SUAT IRMAK, Ph.D., P.E., Professor; F. AAAS; F. ASABE; F. ASCE-EWRI; F. ASA; PA Academy of Science
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Research/Education Programs: Soil & water resources/irrigation engineering; measurement and modeling of surface energy balance, evapotranspiration, transpiration, evaporation and water productivity; impact of climate change on water resources and agro-ecosystem productivity; technology implementation in agriculture and ecosystems; water use efficiency; variable rate irrigation and fertigation; water and nitrogen management; water and soil quality; spatio-temporal plant soil-water extraction; agro-meteorology; tillage practices impact on water and energy balance; water use and productivity response of drought-tolerance; cover crop impact on soil quality and energy balance; plant abiotic stresses; plant phenotyping; measurement and modeling of soil moisture dynamics; specialty crops; agricultural IoTs.

1. EDUCATION AND EMPLOYMENT HISTORY

1.1. EDUCATION HISTORY

Ph.D.	Agricultural and Biological Engineering	University of Florida, Gainesville, FL
MS	Soil and Water Resources and Irrigation Engineering	Akdeniz University, Antalya/Turkiye
BSc	Agricultural Structures and Irrigation Engineering	Cukurova University, Adana/Turkiye

1.2. EMPLOYMENT HISTORY

- Professor, Department of Agricultural and Biological Engineering (2021 – current)
- Professor and Dept. Head, Penn State, Dept. of Agricultural and Biological Engineering (2021–2026)
- Harold W. Eberhard Distinguished Professor, University of Nebraska (UNL) (01/01/2013–06/30/2021)
- Courtesy Full Professor, Department of Earth and Atmospheric Sciences, UNL (07/01/2017–current)
- Courtesy Full Professor, Department of Agronomy and Horticulture, UNL (07/22/2014–current)
- Excellence in Academic Leadership Prog., Office of Senior Vice Provost for Faculty Affairs (1/2026–05/2026)
- Leadership Resources-Leadership Program Graduate (02/01/2020–08/30/2020)
- LEAD-21 Leadership Program Class 13 Graduate (11/2017–02/2018)
- Wheel of Life-Leadership Training Program through Leadership Resources (1/1/2020–6/30/2020)
- Interim Director, Nebraska Water Center, UNL (01/01/2012–07/31/2013)
- Promoted to Full Professor, Department of Biological Systems Engineering, UNL (07/01/2012)
- Granted Tenure and Promoted to Associate Professor, Dept. of Biol. Syst. Engineering, UNL (06/30/2008)
- Assistant Professor, Department of Biological Systems Engineering, UNL (01/01/2004–06/30/2008)
- Research Engineer, Civil and Coastal Engineering Department and Agricultural and Biological Engineering Department, University of Florida, Gainesville, Florida (05/2002–12/2003)
- Graduate Res. Assistant, Agric. and Biol. Eng. Dept., Univ. of Florida, Gainesville, FL (09/1998–05/2002)
- Volunteer, Hourly Wage Worker, Temporary Staff, and Field Research Technician, Agricultural and Biological Engineering Department, University of Florida, Gainesville, Florida (06/1996–09/1998)
- Research and Teaching Assistant, Agricultural Structures and Irrigation Engineering Department, Mediterranean University, Antalya-Turkiye (09/1993–04/1996)
- Research Technician, Agricultural Research and Education Center, Tarsus, Turkiye (06/1992–12/1993)

2. RESEARCH AND SCIENTIFIC ACCOMPLISHMENTS

2.1. PUBLICATION RECORD

2.1.1. PUBLISHED REFEREED JOURNAL ARTICLES

1. **Irmak, S.** 2026. Sweet corn yield, evapotranspiration, transpiration, evaporation, production functions, basal crop coefficients, water productivity and soil-water extraction. *Agricultural Water Management*. 328:110312. https://doi.org/10.1016/j.agwat.2026.110312.

2. Sharma, S., **S. Irmak**, and Kranz, W.L. 2026. Variable rate irrigation: A long-term simulated and field data analyses of irrigation practices, field variability, economic feasibility and profitability. *Irrigation and Drainage*. 2026; 0:1–18. https://doi.org/10.1002/ird.70157.
3. Amiri, E., **S. Irmak** and P.A. Bazkiaee. 2026. Evaluation of CERES-Maize model for predicting yield, evapotranspiration, water productivity and drought stress indices under center pivot, subsurface drip and furrow irrigation systems with different irrigation levels simultaneously. *Irrigation and Drainage*. 2026:75:372–389. https://doi.org/10.1002/ird.70050.
4. Amiri, E., **S. Irmak** and P.A. Bazkiaee. 2026. Maize yield, evapotranspiration, water productivity and economic analysis using CERES-Maize model under center pivot and subsurface drip irrigation with full and limited irrigation and rainfed with under different nitrogen management strategies. *Irrigation and Drainage*. 2026; 0:1–16. 4464950. https://doi.org/10.1002/ird.70188.
5. **Irmak, S**. 2025. Bowen ratio energy balance system-measured evapotranspiration, surface energy fluxes, single and basal crop coefficients and energy partitioning for subsurface drip-irrigated maize canopy. *J. Natural Resources and Agricultural Ecosystems*. 3(3):101-120. https://doi.org/10.13031/jnrae.16332.
6. **Irmak, S**., T.A. Hinn, M.S. Kukal and A.T. Mohammed. 2025. Concurrent response of soybean to fixed (full and limited) and variable rate irrigation management in three soil types: I. Soil water dynamics. *Irrigation and Drainage*. 74:1853–1873. https://doi.org/10.1002/ird.3124.
7. **Irmak, S**., and T.A. Hinn. 2025. Concurrent response of soybean to fixed (full and limited) and variable rate irrigation management in three soil types: II. Growth, yield, evapotranspiration and water productivity. *Irrigation and Drainage*. 74:1874–1888. https://doi.org/10.1002/ird.3121.
8. **Irmak, S**., J. Aguilar, V. Adamchuk, H. Huang, S. O'shaughnessy, M. Kukal, I. Kisekka, D. Porter, M. Andrade-Rodriguez, A. Yari, C. Madramootoo. 2025. Precision Irrigation Management. *The Council for Agricultural Science and Technology* (CAST) Paper. pp. 1-21. https://doi.org/10.62300/6b9hf011.
9. **Irmak, S**. 2025. Yield, evapotranspiration, production functions, crop coefficients, water productivity and soil-water extraction of three watermelon varieties. *Irrigation and Drainage*. 2025:0:1–19. https://doi.org/10.1002/ird.70055.
10. Kumanan, V., C. Raj, **S. Irmak**, K. Van Meter, L. Schott, J.K. Ladha and. M.S. Kukal. 2025. How is nitrogen use efficiency impacted by varying contributions from fertilizer, manure, and biological fixation in US and global croplands? *Journal of the ASABE*. 68(2): 309-319. https://doi.org/10.13031/ja.16114.
11. Irmak, S., **S. Irmak** and J. Kaur. 2025. Sprayable bio-based polymer conserved soil-water, enhanced soybean growth, moderated soil temperature, increased soil organic matter content and reduced giant foxtail [*Setaria faberi* hermm.] density and biomass. *Applied Engineering in Agriculture*. 41(6):695-706. https://doi.org/10.13031/aea.16439.
12. Kumanan, V., M.S. Kukal, C. Raj, **S. Irmak**, K. van Meter, J. Dhillon, J.S. Dharni, and. 2025. Systems-level response of crop nitrogen removal to nitrogen inputs in U.S. agriculture. *Agriculture, Ecosystems and Environment*. 68(3): 451-463. https://doi.org/10.13031/ja.16124.
13. **Irmak, S**. 2024. Maize response to different subsurface drip irrigation management strategies: Yield, production functions, basal and crop evapotranspiration. *Agricultural Water Management*. 300 (2024) 108927. https://doi.org/10.1016/j.agwat.2024.108927.
14. **Irmak, S.**, E. Amiri, P.A. Bazkiaee and H.A. Araji. 2024. Evaluation of CERES-Maize model for simulating maize phenology, grain yield, soil–water, evapotranspiration, and water productivity under different nitrogen levels and rainfed, limited, and full irrigation conditions. *Irrigation Science*. 42:551–573. https://doi.org/10.1007/s00271-023-00909-z.
15. Sheline, C., S. Ingersoll, S. Amrose, **S. Irmak** and A.G. Winter. 2024. Sensitivity study of the Predictive Optimal Water and Energy Irrigation (POWEIr) controller's schedules for sustainable agriculture systems in resource-constrained contexts. *Computers and Electronics in Agriculture*. 226 (2024) 109230. https://doi.org/10.1016/j.compag.2024.109230.
16. Irmak, S., **S. Irmak** and J. Kaur. 2024. Effect of sprayable biobased polymers on soybean growth and yield, weed suppression, soil temperature, soil-water, evapotranspiration and soil quality variables. *Journal of Natural Resources and Agricultural Ecosystems*. 2(4):227-242. https://doi.org/10.13031/jnrae.16177.
17. Bai, G., B. Barker, D. Scoby, **S. Irmak**, J. Luck, C. Neale, J. Schnable, T. Awada and Y. Ge. 2024. High-throughput physiological phenotyping of crop evapotranspiration at the plot scale. *Crop Science*. 316(2024)109507. https://doi.org/10.1016/j.fcr.2024.109507.
18. Saylak, S., **S. Irmak**, K. Eskridge and I. Dweikat. 2024. Sunflower germplasms response to different water and salinity stress levels in the greenhouse and field conditions under subsurface drip irrigation. *Irrigation and Drainage*. 74(1):161-181. https://doi.org/10.1002/ird.2977.

19. Singh, M., V. Kumar, S.Z. Knezevic, J.L. Lindquist, **S. Irmak**, S. Pitla and A.J. Jhala. 2024. Pollen-mediated gene flow from herbicide-resistant yellow corn to non-genetically engineered food-grade white corn. *Crop Science*. 64(3):1887-1900. doi:10.1002/csc2.21230.
20. Amiri, E., **S. Irmak** and D.B. Tari. 2024. Comparison of AquaCrop and CERES-Maize models for simulating maize phenology, grain yield, evapotranspiration and water productivity under different irrigation and nitrogen levels. *Irrigation and Drainage*. 73(3):1052-1068. https://doi.org/10.1002/ird.2917.
21. Kukal, M.S., and **S. Irmak**. 2024. Transpiration dynamics in co-located maize, sorghum, and soybean closed canopies and their environmental controls. *J. Natural Resources and Agricultural Ecosystems*. 2(1):1-15. https://doi.org/10.13031/jnrae.15771.
22. Singh, M., **S. Irmak**, M.S. Kukal, V. Kumar, J. Lindquist, S. Knezevic, S. Pitla and A.J. Jhala. 2024. Effect of center-pivot and subsurface drip irrigation systems on growth and evapotranspiration of volunteer corn in corn, soybean, and sorghum. *Weed Science*. 72(5):567-577. https://doi.org/10.1017/wsc.2024.50.
23. Shin, J.H., W.H. Nam, M.G. Jeon, E.M. Hong, X. Zhang. V. Sharma, **S. Irmak**, J.W. Do and I. Kisekka. 2024. Assessing water distribution and efficiency by coupled hydraulic-hydrological modeling for irrigation canal network. *Paddy and Water Environment*. 22:567-580. doi.org/10.1007/s10333-024-00985-7.
24. **Irmak, S**. 2023. Agriculture and agricultural water management: Historical perspectives and integration of research and extension/outreach for large-scale technology adoption in production fields. *Journal of ASABE*. 66(1):167-192. https://doi.org/10.13031/ja.15272.
25. **Irmak, S.,** A.T. Mohammed and M. Drudik. 2023. Maize nitrogen (N) uptake, grain N concentration and root-zone residual nitrate N (NO_3-N) response under center pivot, subsurface drip and surface (furrow) irrigation. *Agricultural Water Management*. 287(2023)108421. doi.org/10.1016/j.agwat.2023.108421.
26. **Irmak, S.**, and R. Sandhu. 2023. Soybean crop coefficients under different seeding rates and full and limited irrigation and rainfed management. *Irrigation and Drainage*. 73:151-179. https://doi.org/10.1002/ird.2854.
27. **Irmak, S.**, and A.T. Mohammed. 2023. Maize nitrogen uptake and use efficiency, partial factor productivity of nitrogen, and yield response to different nitrogen and water applications under three irrigation methods. *Irrigation and Drainage*. 73:64-88. https://doi.org/10.1002/ird.2868.
28. O'Donnell, E., L. Nogueira, C. Walters, E.W. Peterson and **S. Irmak**. 2023. Economics of deficit irrigation in corn production. *Agricultural and Resource Economics Review*. 52:563-581. doi:10.1017/age.2023.16.
29. Kukal, M.S., **S. Irmak**, R. Dobos and S. Gupta. 2023. Atmospheric dryness impacts on crop yields are buffered in soils with higher available water capacity. *Geoderma*. 429-2023, 116270. https://doi.org/10.1016/j.geoderma.2022.116270.
30. Kukal, M.S., and **S. Irmak**. 2023. Disentangling the role of daytime and nighttime ambient conditions in altering atmospheric desiccation strength for U.S. croplands. *Agronomy Journal*. 115:2227–2238. doi:10.1002/agj2.21397.
31. Koehler-Cole, K., R. Elmore, H. Blanco, C. Francis, C. Shapiro, C. Proctor, S. Ruis, **S. Irmak** and D. Heeren. 2023. Cover crop treatments and planting practices determine their performance in corn systems. *Agronomy Journal*. 115:526-543. https://doi.org/10.1002/agj2.21247.
32. Mausbach, J., **S. Irmak**, M.S. Kukal, K. Karnik, D. Sarangi and A. Jhala. 2023. Evapotranspiration of Palmer amaranth (*Amaranthus palmeri* S. Watson) in maize, soybean, and fallow under subsurface drip and center-pivot irrigation systems. *Weed Science*. 72:86–95. doi:10.1017/wsc.2023.57.
33. Kashyap, S.P., D. Heeren, M. Maguire, W. Woldt, E. Wayne, **S. Irmak**, S. Bhatti, J. Singh, Y. Shi and C. Neale. 2023. Diurnal soybean water stress computed using statistical-based thermal indices with high-frequency unmanned aircraft flights. *Journal of Natural Resources and Agricultural Ecosystems (ASABE)*. 1(1):33-48. https://doi.org/10.13031/jnrae.15465.
34. Kukal, M.S., and **S. Irmak**. 2023. Fractional coefficient for estimating physiologically meaningful and diurnal transpiration cycle weighted VPD from daily ambient environmental data. *Agricultural and Forest Meteorology*. 339 (2023) 109583. https://doi.org/10.1016/j.agrformet.2023.109583.
35. Singh, M., V. Kumar, S.Z. Knezevic, **S. Irmak**, J.L. Lindquist, S. Pitla and A.J. Jhala. 2023. Interaction of quizalofop-p-ethyl with 2,4-D choline and/or glufosinate for control of corn volunteers in corn resistant to aryloxyphenoxypropionates. *Weed Technology*. 37:471–481. doi:10.1017/wet.2023.79.
36. Kukal, M.S., and **S. Irmak**. 2023. Can limits of plant available water be inferred from soil moisture extremes? *Agricultural and Environmental Letters*. 8(2):2023;8:e20113. https://doi.org/10.1002/ael2.20113.
37. Kukal, M.S., S. Kukal, **S. Irmak** and G. Vellidis. 2023. Drivers of enhanced evaporative demand in U.S. croplands: Determining relative contribution using constrained input scenarios. *J. American Water Resources Association*. 60:79-94. doi:10.1111/1752-1688.13156.

