

Emily B. (Merewitz) Holm, Ph.D.

Curriculum Vitae

Department of Plant, Soil, and Microbial Sciences
Michigan State University
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EDUCATION

- Rutgers, The State University of New Jersey** Sept 2001 – May 2005
Dual Degrees: B. Sc. Plant Science (Highest Honors)
B. Sc. Plant Biotechnology (Highest Honors)
- Rutgers, The State University of New Jersey** Sept 2005 – May 2012
Ph.D. Plant Biology (GPA 3.97)

ACADEMIC EMPLOYMENT

- Michigan State University, Plant Soil and Microbial Sci Dept., E. Lansing, MI.** Aug 2012 - present
Assistant Professor
- Rutgers University, Department of Plant Biology and Pathology, New Brunswick, NJ.**
Senior Laboratory Technician and Graduate Student May 2005 – Aug 2012
- Rutgers University, Biotechnology Department, New Brunswick, NJ.**
Teaching Assistant Jan 2011 – May 2011 and Sept 2005 – Feb 2005
- New Jersey Agricultural Experiment Station, New Brunswick, NJ.**
Course Instructor Sept 2011 – Aug 2012

ACADEMIC PUBLICATIONS

Peer Reviewed Journal Articles (Total published = 40; Pending publication = 1; Total as corresponding author = 23 (bold); IF = impact factor at time of publication)

1. Sunoj, J., Maswada, HF, Djanaguiraman M, Krishnan S, **Merewitz E**, and Prasad, V. 2022 *in preparation*. Drought induces modulation of phytohormones and its relationship with physio-biochemical traits in early maturing maize.
2. Krishnan, S., and **E. Merewitz**. 2022. Variation in creeping bentgrass cultivar responses to drought stress. *Horttechnology*. 32(2):87-89. IF = 1.087
3. **Merewitz, E**. 2021. Current outlook on ice encasement stress and management strategies in turfgrasses. *HortTechnology*. 31(5): 561-565. <https://doi.org/10.21273/HORTTECH04907-21>. IF = 1.087
4. Laskowski K and **Merewitz E**. 2021. Influence of ice and ethylene regulation on cellular protection mechanisms in annual bluegrass. *J. Amer. Soc. Hort. Sci.* 146:87-98, <https://doi.org/10.21273/JASHS05000-20>. IF = 1.502.
5. Laskowski K and **Merewitz E**. 2020. Chemical priming to improve annual bluegrass survival of ice encasement. *Agronomy J.* 112:5002-5011, <https://doi.org/10.1002/agj2.20420>. IF = 2.24

6. Laskowski K and **Merewitz E**. 2020. Ethylene regulatory treatment effects on annual bluegrass survival of freezing temperature and ice cover. *Agronomy J*. 112:861-870, <https://doi.org/10.1002/agj2.20030>. IF = 2.24
7. Wei Li, Longmei Zhai, Steven Strauss, Huseyin Yer, Emily Merewitz, Junmei Chen, Xiaomin Wang, Weibing Zhuang, Chu Fang, Yingnan Chen, Richard McAvoy, Zhenhai Han, and Yi Li. 2019. Transgenic reduction of cytokinin levels in roots inhibits root-sprouting in *Populus*. *Plant Physiol*. 180:1788-1792. IF = 6.902
8. **Merewitz, E** and Liu S. 2019. Improvement in heat tolerance of creeping bentgrass with melatonin, rutin, and silicon. *J. Amer. Soc. Hort. Sci.* 144(2): 1-8. 2019. IF=1.216
9. Liu S, Vargas J, and **Merewitz E**. 2018. Temperature and hormones associated with bacterial etiolation symptoms of creeping bentgrass and annual bluegrass. *J. Plant Growth Regul.* 1-13. <https://doi.org/10.1007/s00344-018-9837-4>. IF = 2.74.
10. Laskowski K, Frank K, and **Merewitz E**. 2018. Chemical plant protectant and plant growth regulator effects on annual bluegrass survival of ice cover. *Journal of Agronomy and Crop Science*. 00:1–11. <https://doi.org/10.1111/jac.12309>. IF = 3.473
11. Liu S, Vargas J, and **Merewitz E**. 2018. Jasmonic and salicylic acid treatments reduce bacterial etiolation disease of creeping bentgrass in optimal and high temperatures. *Crop Protection* 109:9–16. IF = 2.25
12. Laskowski K, Frank K, and **Merewitz E**. 2018. Surfactant effects on creeping bentgrass and annual bluegrass exposed to different irrigation and traffic stress treatments. *Agronomy J* 110:1-7. IF = 1.894
13. Li W, Fang C; Krishnan S, Chen J, Yu H, Murphy A, Merewitz E, Katin-grazzini L, Mcavoy R, Deng Z, Zale J, Li Y. 2017. Elevated auxin and reduced cytokinin contents in rootstocks improve their performance and grafting success. *Plant Biotechnology Journal* 10.1111/pbi.12738. IF = 6.845
14. Li Z, Zhang Y, Zhang X, **Merewitz E**, Peng Y, Ma X, Huang L, and Yan Y. 2017. Metabolic pathways regulated by chitosan contributing to drought tolerance in white clover. *J Proteome Research* 16:3039-3052. IF = 3.950
15. Ma Y, Shukla V, and **Merewitz E**. 2017. Transcriptome analysis of creeping bentgrass exposed to drought stress and polyamine treatment. *PLoS ONE* 12(4): e0175848. <https://doi.org/10.1371/journal.pone.0175848>. IF = 2.766
16. Krishnan SK and **Merewitz E**. 2017. Polyamine application effects on gibberellic acid content in creeping bentgrass during drought stress. *J. Amer. Soc. Hort. Sci. JASHS* 142 (2) 2135-142. doi: 10.21273/JASHS03991-16. IF = 0.986
17. Liu S, Vargas J, and **Merewitz E**. 2017. Phytohormones associated with bacterial etiolation disease in creeping bentgrass. *Environmental and Experimental Botany* 133:35-49.
18. Wei Li, Lorenzo Katin-Grazzini, Sanalkumar Krishnan, Rania El-Tanbouly, Huseyin Yer, Chandra Thammina, Emily Merewitz, Karl Guillard, John Inguagiato, Richard J. McAvoy and Yi Li. 2016. A novel two-step method for screening shade tolerant mutant plants via dwarfism. *Frontiers in Plant Science* 7:1495. DOI 10.3389/fpls.2016.01495. IF = 4.484
19. Ma Y and **Merewitz E**. 2016. Role of polyamines in stress responses. *CAB Reviews*. 11 (003):1-11. IF = 0.542
20. Xu Q, S Krishnan, E Merewitz, J Xu, B Huang. 2016. Gibberellin-regulation and genetic variations in leaf elongation for tall fescue in association with differential gene expression controlling cell expansion. *Scientific Reports Nature*. 6:30258. DOI: 10.1038/srep30258. IF = 1.692
21. Li Z, Y Zhang, X Zhang, **Y Peng, E Merewitz**, X Ma, L Huang and Y Yan. 2016. The alterations of endogenous polyamines and phytohormones induced by exogenous application of spermidine regulate antioxidant metabolism, metallothionein and relevant genes conferring drought tolerance in white clover. *Environmental and Experimental Botany* 124: 22-38. 10.1016/j.envexpbot.2015.12.004. IF = 4.369

