management trials.

(\$5,000) 2015. COOP. Support for printing weed manual

(\$2,500) 2015. Helena Support for printing weed manual

(\$77,400) 2016. Life Science Company weed management trials.

(\$107,860) 2017. Life Science Company weed management trials.

C-3.5 In-kind Support (\$436,878 Total In-kind Support)

(\$6,300) 2004. Pesticides/Seed provided by chemical and seed companies.

(\$1,133) 2004. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.

(\$50,000) 2005. John Deere 15" Row Cotton Picker*.
*Cotton picker was collaborative gift to cotton team.

(\$14,900) 2005. Pesticides/Seed provided by chemical and seed companies.

(\$1,440) 2005. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.

(\$38,435) 2006. Pesticides/Seed provided by life science companies.

- (\$2,480) 2006. Meals and refreshments provided by Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$29,114) 2007. Pesticides/Seed provided by life science companies.
- (\$2,400) 2007. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$31,344) 2007. Pesticides/Seed provided by life science companies.
- (\$2,100) 2007. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$25,344) 2007. Pesticides/Seed provided by life science companies.
- (\$2,100) 2007. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$1,800) 2008. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$3,200) 2009. Meals and refreshments provided by DuPont Inc. and Syngenta Corp. for University of Tennessee Weed Research Field Tour.
- (\$29,344) 2008. Pesticides/Seed provided by life science companies.
- (\$31,444) 2009. Pesticides/Seed provided by life science companies.
- (\$29,000) 2010. Pesticides/Seed provided by life science companies.
- (\$23,000) 2011. Willmar 915 hooded spayer donated by Monsanto.
- (\$27,000) 2011. Pesticides/Seed provided by life science companies.
- (\$21,000) 2012. Pesticides/Seed provided by life science companies.
- (\$31,000) 2013. Pesticides/Seed provided by life science companies.
- (\$33,000) 2013. Pesticides/Seed provided by life science companies.
- (\$27,000) 2014. Pesticides/Seed provided by life science companies.

**C-5. Participation in Seminars and Workshops
(Professional Development)**

- 2003 Delta-Wide Weed Science Workshop, Jackson, TN.
- 2003 Weed Control Manual Committee Meeting for 2004, Nashville, TN.
- 2004 Monsanto Company Field Day, Union City, TN.
- 2004 Delta-Wide Weed Science Workshop Baton Rouge, LA.
- 2004 Tennessee Cotton State Support Committee Meeting and Tour. Milan, TN.
- 2004 Weed Control Manual Committee Meeting for 2005, Nashville, TN.
- 2004 Plant Sciences Department Faculty Retreat, Winchester, TN.
- 2004 Southern Weed Science Society Annual Meeting, Memphis, TN.
- 2004 Weed Science Society of America Annual Meeting, Kansas City, MO.
- 2004 Beltwide Cotton Conference, San Antonio, TX.

2004 Extension Conference, Nashville, TN.
 Seminars: Five Generations in the Work Place
 Your Game Plan for Building Wealth
 Retirement Strategies for Every Age
 Are We Communicating
 Keeping Your Audience Engaged