38. **Irmak, S.,** and M.S. Kukal. 2022. Temporal trends in agriculturally-relevant climate indicators across nine agroecosystems of Turkey. *J. Applied Meteorology and Climatology*. 61(6):631-649. doi:10.1175/JAMC-D-21-0209.1.
39. **Irmak, S.,** M.S. Kukal and S. Topcu. 2022. Spatial patterns and magnitudes of agriculturally pertinent climate variables/indicators across agro-ecosystems in Turkiye. *J. Applied Meteorology and Climatology*. 61:1329-1348. doi:10.1175/JAMC-D-21-0175.1.
40. **Irmak, S.,** A.T. Mohammed and M.S. Kukal. 2022. Maize response to coupled irrigation and nitrogen fertilization under center pivot, subsurface drip and surface (furrow) irrigation: Growth, development and productivity. *Agricultural Water Management*. 263(2022):107457. doi.org/10.1016/j.agwat.2022.107457.
41. **Irmak, S**., D. Brar, M.S. Kukal, L. Odhiambo and K. Djaman. 2022. Automated real-time irrigation analytics inform diversity in regional irrigator behavior and water withdrawal and use characteristics. *Agricultural Water Management*. 272(2022)107837. https://doi.org/10.1016/j.agwat.2022.107837.
42. **Irmak, S**., M.S. Kukal and K. Sharma. 2022. Soil moisture heterogeneity and sensor deployment in uniformly-managed field with unitextural soil. *Agronomy Journal*. 114(3):1800-1816. https://doi.org/10.1002/agj2.21064.
43. **Irmak, S.,** and M.S. Kukal. 2022. Alteration in surface energy balance fluxes induced from long-term disk-tilled versus no-till management in maize production. *Soil and Tillage Research*. 221 (2022) 105383. https://doi.org/10.1016/j.still.2022.105383.
44. **Irmak, S**., I. Kabenge, D. Woodward and M. Moravek. 2022. Modeling leaf stomatal resistance for common reed, peach-leaf willow and cottonwood riparian plant communities. *Hydrological Processes*. 36(9):2022;36:e14687: 1-22. https://doi.org/10.1002/hyp.14687.
45. Mausbach, J., **S. Irmak**, P. Chahal, D. Sarangi and A.J. Jhala. 2022. Effect of degree of water stress on growth and fecundity of velvetleaf (*Abutilon theophrasti*) using soil moisture sensors. *Weed Sci*ence. 70(6):698-705. doi:10.1017/wsc.2022.54.
46. Singh, M., R. Thapa, M.S. Kukal, **S. Irmak**, S. Mirsky and A.J. Jhala. 2022. Effects of water stress on weed germination, growth characteristics, and seed production: A global meta-analysis. *Weed Science* 70(6):621-640. https://doi.org/10.1017/wsc.2022.59.
47. Mohammed, A.T., and **S. Irmak.** 2022. Maize response to irrigation and nitrogen under center pivot, subsurface drip and furrow irrigation: Water productivity, production functions, basal evapotranspiration and yield response factors. *Agricultural Water Management*. 271(2022), 107795. https://doi.org/10.1016/j.agwat.2022.107795.
48. Mohammed, A.T., and **S. Irmak.** 2022. Maize response to coupled irrigation and nitrogen fertilization under center pivot, subsurface drip and surface (furrow) irrigation: Soil-water dynamics and crop evapotranspiration. *Agricultural Water Management*. 267 (2022) 107634. https://doi.org/10.1016/j.agwat.2022.107634.
49. Kukal, M.S., and **S. Irmak.** 2022. Nocturnal transpiration in field crops: implications for temporal aggregation and diurnal weighing of vapor pressure deficit. *Agricultural Water Management*. 266 (2022) 107578. https://doi.org/10.1016/j.agwat.2022.107578.
50. Sandhu, R., and **S. Irmak**. 2022. Effects of subsurface drip-irrigated soybean seeding rates on grain yield, evapotranspiration and water productivity under rainfed, limited, and full irrigation. *Agricultural Water Management*. 267:107614. https://doi.org/10.1016/j.agwat.2022.107614.
51. Sharma, V., and **S. Irmak**. 2022. Leaf and canopy stomatal resistance, aerodynamic resistance, and evapotranspiration of irrigated continuous no-till and disk-till maize. *Agronomy Journal*. 2022(114):1512–1533. https://doi.org/10.1002/agj2.20979.
52. Djaman, K., S. Allen, D.S. Djaman, K. Koudahe, **S. Irmak**, N. Puppala, M.K. Darapuneni and S.V. Angadi. 2022. Planting date and plant density effects on maize growth, yield and water use efficiency. *Environmental Challenges*. 6 (2022) 100417. https://doi.org/10.1016/j.envc.2021.100417.
53. Djaman, K., K. Koudahe, A. Saibou, M. Darapuneni, C. Higgins and **S. Irmak**. 2022. Soil water dynamics, effective rooting zone, and evapotranspiration of sprinkler irrigated potato in a sandy loam soil. Agronomy 2022, 12, 864:1-18. https:// doi.org/10.3390/agronomy12040864.
54. Singh, J., Y. Ge, D. Heeren, E. Walter-Shea, C. Neale, **S. Irmak** and M. Maguire. 2022. Unmanned aerial system-based data ferrying over a sensor node station network in maize. *Sensors*. 2022, 22, 1863. https://doi.org/10.3390/s22051863.
55. **Irmak, S.**, R. Sandhu and M.S. Kukal. 2021. Multi-model projections of trade-offs between irrigated and rainfed maize yields under changing climate and future emission scenarios. *Agricultural Water Management*. https://doi.org/10.1016/j.agwat.2021.107344.

56. **Irmak, S**., V. Sharma, A. Haghverdi, A. Jhala, J.O. Payero and M. Drudik. 2021. Alfalfa- and grass-reference crop coefficients for maize under variable and fixed (uniform) rate irrigation and variable rate, fixed rate and pre-plant fertilizer management in three soil types. *Agricultural Water Management*. 243(2021):106489. https://doi.org/10.1016/j.agwat.2020.106489.
57. Sharma, V., and **S. Irmak**. 2021. Comparative analyses of variable and fixed rate irrigation and nitrogen management for maize in different soil types: Part I. Impact on soil-water dynamics and crop evapotranspiration. *Agricultural Water Management*. 246(1):106653. https://doi.org/10.1016/j.agwat.2020.106644.
58. Sharma, V., and **S. Irmak**. 2021. Comparative analyses of variable and fixed rate irrigation and nitrogen management for maize in different soil types: Part II. Plant growth, grain yield, evapotranspiration, production functions and water productivity. *Agricultural Water Management*. 246 (2021):106653. https://doi.org/10.1016/j.agwat.2020.106653.
59. Amiri, E., **S. Irmak** and H.A. Araji. 2021. Assessment of CERES-Maize model in simulating maize growth, yield and drought stress for photosynthesis and leaf expansion under rainfed, limited and full irrigation. *Agricultural Water Management*. 259 (2022) 107271. https://doi.org/10.1016/j.agwat.2021.107271.
60. Sharma, K., **S. Irmak** and M.S. Kukal. 2021. Propagation of soil moisture sensing uncertainty into estimation of total soil water, evapotranspiration and irrigation decision-making. *Agricultural Water Management*. 243 (2021):106454. https://doi.org/10.1016/j.agwat.2020.106454.
61. Singh, M., M.S. Kukal, **S. Irmak** and A. Jhala. 2021. Water use characteristics of weeds: A global systematic review, best practices and future directions. *Frontiers in Plant Science*. 12:794090. doi:10.3389/fpls.2021.794090.
62. Amiri, E., **S. Irmak** and H. Yaghouti. 2021. Performance of the WOFOST model for simulating maize growth, leaf area index, biomass, grain yield, soil water and gross assimilation under full and limited irrigation and rainfed conditions. *J. Irrigation and Drainage Engineering*. 05021005: 1-12. doi:10.1061/(ASCE)IR.1943-4774.0001644.
63. Lena, B., M. Folegatti, D. Flumignan, **S. Irmak**, J. Francisco, A. Diotto, O. Santos, I. Andrade, E. Junior, P. Marques and C. Junior. 2021. Water requirement and crop coefficients of young jatropha (*Jatropha curcas* L.) trees in a subtropical humid environment. *J. Irrigation and Drainage Engineering*. 2021, 147(7): 04021020. doi:10.1061/(ASCE)IR.1943-4774.0001557.
64. Liang, W-Z., I. Possignolo, X. Qiao, K. DeJonge **S. Irmak**, D. Heeren and D. Rudnick. 2021. Utilizing digital image processing and two-source energy balance model for the estimation of evapotranspiration of dry edible beans in western Nebraska. *Irrigation Science*. 39:617-631. https://doi.org/10.1007/s00271-021-00721-7.
65. Singh, J., Y. Ge, D. Heeren, E. Walter-Shea, C. Neale, **S. Irmak**, W. Woldt, G. Bai, S. Bhatti and M. Maguire. 2021. Inter-relationships between water depletion and temperature differential in row crop canopies in a sub-humid climate. *Agricultural Water Management*. 256:107061. https://doi.org/10.1016/j.agwat.2021.107061.
66. Sharma, K., **S. Irmak**, M.S. Kukal, M.C. Vuran, A. Jhala and X. Qiao. 2021. Evaluating soil moisture sensing technologies in silt loam and loamy sand soils: Assessment of performance, temperature sensitivity and site- and sensor-specific calibration functions. *Transactions of the ASABE*. 64(4):1123-1139. https://doi.org/10.13031/trans.14112.
67. Yan, Q., H. Yangy, M. Vuran and **S. Irmak**. 2021. Scalable privacy-preserving geo-distance evaluation for precision agriculture IoT systems. *Transactions on Sensor Networks*. 17(4):38/1-38/30. https://doi.org/10.1145/3463575.
68. Safa, B., T. Arkebauer, Q. Zhu, A. Suyker and **S. Irmak**. 2021. Gap filling of net ecosystem CO_2 exchange (NEE) above rainfed maize using Artificial Neural Networks (ANNs). *J. Software Engineering and Applications*. 14(5):150-171. https://doi.org/10.4236/jsea.2021.145010.
69. Singh, A., M. Kukal, C. Shapiro, D. Snow, **S. Irmak** and J. Iqbal. 2021. Growth phase-specific evaporative demand and nighttime temperatures determine maize (*Zea mays* L.) yield deviations as revealed from a long-term field experiment. *Agricultural and Forest Meteorology*. 308-309 (2021) 108543. https://doi.org/10.1016/j.agrformet.2021.108543.
70. Mausbach, J., **S. Irmak**, D. Sarangi, J. Lindquist and A. Jhala. 2021. Control of acetolactate synthase inhibitor/glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in isoxaflutole/glufosinate/glyphosate-resistant soybean. *Weed Technology*. doi:10.1017/wet.2021.49.
71. Amiri, E., A. Bahrani, **S. Irmak** and N.M. Roshan. 2021. Evaluation of grain yield, biomass and water productivity response of three wheat cultivars to water using AquaCrop model in an arid climate. *Journal of Water Supply*. 1:602-614. doi:10.2166/ws.2021.246.