22. Krishnan S, Ma Y, and **Merewitz E.** 2016. Leaf trimming and high temperature regulation of phytohormones and polyamines in creeping bentgrass leaves. *J. Amer. Soc. Hort. Sci.* 141:66-75. IF = 1.250
23. Merewitz E, Xu Y, and Huang B. 2016. Differential gene expression analysis by suppression subtractive hybridization of creeping bentgrass with a cytokinin biosynthesis transgene exposed to drought stress. *PLOS ONE.* 11(11): e0166676. 10.1371/journal.pone.0166676. IF = 3.179
24. Ma Y and **Merewitz E.** 2016. Polyamine content changes in creeping bentgrass exposed to salt stress. *J. Amer. Soc. Hort. Sci* 141:498-506. IF = 1.250
25. Jespersen D, Merewitz E, Xu Y, Honig J, Bonos S, Meyer W, and Huang B. 2016. Quantitative trait loci associated with physiological traits for heat tolerance in creeping bentgrass. *Crop Sci.* 56:1314-1329. IF = 1.753
26. Shukla V, Yingmei Ma, and **Merewitz E.** 2015. Creeping bentgrass responses to drought stress and polyamine application. *J. Amer. Soc. Hort. Sci.* 140:94-101. IF = 1.252
27. Krishnan SK and **Merewitz E.** 2015. Phytohormone responses and cell viability during salinity stress in two creeping bentgrass cultivars differing in salt tolerance. *J. Amer. Soc. Hort. Sci.* 140:346-355. IF = 1.252
28. Krishnan, SK and **Merewitz E.** 2015. Drought stress and trinexapac-ethyl modify phytohormone content within kentucky bluegrass leaves. *J. Plant Growth Regul.* 34:1-12. DOI: 10.1007/s00344-014-9434-0. IF = 2.71
29. Merewitz, E., F. Belanger, S. Warnke, B. Huang, and S. Bonos. 2014. Quantitative trait loci associated with drought tolerance in creeping bentgrass (*Agrostis stolonifera* L.). *Crop Sci.* doi:10.2135/cropsci2013.12.0810. IF = 1.845
30. Krishnan, S., Laskowski, K., Shukla, V. and **E. Merewitz.** 2013. Mitigation of drought stress damage by exogenous application of a non-protein amino acid γ -aminobutyric acid on perennial ryegrass. *J. Amer. Soc. Hort. Sci.* 138:358-366. IF = 1.53
31. Merewitz, E., and B. Huang. 2013. Research advances in drought resistance mechanisms of turfgrass species. *Int. Turfgrass Soc. Res. J.* ISSN 1817-0641.
32. Merewitz, E., F. C. Belanger, S. E. Warnke, and B. Huang. 2012. Identification of quantitative trait loci (QTL) that influence drought tolerance in a colonial x creeping bentgrass hybrid population. *Crop Sci.* 52(4):1-11. IF = 1.734
33. Yang, Z., J. Yu, E. Merewitz, and B. Huang. 2012. Differential effects of abscisic acid and glycine betaine on physiological responses to drought and salinity stress for two perennial grass species. *J. Amer. Soc. Hort. Sci.* 137(2):96-106. IF= 1.53
34. Merewitz, E. H. Du, W. Yu, Y. Liu, T. Gianfagna, B. Huang. 2012. Elevated cytokinin content in creeping bentgrass may promote drought tolerance by regulation of the metabolite profile. *Journal of Experimental Botany* doi:10.1093/jxb/err372. IF = 6.037
35. Merewitz, E., T. Gianfagna, B. Huang. 2011. Protein accumulation in leaves and roots associated with improved drought tolerance in creeping bentgrass expressing an ipt gene for cytokinin synthesis. *J. Exp. Bot.* doi: 10.1093/jxb/err166. IF = 6.037
36. Rotter, D., E. Merewitz, B. Huang, and F. Belanger. 2011. Chromosomal regions associated with dollar spot resistance in colonial bentgrass. *Plant Breeding*, doi: 10.1111/j.1439-0523.2011.01891.x. IF = 1.797
37. Merewitz, E. T. Gianfagna, and B. Huang. 2011. Photosynthesis, water use, and root viability under water stress as affected by expression of SAG12-ipt controlling cytokinin synthesis in *Agrostis stolonifera*. *J. Exp Bot.* 62: 383-395, doi:10.1093/jxb/erq285. IF = 5.833
38. Merewitz, E. T. Gianfagna, and B. Huang. 2010. Effects of SAG12-ipt and HSP18.2-ipt expression on cytokinin production, root growth and leaf senescence in creeping bentgrass exposed to drought stress. *J. Amer. Soc. Hort. Sci.* 135: 230-239. IF = 1.016

