

RODRIGO WERLE, Ph.D.

Curriculum Vitae

Assistant Professor & Extension Cropping Systems Weed Scientist
Department of Agronomy, University of Wisconsin-Madison

ADDRESS

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EDUCATION AND TRAINING

Ph.D. May 2016	University of Nebraska-Lincoln	Major: Agronomy Specialization: Weed Science
M.S. December 2012	University of Nebraska-Lincoln	Major: Agronomy Specialization: Weed Science
B.S. December 2009	São Paulo State University, Brazil	Major: Agronomy

PROFESSIONAL EXPERIENCE

- *Assistant Professor and Extension Cropping Systems Weed Scientist (Appointment: 30% Research and 70% Extension)*, Department of Agronomy, University of Wisconsin-Madison, January, 2018 to current. Goal: conduct innovative and collaborative research and extension programming in weed biology, ecology and management in annual row crop production systems of in Wisconsin and beyond.
- *Adjunct Assistant Professor*, Department of Agronomy and Horticulture, University of Nebraska-Lincoln. June, 2018 to current.
- *Assistant Professor and Cropping Systems Specialist (Appointment: 50% Research and 50% Extension)*, West Central Research and Extension Center & Department of Agronomy and Horticulture, University of Nebraska-Lincoln, April, 2016 to December, 2017. Goal: conduct innovative and collaborative research and extension programming to increase profitability, productivity and sustainability of irrigated and dryland cropping systems with limited water in Nebraska and beyond.
- *Graduate Research Assistant*, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE, May, 2010 to April, 2016. Masters and Doctoral research in Weed Biology and Ecology, Integrated Weed Management, Herbicide Resistance Evolution and Management, and Weed Population Dynamics Modeling under Dr. John Lindquist's supervision.
- *Undergraduate Senior Intern*, Department of Agronomy and Horticulture, University of Nebraska-Lincoln, Lincoln, NE, 2009. Field and greenhouse research in Weed Science under Dr. Mark Bernards' supervision.

- *Undergraduate Research Assistant*, College of Agricultural Sciences, São Paulo State University, Botucatu, SP, Brazil, 2005-2009. Field, greenhouse, and laboratory research in soil fertility and crop rotation under Dr. Ciro Rosolem's supervision.

TEACHING EXPERIENCE

- UW-Madison Prep Course for Weed Contest, Spring-Summer/2018.
- UNL AGRO 496/896 Prep Course for Weed Contest, Spring-Summer/2015.
- UNL AGRO 426/826 Invasive Plants Lab: Spring/2013, Spring/2014, and Spring/2015.
- UNL AGRI/NRES 103 Introduction to Agricultural and Natural Resource Systems Recitation, Fall/2013.

ACADEMIC HONORS AND AWARDS

- Weed Science Society of America, **Outstanding Graduate Student Award**, 2016
- University of Nebraska-Lincoln Dean's Fellowship, 2014-2015 & 2015-2016
- Milton E. Mohr Award (Biotechnology Degree Program Recipient), 2014-2015 & 2015-2016.
- Department of Agronomy and Horticulture Graduate Student Conference Travel Grant, 2015.
- Honorable mention, Outstanding Graduate Research Assistant, University of Nebraska-Lincoln, 2015.
- Weed Science Society of America Meetings, 3rd Place Outstanding Poster Presentation, 2015.
- North Central Weed Science Society Meetings, 1st place Outstanding Poster Presentation, 2014.
- North Central Weed Science Society Meetings, 2nd place Outstanding Paper Presentation, 2014.
- North Central Weed Science Society Meetings, 2nd Place Team Quiz Bowl, 2014.
- North Central Weed Science Society Weed Contest, 3rd place Overall Graduate Team, 2014.
- North Central Weed Science Society, **Outstanding Graduate Student Award**, 2013.
- Weed Science Society of America, **Outstanding Paper in Weed Technology**, 2013.
- Widaman Trust Distinguished Graduate Assistant Award, 2013-2014.
- North Central Weed Science Society Weed Contest, 3rd place Overall Graduate Team, 2013.
- North Central Weed Science Society Contest, 1st place Team Sprayer Calibration, 2013.
- University of Nebraska Student Government, **Graduate Student of the Year**, 2012-2013.
- North Central Weed Science Society Meetings, 1st Place Outstanding Paper Presentation, 2012.
- North Central Weed Science Society Meetings, 1st Place Team Quiz Bowl, 2012.
- North Central Weed Science Society Weed Contest, 3rd place Overall Graduate Team, 2012.
- North Central Weed Science Society Weed Contest, 1st place Team Sprayer Calibration, 2012.
- APS North Central Division Meeting, 2nd place Graduate Student Poster Contest, 2011.

PROFESSIONAL SOCIETY MEMBERSHIPS

- International Weed Science Society
- Weed Science Society of America
- North Central Weed Science Society
- Agronomy Society of America
- Crop Science Society of America
- Soil Science Society of America

SERVICE

- Ad hoc reviewer for Weed Science, Canadian Journal of Plant Science, and Planta Daninha.
- Member of the University of Wisconsin Integrated Crop and Pest Management Advisory Group, 2018 to present.
- Coach of the University of Wisconsin-Madison Badger Weeds Team, 2018 to present.
- Active member of the North Central Weed Science Society (NCWSS student weed contest volunteer [2017, 2018]; graduate student poster awards chair [2018]; annual meeting Weed Biology, Ecology and Management section chair [2017]).
- Member of the University of Nebraska-Lincoln Department of Agronomy Faculty Advisory Committee, 2016-2017.
- Member/Coach of the University of Nebraska-Lincoln Weeds Team, 2010 to 2017.
- Member of the Search Committee for the University of Nebraska-Lincoln Beef Cattle Nutritionist - Range Production Systems Specialist Position in the Department of Animal Sciences and West Central Research and Extension Center that resulted in the hiring of Dr. Travis Mulliniks, 2017.
- Graduate Student Representative for the Agronomy and Horticulture Seminar Committee, 2012-2015.
- North Central Weed Science Society Graduate Student Chair, 2014.
- Member of the Search Committee for the University of Nebraska-Lincoln Weed Management Specialist Position in the Department of Agronomy and Horticulture that resulted in the hiring of Dr. Amit Jhala, 2012.