72. Djaman, K., **S. Irmak**, K. Koudahe and S. Allen. 2021. Irrigation management in potato (*Solanum tuberosum* L.) production: A review. *Sustainability*. 13:1-19, 2021, 1504. https:// doi.org/10.3390/su13031504.
73. Djaman, K., **S. Irmak**, K. Koudahe, S. Allen. 2021. Chilling and heat accumulation of fruit and nut trees and flower bud vulnerability to early spring low temperatures in New Mexico: Meteorological approach. *Sustainability*. *2021,* 13(5):1-*23*, 2524. https://doi.org/10.3390/su13052524.
74. Porter, D., **S. Irmak**, F. Lamm, T. Marek and Bradley Rein. 2020. Challenges and opportunities for education in irrigation engineering. *Transactions of the ASABE*. 63(5):1289-1294. https://doi.org/10.13031/trans.13943.
75. Kukal, M.S., and **S. Irmak**. 2020. Interrelationships among water use efficiency and light use efficiency in four row crop canopies. *Agrosystems, Geosciences and Environment*. 2020;3:e20110. https://doi.org/10.1002/agg2.20110.
76. Kukal, M.S., and **S. Irmak**. 2020. Canopy light interactions, use and efficiency in four row crops under optimal growth conditions. *Agricultural and Forest Meteorology*. 284:107887. https://doi.org/10.1016/j.agrformet.2019.107887.
77. Sharma, V., and **S. Irmak**. 2020. Economic comparisons of variable rate irrigation and fertigation with fixed (uniform) rate irrigation and fertigation and pre-plant fertilizer management for maize in three soils. *Agricultural Water Management*. 240 (2020) 106307. https://doi.org/10.1016/j.agwat.2020.106307.
78. Ale, S., R.D. Harmel, A.P. Nejadhashemi, K.C. DeJonge, **S. Irmak**, I. Chaubey and K.R. Douglas-Mankin. 2020. Global Water Security: Current research and priorities for action. *Transactions of the ASABE*. 63(1):49-55. https://doi.org/10.13031/trans.13839.
79. Kukal, M.S., and **S. Irmak**. 2020. Characterization of water use and efficiency dynamics across four C3 and C4 row crops under optimal growth conditions. *Agricultural Water Management*. 227:105840. https://doi.org/10.1016/j.agwat.2019.105840.
80. Harmel, R.D., I. Chaubey, S. Ale, A.P. Nejadhashemi, **S. Irmak**, K. DeJonge, S. Evett, E.M. Barnes, M. Catley-Carlson, S. Hunt and I. Mani. 2020. Perspectives on Global Water Security. *Transactions of the ASABE*. 63(1):69-80. https://doi.org/10.13031/trans.13524.
81. Sandhu, R., and **S. Irmak**. 2020. Performance of Hybrid-Maize model in simulating maize growth, grain yield, soil water and evapotranspiration under rainfed, limited and full irrigation using long-term field data. *Agricultural Water Management*. 242:106402. https://doi.org/10.1016/j.agwat.2020.106402.
82. Koehler-Cole, K., R. Elmore, H. Blanco-Canqui, C. Francis, C. Shapiro, C. Proctor, S. Ruis, D. Heeren, **S. Irmak** and R. Ferguson. 2020. Cover crop productivity and subsequent soybean yield in the Western Corn Belt. *Agronomy Journal*. 112(4):2649–2663. doi:10.1002/agj2.20232.
83. Kukal, M., and **S. Irmak**. 2020. Impact of irrigation on interannual variability in United States agricultural productivity. *Agricultural Water Management*. 234:106141. doi.org/10.1016/j.agwat.2020.106141.
84. Salam, A., M.C. Vuran and **S. Irmak**. 2020. A statistical impulse response model based on empirical characterization of wireless underground channel. *IEEE Transactions on Wireless Communications*. *2020*. doi:10.1109/TWC.2020.2998762.
85. Taghvaeian, S., A. Andales, L. Allen, I. Kisekka, S. O'Shaughnessy, D. Porter, R. Sui, **S. Irmak**, A. Fulton and J. Aguilar. 2020. Irrigation scheduling for agriculture in the United States: The progress made and the path forward. *Transactions of the ASABE*. 63(5):1603-1618. https://doi.org/10.13031/trans.14110.
86. Barnes, E.R., N.C. Lawrence, S.Z. Knezevic, O. Rodrigues, **S. Irmak** and A.J. Jhala. 2020. Weed control and response of yellow and white popcorn hybrids to herbicides. *Agronomy Journal*. 112(1):458-469. https://doi.org/10.1002/agj2.20029.
87. Barnes, E., N. Lawrence, S. Knezevic, **S. Irmak**, O. Rodriguez and A. Jhala. 2020. Dose response of white and yellow popcorn hybrids to glyphosate, a premix of 2,4-D choline/glyphosate, or dicamba. *Agronomy Journal*. 112:2956–2967. https://doi.org/10.1002/agj2.20190.
88. **Irmak, S**., A.T. Mohammed, W.L. Kranz, C.D. Yonts and S. van Donk. 2020. Irrigation-yield production functions and irrigation water use efficiency response of drought-tolerant and non-drought-tolerant maize hybrids under different irrigation levels, population densities and environments. *Sustainability*. 12(358):1-28. doi:10.3390/su12010358.
89. Kukal, M**., S. Irmak**, H. Walia and L. Odhiambo. 2020. Spatial and temporal performance, calibration and validation of Hargreaves-Samani equation for quantification of grass-reference evapotranspiration in the USA Great Plains. *Agronomy Journal*. 112:4232–4248. https://doi.org/10.1002/agj2.20325.
90. Barnes, E., S. Knezevic, N. Lawrence, **S. Irmak**, O. Rodriguez and A. Jhala. 2020. Control of Velvetleaf (*Abutilon theophrasti*) at two heights with post-emergence herbicides in Nebraska popcorn. *Weed Technology*. 34:560-567. doi:10.1017/wet.2020.14.

91. Kukal, M., and **S. Irmak**. 2020. Evidence of arithmetical uncertainty in estimates of light and water use efficiency in four row crops. *Sustainability*. 12(2271):1-9. doi:10.3390/su12062271.
92. Kukal, M.S., **S. Irmak** and K. Sharma. 2020. Development and application of a performance and operational feasibility guide to facilitate adoption of soil moisture sensors. *Sustainability*. 12(321):1-20. doi:10.3390/su12010321.
93. Sharma, V., C. Nicholoson, A. Bergantino, **S. Irmak** and D. Peck. 2020. Temporal analysis of meteorological variables and reference evapotranspiration in inter-mountain region of Wyoming. *Water*. 12(2159):1-35. doi:10.3390/w12082159.
94. **Irmak, S**., and M. Kukal. 2019. Disk-till vs. no-till maize grass- and alfalfa-reference single (normal) and basal crop coefficients. *Agricultural Water Management*. 226:105815. https://doi.org/10.1016/j.agwat.2019.105815.
95. Kukal, M., and **S. Irmak**. 2019. Irrigation-limited yield gaps: Trends and variability in the United States post-1950. *Environmental Research Communications*. 1(2019):061005. https://doi.org/10.1088/2515-7620/ab2aee.
96. **Irmak, S**., M.S. Kukal, A.T. Mohammed and K. Djaman. 2019. Disk-till vs. no-till maize evapotranspiration, microclimate, grain yield, production functions and water productivity. *Agricultural Water Management*. 26(5):177-195. https://doi.org/10.1016/j.agwat.2019.02.006.
97. **Irmak, S**., A.T. Mohammed and W.L. Kranz. 2019. Grain yield, crop and basal evapotranspiration, production functions and water productivity response of drought-tolerant and non-drought-tolerant maize hybrids under different irrigation levels, population densities and environments: Part II. In south-central and northeast Nebraska's transition zone and sub-humid environments. *Applied Engineering in Agriculture*. 35(1):83-102. https://doi.org/10.13031/aea.12871.
98. Sandhu, R., and **S. Irmak**. 2019. Performance of AquaCrop model in simulating maize growth, yield, and evapotranspiration under rainfed, limited and full irrigation. *Agricultural Water Management*. 223:105687. https://doi.org/10.1016/j.agwat.2019.105687.
99. Sandhu, R., and **S. Irmak**. 2019. Assessment of AquaCrop model in simulating maize canopy cover, soil-water, evapotranspiration, yield and water productivity for different planting dates and densities under irrigated and rainfed conditions. *Agricultural Water Management*. 224, 105753. https://doi.org/10.1016/j.agwat.2019.105753.
100. Kukal, M., and **S. Irmak**. 2019. Comparative canopy growth dynamics in four row crops and their relationships with allometric and environmental determinants. *Agronomy Journal*. 111(4):1799-1816. doi:10.2134/agronj2019.01.0017.
101. Mohammed, A.T., **S. Irmak**, W.L. Kranz, S. van Donk and C.D. Yonts. 2019. Grain yield, crop and basal evapotranspiration, production functions and water productivity response of drought-tolerant and non-drought-tolerant maize hybrids under different irrigation levels, and population densities: Part I. In western Nebraska's semi-arid environments. *Applied Engineering in Agriculture*. 35(1):65-81. https://doi.org/10.13031/aea.12870.
102. Zhu, Y., **S. Irmak**, A.J. Jhala, M.C. Vuran and A. Diotto. 2019. Time-domain and frequency-domain reflectometry type soil moisture sensor performance and soil temperature effect in fine- and coarse-textured soils. *Applied Engineering in Agriculture*. 35(2):117-134. https://doi.org/10.13031/aea.12908.
103. Salam, A., M. Vuran, X. Dong, C. Argyropoulos and **S. Irmak**. 2019. A theoretical model of underground Dipole Antennas for communications in internet of underground things. *IEEE Transactions on Antennas and Propagation*. 67(6):3996. doi:10.1109/TAP.2019.2902646.
104. Salam, A., M.C. Vuran and **S. Irmak**. 2019. Di-Sense: In situ real-time permittivity estimation and soil moisture sensing using wireless underground communications. *Computer Networks*. 151:31-41. https://doi.org/10.1016/j.comnet.2019.01.001.
105. Vuran, M.C., A. Salam, R. Wong and **S. Irmak**. 2019. Internet of underground things in precision agriculture: Architecture and technology aspects. *Ad Hoc Networks*. 81:160-173. https://doi.org/10.1016/j.adhoc.2018.07.017.
106. Brar, D., W.L. Kranz, T. Lo, **S. Irmak** and D.L. Martin. 2019. Conservation of energy using variable frequency drive for center pivot irrigation: Systems equipped with corner watering attachments. *Transactions of the ASABE*. 62(5):1395-1408. https://doi.org/10.13031/trans.13312.
107. Sharma, V., and **S. Irmak**. 2019. Spatio-temporal magnitudes and trends of cover-crop evapotranspiration in Nebraska, Iowa and Kansas. *J. Irrigation and Drainage Engineering*. 145(2):04018040. doi:10.1061/(ASCE)IR.1943-4774.0001367.