39. Merewitz, E. W. Meyer, S. Bonos, and B. Huang. 2010. Drought stress responses and recovery of Texas x Kentucky hybrids and Kentucky bluegrass genotypes in temperate climate conditions. *Agron. J.* 102:258-268. IF = 2.021
40. Chai, X., F. Jin, E. Merewitz, and B. Huang. 2010. Growth and physiological traits associated with drought survival and post-drought recovery in perennial turfgrass species. *J. Amer. Soc. Hort. Sci.* 135(2):1-9. IF = 1.016
41. Bian, X. E. Merewitz, and B. Huang. 2009. Effects of trinexapac-ethyl on drought responses in creeping bentgrass associated with water use and osmotic adjustment. *J. Amer. Soc. Hort. Sci.* 134: 505-510. IF = 1.264

Book Chapters (2)

Merewitz, E. 2016. Priming-induced drought stress tolerance in plants. In: *Drought Tolerance in Plants*. Editors: A. Hossain, et al. Springer, New York, NY. ISBN: 9783319288970 (2.9k downloads, 14 citations, 500 reads on ResearchGate)

Merewitz, E. and B. Huang. 2007. Biotechnology in plant tolerance to heat and drought stress In: *Plant Stress and Biotechnology*, Thangadurai D, Tang W, Song SQ (eds.), Oxford Book Company, Jaipur, India. pp. 105-125 (ISBN: 8189473105).

Trade Articles (Total 13 published)

E. Merewitz, Rucamumihigo, FX, and K. Laskowski. 2021. Improving turfgrass survival of ice encasement. *Golf Course Management (GCM)* a trade publication of the Golf Course Superintendents Association of America (GCSAA). July
<https://www.gcmonline.com/course/environment/news/turfgrass-survival-ice-cover>

Laskowski, K. Frank, K., and **E. Merewitz**. Surfactant effects on overwatering, underwatering and traffic stress of cool-season greens. 2019. *Golf Course Management (GCM)* a trade publication of the Golf Course Superintendents Association of America (GCSAA).

Frank, K. and **E. Merewitz**. 2018. What's in the freezer? GSCAA Course Conditions.

Rucamumihigo, F.X. and **E. Merewitz**. 2016. Chemical priming for creeping bentgrass stress tolerance. *Golf Course Management (GCM)* a trade publication of the Golf Course Superintendents Association of America (GCSAA).

Frank, K and **E. Merewitz**. 2016. A call from campus: Improving ice stress survival of annual bluegrass. GCSAA Course Conditions.

Laskowski, K. Frank, K. and **E. Merewitz**. 2016. Managing ice stress of annual bluegrass. *Golf Course Management (GCM)* a trade publication of the Golf Course Superintendents Association of America (GCSAA).

Vargas, J. and **E. Merewitz**. 2015. Physiological responses of creeping bentgrass to infection by bacterial pathogen (*Acidovorax avenae* subsp. *Avenae*) *News Notes* a publication of the Michigan Turfgrass Foundation.

Frank, K and **E. Merewitz**. 2015. Evaluation of crown membrane health and gas accumulation in response to ice stress and management practices of creeping bentgrass and poa annua. Course Conditions, a trade publication of the GCSAA.

Frank, K and **E. Merewitz**. 2015. Low temperature Chamber for Winterkill Research. News Notes a publication of the Michigan Turfgrass Foundation.

Frank, K and **E. Merewitz**. 2015. Effects of limited irrigation and traffic stress on creeping bentgrass and poa annua. News Notes a publication of the Michigan Turfgrass Foundation.

Laskowski, K. Frank, K. and **E. Merewitz**. 2014. Effects of Automated Irrigation and Traffic on Annual Bluegrass and Creeping Bentgrass. Golf Course Management (GCM) a trade publication of the Golf Course Superintendents Association of America (GCSAA).

Krishnan, S., Laskowski, K., Shukla, V. and **E. Merewitz**. 2014. GABA mitigates drought stress damage in perennial ryegrass. 2014. Golf Course Management Magazine a trade publication of the Golf Course Superintendents Association of America (GCSAA).

Frank, K. and **E. Merewitz**. 2013. Call from campus: Irrigation and stress physiology research. Course Conditions, a publication of the MI GCSAA.

Technical Industry Reports

Michigan State University, Plant Soil and Microbial Sci Dept., E. Lansing, MI.

Merewitz, E. 2017. Heat stress responses of turfgrass following treatment with Gantec experimental products. For Gantec, Midland, MI.

Merewitz, E. 2017. Drought stress responses of turfgrass following treatment with Gantec experimental products. For Gantec, Midland, MI. Representative

Liu, S. and Merewitz, E. 2016. Effects of fertilizers containing naturally derived supplements on turfgrass survival of heat stress. For Residex, Wixom MI (Turfgrass Management Supply Company; now Target Specialty Products). Technical representative: Steve Loveday.

Laskowski, K and **Merewitz, E.** 2016. Creeping bentgrass and Poa annua survival of winter stress following naturally derived foliar treatments. For Oceans Organics, Waldoboro, ME. Technical representative: Sarah Middleton Williams.

Merewitz, E. 2015. Creeping bentgrass drought stress responses as affected by foliar fertilizer containing naturally derived non-nutritional components. For Residex, Wixom MI (Turfgrass Management Supply Company; now Target Specialty Products). Technical representative: Steve Loveday.