PROFESSIONAL DEVELOPMENT AND NETWORK (*Event Participation; 2018 Onwards*)

- NCWSS 2018 Annual Meeting. Hyatt Regency Milwaukee. Milwaukee, WI. December 03-06, 2018.
- 2nd Monsanto Academic Summit. Marriott St. Louis West. St. Louis, MO. November 07-09, 2018.
- Growmark & Winfield University Weed Scientist Meeting. Sheraton St. Paul Woodbury. Woodbury, MN. September 26-26, 2018.
- 2018 Fall IPCM Technical Advisory Committee Meeting. West Madison Agricultural Research Station. Madison, WI. September 07, 2018.
- UW-Madison New Faculty Welcome and Orientation. Pyle Center, AT&T Lounge. Madison, WI. August 27-28, 3018.
- NCWSS 2018 Weed Contest. Monsanto Water Utilization Learning Center. Gothenburg, NE. July 25-26, 2018.
- 2018 Wisconsin Farm Technology Days. Sterneweis & Weber's Farms. Marshfield, WI. July 10-12, 2018. Represented UW-Extension.
- PAT Field and Vegetable Training. Arlington Agricultural Research Station, Madison, WI. March 29, 2018. Became a Certified Pesticide Applicator in Wisconsin (Category: 001.1).
- UW UAV Pilot Training. West Madison Agricultural Research Station. Madison, WI. March 27, 2018.
- 2018 Spring IPCM Technical Advisory Committee Meeting. West Madison Agricultural Research Station. Madison, WI. March 09, 2018.
- Monsanto New SSR Training. Monsanto Creve Coeur Campus. St. Louis, MO. March 07, 2018.

- UW-Madison Employee Career Conference: “Construct your Career at UW”. Union South. Madison, WI. March 06, 2018.
- 2018 Wisconsin Cover Crop Conference. Holiday Inn and Conference Center. Stevens Point, WI. February 27, 2018.

MENTORSHIP

- Graduate Students at the University of Wisconsin-Madison: Sarah Striegel (MS student, 2018-current), Nikola Arsenijevic (MS student, 2018-current), Victor Ribeiro (visiting MS student, 2018-current).
- Postdoctoral Research Associate at the University of Wisconsin-Madison: Maxwell Oliveira (2018-current).
- Undergraduate Research Scholars at the University of Wisconsin-Madison: Lina Liu (2018-current) and David Wang (2018-2019)
- Undergraduate Research Intern at the University of Wisconsin-Madison: Rachel Renz (2018).
- Research Specialist at the University of Wisconsin-Madison: Ryan DeWerff (2018-current).
- Graduate Students at the University of Nebraska-Lincoln (advised/co-advised or actively mentored): Alexandre Rosa (PhD student, 2017-current), Samuel Koeshall (MS student, 2017-current), Adam Striegel (DPH student, 2017), Don Treptow (MS student, 2016-current), Bruno Vieira (PhD student, 2016-current), Nicholas Arneson (MS student, 2016-current), Strahinja Stepanovic (PhD student, 2016-current), Jasreman Singh (MS student, 2016-2017).
- International Undergraduate Research Interns at the University of Nebraska-Lincoln West Central Research and Extension Center: Nikola Arsenijevic from Serbia (2017), Gustavo Vieira from Brazil (2017), Felipe Faleco from Brazil (2016-2017).
- Research Technician at the University of Nebraska-Lincoln West Central Research and Extension Center: Liberty Butts (2016-2017).
- International Undergraduate Research Interns at the University of Nebraska-Lincoln: Roberto Martins from Brazil (2014), Leonardo Perez from Brazil (2012), Bruno Vieira from Brazil (2011), Gustavo Mastria from Brazil (2011).
- Undergraduate Research Interns at the University of Nebraska-Lincoln: Francisco Junior (2015), Bret Rausch (2014-2015).

STUDENTS' AWARDS

Badger Weeds Team:

- Second Place Graduate Team, 2018 NCWSS Student Weed Contest, Gothenburg, NE
- First Place Weed ID (Nikola Arsenijevic), 2018 NCWSS Student Weed Contest, Gothenburg, NE

Sarah Striegel (MS Student, University of Wisconsin-Madison):

- 2018 Graduate Student Travel Award, NCWSS Meetings, Milwaukee, WI
- 2018 Gordon Harvey Distinguished Fellowship in Weed Science (\$25,000)
- 2018 O.N. Allen Graduate Student Scholarship

Alexandre Tonon Rosa (PhD Student, University of Nebraska-Lincoln):

- 2018-2019 Shear Miles Fellowship, UNL-Agricultural Research Division
- First place Graduate Poster Competition, 2018 NCWSS Meetings, Milwaukee, WI.