2005 Marketing Our Achievements- Putting Our Best Foot Forward!, Knoxville, TN.
 2005 Academic Weed Resistance Workshop Monsanto, St. Louis, MO.
 2005 Southern Weed Science Society Annual Meeting, Charlotte, NC.
 2005 Beltwide Cotton Conference, New Orleans, LA.
 2005 Weed Control Manual Committee Meeting for 2006, Nashville, TN.
 2005 Mississippi State Weed Tour, Starkville, MS.
 2005 Monsanto Flex Cotton Information Meeting, Atlanta, GA.
 2005 Monsanto Roundup Ready Flex Meeting, Tunica, MS.
 2005 Extension Regional Conference, Nashville, TN.
 2005 Pioneer Hi-Bred Field Day, Union City, TN.
 2006 Syngenta Weed Resistance Management Workshop, Wilmington, NC.
 2006 Delta-Wide Weed Science Workshop, Rosedale, AR.
 2006 Weed Control Manual Committee Meeting for 2007, Knoxville, TN.
 2006 Southern Weed Science Society Annual Meeting, San Antonio, TX.
 2006 Beltwide Cotton Conference, San Antonio, TX.
 2006 Weed Science Society of America Annual Meeting, New York, NY
 2006 Cotton Incorporated Crop Management Seminar, Tunica, MS.
 2007 Beltwide Cotton Conference, New Orleans, LA.
 2007 Southern Weed Science Society Annual Meeting. Nashville, TN.
 2007 Plant Sciences Department Faculty Retreat, Sevierville, TN.
 2007 National Glyphosate Stewardship Symposium, St. Louis, MO.
 2007 Governors Conference on Biofuels Montgomery Bell State Park, TN.
 2007 Weed Control Manual Committee Meeting for 2008, Jackson, TN.
 2007 DuPont GAT Tour and Conference, Leland, MS.
 2007 Pioneer Weed Resistance Tour. West TN.
 2007 Monsanto Research Station Tour. Leland, MS.
 2007 SUPER Training, Jackson, TN.
 2008 Academic advisory panel to Monsanto on use of their Dicamba tolerant Trait. St. Louis, MO.
 2008 Pioneer Weed Resistance Tour. West TN.
 2008 Monsanto Research Station Tour. Leland, MS.
 2009 Academic advisory panel to Monsanto on use of their Dicamba tolerant Trait. Jacksonville, FL.
 2008 Weed Control Manual Committee Meeting for 2008, Jackson, TN.
 2009 Weed Control Manual Committee Meeting for 2009, Knoxville, TN.
 2009 Monsanto Crop Consultants Conference. Memphis, TN
 2009 Monsanto Research Station Tour. Scott, MS.
 2009 Bayer CropScience Cotton Specialist Meeting. Tuscan, Arizona.
 2009 Bayer glyphosate-resistant weed tour with Bayer research scientist from Germany
 2009 Syngenta conducted roundtable discussion with large Brazilian farmers on resistant weed management
 2009 Beltwide Cotton Conference, San Antonio, TX.
 2010 Participated in glyphosate resistant workshop with NRCS meeting. Beltsville, MD
 2010 Glyphosate Resistant Conference for Argentinean and Brazilian crop consultants. Fauz De Iguacu, Brazil.
 2010 Chaired the Southern Weed Science Society Herbicide Weed Resistance Committee. Little Rock, AR.
 2010 Tour of Embrapa soyja research facilities Brazil.
 2010 Beltwide Cotton Conference. New Orleans, LA Consultant conference invited speaker
 2010 Participated in Bayer Crop Sciences Respect the Rotation Tour. Memphis and west AR.

2010 Weed Control Manual Committee Meeting for 2010, Jackson, TN.
 2010 Participated in University of Arkansas GR Palmer amaranth symposium, Forrest City, AR
 2011 Participated in establishing Center workshop. Knoxville, TN
 2011 Participated in Monsanto Dicamba trait academic conference. St. Louis, MO.
 2011 Participated in Monsanto Dicamba trait field tours. Tunica, MS.
 2011 Participated in Dow 2,4-D trait academic conference. Indianapolis, IN.
 2012 Attended UT Center workshop. Knoxville, TN.
 2012 Participated Farm Journal Corn College. Heyworth, IL
 2012 Participated in Dow 2,4-D trait academic conference. Indianapolis, IN.
 2012 Chaired the Southern Weed Science Society Herbicide Weed Resistance Committee. Little Rock, AR.
 2012 Participated in Tennessee Agriculture Production Association work shop. Jackson, TN.