Krishnan, S., E. Runkle, and **E. Merewitz**. 2015. Effect of experimental BASF treatments on drought tolerance of grass and ornamental species. In collaboration with BASF Technical Representative: Rebecca Lister.

Merewitz, E. and Frank, K. 2015. Effects of wetting agent chemistries on performance characteristics on golf course putting greens. In collaboration with BASF Technical Representative: Staci Weginer.

Laskowski, K. and E. **Merewitz**. 2015. Effects of experimental treatments on summer stress responses of creeping bentgrass putting green plots. In collaboration with Patrick Burgess Company Rep for BAYER Crop Science, Research Triangle Park, NC.

Laskowski, K. and E. **Merewitz**. 2014. Effects of signature extra stressgard and other pesticide treatments on drought performance of creeping bentgrass putting greens. For BAYER Crop Science, Research Triangle Park, NC.

Rutgers University, Department of Plant Biology and Pathology, 2005-2012. (10)

Merewitz, E. and B. Huang. 2005. Effects of a dew control agent on dew formation, plant water status, soil moisture, and leaf wetness of creeping bentgrass (for Mitchell Products, Millville, NJ)

Merewitz, E. and B. Huang. 2008 and 2009. Photosensitivity of a benzoporphyrin in relation to its influence on photosynthesis in creeping bentgrass (for Bayer Cropsience, Germany)

Merewitz, E. and B. Huang. 2009. Effects of a benzoporphyrin derivative on photosynthesis in Zea mays: The effective rate and duration of effectiveness (for Bayer Cropsience, Germany)

Merewitz, E. and B. Huang. 2008. Physiological effects of biostimulants on turfgrass salinity tolerance (for Oceans Organics, Waldoboro, ME)

Merewitz, E. and B. Huang. Evaluation of the use of HydroJect, solid tine, and biostimulants in summer bentgrass management (For Toro, Bloomington, MN; Summer 2008-2009)

Merewitz, E. and B. Huang. Evaluation of effects of 1MCP and AVG on creeping bentgrass heat and drought tolerance (for Syngenta Corporation; 2008)

Merewitz, E. and B. Huang. Effects of Honor, Heritage, and BASF 50017F on Creeping Bentgrass Performance and root growth characteristics under Drought Stress (for BASF corporation; Fall 2010)

Merewitz, E. and B. Huang. Effects of Honor, Heritage, and BASF 50017F on Creeping bentgrass Responses to High and Low Nitrogen Fertilization (for BASF corporation; Spring 2010-2011)

Merewitz, E. and B. Huang. Evaluation of Nature's Wonder Apex-10 biostimulant for reducing fertilizer usage in turfgrasses (Nature's Wonder LLC, NJ; 2011)

Merewitz, E. and B. Huang. Investigation of dosage effects and causation of physiological damage due to triazole fungicide applications in turfgrasses (Syngenta Corp; 2012)

ACADEMIC TEACHING

Michigan State University, Plant Soil and Microbial Sci Dept., E. Lansing, MI.

Instructor - Turfgrass Physiology CSS 282 301- a required undergraduate class for 4-year undergraduate students on the Turfgrass Management track and 2-year turfgrass management certificate students. It is 2 credits offered every Spring semester and has an average of 20 students per semester.

Instructor - Data Analysis and Interpretation in the Agronomic Sciences CSS-313 – a required undergraduate course for 4-year Agronomy and Turfgrass major students, with an average of 30 students per Spring semester. The course is 2 credits.

Co-Instructor - Environmental Plant Physiology PLB 863. This is a graduate level class offered every other Spring for 3 credits.

Rutgers University, Department of Plant Biology and Pathology, New Brunswick, NJ.

Teaching assistant - Methods in Recombinant DNA Technology (11:126:427, 4 credits; lecture and 2 lab sections)

Teaching assistant - Advanced Plant Physiology (16:765:502:01, 3 credit lecture and lab). Assisted with grading of papers and plant preparation and experiment set up and demonstration for laboratory sections.

New Jersey Agricultural Experiment Station, New Brunswick, NJ (9/1/11- 5/15/2012)

Instructor - Turfgrass Development/Physiology (a two-year certificate program of the Rutgers Professional Golf Turf Management School)

PROFESSIONAL SOCIETY MEMBERSHIPS

Crop Science Society of America (CSSA), 2005 – present.

American Society of Agronomy (ASA), 2005 – present.

Soil Science Society of America (SSSA), 2005 – present.

American Society for Horticultural Science (ASHS), 2005 – present.

Plant Growth Regulation Society of America (PGRSA), 2017.

Golf Course Superintendents Association of America, 2015 – 2017.

HONORS AND AWARDS

1. H.B. Musser Foundation Award of Excellence. This is the most prestigious award for doctoral candidates in the Turfgrass Sciences. \$30,000 award, 2013.
2. Rutgers University Graduate School Dissertation Research Award, 2012.
3. Gerald O. Mott Meritorious Graduate Student in Crop Science Award and Scholarship (\$2500), funded by Crop Science Society of America (CSSA), 2011.
4. James R. Watson Fellowship (\$5000) recipient funded by the TORO company and the Environmental Institute for Golf (GCSAA), 2010.
5. Spencer H. Davis, Jr. Plant Biology & Pathology Department of Rutgers University, Graduate Student Research Award recipient, 2010.
6. 1st place in Annual ASA-CSSA-SSSA graduate student poster competition C5 Turfgrass Science division, 2011.
7. 1st place in NE-ASHS graduate student oral competition: Norman S. Childers award, 2008.
8. 1st place poster award for outstanding graduate paper award, CSSA annual meeting, 2011.
9. 2nd place in CSSA-ASA-SSSA C2 Crop Physiology graduate student oral competition, 2010.
10. 2nd place for Annual ASA-CSSA-SSSA C5 graduate student poster competition, Turfgrass Breeders Committee, 2008.