- Second place on 5-minute rapid talk and third place on poster competitions at the C-3 Division (Crop Ecology, Management and Quality), 2018 ASA, CSSA & CSA, Baltimore, MD
- 2018 Graduate Student Travel Award, UNL-Agricultural Research Division, David H. & Annie E. Larrick Student Travel Funds
- 2018 North Central Sustainable Agriculture Research and Education Graduate Student Grant. Project: Double Cropping Field Peas with Cover Crops, Forages and Short Season Crops in Sub-Humid Climates (\$11,525)
- 2017 Graduate Student Travel Award, NCWSS Meetings, St. Louis, MO

Italo Kayke Pinho de Faria (Visiting Undergraduate Student, University of Nebraska-Lincoln):

- Fourth Place Undergraduate Poster Competition, 2018 Corteva Agriscience Plant Sciences Symposia Series, Kansas State University, Manhattan, KS

Don Treptow (MS Student, University of Nebraska-Lincoln):

- Second Place Graduate Student Paper Competition, 2017 NCWSS Meetings, St. Louis, MO.

Adam Striegel (DPH Student, University of Nebraska-Lincoln):

- Second Place Graduate Student Poster Competition, 2017 NCWSS Meetings, St. Louis, MO.

Felipe Faleco (Visiting Undergraduate Student, University of Nebraska-Lincoln):

- First Place Undergraduate Student Poster Competition, 2016 NCWSS Meetings, Des Moines, IA.

SELECTED GRANT PROPOSALS

Johnson, B., K. Bradley, M. Loux, C. Sprague, A. Hager, B. Hartzler, **R. Werle**, D. Peterson, and L. Steckel. United Soybean Board. \$270,000 (2018-2019).

Werle, R. Optimizing the use of dicamba for management of troublesome weeds in soybean production in Wisconsin. Monsanto Company. \$136,380 (2018-2020)

Werle, R. Understanding and overcoming the weed management challenges in Wisconsin soybean production. Wisconsin Soybean Marketing Board. \$75,000 (2018-2020).

Lindquist, J., A. Jhala, B. Sigmon, B. Tenhumberg, **R. Werle**, and M. Yerka. A risk-assessment model and population genomics tools for monitoring herbicide-resistance evolution in weedy sorghum. USDA-BRAG. \$499,998 (2017-2020).

Jackson-Ziems, T., and **R. Werle**. Development and implementation of mitigation strategies for the emerging maize pathogen *Xanthomonas vasicola* *pv.* *vasculorum*. USDA-APHIS. \$70,000 (2017-2018).

Proctor, C., M. Drewnoski, R. Elmore, S. Everhart, A. McMechan, J. Parsons, D. Redfearn, and **R. Werle**. Optimizing Cropping Systems for Resilience to Stress: The Role of Maturity Group Selection and Cover Crops on Yield, Weeds, Insects, and Microbes. USDA-NIFA. \$500,000 (2017-2019).

Werle, R., S. Stepanovic, A. Adesemoye, H. Blanco, C. Burr, C. Creech, J. Peterson, D. Rudnick, D. Santra, and M. Stockton. Rotational Benefits and Agronomic Evaluation of Field Peas in Cereal Based Cropping Systems. NCR-SARE Research and Education Grant Program. \$200,000 (2017-2019).

Werle, R., C. Burr, C. Creech, R. Klein, J. Lindquist, D. Rudnick, and S. Stepanovic. Impact of Wheat Stubble Management and Cover Crops on Sustainability of Wheat-Corn-Fallow Rotation in Semi-Arid Nebraska. ARD Innovation Fund for Wheat/Cereal Crops. \$150,000 (2016-2019)

Lindquist, J.L., A. Jhala, and **R. Werle**. ALS resistance in shattercane and johnsongrass: current status and future predictions. United Sorghum Checkoff Program. \$220,525 (2013-2016).

REFEREED PUBLICATIONS

In Preparation (Expected Submission: Spring 2019)

- Oliveira, M.C., A.J. Jhala, C.A. Proctor, **R. Werle**. 2019. Survey of Nebraska and Wisconsin stakeholders' adoption of dicamba-resistant soybean technology and dicamba off-target movement. *Target Journal: Pest Management Science or Weed Technology*.
- Oliveira, D. Giacomini, P. Tranel, G.S. Vieira, N. Arsenijevic, and **R. Werle**. 2019. Molecular and greenhouse validation of field-evolved resistance to glyphosate and PPO-inhibitors in Palmer amaranth. *Target Journal: Pest Management Science or Weed Technology*.
- Oliveira, M.C., L. Butts, and **R. Werle**. 2019. Survey of cover crop management in Nebraska. *Target Journal: Agriculture; invited submission for special issue entitled: "Cover Crops"*.
- Werle, R.** and L. Butts. 2019. Combining herbicide programs and cereal rye cover crop for integrated weed management in soybeans. *Target Journal: Agriculture; invited submission for special issue entitled: "Cover Crops"*.
- Latorre, D.O., S. Samuelson, C.A. Carbonari, **R. Werle**, and G.R. Kruger. 2019. Low frequency of glyphosate-resistant horseweed (*Conyza canadensis*) in Nebraska rangeland. *Target Journal: Canadian Journal of Plant Science*.