C-6. Professional Honors and Awards

Awards	1994	Winner Pioneer Agronomist Sales Support Award
	1999	Finalist Pioneer Agronomist Sales Support Award
	2000	Incomplete List of Teachers Ranked as Excellent by Their Students
	2004	The Dutch and Marilee Cavender Publication Award Presented for the 2004 Tennessee Weed Control Manual
	2004	Team Member, Communication State Award for the IPM Newsletter
	2004	Finalist for the Team Communication Southern Region Award for the IPM Newsletter
	2006	The Dutch and Marilee Cavender Publication Award Presented for the Web-Based Weed Identification Series
	2011	The outstanding person in Tennessee award. Presented by the Tennessee Agricultural Production Association in recognition of outstanding research and extension programs.
	2012	Excellence in Extension Award of Merit. The University of Tennessee Chapter of Gama Sigma Delta.
	2013	The University of Tennessee AgResearch Impact Award. This award is presented to an AgResearch faculty or professional staff member whose efforts have had a profound effect on improving the efficiency, sustainability and/or economic viability of the food and fiber industry of rural areas of Tennessee.
	2015	Extension Award. The Weed Science Society of America. This award is for outstanding service as an extension worker in the field of Weed Science.
	2016	Conservation Systems Cotton Researcher of 2016. National Conservation Systems Cotton and Rice Conference.
	2017	Outstanding Paper Award. Journal of Weed Technology. Weed Science Society of America. "Managing winter-annual cover crops to control glyphosate-resistant Palmer amaranth.
	2018	Outstanding Paper Award. Journal of Weed Technology. Weed Science Society of America. "Influence of cover crops on management of <i>Amaranthus</i> spp. In glyphosate- and glufosinate-resistant soybean".

Academic Honors	1987	Graduate <i>Cum Laude</i> , Western Illinois University
	2000	Brockton Graduate Fellowship
	2001	Brockton Graduate Fellowship
	2002	University Graduate Fellowship
	2003	University Graduate Fellowship
	2003	The University of Illinois Chapter of Gamma Sigma Delta

C-7. Program Involvement Out of State

UTCrops.com. FACT sheets and 96 IPM Newsletters accessed by producers, consultants, industry personnel and government agencies in many Southern and Midwestern States.

Cooperative research examining glufosinate drift onto glyphosate-resistant cotton. 2004. Conducted jointly with weed scientists at Louisiana State University.

Multi-state research and demonstrations examining desiccation of annual ryegrass cover crop with glyphosate. 2004. Funded through Oregon Ryegrass Growers Seed Commission in a cooperative effort with weed scientists at Oregon State University.

Cooperative research examining residual herbicides in glyphosate-resistant Flex cotton. 2005. Conducted jointly with weed scientists at Louisiana State University.

Multi-state research and demonstrations examining desiccation of annual ryegrass cover crop with various burndown herbicides. 2005. Funded through Oregon Ryegrass Growers Seed Commission in a cooperative effort with weed scientists at Oregon State University.

North Central Region IPM Grant Review Panel member. 2006. St. Louis, MO.

Multi-state research evaluating Reflex herbicide as a pre plant in cotton. 2006. Conducted jointly with weed scientists at Clemson University, University of Georgia and North Carolina State University.

National glyphosate stewardship symposium: A call to action. Moderator. March 20-21, 2007 St. Louis, MO.

Cooperative research examining residual herbicides in glyphosate-resistant Flex cotton. 2007. Conducted jointly with weed scientists at Mississippi State University.

Presented management recommendations on delaying the development of glyphosate-resistant weeds. 6th Annual Dean Lee Research Station Field Day. Louisiana State AgCenter. Alexandria, LA. August 23, 2007. (Fifteen minute presentation on field day tour, presented 3 times during the field day). (Invited)

Management of glyphosate-resistant horseweed. 2008. North Carolina State Weed Resistance Tour. July 22, 2008. (Invited).

Bayer Respect the Rotation Tours. I presented Glyphosate-resistant weed management information in 2011 in Portageville, MO; Red Bud, IL and

University of Illinois Weed Resistance Field day. I presented Glyphosate-resistant weed management information in 2012 in Tuscola, IL

International Experience

England. 1993. Toured English farms. Sponsored by Pioneer Hi-Bred Intl. Inc.

Austria. 1995. Visited Austrian farms and hybrid seed corn facility. Sponsored by Pioneer Hi-Bred Intl. Inc.

Japan. *Mueller, T. C., **L. E. Steckel**, and C. L. Main 2006. Reduced sensitivity of [*Amaranthus palmeri* S. Wats] to glyphosate results in lack of control in genetically modified crops. Abs of 11th International Congress of Pesticide Chemistry, IUPAC. Abstract II-1-ii-10C (poster and invited oral presentation in Kobe, Japan).