108. Safa, B., T.J. Arkebauer, Q. Zhu, A. Suyker and **S. Irmak**. 2019. Net ecosystem exchange (NEE) simulation in maize using artificial neural networks. *Journal of Systems and Control*. 7(100036):1-10. doi.org/10.1016/j.ifacsc.2019.100036.
109. Bai, G., Y. Ge, D. Scoby, B. Leavitt, V. Stoerger, N. Kirchgessner, **S. Irmak**, G. Graef, J. Schnable and T. Awada. 2019. NU-Spidercam: A large-scale, cable-driven, integrated sensing and robotic system for precision phenotyping, remote sensing, and agronomic research. *Computers and Electronics in Agriculture*. 160(5):71-81. https://doi.org/10.1016/j.compag.2019.03.009.
110. Barnes, E.R., S.Z. Knezevic, N.C. Lawrence, **S. Irmak**, O. Rodriguez and A. Jhala. 2019. Pre-emergence herbicide delays the critical time of weed removal in popcorn. *Weed Technology*. 33:785–793. doi:10.1017/wet.2019.58.
111. Djaman, K., D. Rudnick, Y. Moukoumbi, A. Sow and **S. Irmak**. 2019. Actual evapotranspiration and crop coefficients of irrigated lowland rice (*Oryza sativa* L.) under semiarid climate. *Ital. J. Agronomy*. 14(1059):19-25. doi:10.4081/ija.2019.1059.
112. Rudnick, D., **S. Irmak**, C. West, I. Kisekka, T.H. Marek, J.P. Schneekloth, D. Mitchell, D. McCallister, V. Sharma, K. Djaman, J. Aguilar, J.L. Chávez, M.E. Schipanski, D.H. Rogers and A. Schlegel. 2019. Deficit irrigation management of maize in the High Plains Aquifer region: A Review. *Journal of American Water Resources Association*. 55(1):38–55. doi.org/10.1111/1752-1688.12723.
113. Singh, J., T. Lo, D. Rudnick, **S. Irmak** and H. Blanco-Canqui. 2019. Quantifying and correcting for clay content effects on soil water measurement by reflectometers. *Agricultural Water Management*. 216(5):390-399. https://doi.org/10.1016/j.agwat.2019.02.024.
114. Kukal, M.S., and **S. Irmak**. 2018. U.S. Agro-climatology in 20th Century: Growing degree days, first and last frost, growing season length, and impacts on crop yields. *Nature Scientific Reports*. 8(1):6977. doi:10.1038/s41598-018-25212-2.
115. Kukal, M.S., and **S. Irmak**. 2018. Climate-driven crop yield and yield variability and climate change impacts on the U.S. Great Plains agricultural production. *Nature Scientific Reports*. 8(1):3450. doi:10.1038/s41598-018-21848-2.
116. **Irmak, S**., V. Sharma, A.T. Mohammed and K. Djaman. 2018. Impacts of cover crops on soil physical properties: Field capacity, permanent wilting point, soil-water holding capacity, bulk density, hydraulic conductivity and infiltration. *Transactions of the ASABE*. 61(4):1307-1321. doi.org/10.13031/trans.12700.
117. Oliveira, M.C., T. Gaines, E.L. Patterson, A.J. Jhala, **S. Irmak**, K. Amundsen and S.Z. Knezevic. 2018. Interspecific and intraspecific transference of metabolism-based Mesotrione resistance in *Dioecious Weedy Amaranthus*. *The Plant Journal*. 96(5):1051-1063. doi:10.1111/tpj.14089.
118. Djaman, P.M. Ndiaye, K. Koudahe, A. Bodian, L. Diop and **S. Irmak**. 2018. Spatial and temporal trend in monthly and annual reference evapotranspiration in Madagascar for the 1980-2010 period. *Int. J. Climatology*. 2(2):110-120. doi:10.15406/ijh.2018.02.00058.
119. Yonts, C.D., A. Haghverdi, D.L. Reichert and **S. Irmak**. 2018. Deficit irrigation and surface residue cover effects on dry bean yield, in-season soil water content and irrigation water use efficiency in western Nebraska High Plains. *Agricultural Water Management*. 199:138-147. doi.org/10.1016/j.agwat.2017.12.024.
120. Anderson, R., D. Keshwani, A. Guru H. Yang, **S. Irmak**, and J. Subbiah. 2018. An integrated modeling framework for crop and biofuel systems using DSSAT and GREET models. *J. Environmental Modelling and Software*. 108:40-50. doi.org/10.1016/j.envsoft.2018.07.004.
121. Vuran, M.C., A. Salam, R. Wong and **S. Irmak.** 2018. Internet of underground things: Sensing and communications on the field for precision agriculture. *IEEE Internet of Things. (WF-IoT 2018)*. 307:586-591. doi:10.1109/WF-IoT.2018.8355096.
122. Safa, B., T.J. Arkebauer, Q. Zhu, A. Suyker and **S. Irmak**. 2018. Latent heat and sensible heat flux simulation in maize using artificial neural networks. *Computers and Electronics in Agriculture*. 154:155-164. doi.org/10.1016/j.compag.2018.08.038.
123. Sharma, V., **S. Irmak** and J. Padhi. 2018a. Effect of cover crops on soil quality: Part I: Soil chemical properties – organic C, total N, pH, EC, organic matter content, NO_3-N and P. *J. Soil and Water Conservation*. 73(6):637-651. doi:10.2489/jswc.73.6.637.
124. Sharma, V., **S. Irmak** and J. Padhi. 2018b. Effect of cover crops on soil quality: Part II. Soil exchangeable bases (K, Mg, Na, Ca) and soil micronutrients (Zn, Mn, Fe, Cu and B). *J. Soil and Water Conservation*. 73(6):652-668. doi:10.2489/jswc.73.6.652.

125. Chahal, P., **S. Irmak**, M. Jugulam and A. Jhala. 2018. Evaluating effect of degree of water stress on growth and fecundity of Palmer amaranth (*Amaranthus palmeri*) using soil moisture sensors. *Weed Science*. 66(6):738-745. doi.org/10.1017/wsc.2018.47.
126. Djaman, K., V.C. Mel, L. Diop, A. Sow, R. El Namaky, B. Manneh, K. Saito, K. Futakuchi and **S. Irmak**. 2018. Effects of alternate wetting and drying irrigation regime and nitrogen fertilizer on yield and nitrogen use efficiency of irrigated rice in the Sahel. *Water*. 10(711):1-20. doi:10.3390/w10060711.
127. Djaman, K., M. Sall, A. Sow, B. Manneh and **S. Irmak**. 2018. Analysis of air temperature and relative humidity measured over rice and grass canopies and their impacts on Penman-Monteith reference evapotranspiration. *J. Irrigation and Drainage Engineering*. 145(1):06018008. doi:10.1061/(ASCE)IR.1943-4774.0001362.
128. Chahal, P.S., **S. Irmak**, T. Gaines, K. Amundsen, M. Jugulam, P. Jha, I.S. Travlos and A.J. Jhala. 2018. Control of photosystem (PS) II- and 4-Hydroxyphenylpyruvate Dioxygenase (HPPD)-inhibitor-resistant Palmer amaranth (*Amaranthus palmeri* S. Wats.) in conventional corn. *Weed Technology*. 32:326-335. doi:10.1017/wet.2017.111.
129. Djaman, K., M. O'Neill, C. Owen, D. Smeal, K. Koudahe, M. West, S. Allen, K. Lombard and **S. Irmak**. 2018. Crop evapotranspiration, irrigation water requirement, and water productivity of maize from meteorological data under semiarid climate. *Water*. 10(405):2-17. doi:10.3390/w10040405.
130. Djaman, K., and **S. Irmak**. 2018. Evaluation of critical N and P models for maize under full and limited irrigation conditions. *Ital. Journal of Agronomy*. 13(1):80-92. doi.org/10.4081/ija.2017.958.
131. Djaman, K., K. Lombard, C. Owen, D. Smeal, K. Koudahe, M. West, S. Allen, D. Begay, M. O'Neill and **S. Irmak**. 2018. Long-term winter wheat seasonal irrigation amount, evapotranspiration, yield, and water productivity under semiarid climate. *Agronomy* 8(96):1-16. doi:10.3390/agronomy8060096.
132. Barker, J., D. Heeren, K. Koehler-Cole, C. Shapiro, H. Blanco-Canqui, R. Elmore, C. Proctor, **S. Irmak**, C. Francis, T. Shaver and A. Mohammed. 2018. Cover crops have negligible impact on soil water in Nebraska maize–soybean rotation. *Agronomy Journal*. 110(5):1718-1730. doi:10.2134/agronj2017.12.0739.
133. Ringenberg, D., W. Kranz, **S. Irmak** and B. Dvorak. 2018. Extending Extension's Outreach: Efficacy of using student interns to obtain implementation of irrigation improvements. *J. Extension*. 56(4):1-6.
134. Kukal, M., and **S. Irmak**. 2017. Spatial and temporal changes in maize and soybean grain yields, precipitation use efficiency and crop water use efficiency in the USA Great Plains. *Transactions of the ASABE*. 60(4):1189-1208. doi:10.13031/trans.12072.
135. Djaman, K., **S. Irmak**, M. Sall, A. Sow, K. Koudahe and I. Kabenge. 2017. Comparison of sum-of-hourly and daily time step standardized ASCE Penman-Monteith (ASCE-PM) grass-reference evapotranspiration in western Africa. *Theoretical and Applied Climatology*. 134(1-2):533-543. doi.org/10.1007/s00704-017-2291-6.
136. Djaman, K., **S. Irmak** and K. Futakuchi. 2017. Daily reference evapotranspiration estimation under limited data in eastern Africa. *J. Irrigation and Drainage Engineering*. 143(4):06016015. doi:10.1061/(ASCE)IR.1943-4774.0001154.
137. Sharma, V., and **S. Irmak**. 2017. Soil-water dynamics, evapotranspiration, and crop coefficients of cover crop mixtures in seed maize-cover crop rotation fields: Part II. Grass- and alfalfa-reference single (normal) and basal crop coefficients. *J. Irrigation and Drainage Engineering*. 143(9):04017033. doi:10.1061/(ASCE)IR.1943-4774.0001215.
138. Kukal, M., **S. Irmak** and A. Kilic. 2017. Long-term spatial and temporal maize and soybean evapotranspiration derived from ground and satellite-based NDVI datasets over the USA Great Plains. *J. Irrigation and Drainage Eng*. 143(9):04017031. doi:10.1061/(ASCE)IR.1943-4774.0001212.
139. Aegerter, C., J. Wang, B. Oglesby, **S. Irmak**, B. Wardlow, H. Yang and C. Ge. 2017. Mesoscale modeling of the meteorological impacts of irrigation during the 2012 Central Plains drought. *J. Applied Meteorology and Climatology*. *56:*1259-1283. doi:10.1175/JAMC-D-16-0292.1.
140. Djaman, K., K. Kouhade, S. Allen, M. O'Neill and **S. Irmak**. 2017. Validation of Valiantzas' reference evapotranspiration equation under different climatic conditions. *J. Irrigation and Drainage Systems Engineering*. 6(3):1-7. doi:10.4172/2168-9768.1000196.
141. Haghverdi, A., C.D. Yonts, D.L. Reichert and **S. Irmak**. 2017. Impact of irrigation, surface residue cover and plant population on sugarbeet growth and yield, irrigation water use efficiency and soil water dynamics. *Irrigation Science*. 180:1-12. doi.org/10.1016/j.agwat.2016.10.018.
142. Oliveira, M.C., A. Jhala, T. Gaines**, S. Irmak**, K. Amundsen, J. Scott and S. Knezevic. 2017. Confirmation and control of HPPD-inhibiting Common Waterhemp (*Amaranthus tuberculatus*) in Nebraska. *Weed Technology*. 31(1):67-79. https://doi.org/10.1017/wet.2016.4.