Published (25 Journal Articles and 1 Book Chapter)

- Lo, T.H., D.R. Rudnick, C.A. Burr, M.C. Stockton, and **R. Werle**. 2019. Approaches to evaluating grower irrigation and fertilizer nitrogen amount and timing. *Agricultural Water Management*. 213:693-706. *Accepted Directly by the Editor Due to High Quality and Relevance to Readers*. <https://doi.org/10.1016/j.agwat.2018.11.010>
- Werle, R.**, M.C. Oliveira, A.J. Jhala, C.A. Proctor, J. Rees, and R. Klein. 2018. Survey of Nebraska farmers' adoption of dicamba-resistant soybean technology and dicamba off-target movement. *Weed Technology*. 32:754-761. <https://doi.org/10.1017/wet.2018.62>
- Butts, T.R., B.C. Vieira, D.O. Latorre, **R. Werle**, and G. Kruger. 2018. Competitiveness of herbicide-resistant waterhemp (*Amaranthus tuberculatus*) with soybeans. *Weed Science*. 66:729-737. <http://dx.doi.org/10.1017/wsc.2018.45>
- Oliveira, M.C., G.A.M. Pereira, E.A. Ferreira, J.B. Santos, S.Z. Knezevic, and **R. Werle**. 2018. Additive design: the concept and data analysis. *Weed Research*. 58:335-347. <https://onlinelibrary.wiley.com/doi/abs/10.1111/wre.12317>
- Vennapusa, A.R., F. Faleco, B. Vieira, S. Samuelson, G.R. Kruger, **R. Werle**, and M. Jugulam. 2018. Prevalence and mechanism of atrazine resistance in common waterhemp (*Amaranthus tuberculatus*) from Nebraska. *Weed Science*. 66:595-601. <https://doi.org/10.1017/wsc.2018.38>
- Stepanovic, S.V., C. Burr, J.A. Peterson, D. Santra, D. Rudnick, T. Adesemoye, C.F. Creech, and **R. Werle**. 2018. Field peas response to seeding rate, depth and inoculant in west-central Nebraska. *Agronomy Journal*. 110:1412-1419. <https://dl.sciencesocieties.org/publications/aj/articles/110/4/1412>
- Elmore, R.W., **R. Werle**, C. Wortmann, P. Tukamuhabwa, and N. Mueller. 2018. Sustainable soybean production research and practice: contrasting case studies from three soybean production areas. Nguyen, H. (ed.), *Achieving sustainable cultivation of soybeans Volume 1: Breeding and cultivation techniques*, Burleigh Dodds Science Publishing, Cambridge, UK (ISBN: 978 1 78676 112 5; www.bdspublishing.com)

- Werle, R.**, and J. Miller. 2018. Survey of Nebraska soybean producers: current and future status of weed management. *Journal of Extension*. 56(2) <https://www.joe.org/joe/2018april/rb5.php>
- Werle, R.**, C. Burr, and H. Blanco-Canqui. 2018. Cereal rye cover crop suppresses winter annual weeds. *Canadian Journal of Plant Science*. 98:498-500.
<http://www.nrcresearchpress.com/doi/abs/10.1139/CJPS-2017-0267#.WuC6AZdOlaR>
- Vieira, B.C., S.L. Samuelson, G.S. Alves, T.A. Gaines, **R. Werle**, and G.R. Kruger. 2018. Distribution of glyphosate-resistant *Amaranthus spp.* in Nebraska. *Pest Management Science*. Wiley Online Library. DOI 10.1002/ps.4781 <https://onlinelibrary.wiley.com/doi/full/10.1002/ps.4781>
- Rudnick, D.R., T. Lo, J. Singh, **R. Werle**, F. Munoz-Arriola, T. Shaver, C.A. Burr, T.J. Dorr. 2018. Reply to comments on “Performance assessment of factory and field calibrations for electromagnetic sensors in a loam soil”. *Agricultural Water Management*. 203: 272-276.
<https://www.sciencedirect.com/science/article/pii/S0378377418301318>
- Singh, J., T. Lo, D.R. Rudnick, T.J. Dorr, C.A. Burr, **R. Werle**, T.M. Shaver, F. Munoz-Arriola. 2018. Performance assessment of factory and field calibrations for electromagnetic sensors in a loam soil. *Agricultural Water Management*. 196:87-98.
<https://www.sciencedirect.com/science/article/pii/S0378377417303463>
- Barnes, E., **R. Werle**, L.D. Sandell, J.L. Lindquist, S.Z. Knezevic, P.H. Sikkema, and A. Jhala. 2017. Influence of tillage on common ragweed (*Ambrosia artemisiifolia*) emergence pattern in Nebraska. *Weed Technology*. 31:623-631. <http://www.bioone.org/doi/abs/10.1017/wet.2017.38>
- Werle, R.**, K. Begcy, M. K. Yerka, I. Dweikat, A. J. Jhala, J. P. Mower, and J. L. Lindquist. 2017. Independent evolution of acetolactate synthase-inhibiting herbicide resistance in weedy *Sorghum* populations across common geographic regions. *Weed Science*. 65:164-176.
<http://www.bioone.org/doi/abs/10.1614/WS-D-16-00095.1>
- Werle, R.**, B. Tenhumberg, and J. L. Lindquist. 2017. Modeling the evolution of shattercane resistance to ALS-inhibiting herbicides in an ALS-tolerant sorghum cropping system. *Ecological Modeling*. 343:131-141. <https://www.sciencedirect.com/science/article/pii/S0304380016306342>
- Saini, S., **R. Werle**, L.D. Sandell, and A. Jhala. 2016. Spring-tillage has no effect on the emergence pattern of glyphosate-resistant giant ragweed (*Ambrosia trifida* L.) in Nebraska. *Canadian Journal of Plant Science*. 96: 726-729. <http://www.nrcresearchpress.com/doi/abs/10.1139/cjps-2015-0287#.WuCdGZdOlaR>
- Werle, R.**, A. Jhala, M.K. Yerka, J.A. Dille, and J.L. Lindquist. 2016. Distribution of herbicide-resistant shattercane and johnsongrass populations in sorghum production areas of Nebraska and northern Kansas. *Agronomy Journal*. 108:321-328. *Invited Submission*.
<https://dl.sciencesocieties.org/publications/aj/abstracts/108/1/321>
- Werle, R.**, L.J. Giesler, M.L. Bernards, and J.L. Lindquist. 2015. Likelihood of soybean cyst nematode (*Heterodera glycines*) reproduction on henbit (*Lamium amplexicaule*) roots in Nebraska. *Weed Technology*. 29:35-41. <http://www.bioone.org/doi/abs/10.1614/WT-D-14-00063.1>
- Werle, R.**, L.D. Sandell, D.D. Buhler, R.G. Hartzler, and J.L. Lindquist. 2014. Predicting emergence of twenty three summer annual weed species. *Weed Science*. 62:267-279.
<http://www.bioone.org/doi/abs/10.1614/WS-D-13-00116.1>
- Werle, R.**, M.L. Bernards, T.J. Arkebauer, and J.L. Lindquist. 2014. Environmental triggers of winter annual weed emergence in the midwestern United States. *Weed Science*. 62:83-96.
<http://www.bioone.org/doi/abs/10.1614/WS-D-13-00091.1>