GRANT FUNDING

Awards Pending (2)

Merewitz, E. and E. Olson. Submitted for 2022 funding. Management strategies to reduce wheat winterkill. Project GREEN. \$40,000

Merewitz, E. and M. Singh. Submitted for 2022 funding. Quantifying physiological consequences and management options for tar spot in corn production Project GREEN. \$40,000

Awards Funded (29)

Merewitz, E and B. McGraw. 2020 – 2023. Characterization of turfgrass plant induced defenses in response to annual bluegrass weevil feeding. United States Golf Association. MSU \$20,000.

Merewitz, E. 2022-2023. High throughput phenotyping of turfgrass photosynthetic and growth responses to drought. United States Golf Association. Submitted 8/2/2021. 1 year. \$29,648

Merewitz, E., J. Dedecker, B. Wilke submitted 11/2/2021. Funds awarded for 1 year 2022-2023. Winter hardiness of malting barley in Michigan. MI Craft Bev. Council. \$40,000 (\$12,000)

Merewitz, E. and E. Olson. Submitted 2020 for 2021 funding. Management strategies to reduce wheat winterkill. Project GREEN \$40,000

Merewitz, E and M. Singh. Submitted 11/22/2021. Funds for 1 year 2022-2023. Quantifying physiological consequences and management options for tar spot in corn production. Corn Marketing Program of Michigan. \$19,965. (\$8,000)

Merewitz, E. 2021. Turfgrass abiotic stress tolerance research. Michigan Turfgrass Foundation. \$24,000.

Merewitz, E J. Vargas, K. Frank, E. Watkins et al. Submitted 5/2021 for 9/1/2021 -8/31/25 funding. Winter Turf: A holistic approach to understanding the mechanisms and mitigating the effects of winter stress on turfgrasses in northern climates. USDA NIFA Specialty Crop Research Initiative. Total - \$8,000,000; MSU - \$738,690 (\$295,476)

Merewitz, E. 2021. Proposal for acquisition of research equipment (automated tissue grinder and homogenizer). Founder's Society of the Michigan Turfgrass Foundation \$14,000

Merewitz, E. E. Olson, and M DaCosta. 2019. Using physiological and hormone indicators to develop a novel winter preparatory management strategy for winter wheat. \$37,000 Michigan Wheat Program

Merewitz, E. 2019. Soil water content and ethylene effects on annual bluegrass winterkill tolerance \$40,000. Golf Course Association of America and OJ NOER Foundation

Merewitz, E. Effects of experimental fertilizer treatments on creeping bentgrass drought tolerance. Gantec \$6300

Merewitz, E. 2012-2018. Industry matching funds for research on abiotic and biotic stresses of turfgrasses. Michigan Turfgrass Foundation \$155,737

Merewitz, E. 2016-2018. Chemical priming to improve annual bluegrass responses to ice stress. United States Golf Association \$20,000.00

Merewitz, E. 2016. Heat and drought stress research of creeping bentgrass. Residex, LLC \$30,421

Merewitz E. 2016 Winterkill effects on creeping bentgrass and annual bluegrass treated with natural fertilizers. Ocean Organics Corporation \$9,000

Merewitz, E and Frank K. 2016-2018. Effects of ethylene inhibition on creeping bentgrass and annual bluegrass survival of ice cover stress. Canadian Turfgrass Research Foundation. \$54,546

Merewitz E. 2016. Determine endogenous hormone levels on corn. Winfield Solutions, LLC \$27,632

Merewitz E. 2015. Proposal for acquisition of research equipment (Rainout field structure) Founder's Society of the Michigan Turfgrass Foundation \$12,000

Merewitz, E. 2015. Fungicide effects on drought tolerance of creeping bentgrass putting greens. Bayer Corp. \$20,000

Merewitz, E. 2015. Evaluation of an ice melt product on turfgrass surfaces. Turf Max LLC \$5180

Merewitz, E. 2015. Investigate the effects of agm 15053 on the physiological characteristics of soybean. Winfield Solutions, LLC. \$18,353

Merewitz, E. and Frank K. 2015. Effects of wetting agent chemistries on performance characteristics on golf course putting greens. BASF Corp. \$27,447.84

Merewitz, E. and Frank K. 2014 Evaluation of crown membrane health and gas accumulation in response to ice stress and management practices of creeping bentgrass and poa annua. United States Golf Association. \$5,000

Merewitz, E. and J. Vargas 2014. Physiological responses of creeping bentgrass to infection by a bacterial pathogen. Project GREEN. \$68,500

Merewitz, E. 2013. Physiological evaluation of new germplasm. Scotts Co. \$92,000

Merewitz, E. and Frank, K. 2013. Effects of drought and traffic stresses on physiological responses and water use characteristics of creeping bentgrass and annual bluegrass. Project GREEN \$70,000

Merewitz, E. 2013. Effects of higher polyamines on abiotic stress tolerance of creeping bentgrass. Project GREEN \$27,000

Merewitz E and Frank K. 2012. Effects of drought and traffic stresses on physiological responses and water use characteristics of creeping bentgrass and annual bluegrass. Golf Course Superintendents Association of America \$40,000

Merewitz, E. 2012. Proposal for acquisition of research equipment (Rhizotron imaging system) Founder's Society of the Michigan Turfgrass Foundation \$20,000

Awards Not Funded (past 5 years)

Merewitz, E., M. DaCosta, J. Dedecker, N. Long, E. Olson, D. Pennington. 2019, 2020, 2021. Developing winter preparatory management strategies and identifying physiological mechanisms to reduce winterkill losses in winter wheat. USDA NIFA Foundational – Physiology of Agricultural Plants \$649,000. Received High Priority review.