143. Sarangi, D., A. Tyre, E. Patterson, T. Gaines, **S. Irmak**, S. Knezevic, J. Lindquist and A. Jhala. 2017. Pollen-mediated gene flow from glyphosate-resistant Common Waterhemp (*Amaranthus rudis* Sauer): Consequences for the dispersal of resistance genes. *Nature Scientific Reports*. 7:44913(2017). doi:10.1038/srep44913.
144. Djaman, K., V. Sharma, D. Rudnick, **S. Irmak**, K.A. Amouzou, J.M. Sogbedji and K. Koudahe. 2017. Spatial and temporal variation in rainfall in Togo during the 1961-2001 period. *International Journal of Hydrology*. 1(4):97-105. doi:10.15406/ijh.2017.01.00019.
145. Sarangi, D., L. Sandell, S.Z. Knezevic, J.L. Lindquist, **S. Irmak** and A.J. Jhala. 2017. Comparison of herbicide programs for season-long control of glyphosate-resistant Common Waterhemp (*Amaranthus rudis*) in soybean. *Weed Technology*. 31:53-66. doi.org/10.1017/wet.2016.1.
146. Djaman, K., V. Mel, A. Balde, B. Bado, B. Manneh, L. Diop, D. Mutiibwa, D. Rudnick, **S. Irmak** and K. Futakuchi. 2017. Evapotranspiration, irrigation water requirement and water productivity of rice (*Oryza sativa* L.) in the Sahelian environment. *Paddy and Water Environment*. 15(3):469-482. doi:10.1007/s10333-016-0564-9.
147. Brar, D., W. Kranz, T. Lo, **S. Irmak** and D. Martin. 2017. Conservation of energy using variable frequency drive for center pivot irrigation: Standard systems. *Transactions of the ASABE*. 60(1):95-106. doi:10.13031/trans.11683.
148. Djaman, K., A.B. Balde, K.B. Muller, D. Rudnick and **S. Irmak**. 2017. Long-term trend analysis in climate variables and agricultural adaptation strategies to climate change in the Senegal River Basin. *Int. J. Climatology (Royal Meteorological Society)*. 37(6):2873-2888. doi:10.1002/joc.4885.
149. Djaman, K., D. Rudnick, D. Mutiibwa, L. Diop, M. Sall, I. Kabenge, A. Bodian, H. Tabari and **S. Irmak**. 2017. Evaluation of Valiantzas' Simplified Forms of the FAO-56 Penman-Monteith Reference Evapotranspiration Model in a Humid Climate. *J. Irrigation and Drainage Engineering*. 143(8):06017005-1. https://doi.org/10.1061/(ASCE)IR.1943-4774.00011.
150. Salam, A., M.C. Vuran and **S. Irmak**. 2017. Towards internet of underground things in smart lighting: A statistical model of wireless underground channel. *ICNSC 2017. IEEE Networking, Sensing and Control*. 304:574-579. doi:10.1109/ICNSC.2017.8000155.
151. Sharma, V., **S. Irmak**, V. Sharma, K. Djaman and L. Odhiambo. 2017. Soil-water dynamics, evapotranspiration and crop coefficients of cover crop mixtures in seed maize-cover crop rotation fields: Part I. Soil-water dynamics and evapotranspiration. *J. Irrigation and Drainage Engineering*. 143(9):04017032. doi:10.1061/(ASCE)IR.1943-4774.0001214.
152. Yan, Q., H. Yang, M.C. Vuran and **S. Irmak**. 2017. SPRIDE: Scalable and private continual geo-distance evaluation for precision agriculture. *IEEE Communications and Network Security*. CFP17CNM-ART:1-9. doi:10.1109/CNS.2017.8228620.
153. Koudahe, K., K. Djaman, A. Bodian, **S. Irmak**, M. Sall, L. Diop, A.B. Balde and D. Rudnick. 2017. Trend analysis in rainfall, reference evapotranspiration and aridity index in Southern Senegal: Adaptation to the vulnerability of rainfed rice cultivation to climate change. *Atmospheric and Climate Sciences*. 7(4):476-495. doi.org/10.4236/acs.2017.74035.
154. Rudnick, D., **S. Irmak**, K. Djaman and V. Sharma. 2017. Impact of irrigation and nitrogen fertilizer rate on soil water dynamics and maize actual evapotranspiration during the vegetative and reproductive periods. *Agricultural Water Management*. 191:77-84. dx.doi.org/10.1016/j.agwat.2017.06.007.
155. Djaman K., K. Koudahe, C.O. Akinbile and **S. Irmak**. 2017. Evaluation of eleven reference evapotranspiration models in semi-arid conditions. *J. Water Resource and Protection*. 9:1469-1490. doi.org/10.4236/jwarp.2017.912094.
156. Djaman, K., K. Koudahe, M. Sall, I. Kabenge, D. Rudnick and **S. Irmak**. 2017. Performance of twelve mass transfer-based reference evapotranspiration models under humid climate. *J. Water Resource and Protection*. 9:1347-1363. doi.org/10.4236/jwarp.2017.912086.
157. **Irmak, S**., and K. Djaman. 2016. Effects of planting date and density on plant growth, yield, evapotranspiration, and irrigation- and evapotranspiration-yield production functions of maize (*Zea mays* L.) under subsurface drip irrigation and rainfed conditions. *Transactions of the ASABE*. 59(5):1235-1256. doi:10.13031/trans.59.11169.
158. Kukal, M., and **S. Irmak**. 2016. Long-term patterns of air temperatures, daily temperature range, precipitation, grass-reference evapotranspiration and aridity index in the USA Great Plains: Part I. Spatial trends. *Journal of Hydrology*. 542:953-977. dx.doi.org/10.1016/j.jhydrol.2016.06.006.
159. Kukal, M., and **S. Irmak**. 2016. Long-term patterns of air temperatures, daily temperature range, precipitation, grass-reference evapotranspiration and aridity index in the USA Great Plains: Part II. Temporal trends. *Journal of Hydrology*. 542:978-1001. dx.doi.org/10.1016/j.jhydrol.2016.06.008.

160. Djaman, K., **S. Irmak**, I. Kabenge and K. Futakuchi. 2016. Evaluation of FAO-56 Penman-Monteith model with limited data and the Valiantzas models for estimating grass-reference evapotranspiration in the Sahelian conditions. *J. Irrigation and Drainage Engineering*. 142(11):1-14. doi:10.1061/(ASCE)IR.1943-4774.0001070.
161. **Irmak, S**., and G.M. Arellano. 2016. Reference (potential) evapotranspiration: Part II. Frequency distribution in humid, subhumid, arid, semiarid and Mediterranean-type climates. *J. Irrigation and Drainage Engineering*. 142(4):1-11. 04015066. doi:10.1061/(ASCE)IR.1943-4774.0000979, 04015066.
162. Arellano, G.M., and **S. Irmak**. 2016. Reference (potential) evapotranspiration: Part I. Comparison of temperature, radiation, and combination-based energy balance equations in humid, subhumid, arid, semiarid and Mediterranean-type climates. *J. Irrigation and Drainage Engineering*. 142(4):1-21. doi:10.1061/(ASCE)IR.1943-4774.0000978.
163. Sharma, V., **S. Irmak**, K. Djaman and V. Sharma. 2016. Large-scale spatial and temporal variability in evapotranspiration, crop water use efficiency, and evapotranspiration water use efficiency for irrigated and rainfed maize and soybean. *J. Irrigation and Drainage Engineering*. 142(3):04015063. doi:10.1061/(ASCE)IR.1943-4774.0000985.
164. Sharma, V., A. Kilic and **S. Irmak**. 2016. Impact of scale/resolution on evapotranspiration from LANDSAT and MODIS images. *Water Resources Research*. 52:1-20. doi:10.1002/2015WR017772.
165. Salam, A., M.C. Vuran and **S. Irmak**. 2016. Pulses in the sand: Impulse response analysis of wireless underground channel. *IEEE INFOCOM*. 81(1):160-173. doi:10.1109/INFOCOM.2016.7524457.
166. Amatya, D.M., **S. Irmak**, P. Gowda, G. Sun, J.E. Nettles and K.R. Douglas-Mankin. 2016. Ecosystem evapotranspiration: Challenges in measurements, estimates and modeling. *Transactions of the ASABE*. 59(2):555-560. https://doi.org/10.13031/trans.59.11808.
167. Wang, J., A.L. Kessner, C. Aegerter, A. Sharma, L. Judd, B. Wardlow, J. You, M. Shulski, **S. Irmak**, A. Kilic and J. Zeng, 2016. A multi-sensor view of the 2012 Central Plains drought from space. *Frontiers in Environmental Science*. 4(45):1-13. dx.doi.org/10.3389/fenvs.2016.00045.
168. Sharma, V., **S. Irmak**, A. Kilic, V. Sharma, J.E. Gilley, G.E. Meyer, S.Z. Knezevic and D. Marx. 2016. Quantification and mapping of surface residue cover and tillage practices for maize and soybean fields in south central Nebraska-USA using Landsat imagery. *Transactions of the ASABE*. 59(3):925-939. doi:10.13031/trans.59.11489.
169. Diotto, A.V., and **S. Irmak**. 2016. Embodied energy and return of investment energy analyses in maize production for grain and ethanol under surface (furrow)-, center pivot-, and subsurface drip irrigation with disk-till and no-till practices. *Transactions of the ASABE*. 59(3):873-884. doi:10.13031/trans.59.11331.
170. Djaman, K., A.B. Balde, L. Diop, K. Futakuchi and **S. Irmak**. 2016. Analyses, calibration and validation of evapotranspiration models to predict grass-reference evapotranspiration in the Senegal River Delta. *Journal of Hydrology*. 8:82-94. dx.doi.org/10.1016/j.ejrh.2016.06.003.
171. Rudnick, D., **S. Irmak**, R. Ferguson, T. Shaver, K. Djaman, G. Slater, A. Bereuter, N. Ward, D. Francis, M. Schmer, B. Wienhold and S. van Donk. 2016. Economic return vs crop water productivity of maize for various nitrogen rates under full irrigation, limited irrigation, and rainfed settings in south central Nebraska. *J. Irrigation and Drainage Engineering*. 142(6):1-12. 04016017. doi:10.1061/(ASCE)IR.1943-4774.0001023.
172. **Irmak, S.,** K. Djaman and D. Rudnick. 2016. Effect of full and limited irrigation rate and frequency on subsurface drip-irrigated maize evapotranspiration, yield, water use efficiency and yield response factors. *Irrigation Science*. 34(4):271-286. https://doi.org/10.1007/s00271-016-0502-z.
173. **Irmak, S**. 2015. Inter-annual variation in long-term center pivot-irrigated maize evapotranspiration (ET) and various water productivity response indices: Part I. Grain yield, actual and basal ET, irrigation-yield production functions, ET-yield production functions, and yield response factors. *J. Irrigation and Drainage Engineering*. 141(5):1-17. doi:10.1061/(ASCE)IR.1943-4774.0000825.
174. **Irmak, S**. 2015. Inter-annual variation in long-term center pivot-irrigated maize evapotranspiration (ET) and various water productivity response indices: Part II. Irrigation water use efficiency (IWUE), crop WUE, evapotranspiration WUE, irrigation-evapotranspiration use efficiency, and precipitation use efficiency. *J. Irrigation and Drainage Engineering*. 141(5):1-11. doi:10.1061/(ASCE)IR.1943-4774.0000826.
175. **Irmak, S.**, and V. Sharma. 2015. Large scale and long-term trends and magnitudes in irrigated and rainfed maize and soybean water productivity: Grain yield, evapotranspiration, crop water use efficiency, and yield production functions. *Transactions of the ASABE*. 58(1):103-120. doi:10.13031/trans.58.10784.

176. **Irmak, S**., K. Djaman and V. Sharma. 2015. Winter wheat (*Triticum aestivum* L.) evapotranspiration and single and basal crop coefficients. *Transactions of the ASABE*. 58(4):1047-1067. doi:10.13031/trans.58.11083.
177. **Irmak, S.,** J.E. Specht, L. Odhiambo, J.M. Rees and K.G. Cassman 2015. Soybean yield, water productivity, evapotranspiration and soil-water extraction response to subsurface drip irrigation. *Transactions of the ASABE*. 57(3):729-748. doi:10.13031/trans.57.10085.
178. Mitchell, J.P., A. Shrestha and **S. Irmak**. 2015. Trade-offs between winter cover crop production and soil water depletion in California's San Joaquin Valley. *J. Soil and Water Conservation* 70(6):430-440. doi:10.2489/jswc.70.6.430.
179. Sharma, V., **S. Irmak**, A. Kilic and D. Mutiibwa. 2015. Application of SEBS for quantifying and mapping surface energy fluxes in south central Nebraska, USA: Analyses with respect to field measurements. *Transactions of the ASABE*. 58(5):1265-1285. doi: 10.13031/trans.58.11091.
180. Odhiambo, L., and **S. Irmak**. 2015. Surface energy balance, evapotranspiration, and surface coefficients during non-growing season in a maize-soybean cropping system. *Transactions of the ASABE*. 58(3):667-684. doi:10.13031/trans.58.10790.
181. Sarangi, D., **S. Irmak**, J. Lindquist, S.Z. Knezevic and A.J. Jhala. 2015. Effect of water stress on growth and fecundity of Common Waterhemp (Amaranthus rudis). *Weed Science*. 64(1):42-52. https://doi.org/10.1614/WS-D-15-00052.1.
182. Rudnick, D., K. Djaman and **S. Irmak**. 2015. Performance and hysteresis analyses of capacitance and electrical resistance sensors in a silt-loam soil. *Transactions of the ASABE*. 58(3):649-665. doi: 10.13031/trans.58.10761.
183. Djaman, K., A.B. Balde, A. Sow, B. Muller, **S. Irmak**, M.K. Ndiaye, B. Manneh, Y.D. Moukoumbi, K. Futakuchi and K. Saito. 2015. Evaluation of sixteen reference evapotranspiration methods under Sahelian conditions in the Senegal River Valley. *Journal of Hydrology: Regional* Studies. 3:139-159. doi:10.1016/j.ejrh.2015.02.002.
184. Odhiambo, L., and **S. Irmak.** 2015. Relative evaporative losses and water balance in subsurface drip- and center pivot-irrigated soybean fields. *J. Irrigation and Drainage Eng*. 141(11):1-17. 04015020. https://doi.org/10.1061/(ASCE)IR.1943-4774.0000907.
185. Rudnick, D., V. Sharma, G.E. Meyer and **S. Irmak**. 2015. Using fuzzy logic to predict and evaluate the impact of temporal and spatial precipitation on rainfed maize and soybean yields in Nebraska. *Transactions of the ASABE*. 58(5):1215-1229. doi:10.13031/trans.58.10831.
186. Sarangi, D., L.D. Sandell, S.Z. Knezevic, J.S. Aulakh, J.L. Lindquist, **S. Irmak** and A.J. Jhala. 2014. Conformation and control of Glyphosate-resistant Common Waterhemp (*Amaranthus rudis*) in Nebraska. *Weed Technology*. 29:82-92. doi:10.1614/WT-D-14-00090.1.
187. Rudnick, D., and **S. Irmak**. 2014. Spatial and temporal maize soil-water extraction (depletion) dynamics: Part I. Development and evaluation of a soil-water extraction model. *Transactions of the ASABE*. 57(2):431-444. doi: 10.13031/trans.57.10254.
188. Rudnick, D., and **S. Irmak**. 2014. Spatial and temporal maize soil-water extraction (depletion) dynamics: Part II. Impact of water and nitrogen management strategies on soil-water extraction. *Transactions of the ASABE*. 57(2):445-462. doi: 10.13031/trans.57.10254.
189. Mutiibwa, D., A. Kilic and **S. Irmak**. 2014. The effect of land cover/land use changes on the regional climate of the U.S.A. High Plains. *Climate*. 2(3):153-167. doi:10.3390/cli2030153.
190. Torrion, J., T. Setiyono, G. Graef, K. Cassman, **S. Irmak** and J. Specht. 2014. Agronomic impacts of deferred, deficit, and full-season irrigation strategies. *Crop Science*. 54:1-14. doi:10.2135/cropsci2014.03.0261.
191. Rudnick, D., and **S. Irmak**. 2014. Impact of nitrogen fertilizer on maize evapotranspiration crop coefficients under fully-irrigated, limited irrigation, and rainfed settings. *J. Irrigation and Drainage Engineering*. 140(12):04014039. doi:10.1061/(ASCE)IR.1943-4774.0000778.
192. Rudnick, D., and **S. Irmak**. 2014. Implementation of soil water extraction model on a spatial domain using field capacity and apparent electrical conductivity relationships. *Transactions of the ASABE*. 57(5):1359-1373. doi:10.13031/trans.57.10515.
193. **Irmak, S**., K.E. Skaggs and S. Chatterjee. 2014. A review of the Bowen ratio surface energy balance method for quantifying evapotranspiration and other surface energy fluxes. *Transactions of the ASABE*. 57(6):1657-1674. doi:10.13031/trans.57.10686.
194. **Irmak, S**., A. Kilic and S. Chatterjee. 2014. On the uncertainty in inequality of latent and sensible heat energy transfer coefficients of the Bowen ratio theory: Another look at the potential causes of inequalities. *Climate*. 2:181-205, doi:10.3390/cli2030181.