- Werle, R.**, L.L. Perez, L.D. Sandell, and J.L. Lindquist. 2014. Corn (*Zea mays*) emergence and early growth as influenced by tansymustard (*Descurainia pinnata*) residue. *Crop Management*. doi:10.2134/CM-2013-0088-RS.
<https://dl.sciencesocieties.org/publications/cm/abstracts/13/1/CM-2013-0088-RS>
- Werle, R.**, J.J. Schmidt, J. Laborde, A. Tran, C. Creech, and J.L. Lindquist. 2014. Shattercane X ALS-resistant sorghum F1 hybrid and shattercane interference in ALS-resistant sorghum. *Journal of Agricultural Science*. 6:159-165. <http://www.ccsenet.org/journal/index.php/jas/article/view/32906>
- Werle, R.**, M.L. Bernards, L.J. Giesler, and J.L. Lindquist. 2013. Influence of two herbicides on soybean cyst nematode (*Heterodera glycines*) reproduction on henbit (*Lamium amplexicaule*) roots. *Weed Technology*. 27:41-46. **Outstanding paper in Weed Technology**.
<http://www.bioone.org/doi/abs/10.1614/WT-D-12-00094.1>
- Han, C., C. Borman, D. Osantowski, J. Wagnitz, K. Koehler-Cole, K. Korus, E. Sonderegger, **R. Werle**, T. Wood, and J. L. Lindquist. 2012. Productivity of field pea (*Pisum sativum* L.) and spring oat (*Avena sativa* L.) grown as sole and intercrops under different nitrogen levels. *Journal of Agricultural Science*. 4:136-143. <http://www.ccsenet.org/journal/index.php/jas/article/view/18937>
- Rosolem, C.A., **R. Werle**, R.A. Garcia. 2010. Nitrogen washing from C₃ and C₄ cover grasses residues by rain. *Revista Brasileira de Ciência do Solo*. 34:1899-1905.
http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-06832010000600014
- Werle, R.**, R.A. Garcia, C.A. Rosolem. 2008. Potassium leaching as affected by soil texture and potassium availability. *Revista Brasileira de Ciência do Solo*. 32:2297-2305. (In Portuguese with English abstract). http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-06832008000600009

EXTENSION ARTICLES AND TECHNICAL PUBLICATIONS

- Werle, R.** 2018. Understanding the additional buffer requirements for dicamba applications in Xtend (dicamba-tolerant) crops. *WiscWeeds Info & Wisconsin Crop Manager Newsletter*. UW-Madison Integrated Pest and Crop Management. December 12, 2018.
<http://www.wiscweeds.info/post/dicamba-buffer-requirements/>
- Zimbric, J., D. Stoltenberg, M. Renz, and **R. Werle**. 2018. Herbicide resistance in Wisconsin: an overview (December 2018). *WiscWeeds Info & Wisconsin Crop Manager Newsletter*. UW-Madison Integrated Pest and Crop Management. December 11, 2018.
<http://www.wiscweeds.info/post/herbicide-resistance-in-wisconsin-an-overview/>
- DeWerff, R., B. Jensen, P.J. Liesch, G. Nice, M. Renz, D. Smith, and **R. Werle**. 2019. Pest management in Wisconsin field crops. University of Wisconsin-Extension, Cooperative Extension Publishing, Madison, WI. A3646.
- Smith, D., R. Proost, and **R. Werle**. 2018. UW waterhemp challenge: comparison of soil residual herbicides (preliminary report). University of Wisconsin-Madison Nutrient and Pest Management Program.
<http://www.wiscweeds.info/img/2018%20waterhemp%20challenge/Waterhemp%20Management%20PRE%20Comparison%20Lancaster%20WI%202018.pdf>
- Werle, R.**, M. Jugulam, G. Kruger, A. Vennapusa, F. Faleco, B. Vieira, and S. Samuelson. 2018. Research report: prevalence and mechanism of atrazine resistance in waterhemp from Nebraska. October 26, 2018. University of Nebraska-Lincoln CropWatch. Nebraska crop production and