Merewitz, E, E. Olson, D. Pennington. Submitted 2021. Using physiological and hormone indicators to develop a novel winter preparatory management strategy for winter wheat. Michigan Wheat Program. \$37,000

Merewitz, E J. Vargas, K. Frank, E. Watkins et al. Submitted 2019, 2020. Winter Turf: A holistic approach to understanding the mechanisms and mitigating the effects of winter stress on turfgrasses in northern climates. USDA NIFA Specialty Crop Research Initiative. Total- \$5,661,290, MSU - \$738,690 (\$295,476)

Merewitz, E. 2019. Enhancing Turfgrass Survival of Winter Stresses. United States Golf Association. \$104,000

Szendrei, Zsofia. Hayden, Zachary, M. Hausbeck, S. Cho, E. Merewitz, B. Behe, D. Brainard. Submitted 2018 and 2019. Rebuilding the capacity of the Michigan and Washington asparagus industries through new varieties and improved production practices. USDA NIFA \$1,164,401

Rogers, J., J. Crum, E. Merewitz, T. Gannon, F Yelverton. 2018. Cultural and chemical pest management strategies as alternatives to methyl bromide for the turfgrass industry. Michigan Department of Agriculture and Rural Development. \$100,000

Merewitz, E. 2016. Effects of ethylene inhibition on creeping bentgrass and annual bluegrass survival of ice cover stress. United States Golf Association. \$55,416

Merewitz, E. 2016. Effects of ethylene inhibition on creeping bentgrass and annual bluegrass survival of ice cover stress. Project GREEN \$76,673

Merewitz, E. 2017. Effects of mowing height change timing on winterkill of annual bluegrass putting greens. Golf Course Superintendents Association of America \$20,000

Merewitz, E. 2017. Effects of mowing height change timing on winterkill of annual bluegrass putting greens. Canadian Turfgrass Research Foundation \$30,000

Merewitz, E. and K. Laskowski. 2017. Efficacy of plant growth regulators for reducing annual bluegrass populations from creeping bentgrass putting greens, Golf Course Superintendents Association of America, \$20,000.

Merewitz, E. T. Nikolai, and M. Nair. 2017. Evaluation of bioactive fractions from maple leaves for herbicidal activity. Project GREEN. \$40,000.

SCHOLARLY PRESENTATIONS

Keynote/Plenary Speaker

Merewitz, E. B. 2017. New Approaches and Uses of Plant Growth Regulators in Turfgrasses. Plant Growth Regulation Society of America, Anchorage, AK, United States.

Oral

Krishnan, S. K., & Merewitz, E. B. (2016). Effect of plant growth regulators on creeping bentgrass shade stress physiology. ASA, CSSA, and SSSA International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2016). Changes in turfgrass crown membrane fatty acid ratios in response to chemical applications and ice stress within annual bluegrass putting green species. American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA) International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2015). A soil surfactant improves creeping bentgrass and annual bluegrass performance under traffic stress and limited irrigation. ASA, CSSA, and SSSA International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2015). Evaluation of turfgrass crown membrane health in response to ice stress and management practices of creeping bentgrass and annual bluegrass putting green species. ASA, CSSA, and SSSA International Annual Meeting.

Merewitz, E. B., Krishnan, S. K. (November 5, 2014) Salt stress effects on root viability and major phytohormones in leaves and roots for two creeping bentgrass cultivars differing in salt tolerance. Presented paper at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States.

Merewitz, E. B., Laskowski, K. (November 4, 2014) Effects of drought and traffic stresses on physiological responses and water use characteristics of creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*). Presented paper at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States.

Merewitz, E. B., Guan, X., Ebdon, J. S., DaCosta, M., Krishnan, S. (November 4, 2014) Hormonal changes associated with freezing tolerance of two cool-season grasses. Presented paper at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States.

Merewitz, E. B. (November 3, 2014) Mitigation of drought stress through the use of ethylene absorbent on creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*). Presented poster at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States.

Merewitz, E. B. (Nov 4, 2014). Drought stress and polyamines in creeping bentgrass. Presented paper at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States. Nov 4

Merewitz, E. B. (Nov 5, 2013). Effects of growth regulation by trinexapac-ethyl treatment on the content of phytohormones involved in the abiotic and biotic stress responses. Presented paper at ASA-CSSA-SSSA International Meeting, Tampa Bay, FL, United States. Nov 5

Merewitz, E. B. (Nov 4, 2013). Mitigation of drought stress damage by exogenous application of a non-protein amino acid aminobutyric acid (GABA) on perennial ryegrass. Presented paper at ASA-CSSA-SSSA International Meeting, Tampa Bay, FL, United States. Nov 4

Poster

Miller, K., E. Olson, E. Merewitz. (Nov 9, 2021). Effects of fall applications of plant growth regulators in winter wheat on yield and plant growth. ASA-CSSA-SSSA international meeting. Salt Lake City, UT.

Gendjar, M., E. Merewitz, J DeDecker and N Jaikumar. (Nov 8, 2021). The role of glutathione reductase in winter barley hardiness. ASA-CSSA-SSSA international meeting. Salt Lake City, UT.

Laskowski, K., & Merewitz, E. B. (2016). Efficacy of plant growth regulators for the removal of annual bluegrass from a creeping bentgrass putting green. ASA, CSSA, and SSSA International Annual Meeting.

Krishnan, S. K., & Merewitz, E. B. (2016). Effect of plant growth regulators on creeping bentgrass shade stress physiology. ASA, CSSA, and SSSA International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2016). Changes in turfgrass crown membrane fatty acid ratios in response to chemical applications and ice stress within annual bluegrass putting green species. American Society of Agronomy (ASA), Crop Science Society of America (CSSA), and Soil Science Society of America (SSSA) International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2015). A soil surfactant improves creeping bentgrass and annual bluegrass performance under traffic stress and limited irrigation. ASA, CSSA, and SSSA International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2015). Evaluation of turfgrass crown membrane health in response to ice stress and management practices of creeping bentgrass and annual bluegrass putting green species. ASA, CSSA, and SSSA International Annual Meeting.