195. **Irmak, S**., J.O. Payero, A. Kilic, L. Odhiambo, V. Sharma, D. Rudnick and D. Billesbach. 2014. On the magnitude and dynamics of eddy covariance residual energy (energy closure) from a subsurface drip-irrigated maize field during growing and non-growing (dormant) seasons. *Irrigation Science*. 32:471-483. doi:10.1007/s00271-014-0443-3.
196. **Irmak, S**., L. Odhiambo, J.E. Specht and K. Djaman. 2013. Hourly and daily single and basal evapotranspiration crop coefficients as a function of growing degree days, days after emergence, leaf area index, fractional green canopy cover, and plant phenology for soybean. *Transactions of the ASABE*. 56(5):1785-1803. doi:10.13031/trans.56.10219.
197. **Irmak, S.,** I. Kabenge, I., D. Rudnick, S. Knezevic, D. Woodward and M. Moravek. 2013. Evapotranspiration crop coefficients for mixed riparian plant community and transpiration crop coefficients for phragmites, cottonwood and peach-leaf willow in the Platte River Basin, Nebraska-USA. *Journal of Hydrology*. 481:177-190. https://doi.org/10.1016/j.jhydrol.2012.12.032.
198. **Irmak, S**., D. Mutiibwa, J.O. Payero, T. Marek and D. Porter. 2013. Modeling canopy resistance on hourly time steps from micrometeorological and plant variables for one-step estimation of actual crop evapotranspiration. *Journal of Hydrology*. 507:1-18. dx.doi.org/10.1016/j.jhydrol.2013.10.008.
199. Mutiibwa, D., and **S. Irmak**. 2013. AVHRR-NDVI-based crop coefficients for analyzing long-term trends in evapotranspiration in relation to changing climate in the USA High Plains. *Water Resources Research*. 49(1):231-244. doi:10.1029/2012WR012591.
200. Rudnick, D., and **S. Irmak.** 2013. Impact of water and nitrogen management strategies on maize yield and water productivity indices under linear-move sprinkler irrigation. *Transactions of the ASABE*. 56(5):1769-1783. doi:10.13031/trans.56.10215.
201. Payero, J.O., and **S. Irmak.** 2013. Daily energy fluxes, evapotranspiration and crop coefficients of soybean. *Agric. Water Management*. 129:31-43. dx.doi.org/10.1016/j.agwat.2013.06.018.
202. Mutiibwa, D., and **S. Irmak**. 2013. Transferability of Jarvis-type models developed/re-parameterized for specific crops to estimate stomatal resistance for other crops: Analyses on model calibration, validation, performance, sensitivity, and elasticity. *Transactions of the ASABE*. 56(2):409-422. doi:10.13031/2013.42688.
203. Kabenge, I., **S. Irmak**, G.E. Meyer, J.E. Gilley, S. Knezevic, T.J. Arkebauer, D. Woodward and M. Moravek. 2013. Evapotranspiration and surface energy balance of a common reed-dominated riparian system in the Platte River Basin, central Nebraska, USA. *Transactions of the ASABE*. 56(1):135-153. doi:10.13031/2013.42596.
204. Djaman, K., **S. Irmak**, D.L. Martin, R.B. Ferguson and M.L. Bernards. 2013. Plant nutrient uptake and soil nutrient dynamics under full and limited irrigation and rainfed maize production. *Agronomy Journal*. 105(2):527-538. doi:10.2134/agronj2012.0269.
205. Djaman, K., and **S. Irmak.** 2013. Actual crop evapotranspiration and alfalfa- and grass-reference crop coefficients of maize under full and limited irrigation and rainfed conditions. *J. Irrigation and Drainage Engineering*. 139(6):433-446. https://doi.org/10.1061/(ASCE)IR.1943-4774.0000559.
206. Djaman, K., **S. Irmak**, W.R. Rathje, D.L. Martin and D.E. Eisenhauer. 2013. Maize evapotranspiration, yield production functions, biomass, grain yield, harvest index, and yield response factors under full and limited irrigation. *Transactions of the ASABE*. 56(2):273-293.
207. Sharma, V., D. Rudnick and **S. Irmak.** 2013. Development and evaluation of ordinary least square regression models for predicting irrigated and rainfed maize and soybean yields. *Transactions of the ASABE*. 56(4):1361-1378.
208. Dong, X., M.C. Vuran and **S. Irmak.** 2013. Autonomous precision agriculture through integration of wireless underground sensor networks with center pivot systems. *Ad Hoc Networks*. 11(7):1975-1987. dx.doi.org/10.1016/j.adhoc.2012.06.012.
209. Knezevic, S., R. Rapp, A. Datta and **S. Irmak**. 2013. Common reed (*Phragmites australis*) control as influenced by the timing of herbicide application. *Int. J. Pest Management*. 59(3):224-228. doi:10.1080/09670874.2013.830796.
210. Lagos, L.O., D.L. Martin, S.B. Verma, **S. Irmak**, A. Irmak, D.E. Eisenhauer and A. Suyker. 2013. Surface energy balance model of transpiration and evaporation from residue-covered or bare-soil systems: Model evaluation. *Irrigation Science*. 31(2):135-150. doi:10.1007/s00271-011-0298-9.
211. **Irmak, S.,** I. Kabenge, K. Skaggs and D. Mutiibwa. 2012. Trend and magnitude of changes in climate variables and reference evapotranspiration over 116-year period in the Platte River Basin, central Nebraska-USA. *Journal of Hydrology*. 420-421: 228-244.
212. Skaggs, K.E., and **S. Irmak**. 2012. Long-term trends in air temperature distribution and extremes, growing degree days, and spring and fall frosts for climate impact assessments on agricultural practices in

Nebraska, USA. *J. Applied Meteorology and Climatology*. 51:2060–2073. doi:dx.doi.org/10.1175/JAMC-D-11-0146.1.

213. Kabenge, I., and **S. Irmak**. 2012. Evaporative losses from a phragmites (Common Reed)-dominated peach-leaf willow and cottonwood riparian plant community. *Water Resources Research*. 48:1-17, W09513, doi:10.1029/2012WR011902.
214. **Irmak, S.,** M. Burgert, H. Yang, K. Cassman, D. Walters, W. Rathje, J. Payero, P. Grassini, M. Kuzila, K. Brunkhorst, B. VanDeWalle, J. Rees, W. Kranz, D. Eisenhauer, C. Shapiro, G. Zoubek and G. Teichmeier. 2012. Large scale on-farm implementation of soil moisture-based irrigation management strategies for increasing maize water productivity. *Transactions of the ASABE*. 55(3):881-894.
215. Sharma, V., and **S. Irmak.** 2012. Mapping spatially interpolated precipitation, reference evapotranspiration, actual crop evapotranspiration, and net irrigation requirements: Part I. Precipitation and reference evapotranspiration. *Transactions of the ASABE*. 55(3):907-921.
216. Sharma, V., and **S. Irmak.** 2012. Mapping spatially interpolated precipitation, reference evapotranspiration, actual crop evapotranspiration, and net irrigation requirements: Part II. Actual crop evapotranspiration and net irrigation requirements. *Transactions of the ASABE*. 55(3):923-936.
217. Djaman, K., and **S. Irmak.** 2012. Soil water extraction patterns and crop-, irrigation-, and evapotranspiration water use efficiency of maize under full and limited irrigation and rainfed settings. *Transactions of the ASABE*. 55(4):1223-1238.
218. Skaggs, K.E., and **S. Irmak**. 2012. Analysis of microclimate data measured over grass and soybean canopy and their impacts on Penman-Monteith grass and alfalfa-reference evapotranspiration. *J. Irrigation and Drainage Engineering*. 138(2) 120-134.
219. Odhiambo, L., and **S. Irmak**. 2012. Evaluation of the impact of surface residue cover on single and dual crop coefficient methods for estimating soybean actual evapotranspiration. *Agricultural Water Management*. 104:221-234. https://doi.org/10.1016/j.agwat.2011.12.021.
220. Torrion, J., T. Setiyono, K. Cassman, R. Ferguson, **S. Irmak** and J. Specht. 2012. Soybean root development relative to vegetative and reproductive phenology. *Agronomy Journal*. 104(6):1702-1709. https://doi.org/10.2134/agronj2012.0199.
221. Porter, D., P. Gowda, T. Marek, T. Howell, J. Moorehead and **S. Irmak**. 2012. Sensitivity of grass and alfalfa-reference evapotranspiration to sensor accuracy. *Applied Engineering in Agriculture*. 28(4):543-549.
222. Rapp, R.E., A. Datta, **S. Irmak,** T. Arkebauer and S.Z. Knezevic. 2012. Integrated management of common reed (*Phragmites australis*) along the Platte River in Nebraska. *Weed Technology*. 26(2):326-333. http://dx.doi.org/10.1614/WT-D-11-00119.1.
223. Tooker, J., X. Dong, M.C, Vuran and **S. Irmak**. 2012. Connecting soil to the cloud: A wireless underground sensor network testbed. *IEEE Ad Hoc Communications and Networks* (SECON). 978(1):4673-1905-8/12: p. 79-81. doi:10.1109/SECON.2012.6275848.
224. **Irmak, S.** 2011. On the dynamics of nocturnal, daytime and sum-of-hourly evapotranspiration and other surface energy fluxes over a non-stressed maize canopy. *J. Irrigation and Drainage Engineering*. 137(8):475-490.
225. **Irmak, S**., L. Odhiambo and D. Mutiibwa. 2011. Assessing the impact of daily net radiation models on grass and alfalfa-reference evapotranspiration estimated using Penman-Monteith equation in a sub-humid and arid climate. *J. Irrigation and Drainage Engineering*. 137(2):59-72.
226. Mutiibwa, D., and **S. Irmak**. 2011. On the scaling up soybean leaf level stomatal resistance to canopy resistance for one-step estimation of actual evapotranspiration. *Transactions of the ASABE*. 54(1):141-154. doi:10.13031/2013.36269.
227. Grassini, P., H. Yang, **S. Irmak**, J. Thorburn, C. Burr and K.G. Cassman. 2011. High-yield irrigated maize in Western U.S. Corn-Belt II. Irrigation management and crop water productivity. *Field Crops Research*. 120:133-141.
228. Odhiambo, L., and **S. Irmak**. 2011. Evaluation of Extended Shuttleworth-Wallace Model for estimating and partitioning of evapotranspiration in a partial residue-covered subsurface drip-irrigated soybean field. *Transactions of the ASABE*. 54(3):915-930.
229. Skaggs, K.E., and **S. Irmak.** 2011. Characterization of nighttime evapotranspiration and other surface energy fluxes and interactions with microclimate variables in subsurface drip and center pivot-irrigated soybean fields. *Transactions of the ASABE*. 54(3):941-952.
230. Sharma, V., A. Irmak, I. Kabenge and **S. Irmak**. 2011. Application of GIS and geographically-weighted regression to evaluate spatial non-stationarity relationships between precipitation vs. irrigated and rainfed maize and soybean yields. *Transactions of the ASABE*. 54(3):953-972.
231. Abunyewa, A., R. Ferguson, C. Wortmann, D. Lyon, S. Mason, **S. Irmak** and R. Klein. 2011. Grain sorghum