- pest management information. <https://cropwatch.unl.edu/2018/research-atrazine-resistance-waterhemp>
- Werle, R.**, D. Smith, and R. Proost. 2018. UW waterhemp challenge: comparison of soil residual soybean herbicides. WiscWeeds Info & Wisconsin Crop Manager Newsletter. UW-Madison Integrated Pest and Crop Management. October 25, 2018. <http://www.wiscweeds.info/post/2018-uw-waterhemp-challenge-comparison-of-soil-residual-soybean-herbicides/>
- Werle, R.**, and M.C. Oliveira. 2018. Chave para Identificação de Injúrias Causadas por Herbicidas. University of Wisconsin-Madison Nutrient and Pest Management Program (*Brazilian Portuguese*). https://maxweeds.rbind.io/files/Herbicide%20chart/2018_HerbicideInjury_BRA.pdf
- Werle, R.**, and M.C. Oliveira. 2018. Herbicide site of action key for crop injury symptoms. University of Wisconsin-Madison Nutrient and Pest Management Program. http://www.wiscweeds.info/img/2018%20Herbicide%20SOA%20injury%20chart/2018_HerbicideInjury_EN.pdf
- Butts, T., B. Vieira, D. Latorre, **R. Werle**, and G. Kruger. 2018. Competitiveness of herbicide-resistant waterhemp in soybean: research update. University of Nebraska-Lincoln CropWatch. Nebraska crop production and pest management information. September 26, 2018. <https://cropwatch.unl.edu/2018/competitiveness-herbicide-resistant-waterhemp-amaranthus-tuberculatus-soybean>
- Werle, R.** 2018. Application window for most soybean herbicides coming close to an end. WiscWeeds Info & Wisconsin Crop Manager Newsletter. UW-Madison Integrated Pest and Crop Management. June 26, 2018. <http://www.wiscweeds.info/post/application-window-for-most-soybean-herbicides-coming-close-to-an-end/>
- Werle, R.** 2018. Palmer amaranth is now a prohibited noxious weed seed in Wisconsin, but what does it look like? WiscWeeds Info & Wisconsin Crop Manager Newsletter. UW-Madison Integrated Pest and Crop Management. June 07, 2018. <http://www.wiscweeds.info/post/palmer-amaranth-is-now-a-prohibited-noxious-weed-seed-in-wisconsin-but-what-does-it-look-like/>
- Werle, R.** 2018. Waterhemp management in soybeans. WiscWeeds Info & Wisconsin Crop Manager Newsletter. UW-Madison Integrated Pest and Crop Management. June 04, 2018. <http://www.wiscweeds.info/post/waterhemp-management-in-soybeans/>
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EXTENSION PRESENTATIONS

- Werle, R.** 2018. Waterhemp and Palmer amaranth Update & Value of PRE-emergence herbicides. BASF Take Control NOW by Planning for 2019 Winter Meeting. UW-Arlington Agricultural Research Station Arlington, WI. December 18, 2018. *(45 minutes; 85 participants)*.
- Werle, R.** 2018. Waterhemp and Other Resistant Weed Management Programs for 2019. 2018 Columbia County Corn Growers Meeting. Columbus, WI. December 13, 2018. *(45 minutes; 65 participants)*.
- Werle, R.** 2018. Corn and soybeans weed management research update. 2018 Wisconsin Pest Management Update Meetings. November 12, 2018 at Marshfield, WI, November 13, 2018 at Chippewa Falls, November 14, 2018 at Platteville and Janesville, WI, November 15, 2018 at Fond du Lac and Kimberly, WI, and November 16, 2018 at Bangor, WI. *(7 presentations, 40 minutes each, 350 participants total)*.
- Werle, R., R. DeWerff, and M.C. Oliveira.** 2018. WiscWeeds Soybean Research Update. WSA and WSMB in-field plot tour. UW-Arlington Agricultural Research Station. Arlington, WI. September 11, 2018. *(30 minutes, 30 participants)*.
- Werle, R., and D. Smith.** 2018. Limit the spread of weed seeds. 2018 Combine Cleaning Clinic. August 30, 2018 at Monticello, WI and September 05, 2018 at Columbus, WI. *(2 presentations, 90 minutes each, 50 participants total)*.
- Werle, R., V.H. Ribeiro, S. Striegel, and N. Arsenijevic.** 2018. Research update on weed management for annual cropping systems. 2018 Agronomy and Soils Field Day. UW-Arlington Agricultural Research Station. Arlington, WI. August 22, 2018. *(2 presentations, 20 minutes each, 150 participants total)*.
- Werle, R.** 2018. Recap of 2018 weed management season, systems approach to weed management, waterhemp and dicamba updates. 2018 Western Wisconsin Crop Management Field Days. August 15 at Chippewa Falls, Waumandee and La Crosse, WI, and August 16 at Tomah and Viola, WI. *(5 presentations, 40 minutes each, 150 participants total)*.
- Werle, R., and C.A. Proctor.** 2018. Integrating weed management strategies in soybeans. 2018 Nebraska Soybean Management Field Days. August 07, 2018 at Kenesaw, NE, August 08, 2018 at Albion, NE, August 09, 2018 at Hartington, NE, and August 10 at Cedar Bluffs, NE. *(14 presentations, 60 minutes each, 420 participants total)*.
- Werle, R.** 2018. 2018 Update on herbicide resistant in Wisconsin corn and soybeans. 2018 BASF Agronomy Field Day. Janesville, WI. July 12, 2018. *(3 presentations, 30 minutes each; 150 participants total)*
- Werle, R.** 2018. Developing a spray program to combat herbicide-resistant weeds. 2018 Summer Field Day: Grain Crop Management. Sturgeon Bay, WI. June 12, 2018. *(30 minutes, 15 participants total)*.
- Werle, R.** 2018. Distribution and management of herbicide-resistant weeds in Wisconsin. John Deere Tractor Central – 2018 Westby Spring Expo. Westby, WI. March 14, 2018. *(40 minutes, 100 participants total)*.
- Werle, R.** 2018. Herbicide resistance update and management of herbicide-resistant weeds. Crop Management Meeting, Trempealeau County. Centerville, WI. March 08, 2018. *(40 minutes, 15 participants total)*.
- Werle, R.** 2018. Weed science program update. Grains Team Wisline (conference call). March 02, 2018. *(20 minutes, 10 participants total)*.