Laskowski, K., Merewitz, E. B., & Frank, K. W. (2014). Effects of drought and traffic stresses on physiological responses and water use characteristics of creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*). ASA, CSSA, and SSSA International Annual Meeting.

Merewitz, E. B., Laskowski, K. (November 5, 2014) Enhancing creeping bentgrass drought tolerance with gamma amino butyric acid application. Presented poster at ASA-CSSA-SSSA International Annual Meeting, Crop Science Society of America, Long Beach, CA, United States.

EXTENSION ACTIVITIES

Oral presentations

Merewitz, E. (Jan 2022). Turfgrass stress physiology research update. Michigan Turfgrass Conference.

Merewitz, E. (Aug 2021). Turfgrass stress physiology research update. MSU Turfgrass Field Day. Hancock Turfgrass Research Center.

Merewitz, E. (Aug 2019). Turfgrass stress physiology research update. MSU Turfgrass Field Day. Hancock Turfgrass Research Center. Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States

Merewitz, E (January 2019) Turf physiology research update. Presented paper at Michigan Turfgrass Conference, Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States.

Merewitz, E. (Jan 2018). Turfgrass stress physiology research update. Michigan Turfgrass Conference. Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States

Merewitz, E. (Aug 2018). Turfgrass stress physiology research update. MSU Turfgrass Field Day. Hancock Turfgrass Research Center. East Lansing, MI, United States

Merewitz, E. B., Laskowski, K. (January 2018) Plant growth regulators effects on ice tolerance of annual bluegrass. Ontario Golf Superintendents Association annual conference, Ontario Turfgrass Research Foundation, Niagra Falls, Canada.

Merewitz, E. (Aug 2017). Turfgrass stress physiology research update. MSU Turfgrass Field Day. Hancock Turfgrass Research Center.

Merewitz, E., Laskowski, K. (January 2017) Plant growth regulator effects on ice tolerance of annual bluegrass. Ontario Golf Superintendents Association Annual Conference, Ontario Turfgrass Research Foundation, Toronto, Canada.

Merewitz, E (January 2017) Turf physiology research update. Presented paper at Michigan Turfgrass Conference, Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States.

Merewitz, E (January 2016) Turf physiology research update. Presented paper at Michigan Turfgrass Conference, Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States.

Merewitz, E. B. (January 20, 2015) New insights into drought stress responses of creeping bentgrass. Michigan Turfgrass Conference, Michigan Turfgrass Foundation, East Lansing, MI, United States.

Merewitz, E. (Aug 2014). Turfgrass stress physiology research update. MSU Turfgrass Field Day. Hancock Turfgrass Research Center. East Lansing, MI, United States

Merewitz, E. B. (October 23, 2014) Winterkill research progress and plan. Winterkill Prep Meeting, Michigan Chapter of the Golf Course Superintends Association of America, Franklin Hills, MI, United States.

Merewitz, E. B. (January 15, 2014) Turf physiology research update. Presented paper at Michigan Turfgrass Conference, Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States.

Merewitz, E. B., Laskowski, K. (August 14, 2013) Effects of drought and traffic stress on creeping bentgrass and poa annua. Presented paper at Turfgrass Research Field Day, Michigan State University (MSU), East Lansing, MI, United States.

Merewitz, E. B. (August 14, 2013) Effects of PGRs on phytohormone profiles in Kentucky bluegrass. Presented paper at Turfgrass Research Field Day, Michigan State University (MSU), East Lansing, MI, United States.

Merewitz, E. (August 14, 2013) Turfgrass research laboratory at the HTRC. Turfgrass Research Field Day, Michigan State University (MSU), East Lansing, MI, United States.

Merewitz, E. (March 25, 2013) Turfgrass physiology research at MSU. Northern Education Conference, Michigan Golf Course Superintendents Association (MiGCSA), Gaylord, MI, United States.

Merewitz, E, Laskowski, K. (March 14, 2013) Use of automated irrigation system to determine the effects of drought and traffic stresses on creeping bentgrass and poa annua. Presented paper at Rainbird Technology Summit, Detroit Golf Club, Detroit, MI, United States.

Merewitz, E., Laskowski, K. (March 13, 2013) Use of automated irrigation system to determine the effects of drought and traffic stresses on creeping bentgrass and poa annua. Presented paper at Rainbird Technology Summit, Traverse City Golf and Country Club, Traverse City, MI, United States.

Merewitz, E. (March 11, 2013) Turfgrass physiology research at MSU. Western Education Conference, Michigan Golf Course Superintendents Association (MiGCSA), Ada, MI, United States.

Merewitz, E. (February 25, 2013) Turfgrass physiology research at MSU. Eastern Education Conference, Michigan Turfgrass Foundation (MTF), Plymouth, MI, United States.

Merewitz, E. (January 23, 2013) Turfgrass physiology research. Michigan Turfgrass Conference, Michigan Turfgrass Foundation (MTF), East Lansing, MI, United States.

