

Report section: Accomplishments

State summary of accomplishments

Cover crops continue to have a focus for the research, extension and teaching in Iowa. This work has and continues to be integrated both across research, teaching and extension as well as across disciplines. Current activities include economists, social scientists, plant pathologists, entomologies, plant breeders, agricultural engineers, and agronomists. Our focus has largely been on integrating cover crops into the corn and soybean centric cropping system found in Iowa. However, there are ongoing efforts exploring new cover crops and modifying existing cropping systems in a way to build a more resilient system. Researchers are looking at the role of allelochemicals, disease implications of planting green, changes to cover crop management, changes to corn management following cover crops, weed suppression from cover crops, perennial cover crop systems, and nitrogen export from cover crops systems.

Metrics

Number of graduate students and post docs involved in cover crop work: MS/PHD = 3; Post doc = 2

Number of presentations (lists are OK, but not necessary): 105

Number of publications (list is needed, see below): 10

Report section: Impact statements

Impact statement

Cover crops efforts in Iowa are being used to develop BMPs for resilient corn and soybean cropping systems.

Report section: Publications

Publication list

1. Acharya, J., T.B. Moorman, T.C. Kaspar, A.W. Lenssen, and A.E. Robertson. 2020. Effect of cover crop species and rotation on corn and soybean seedling disease and yield in no-till system. *Plant Disease* 104:677-687. <https://doi.org/10.1094/PDIS-09-19-1904-RE>
2. Banik, C., C.A. Bartel, D.A. Laird, K.J. Moore, and A.W. Lenssen. 2020. Perennial cover crop influences on soil C and N and maize productivity. *Nutrient Cycling in Agroecosystems* 116:135-150.
3. Bartel, C.A., S.V. Archontoulis, A.W. Lenssen, K.J. Moore, I.L. Huber, D.A. Laird, S. Fei, and P.M. Dixon. 2020. Modeling perennial groundcover effects on annual maize grain crop growth with the Agricultural Production Systems sIMulator. *Agronomy Journal* 112:1895–1910.
4. Casler, M.D., K.P. Vogel, D.K. Lee, R.B. Mitchell, P.R. Adler, R.M. Sulc, K.D. Johnson, R.L. Kallenbach, A.R. Boe, R.D. Mathison, K.A. Cassida, D.H. Min, and K.J. Moore. 2020. Nitrogen demand associated with increased biomass yield of switchgrass and big bluestem. *BioEnergy Research* 13:120-131; doi.org/10.1007/s12155-019-10081-y
5. Forcella, F., S. Patel, A.W. Lenssen, C. Hoerning, M.S. Wells, R.W. Gesch, and M.T. Berti. 2021. Pollinator visitation of flowering winter oilseeds (field pennycress and winter camelina). *Journal of Entomology*. [doi:10.1111/jen.12854](https://doi.org/10.1111/jen.12854).
6. Moore, K.J., C.L. Kling, and D.R. Raman. 2020. A Midwest USA Perspective on Von Cossel et al.'s Prospects of Bioenergy Cropping Systems for A More Social-Ecologically Sound Bioeconomy. *Agronomy* 10:1658; [doi:10.3390/agronomy10111658](https://doi.org/10.3390/agronomy10111658)
7. Muhammed, Y.A., H.L. Matthees, R.W. Gesch, S. Patel, F. Forcella, K. Aasand, N. Steffl, B.L. Johnson, M.S. Wells, and A.W. Lenssen. 2020. Establishing winter annual cover crops in the upper Midwest,

USA: Interseeding into maize and soybean. *Agronomy Journal* 112:719-732. doi: 10.2134/agronj2019.06.0415

8. Muhammed, Y.A., S. Patel, H.L. Matthees, A.W. Lenssen, B.L. Johnson, M.S. Wells, F. Forcella, M.T. Berti, and R.W. Gesch. 2020. Biomass and soil N dynamics in response to interseeded oilseed cover crops in a maize-soybean system. *Agronomy* 10, 1439; doi:10.3390/agronomy10091439
9. Nichols, V., L. English, S. Carlson, S. Gailans, and M. Liebman. 2020. Effects of Long-Term Cover Cropping on Weed Seedbanks. *Front. Agron.* 2:591091. doi: 10.3389/fagro.2020.591091.
10. Nichols, V., R. Martinez-Feria, D. Weisberger, S. Carlson, B. Basso, and A. Basche. 2020. Cover crops and weed suppression in the US Midwest: A meta-analysis and modeling study. *AriXiv*. doi: 10.31220/osf.io/43b9n.