water use with skip-row configuration in the Central Great Plains. *A. J. Agric. Res*. 6(23):5328-5338.
232. **Irmak, S**., and D. Mutiibwa. 2010. On the dynamics of canopy resistance: Generalized-linear estimation and its relationships with primary micrometeorological variables. *Water Resources Research*. 46:1-20, W08526. doi:10.1029/2009WR008484.
233. **Irmak, S**. 2010. Nebraska Water and Energy Flux Measurement, Modeling, and Research Network (NEBFLUX). *Transactions of the ASABE*. 53(4):1097-1115. doi: 10.13031/2013.32600.
234. **Irmak, S.,** D. Mutiibwa and J.O. Payero. 2010. Net radiation dynamics: Performance of 20 daily net radiation models as related to model structure and intricacy in two climates. *Transactions of the ASABE*. 53(4):1059-1076. doi:10.13031/2013.32596.
235. Irmak, A., P. Ranade, D. Marx, **S. Irmak**, K.G. Hubbard, G. Meyer and D.L. Martin. 2010. Spatial interpolation of climate variables in Nebraska. *Transactions of the ASABE*. 53(6):1759-1771.
236. **Irmak, S.**, J. Rees, G. Zoubek, B. vanDeWalle, W. Rathje, R. DeBuhr, D. Leininger, D. Siekman, J. Schneider and A. Christiansen. 2010. Nebraska Agricultural Water Management Demonstration Network (NAWMDN): Integrating Research and Extension/Outreach. *Applied Engineering in Agriculture*. 26(4):599-613.
237. Hay, C.H., and **S. Irmak**. 2010. Recursive and explicit combination-based energy balance equations for calculating reference evapotranspiration in relation to Bowen ratio measurements. *Transactions of the ASABE* 53(6):1799-1810.
238. Van Donk, S.J., D.L. Martin, **S. Irmak**, S.R. Melvin, J.L. Petersen and D.R. Davison. 2010. Crop residue cover effects on evaporation, soil water content, and yield of deficit-irrigated corn in west-central Nebraska. *Transactions of the ASABE*. 53(6):1787-1797.
239. **Irmak, S**., and D. Mutiibwa. 2009. On the dynamics of stomatal resistance: Relationships between stomatal behavior and micrometeorological variables and performance of Jarvis-type parameterization. *Transactions of the ASABE*. 52(6):1923-1939.
240. **Irmak, S.**, and D. Mutiibwa. 2009. On the dynamics of evaporative losses from Penman-Monteith with fixed and variable canopy resistance during partial and complete maize canopy. *Transactions of the ASABE*. 52(4):1139-1153. doi:10.13031/2013.27791.
241. **Irmak, S**., and L. Odhiambo. 2009. Impact of microclimatic data measured above maize and grass canopies on Penman-Monteith reference evapotranspiration calculations. *Transactions of the ASABE*. 52(4):1155-1169.
242. Lagos, O., D.L. Martin, S. Verma, A. Suyker and **S. Irmak**. 2009. Surface energy balance model of transpiration from variable canopy cover and evaporation from residue-covered or bare soil systems. *Irrigation Science*. 28:51-64.
243. Ortega-Farias, S., **S. Irmak** and R.H. Cuenca. 2009. Special issue on evapotranspiration measurement and modeling. *Irrigation Science*. 28:1-3.
244. Hay, C.H., and **S. Irmak.** 2009. Actual and reference evaporative losses and surface coefficients of a maize field during non-growing (dormant) periods. *J. Irrigation and Drainage Eng*. 135(3):313-322.
245. Payero, J.O., D.D. Tarkalson, **S. Irmak**, D. Davison and J. Petersen. 2009. Effect of irrigation timing of a deficient water allocation on corn evapotranspiration, yield, water use efficiency, and dry matter production in a semiarid climate. *Agricultural Water Management*. 96:1387-1397.
246. **Irmak, S.,** and D. Mutiibwa. 2008. Dynamics of photosynthetic photon flux density and light extinction coefficient for assessing radiant energy interactions for maize canopy. *Transactions of the ASABE*. 51(5):1663-1673.
247. **Irmak, S.,** D. Mutiibwa, A. Irmak, T.J. Arkebauer, A. Weiss, D.L. Martin and D.E. Eisenhauer. 2008. On the scaling up leaf stomatal resistance to canopy resistance using photosynthetic photon flux density. *Agricultural and Forest Meteorology*. 148(6-7):1034-1044.
248. Irmak, A., **S. Irmak** and D.L. Martin. 2008. Reference and crop evapotranspiration in south central Nebraska: I. Comparison and analysis of grass and alfalfa-reference evapotranspiration. *J. Irrigation and Drainage Engineering*. 134(6):690-699.
249. Irmak, A., and **S. Irmak**. 2008. Reference and crop evapotranspiration in south central Nebraska: II. Measurement and estimation of actual evapotranspiration. *J. Irrigation and Drainage Engineering*. 134(6):700-715.
250. **Irmak, S.**, A. Irmak, T.A. Howell, D.L. Martin, J.O. Payero and K.S. Copeland. 2008. Variability analyses of alfalfa-reference to grass-reference evapotranspiration ratios in growing and dormant seasons. *J. Irrigation and Drainage Engineering*. 134(2):147-159.

251. **Irmak, S.,** E. Istanbulluoglu and A. Irmak. 2008. An evaluation of evapotranspiration model complexity versus performance in comparison with Bowen ratio energy balance measurements. *Transactions of the ASABE*. 51(4):1295-1310. doi: 10.13031/2013.25246.
252. Singh, R.K., A. Irmak, **S. Irmak** and D.L. Martin. 2008. Application of SEBAL for mapping evapotranspiration and estimating surface energy fluxes in south central Nebraska. *J. Irrigation and Drainage Engineering*. 134(3):273-285.
253. Payero, J.O., D.D. Tarkalson and **S. Irmak**, D. Davison, and J.L. Petersen. 2008. Effect of irrigation amounts applied with subsurface drip irrigation on corn evapotranspiration, yield, water use efficiency, and dry matter production in a semi-arid climate. *Agricultural Water Management*. 95:895-908.
254. Payero, J.O., and **S. Irmak**. 2007. Design, construction, installation, and performance of two large repacked weighing lysimeters for measuring crop evapotranspiration. *Irrigation Science*. 26(2):191-202.
255. Irmak, A., J.W. Jones, W.D. Batchelor, **S. Irmak**, K.J. Boote and J.O. Paz. 2006. Artificial neural network model as a data analysis tool in precision farming. *Transactions of the ASABE*. 49(6):2027-2037.
256. Irmak, A., J. Jones, W. Batchelor, **S. Irmak**, J. Paz and K. Boote. 2006. Analysis of spatial yield variability using a combined crop model-empirical approach. *Transactions of the ASABE*. 49(3):811-818.
257. **Irmak, S.**, J.O. Payero, D.L. Martin, A. Irmak and T.A. Howell. 2006. Sensitivity analyses and sensitivity coefficients of the standardized ASCE-Penman-Monteith equation to climate variables. *J. Irrigation and Drainage Engineering*. 132(6):564-578.
258. Payero, J.O., and **S. Irmak**. 2006. Variable upper and lower crop water stress index (CWSI) baselines for corn and soybean. *Irrigation Science*. 25:21-32.
259. Payero, J.O., D.D. Tarkalson and **S. Irmak**. 2006. Use of Time-Domain Reflectometry for continuous monitoring of nitrate in soil and water. *Applied Engineering in Agriculture*. 22(5):689-700.
260. Xinhua, J., M.D. Dukes, J.M. Jacobs and **S. Irmak**. 2006. Weighing lysimeters for evapotranspiration research in a humid environment. *Transactions of the ASABE*. 49(2):401-412.
261. Payero, J.O., S.R. Melvin, **S. Irmak** and D.D. Tarkalson. 2006. Yield response of corn to deficit irrigation in a semi-arid environment. *Agricultural Water Management*. 84:101-112.
262. Payero, J.O., S.R. Melvin and **S. Irmak**. 2005. Response of soybean to deficit irrigation in the semi-arid environment of West-Central Nebraska. *Transactions of the ASAE*. 48(6):2189-2203.
263. **Irmak, S.**, and A. Irmak. 2005. Performance of frequency-domain, capacitance, and psuedo-transit time-based soil water content probes in four coarse-textured soils. *Applied Engineering in Agriculture*. 21(6):999-1008.
264. **Irmak, S**. 2005. Closure on predicting daily net radiation using minimum climatological data. *J. Irrigation and Drainage Engineering*. 4:389-390.
265. **Irmak, S.**, T.A. Howell, R.G. Allen, J.O. Payero and D.L. Martin. 2005. Standardized ASCE-Penman-Monteith: Impact of sum-of-hourly vs. 24-hr-time step computations at reference weather station sites. *Transactions of the ASAE*. 48(3):1063-1077.
266. **Irmak, S.**, D.Z. Haman, A. Irmak, J.W. Jones, B. Tonkinson, D. Burch, T.H. Yeager and C. Larsen. 2005. Root-zone temperatures of *V. odoratissimum* grown in the MPBS and conventional systems: Measurement and analyses of temperature profiles and predicting root-zone temperatures. *J. American Soc. Horticultural Sci*. 40(3):808-818.
267. **Irmak, S.** 2005. Crop evapotranspiration and crop coefficients of *Viburnum Odoratissimum* (Ker-gawl). *Applied Engineering in Agriculture*. 21(3):371-381.
268. **Irmak, S.**, M.D. Dukes and J.M. Jacobs. 2005. Using modified Bellani plate evaporation gauges to estimate short canopy reference evapotranspiration. *J. Irrigation and Drainage Eng*. 131(2):164-175.
269. **Irmak, S.**, D.Z. Haman, A. Irmak, J.W. Jones, K.L. Campbell and T.L. Crisman. 2004. Measurement and analyses of growth and stress parameters of *Viburnum Odoratissimum* (Ker-gawl.) grown in a MPBS. *J. American Soc. Horticultural Sci*. 39(6):1445-1455.
270. Satti, S.R., J.M. Jacobs and **S. Irmak.** 2004. Agricultural water management in a humid region: sensitivity to climate, soil, and crop parameters. *Agricultural Water Management*. 70:51-65.
271. **Irmak, S.**, R.G. Allen and E.B. Whitty. 2003. Daily grass and alfalfa-reference evapotranspiration estimates and alfalfa-to-grass evapotranspiration ratios in Florida. *J. Irrigation and Drainage Engineering*. 129(5):360-370.
272. **Irmak, S.**, A. Irmak, J.W. Jones, T.A. Howell, J.M. Jacobs, R.G. Allen and G. Hoogenboom. 2003. Predicting daily net radiation using minimum climatological data. *J. Irrigation and Drainage Engineering*. 129(4):256-269.
273. **Irmak, S.**, A. Irmak, R. Allen and J. Jones. 2003. Solar and net radiation-based equations to estimate reference evapotranspiration in humid climates. *J. Irrigation and Drainage Eng*. 129(5):336-347.

274. **Irmak, S.**, D. Z. Haman, A. Irmak, J. W. Jones, K. L. Campbell and T. H. Yeager. 2003. New irrigation-plant production system for water conservation in ornamental nurseries: Quantification and evaluation of irrigation, runoff, plant biomass, and irrigation efficiencies. *Applied Eng. in Agriculture*. 19(6):651-655.
275. **Irmak, S.** and D.Z. Haman. 2003. Evaluation of five methods for estimating Class A pan evaporation in a humid climate. *HortTechnology*. 13(3):500-508.
276. **Irmak, S.**, A. Irmak and J.W. Jones. 2003. Predicting multiple layers of bare soil temperatures: A model evaluation and modifications for sandy soils. *Soil and Crop Sci. Soc. of FL*. 62:20-29.
277. **Irmak, S.**, D.Z. Haman and J.W. Jones. 2002. Evaluation of Class A Pan coefficients for estimating reference evapotranspiration in a humid location. *J. Irrigation and Drainage Eng*. 128(3):153-159.
278. Irmak, A., W.D. Batchelor, J.W. Jones, **S. Irmak**, J.O. Paz, H. Beck and M. Engel. 2002. Relationship between plant available soil water and yield for explaining soybean yield variability. *Applied Engineering in Agriculture*. 18(4):471-482.
279. **Irmak, S.** and D.Z. Haman. 2001. Performance of the Watermark granular matrix sensor in sandy soils. *Applied Engineering in Agriculture*. 17(6):787-795.
280. **Irmak, S.** D.Z. Haman and A. Irmak. 2001. Dew point hygrometers for irrigation scheduling in fine-textured soils. *Applied Engineering in Agriculture*. 17(1):17-25.
281. **Irmak, S.**, D.Z. Haman and T.H. Yeager. 2001. Seasonal irrigation water use efficiency of MPB System. *J. Environmental Horticulture*. 19(1):4-10.
282. **Irmak, S.**, D.Z. Haman and R. Bastug. 2000. Determination of crop water stress index for irrigation timing and yield estimation of corn. *Agronomy Journal*. 92(6):1221-1227.
283. Irmak, A., J.W. Jones, C.D. Stanley, J.W. Hansen, **S. Irmak** and K.J. Boote. 1999. Some effects of an antitranspirant (Vapor Gard™) on tomato growth and yield. *Soil and Crop Sci. Soc. FL* 58:118-122.
284. Haman, D.Z., **S. Irmak**, T.H. Yeager, R.C. Beeson, Jr., and G.W. Knox. 1998. MPB and funneled containers in container nursery production. *Proc. Florida State Horticultural Society*. 111:39-41.
285. Bastug, R. and **S. Irmak**. 1996. Using soil matric potential and crop water stress index for irrigation management. *Mediterranean University-Journal of Agriculture*. 9:241-255.
286. Bastug, R. and **S. Irmak**. 1995. Measuring leaf water potential using thermocouple hygrometers and psychrometers. *Mediterranean University-Journal of Agriculture*. 8:383-394.
287. Hakgoren, F., A. Irmak and **S. Irmak**. 1995. Cooling of greenhouses. *Mediterranean University-Journal of Agriculture*. 8:238-252.