SERVICE

Internal – Michigan State University, College and University

| Sub-organization | Role | Duration |
|---|-------|--------------|
| Arthur Berkey Science Fair – Agriculture, Food, and Natural Resources – Preliminary presentations | Judge | Feb 22, 2022 |

Internal – Michigan State University, Dept of Plant Soil and Microbial Sciences (9)

| Sub-organization | Role | Duration |
|--|-----------|----------------------|
| MSU PSM Turfgrass Committee | Member | 2012 - present |
| MSU PSM Agronomy Committee | Member | 2021 - present |
| Plant Science Graduate Student Research Symposium, MSU Council of Graduate Students | Judge | 2021 |
| Harrison Endowment Graduate Student Award Proposals | Reviewer | Mar 2019 |
| Dale and Mary Harpstead Endowment for Graduate Student Support in Food Crop Production Award Proposals | Reviewer | Mar 2016 |
| Department Advisory Committee (DAC) | Secretary | Sept 2017 - 2018 |
| Department Advisory Committee (DAC) | Member | Sept 2016 - 2017 |
| Graduate Programs Committee (GPC) | Member | Sept 2015 - Feb 2016 |
| Reading Room Committee | Member | Sept 2014 - 2015 |
| Plant Science Fellowship (PSF) Committee | Member | 2013 |

External – Scholarly and Professional Organizations (3)

| Sub-organization | Role | Duration |
|---|-------------------|----------------------|
| ASA and CSSA K-12 Committee | Member | Jan 2022 - Dec 2023 |
| Crop Science Research Award Committee (C451) within the Crop Science Society of America | Member | Jan 2022 – Dec 2023 |
| ASA-CSSA-SSSA annual meeting, Turfgrass Physiology and Abiotic Stress Oral, C5 division | Session moderator | Nov 8, 2021 |
| ASA-CSSA-SSSA annual meeting division C2: Crop Physiology and Metabolism Oral (includes Society-wide student competition) | Session moderator | Nov 7, 2021 |
| American Society for Horticultural Sciences Mentoring Program (mentee: Sara Brecher) | Mentor | Sept 2021 – Mar 2022 |

| | | |
|--|--------|--------------------|
| Partnership Development and Sponsorship Committee (PDSC) within the American Society for Horticultural Sciences (ASHS) | Member | Aug 2021 - present |
| Subcommittee of PDSC – charged with developing a new resource, a Collaboration Center, for the ASHS annual conference | Member | Dec 2021 - present |
| ASA-CSSA-SSSA annual meeting, C5 division poster competition, Long Beach CA | Judge | Nov 2, 2014 |

Prior Internal – Rutgers University, Department of Plant Biology (3)

| Sub-organization | Role | Duration |
|--|-------------|-----------------|
| Graduate Student Organization, Cook Researchers of Plant Science (CROPS) | President | 2009-2010 |
| Graduate Student Organization, Cook Researchers of Plant Science (CROPS) | Secretary | 2007-2009 |
| Graduate Student Organization, Cook Researchers of Plant Science (CROPS) | Member | 2005-2007 |

Internal – Broader Community

| Sub-organization | Role | Duration |
|--|----------------------|------------------|
| MSU Science Festival Virtual School Program: “Winter is Coming: How Plants Prepare and Defend” | Presenter/Instructor | Mar and Apr 2022 |
| | | |

External – Broader Community

| Sub-organization | Role | Duration |
|---|----------------------|------------------|
| MSU Science Festival Virtual School Program: “Winter is Coming: How Plants Prepare and Defend” | Presenter/Instructor | Mar and Apr 2022 |
| Proposal review panel, USDA-NIFA Hatch grant proposal | Reviewer | Sept 2020 |
| USDA-NIFA Agricultural Microbiomes in Plant Systems and Natural Resources program, Washington D.C. | Panel reviewer | 2018 |
| Consultant for Product Developer at Residex, Wixom, MI (Turfgrass Management Supply Company; now Target Specialty Products) | Volunteer consultant | 2012-2020 |
| Consultant for Product Developer at Gantec | Volunteer consultant | 2012-2016 |

Prior External – Broader Community

Scientist Mentor on the PlantingScience Master Plant Science Team (<http://www.plantingscience.com/>; Fall 2011- Summer 2012)

EDITORIAL ACTIVITIES

| Journal | Sub-organization/Details | Role | Duration |
|--------------------------------------|---|-----------------------|---------------------|
| Frontiers in Plant Science | Celebrating Women Scientists: Women in Plant Science Series Initiative. Women in Plant Abiotic Stress | Editor/Panel reviewer | Jan 2022 - present |
| Frontiers in Plant Science | . | Review Editor | 2021 - present |
| Journal of Agronomy and Crop Science | Served on total of 10 articles. Impact factor 3.473. | Associate Editor | Aug 2021 – Dec 2023 |
| Crop Science | Served on a total of 35 articles. Impact factor 2.319. | Associate Editor | 2014 - 2020 |

PROFESSIONAL DEVELOPMENT

Attended. Thriving in the Tenure System I: Articulating Your Scholarly Identity Through a Strong Reappointment, Promotion, and Tenure Packet. Feb 2022.

Attended. Women in STEM conference. Dec 2021.

Attended. Supporting Indigenous Students in STEAM Fields Panel. MSU College of Agriculture and Natural Resources. ODEI. Dec 7, 2021.

Participant in Bootcamp of the Faculty Success Program through the National Center for Faculty Development and Diversity. Fall 2018.

Participant in the Faculty Success Program Alumni Program through the National Center for Faculty Development and Diversity. Summer 2018.

Received CANR Coaching for Teaching from Jen Rivera, Fall and Winter 2018.

Attended. Demystifying Reappointment, Tenure & Promotion and/or Promotion in Rank. Hendrick, Grumet, Cognato, and Lang. 2018.

Attended. CANR Mentoring Workshop for Early Career Faculty. Michigan State University. Grumet, Johnson, and McDaniels. 2018.

Attended. Demystifying Reappointment, Tenure & Promotion and/or Promotion Rank. 2013.

Attended. Write Winning Grant Proposal Workshop. Michigan State University and Grant Writers' Seminars and Workshops. January 2014.

Certificate achieved. Rutgers Teaching Assistant Project Certifications (Issues in Class Management; Tips for Future Faculty; Fall 2010)