- Werle, R.** 2018. Weed management and herbicide resistance update. 2018 Winter Crops Update. Sparta, WI. February 15, 2018. *(40 minutes, 15 participants total)*.
- Werle, R.** 2018. Dissecting dicamba and other spray issues. 2018 Wisconsin Corn-Soy Expo. Wisconsin Dells, WI. February 01, 2018. *(2 presentations, 60 minutes each, 250 participants total)*.
- Werle, R.** 2018. Tips on waterhemp management in soybeans. 2018 Wisconsin Agribusiness Classic. Madison, WI. January 09, 2018. *(30 minutes, 300 participants total)*.
- Werle, R.** 2018. Weed management in corn and soybeans. 2018 Wisconsin agronomy update meetings. January 02, 2018 at Janesville, WI; January 03, 2018 at DeForest and Fond du Lac, WI; January 04, 2018 at Kimberly and Wausau, WI; January 05, 2018 at Eau Claire and Sparta, WI; January 08, 2018 at Belmont, WI. *(8 presentations, 40 minutes each, 380 participants total)*.
- Werle, R.** 2017 Survey of Nebraska soybean farmer's adoption of Xtend technology and off-site dicamba movement. Nebraska Farm Bureau Dicamba Industry Roundtable. Lincoln, NE. October 10, 2017.
- Werle, R.** 2017. Overview of cover crops and weed management in Nebraska. University of Nebraska WCREC Educational Travel to NDSU Extension Personnel and ND stakeholders. North Platte, NE. August 15, 2017.
- Elmore, R., and **R. Werle.** 2017. Maturity group and traits, cover crops and weed management. August 08, 2017 at North Platte, NE; August 09, 2017 at Ord, NE; August 10, 2017 at Auburn, NE; August 11, 2017 at Tekamah, NE.
- Werle, R.** 2017. Research update – cover crops after wheat harvest. 2017 Nebraska Extension rainfed cropping systems field day. West Central Research and Extension Center, North Platte, NE. June 19, 2017.
- Werle, R.** 2017. Research update – cover crops after wheat harvest. 2017 Nebraska Extension field pea, forages, and cover crops field day. Bladen, NE. June 16, 2017.
- Werle, R.**, and C. Proctor. 2017. Using knowledge on plant morphology and a seedling identification key to ID weeds. University of Nebraska-Lincoln Extension, Introductory Level Field Scout Training. Agricultural Research and Development Center, Ithaca, NE. May 10, 2017.
- Werle, R.** 2017. Termination of cover crops – what if the plan does not work? Developing a plan for grain crop herbicide management. 2017 Cover Crop Conference. UNL Agricultural Research and Development Center, Ithaca, NE. February 14, 2017.
- Werle, R.**, and C. Creech. 2017. Weed control in grain sorghum and update on herbicide-resistant weeds. 2017 Sorghum Symposium. UNL West Central Research and Extension Center, North Platte, NE. January 25, 2015.
- Werle, R.** 2016. Palmer amaranth and other weed issues headed our way. 2016 Wilber Crop Clinic. Wilber, NE. February 12, 2016.
- Werle, R.** 2016. Herbicide-resistance management: grain sorghum as a case study. 2016 Pest Resistance Workshop. Grant, NE. March 10, 2016.
- Werle, R.**, C. Proctor, and J. Miller. 2016. Using knowledge on plant morphology and a seedling identification key to ID weeds. University of Nebraska-Lincoln Extension, Introductory Level Field Scout Training. Agricultural Research and Development Center, Ithaca, NE. May 11, 2016.
- Werle, R.**, and M.K. Yerka. 2016. Update on Weed Management in Inzen Sorghum. 2016 Weed Management Field Day. June 29, 2016, Clay Center, NE
- Werle, R.**, and J. Miller. 2016. Cover crop termination and weed management. University of Nebraska-Lincoln Extension, Mid-Summer Crop Management Diagnostic Clinics. Agricultural Research

- and Development Center, Ithaca, NE. July 13, 2016.
- Arneson, N., B. Krienke, C. Shapiro, and **R. Werle**. 2016. Soil fertility, PPO herbicide, and conventional soybean studies. Soybean Management Field Days. August 09, 2016 at Orchard, NE; August 10, 2016 at Chapman, NE; August 11, 2016 at Cordova, NE; August 12, 2016 at Schuyler, NE.
- Werle, R.** and L. Butts. 2016. Sorghum weed control and field peas research. Water and Crops Field Day: Systems Approach to Cropping Systems and Irrigation Management. August 23, 2016 at the West Central Research and Extension Center, North Platte, NE.
- Werle, R.** and S. Stepanovic. 2016. Soil nutrients, microbial activity, and soil infiltration. Field Pea Production Workshop. November 04, Culbertson, NE.
- Werle, R.** and S. Stepanovic. 2016. Seeding rates, seeding depth, and inoculants. Field Pea Production Workshop. November 04, Culbertson, NE.
- Werle, R.** 2016. Alternative strategies for herbicide resistance management. Nebraska Agri-Business Association: 2016 Research Symposium. November 16, 2016, Grand Island.
- Werle, R.** 2016. Update on distribution of herbicide resistant weeds in Nebraska and Palmer amaranth research in southwest Nebraska. Red Willow Chemical and Fertilizer and BASF Grower Meeting. December 05, 2016, McCook, NE.
- Werle, R.** 2016. Update on distribution of herbicide resistant weeds in Nebraska and Palmer amaranth research in southwest Nebraska. Extreme Ag and BASF Grower Meeting. December 06, 2016, North Platte and Cambridge, NE.
- Werle, R.** and J. Miller. 2015. Using knowledge on plant morphology and a seedling identification key to ID weeds. University of Nebraska-Lincoln Extension, Field Scout Training. Agricultural Research and Development Center, Ithaca, NE. May 12, 2015.
- Sandell, L. and **R. Werle**. 2013. Update on herbicide resistance and results from the weed resistance management field days. Nebraska AgriBusiness Association Update Meeting. Lincoln, NE. December 06, 2013.
- Sandell, L. and **R. Werle**. 2012. Herbicide resistance and timing and control recommendations for winter annual weeds. University of Nebraska-Lincoln Extension, Late Season Crop Management Diagnostic Clinics. Agricultural Research and Development Center, Ithaca, NE. August 9, 2012.
- Sandell, L., **R. Werle**, A. J. Jhala. 2012. Addressing winter annual and glyphosate-resistant weeds. University of Nebraska-Lincoln Extension, South Central Agricultural Laboratory Field Day. Clay Center, NE. August 10, 2012.