Germany. 2009 Bayer Crop Sciences Herbicide Innovation Conference. Invited and participated in a herbicide conference hosted by Bayer Crop Sciences at their facilities in Monheim and Dueseldorf, Germany.

Switzerland. 2009 Toured Pioneer Hybrid Europe Headquarters in Luzerne, Switzerland.

Brazil. 2010. Invited to speak to 12 large Brazilian soybean producers. Memphis, TN.

International. 2010. "Weed resistance situation in southern US row crops." Pan America Weed Resistance Conference. Invited to speak on the weed resistant issues of the southern US to Weed Scientist from across the Western Hemisphere. Miami, FL.

Brazil. 2010. Invited by Valent to give presentations on glyphosate-resistant weeds to 85 crop consultants from Brazil and Argentina. Fauz de Igocu, Brazil. Also tour Embrapa and Coamo research facilities

Israel. 2010. Invited by MANA to give presentation on glyphosate-resistant weeds to 45 folks from MANA as well as faculty and graduate students from Hebrew University. Tel Aviv, Israel. Also toured MANA herbicide manufacturing plant.

Argentina. 2011. Spoke about herbicide resistant weed management issues with 61 soybean/corn growers and consultants. Milan, TN.

Brazil. 2011. Spoke about weed management issues with 54 soybean growers and consultants. Jackson, TN.

Brazil. 2012. Spoke about weed management issues with 27 soybean growers and consultants. Jackson, TN.

Croatia 2014. Conducted extension demonstration on no-till compared to conventional and minimum-till with Croatian famers on about 100 hectares in 6 different fields.

Argentina. 2014. Spoke about herbicide resistant weed management issues with 67 soybean/corn growers and consultants. Milan, TN.

Argentina. 2015. Spoke about herbicide resistant weed management issues with 57 soybean/corn growers and consultants. Milan, TN.

Argentina. 2016. Spoke about herbicide resistant weed management issues with 47 soybean/corn growers and consultants. Jackson, TN.

Australia. 2016. Spoke about herbicide resistant weed management issues with 65 soybean/corn growers and consultants. Jackson, TN.

Argentina. 2017. Spoke about herbicide resistant weed management issues with 38 soybean/corn growers and consultants. Jackson, TN.

Brazil. 2017. Spoke about herbicide resistant weed management issues with soybean/corn growers and consultants. Jackson, TN.

D. Service to the University, the Public, and the Profession

D-1. Summary of Service Record.

My philosophy of service has been heavily shaped by the many individuals who have assisted me in getting to where I am today. Therefore, I try to provide service when asked for whether it is the Department, University or Public. However I do realize that service to the institution, discipline and profession must be balanced with research and Extension duties.

One of the bigger services I render to Extension is the time commitment I make in the area of plant identification. To date, I have identified well over 500 plants samples sent in through the Distance Diagnostic Center, email or walk-ins. I also provide assistance to the 4-H program through judging at the 4-H Roundup and assisting coaches with seed and plant identification. Within the department, I am or have served on a number of committees including the equipment committee, search committees for cotton specialist, crop physiologist and department head. In the college I am serving on the search committee for EPPs plant pathologist position. I also provide a number of internal critical reviews for FACT sheets from my extension colleagues.

Within my profession, I have served as an Associate editor for the last 4 years for the *Journal of Weed Technology*. Moreover, I review for the Weed Science Society of America's journal *Weed Science*. I also have provided critical review of manuscripts based on weed science in the *Journal of Cotton Science*. Each year I judge the student paper contest at the Beltwide Cotton Conference. I have also been a judge for the student paper contest from 2004 to 2006 at the Southern Weed Science Society Annual Meeting. I have chaired the Agronomic session for the Weed Science Society of America annual meetings in 2006 and 2010. I have also chaired the Agronomic session for the Southern Weed Science Society in 2012. I have been a member of the Southern Weed Science Society board since 2011. I have also chaired the Weed Science section for the 2012 Beltwide Cotton Conference. I was also academic representative to the TAPA board, President Elect of TAPA 2012.