EXTENSION VIDEOS

- Werle, R.** 2018. 2018 Large-scale dicamba drift study. University of Wisconsin Integrated Pest and Crop Management. August 02, 2018. <https://www.youtube.com/watch?v=k6jMoGwRp0>
- Werle, R.** 2018. Tips on waterhemp management in soybeans for the 2018 growing season. University of Wisconsin Integrated Pest and Crop Management. March 12, 2018. <https://www.youtube.com/watch?v=agxSPiCEKrg>
- Werle, R.** 2018. 2018 herbicide resistance update in Wisconsin. University of Wisconsin Integrated Pest and Crop Management. March 12, 2018. <https://www.youtube.com/watch?v=HR1KFvHgYr0>
- Werle, R.** 2017. 2017 Dicamba survey. University of Nebraska-Lincoln Market Journal. December 15, 2017. <https://www.youtube.com/watch?v=piop0p0u9Gk>
- Werle, R.** 2017. Cover crop and weed control. University of Nebraska-Lincoln Market Journal. September 08, 2017. <https://www.youtube.com/watch?v=CIW50H1cTdw>

- Werle, R.** 2017. Terminating cover crops. University of Nebraska-Lincoln Market Journal. March 10, 2017. <https://www.youtube.com/watch?v=mf5Jq8PYJ5g>
- Werle, R.** 2017. Brazil's growing season. University of Nebraska-Lincoln Market Journal. January 27, 2017. https://www.youtube.com/watch?v=_bmO25sUKTk
- Werle, R.** 2016. Crop research update. University of Nebraska-Lincoln Market Journal. July 29, 2016. <https://www.youtube.com/watch?v=Fjz8y7v0hd0&feature=youtu.be>

HOSTED EXTENSION EVENTS (e.g., *Field Days, Plot Tours; 2018 Onwards*)

- Dicamba off-target large-scale and low-tunnel trials. UW-Arlington Agricultural Research Station. Arlington, WI. August 02, 2018 (Monsanto Team and stakeholders) and August 20, 2018 (Dekalb Team and stakeholders). (2 events; 120 minutes each; 50 participants total).
- Waterhemp Management Challenge Plot Tour. UW-Lancaster Agricultural Research Station. Lancaster, WI. July 17, 2018 (open to the public), August 02, 2018 (DeLong Company), and August 06, 2018 (Valent Company). (3 events; 120 minutes each; 180 participants total).
- Weed Science Plot Tour. UW-Arlington Agricultural Research Station. Arlington, WI. July 17, 2018. (180 minutes, 60 participants total).
- UW-Weed Science Tour – Corteva (Dow AgroSciences and DuPont). UW-Arlington Agricultural Research Station. Arlington, WI. July 09, 2018. (180 minutes, 30 participants).
- Herbicide Plot Tour – Sipcam. Rock County Farm. Janesville, WI. June 19, 2018. (90 minutes; 10 participants)
- Columbia County Corn Growers Association Early-Season Weed Management Field Day. UW-Arlington Agricultural Research Station. Arlington, WI. June 06, 2018. (90 minutes, 20 participants total).

INVITED PRESENTATIONS (*CLASSROOM & SYMPOSIUM*)

- Oliveira, M., and R. Werle. 2018.** From herbicide resistance to dicamba off-target management: the weed management challenges in the United States. 2nd International Meeting of Agrarian Science and Technology (IMAST). Dracena, SP, Brazil. September 27, 2018.
- Werle, R.** 2018. Dicamba and crop status update for the United States northwestern soybean production region. November 08, 2018. Bayer Academic Summit. St Louis, MO.
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ON THE MEDIA (*Selected Media Interviews*)

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- WI Farm Report Radio Network; Farm Report with Pam Jahnke: Waterhemp war (Audio Interview with Weed Scientist Rodrigo Werle): <http://www.fabulousfarmbabe.net/2018/08/27/waterhemp-war/> (08/27/2018)
- PAT CHAT Newsletter; UW-Extension Pesticide Applicator Training Program: Waterhemp and Palmer amaranth: an interview with Dr. Rodrigo Werle (Audio Interview):
http://ipcm.wisc.edu/tools/Newsletter/013_18_Aug.html#TOP (Issue: August, 2018)
- NTV's Grow: Wisconsin Weed Scientist Rodrigo Werle shares his thought on dicamba use in soybeans (YouTube Video). https://www.youtube.com/watch?time_continue=2&v=cJVr7ggzHAE (08/12/2018)
- NTV's Grow: Wisconsin Weed Scientist Rodrigo Werle talks about value of integrated weed management (YouTube Video): <https://www.youtube.com/watch?v=rvHjfriEGpc> (08/19/2018)
- Brownfield; Ag news for America: Dicamba test plots demonstrate volatility and drift results. <https://brownfieldagnews.com/news/dicamba-test-plots-demonstrate-volatility-and-drift-results/> (08/02/2018)

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