D-1.1 Service to the University

Department

- (2004-Present) UT Information Systems Committee
- (2007) Graduate Programs Committee
- (2006-2007) Plant Sciences Equipment Committee
- (2006) Search Committee for Cotton Specialist
- (2006) PS457 guest lecture
- (2007) Academic representative on the TAPA Board
- (2008) Academic representative on the TAPA Board
- (2009) Academic representative on the TAPA Board
- (2009) Was fill in member for department on metrics committee meeting.
- (2008-2009) Member of graduate student committee.
- (2010) Academic representative on the TAPA Board
- (2011) Member of search committee for Plant Sciences physiologist
- (2012) Member of search committee for EPP plant pathologist
- (2012) Member of search committee for Plant Sciences Department Head
- (2013) Member of search committee for Cotton Specialist
- (2014) Member of search committee for Cotton Specialist
- (2015) Plant Sciences Graduate Student committee

(2016) Plant Sciences Graduate Student committee

Extension Service

(2005) Regional Cotton Pest Management Workshop Committee
(2004-Present) University of Tennessee Weed Control Manual Committee and Chair
(2004-Present) UT Row Crops Committee
(2004-Present) UT Soybean Rust Committee
(2006) Horticulture Production Manual Judge for 4-H Roundup
(2005-2006) Advised on 4-H Weed Seed Identification Quiz
(2009) Judged horticulture projects at 4-H Roundup
(2010) Judged horticulture projects at 4-H Roundup
(2016) Member of search committee for West Tennessee Extension program leader

University of Tennessee

(2004-Present) Bio-Based Energy Analysis Group
(2004,2006, 2008, 2010, 2012) Milan No-Till Field Day Contributor (Speaker and Organizer for Weed Control Stops)

Record of contribution to enhance equal opportunity

Supervise 3 minority employees and am major advisor for 1 minority graduate student (Ph.D). I strive to recruit graduate and undergraduate students to UT and encourage participation in 4-H and FFA.

D-1.2 Service to the Public

Service to Government Agencies

(2004-2012) Written 12 letters of support for state 24c special needs labels for herbicides.

(2005-2007) Conducted research on weed control in switchgrass to support United States Department of Energy biofuels initiative.

(2004) Assisted Tennessee Department of Agriculture evaluating injury from pesticide spray drift.

(2006) North Central Region Integrated Pest Management Grant Review Panel Committee.

(2007) Biofuels Initiative Farmer Education Sub Committee.

(2007) Coordinated Crisis Exemption label for wheat treated with Harmony.

(2007) Coordinated Crisis Exemption label for Select herbicide on corn replant situations.

(2007) National Glyphosate Stewardship Symposium Committee Member.

(2009) Assisted TN Department of AG on herbicide drift complaints.

(2009) Asked to evaluate credentials of Assistant Professor applying for Promotion and tenure in the Department of Plant and Soil Sciences at Mississippi State University.

(2009) Asked to evaluate credentials of Assistant Professor applying for Promotion and tenure in the School of Plant and Soil Sciences at Louisiana State University.

(2009) Gave deposition on possible PGR herbicide drift to 10 acres of tomatoes.

(2010) Witness in trial on possible PGR herbicide drift to 10 acres of tomatoes.

(2010) Presented a seminar to NACD Herbicide Resistance Task Force. Initial Meeting – January 11, 2010 –Beltsville, MD

(2010) Presented a seminar to NACD Herbicide Resistance Task Force. Second Meeting – August 10-11, 2010 – Little Rock, AR

Service to Industry

(2004) Advised National Cotton Council on the use and importance of minor use herbicides in cotton
Refer back to “Invited Presentations” and “Workshop Seminar” sections for other citations.

(2006) North Central Region IPM Grant Review Panel member.

(2006) Member of Weed Scientist Team for Preservation of MSMA for use in cotton.

(2004-2007) Advised life science companies (BASF, Bayer, Dow, DuPont, Monsanto, Syngenta, etc.) on feasibility of experimental herbicide’s value in southern row crop production systems.
Refer to Section B-2 and C-2.4.1 for other industry workshops.

(2007-2008) Showed glyphosate-resistant weeds on grower fields to Pioneer management. Also advised them on probable utility and grower acceptance of possible new herbicide resistant traits.

(2008) Served on dicamba tolerant soybean academic advisory panel.

(2008-2010) Monsanto academic advisory panel for dicamba trait in soybean.

(2009) Wrote letter of disagreement with fomesafen 850’ buffer to no target plants to EPA public comment

(2009) Attended Dow Ag Sciences DHT academic advisory panel.

(2009) First forty days steering committee.

(2009) Southern Field Crop Alliance Steering committee.

(2010) Southern Field Crop Alliance Steering committee

(2010) Tennessee Agriculture Production Association. Outstanding Academic board member.

(2011) Southern Weed Science Society board member (Member at large academic).

(2011) Tennessee Agriculture Production Association. President Elect.

(2012) Southern Weed Science Society board member (Member at large academic).

(2012) Invited speaker to Bayer seed partners meeting. Raleigh North Carolina.

Clientele Recommendations (Growers/Ext. Agents/etc.)

>10,000 phone calls logged from county agents, crop consultants and growers on weed management related issues.

856 Field Complaint Diagnostics (In-field visits)

675 Plant and Weed Identifications for Public (Through UT distance diagnostics lab, email, walk-ins)

Community Activities Knights of Columbus
Assist in fund drives for mentally handicapped youth in West Tennessee. 2004-2018

D-1.3 Service to the Profession

Professional Organizations Weed Science Society of America, Southern Weed Science Society of America,
North Central Weed Science Society.

(2003) Judge of various events at the Southern Weed Contest
(2004) Moderator for Beltwide Cotton Conference Weed Section
(2004) Eastern Weed Team Coach for 2004 Southern Weed Contest
(2004) Judge of Southern Weed Science Society Paper Contest
(2005) Weed Science Society of America Integrated Pest Management Section Chair
(2005) Regional Cotton Pest Management Workshop Committee
(2005) Moderator for Weed Science Society of America Integrated Pest Management Section
(2005) Judge of Beltwide Cotton Conference Paper Contest
(2005) Judge of Southern Weed Science Society Paper Contest
(2006 to present) Associate Editor *Weed Technology* Journal
(2006) Local Arrangements Committee for 2007 Southern Weed Science Society Conference
(2006) Judge of Beltwide Cotton Conference Paper Contest
(2006) Judge of Southern Weed Science Society Paper Contest
(2006) Eastern Weed Team Coach for 2006 Southern Weed Contest
(2007) Judge of Beltwide Cotton Conference Paper Contest
(2007) Moderator for Beltwide Cotton Conference Weed Section
(2007-Present) Southern Weed Society Student Program Committee
(2007-Present) Southern Weed Society Sales Coordination Committee
(2007) Agronomic Session Chair Southern Weed Society Conference
(2008) Judge of Beltwide Cotton Conference Paper Contest
(2009) Judge of Beltwide Cotton Conference Paper Contest
(2009) Judge of Southern Weed Society Conference Paper Contest
(2009) Weed Resistance Committee Secretary Southern Weed Society Conference
(2010) Weed Resistance Committee Chair Southern Weed Society Conference
(2011) Glyphosate-resistant weed management symposium organizer Southern Weed Society Conference
(2011) Agronomic Session Chair Weed Science Society of America Conference
(2012) Agronomic Session Chair Southern Weed Science Society Conference
(2012) Weed Section Chair Beltwide Cotton Conference
(2010) Tennessee Agriculture Production Association. Outstanding Academic board member.
(2011) Southern Weed Science Society board member (Member at large academic).
(2011) Tennessee Agriculture Production Association. President Elect.
(2011) Judged and took farmer role in Farmer problem in weed Olympics.
(2011 to Present) Adjutant status with Plant and Soil Science Dept. Mississippi State University
(2012) Southern Weed Science Society board member (Member at large academic).
(2013) Southern Weed Science Society board member (Member at large academic).
(2014-2016) Weed Science Society of America (Board Of Directors - Secretary).
(2017-2018) Weed Science Society of America (Board Of Directors – Vice President).
(2018) Weed Science Society of America (Board Of Directors – President Elect).

Journal Referee *Weed Technology* Journal (Associate Editor 2008 to present)
Weed Science Journal

Journal of *Cotton Science*
Delta Agricultural Digest
Critical Review in Plant Sciences