2.1.2. REFEREED JOURNAL ARTICLES ACCEPTED (OR IN PRESS) FOR PUBLICATION

1. Didari, S., F. Razzaghi and **S. Irmak**. 2026. Regional calibration of the Hargreaves–Samani equation for reference evapotranspiration using climatic and physiographic variables in an arid and semi-arid region. *Nature Scientific Reports* (in press).

2.1.3. REFEREED JOURNAL ARTICLES UNDER REVIEW

1. Amiri, E., **S. Irmak**, et al. 2025. Evaluation of DSSAT CSM-CROPGRO-Tomato model for simulating fruit yield, biomass, evapotranspiration, leaf area index and water productivity of different tomato cultivars under different irrigation strategies. *Agricultural Water Management* (under review).
2. Coruh, U., T. Yüksek, S. Aktaş, U. Albayrak, W. Wang, S. Ghatrehsamani and **S. Irmak**. 2026. Mapping the integration gap between earthworm behavioral ecotoxicology, soil-borne pathogen detection, and spatiotemporal artificial intelligence: A PRISMA-ScR scoping analysis. (under review).
3. Coruh, U., T. Yüksek, S. Aktaş, U. Albayrak, W. Wang, S. Ghatrehsamani and **S. Irmak**. 2026. Integration of pathogen-specific sensing, artificial intelligence, and closed-loop control for commercial mushroom disease detection: A scoping analysis of evidence gaps and integration pathways. (under review).
4. **Irmak, S**. 2026. Irrigated seed maize yield, evapotranspiration, production functions, single and basal crop coefficients and water productivity. *J. Natural Resources and Agricultural Ecosystems* (under review).
5. Nangia, V., D.B. Leenhardt, T. Fuqiang, K. Noda, V. Sharma, V. Sharda, M. Kukal, **S. Irmak**, R. Nael, I. Szamosvari and G. Castelli. 2026. Irrigation, drainage and the agroecological transition: Bridging the knowledge divide in a changing climate. *Irrigation and Drainage* (under review).
6. Panda, S.S., D.M. Amatya, A.D. Atnurkar, M. Aguilas, A. Nanda, A.C. Oishi, G. Sun, P. Knox, T. O'Halloran, Y. Yang, **S. Irmak**, G. Star, S. Mukherjee, N. Liu and M.S. Kukal. 2026. Forest health remote management decision support system development with multi-sensor data fusion: A case studies-based research. *Journal of Natural Resources and Agricultural Ecosystems* (under review).

7. Zamzami, A., F.D. Gioia, **S. Irmak**, L. He and S. Ghatrehsamani. 2026. Imaging-based phenotyping in leafy greens: A scoping review of progress, cross-domain insights and emerging challenges *Smart Agricultural Technology* (under review).
8. Zamzami, A., F. Di Gioia, **S. Irmak**, L. He and S. Ghatrehsamani. 2026. Biological ambiguity in imaging-based plant-state inference: Evidence from longitudinal greenhouse lettuce phenotyping across water-stress trajectories and nutrient solution EC regimes. *Computers and Electronics in Agriculture* (in review).

2.1.4. BOOKS

1. **Irmak, S.** 2025. Evapotranspiration in Agro-Ecosystems and Forestry: Spatio-temporal Applications. S. Irmak (Ed.). Elsevier. Publ.: Academic Press, United Kingdom. 246 pp. ISBN: 978-0-443-21649-7 (invited).

2.1.5. BOOK CHAPTERS

1. Sertyesilisik, P., A.V. Veettil, **S. Irmak** and Md. S. Islam. 2026. Urban drought under climate and land use change: Drivers, forecasting and management. pp. 23-39. https://doi.org/10.1016/B978-0-443-44625-2.00013-8. *In: Global Drought and Sustainability*. A. Fares (Ed.). 1st Edition. 354 p. Elsevier. ISBN: 9780443446252 (invited).
3. **Irmak, S**., and M.S. Kukal. 2022. Evapotranspiration, Transpiration, and Evaporation Processes and Modeling in the Soil–Residue–Canopy System. *In*: *Models, Processes and Their Interactions in Cropping Systems: Challenges for the 21st Century*, 1st Edition. L.R. Ahuja, K.C. Kersebaum and O. Wendroth (eds.). Am. Soc. Agronomy/Crop Sci. Soc. Am./Soil Sci. Soc. Am. pp. 53-114. ISBN: 978-0-891-18385-3 (invited). 416 p.
4. Mutiibwa, D., A. Kilic and **S. Irmak**. 2018. Identifying changes in trends of summer air temperatures of the USA High Plains. Book Chapter. *In*: *Water Challenges of Urbanizing World*. M. Glavan (Ed.). Chapter 9. pp. 145-161. *InTech Publications*. dx.doi.org/10.5772/intechopen.71788. London, UK (invited).
5. Payero, J., and **S. Irmak**. 2011. Actual evapotranspiration, crop coefficient, and energy-balance components of surface-irrigated corn. *In*: *Evapotranspiration: From Measurements to Agricultural and Environmental Applications*. Chapter 4, INTECH Publisher, G. Gerosa (Ed.). ISBN 978-953-307-512-9, November 11, 2011. pp. 59-78 (invited).
6. **Irmak, S**. Evapotranspiration. 2008. *In: Encyclopedia of Ecology*. Manuscript No. 270. Sven Erik Jorgensen & Brian D. Fath, (eds). *Encyclopedia of Ecology*, 1st Edition, Elsevier B.V., Oxford. Elsevier. pp 1432-1439. Journal Series No. 1037 (invited).

2.1.6. PROFESSIONAL SOCIETY CONFERENCE TECHNICAL and SCIENTIFIC PAPERS and ABSTRACTS

1. Shin, J-H, W-H. Nam, V. Sharma and **S. Irmak**. 2024. The impact of return flow on the water cycle and water allocation using EPA-SWMM. AGU Annual Conference. December 9-13, Washington, DC. (Abstract).
2. Shin, H., W.H. Nam, **S. Irmak**, V. Sharma, and X. Zhang. 2023. Modeling irrigation canal network flow for return flow on agricultural watershed using EPA-SWMM. ASABE Conference Paper No. 2300722. doi.org/10.13031/aim.202300722. 2023 ASABE Annual Int. Conference. Omaha, NE. July 9-12, 2023.
3. Kashyap, S. P., D. Heeren, W. Woldt, C. Neale, **S. Irmak**, Y. Shi, M. Maguire, S. Bhatti and J. Singh. 2021. High-frequency unmanned aircraft flights for crop canopy imaging during moisture-stress and subsequent irrigation. ASABE Annual Int. Conference (Abstract). July 11-14.
4. Mausbach, J., **S. Irmak**, M. Kukal, D. Sarangi, J. Lindquist and A. Jhala. 2020. Evapotranspiration of Palmer amaranth (*Amaranthus palmeri*) in corn, soybean, and fallow under subsurface drip and center-pivot irrigation systems. WSSA Annual Conference (Abstract). March 2-5, 2020. Hawaii.
5. Brar, D., W. Kranz, D. Martin and **S. Irmak**. 2019. Energy conservation using variable frequency drives for center pivot irrigation systems. Proc. 31st Ann. Central Plains Irrig. Conf., Kearney, NE, Feb. 26-27, 2019.
6. Barnes, E., N. Lawrence, S. Knezevic, O. Rodriguez, **S. Irmak** and A. Jhala. 2019. Response of white and yellow popcorn hybrids to pre- and post-emergence herbicides. 2019 WSSA Annual Meeting. February 11-14, 2019. New Orleans, LA.
7. Barnes, E., **S. Irmak**, S. Knezevic, O. Rodriguez, N. Lawrence and A. Jhala. Response of white and yellow popcorn hybrids to Glyphosate, 2,4-D/Glyphosate, or Dicamba (oral). 2018. NCWSS Annual Meeting. December 3-6, 2018. Milwaukee, WI.

8. Barnes, E., S. Knezevic, N. Lawrence, **S. Irmak**, O. Rodriguez and A. Jhala. 2018. Post-emergence control of Velvetleaf in popcorn (poster). December 3 -6, 2018. Milwaukee, WI.
9. G. Bai, Y. Ge, B. Leavitt, J.A. Gamon, Y. Qi, T. Awada, G. Graef, **S. Irmak**, J.C. Schnable, D. Scoby and V. Stoerger. 2018. Capturing diurnal variation of phenotypic traits for breeding plots using UNL Field Phenotyping Facility (Abstract). December 10-14, 2018. AGU Fall Meeting. Washington, DC, USA.
10. Naser, M., R. Ferguson, B. Krienke, **S. Irmak**, D. Rudnick, T. Shaver, C. Shapiro and K. Glewen. 2018. Can the integration of a crop sensor and crop model be used to determine timing and rate of nitrogen fertigation? *Proc. Great Plains Soil Fertility Conference*, March 6-7, Denver, CO.
11. Kranz, B., D. Brar, T. Lo, **S. Irmak** and D. Martin. 2017. Energy conservation using variable-frequency drives for center pivot irrigation. *Proc. Central Plains Irrig. Conf.* pp. 155-166. Feb. 21-22, 2017. Burlington, CO.
12. Martin, D., W. Kranz, **S. Irmak**, D. Rudnick, C. Burr and S. Melvin. 2017. Pumping plant performance. *Proc. Central Plains Irrigation Conference*. pp. 167-187. February 21-22, 2017. Burlington, CO.
13. Rudnick, D., **S. Irmak**, C. Ray, J. Schneekloth, M. Schipanski, I. Kisekka, A. Schlegel, J. Aguilar, D. Rogers, D. Mitchell, C. West, T. Marek, Q. Xue, W. Xu and D. Porter. 2017. Deficit irrigation management of corn in the High Plains: A Review. *Proc. Central Plains Irrig. Conf.* p. 66-84. Feb. 21-22, 2017. Burlington, CO.
14. Sun, G., S. Sun, J. Xiao, P. Caldwell, D. Amatya, **S. Irmak**, P. Gowda, S. Panda, S. McNulty and Y. Zhang. 2016. Estimating watershed evapotranspiration across the United States using multiple methods. *In* Stringer, Christina E.; Krauss, Ken W.; Latimer, J.S. (eds). Headwaters to estuaries: Advances in Watershed Science and Management. *Proc. 5th Interagency Conf. on Research in the Watersheds*. March 2-5, 2015, North Charleston, SC. e-Gen. Tech. Rep. SRS-211. Asheville, NC. p. 302.
15. Sarangi, D., S.Z. Knezevic, J.L. Lindquist, **S. Irmak** and A.J. Jhala. 2015. Pollen-mediated gene flow from Glyphosate-resistant to susceptible Common Waterhemp under field conditions. (Abstract). *North Central Weed Science Society (NCWSS) Annual Meeting*. December 7-10, 2015. Indianapolis, IN.
16. Sarangi, D., L.D. Sandell, S.Z. Knezevic, J.S. Aulakh, J.L. Lindquist, **S. Irmak** and A.J. Jhala. 2014. Glyphosate-resistant Common Waterhemp in Nebraska: confirmation and control in soybean. *Proc. 69th Annual Meeting of the North Central Weed Sci. Soc*. Minneapolis, MN. Dec 1-4, 2014.
17. Aegerter, C., J. Wang, C. Ge, A. Kessner, A. Sharma, L. Judd, B. Wardlow, J. You, M. Shulski, **S. Irmak** and A. Kilic. 2014. Modeling and satellite remote sensing of meteorological effects of irrigation during the 2012 Central Plains drought. 2014. *AGU Annual Conf.* December 15-19, *San Francisco, USA* (abstract).
18. Eisenhauer, D., J. Deck, A. Volkmer, **S. Irmak**, J. Gates, D. Martin and J. Gibson. 2014. Percolation of water beneath crop root zones of center-pivot irrigated tilled and no-till fields in south central Nebraska. ASABE Paper No. 141914240.
19. Volkmer, A., J. Deck, D. Eisenhauer, **S. Irmak**, J. Gates, D. Martin and L.O. Odhiambo. 2014. Hydraulic conductivity land use coefficients for no-till and tilled row crops. ASABE Paper No. 141913882.
20. Volkmer, A., D. Eisenhauer, J. Deck, **S. Irmak**, J. Gates, D. Martin and L. Odhiambo. 2014. Curve numbers of hydrologic soil Groups B and C for long-term no-till agriculture. ASABE Paper No. 141913816.
21. Amatya, D., G. Sun, P. Gowda, J. de Jong, J. Nettles, S. Basu and **S. Irmak**. 2014. Evapotranspiration: Challenges in measurement and modeling from leaf to the landscape scale and beyond. *Proc. ASABE International Evapotranspiration Symposium*, Raleigh, NC, April 07-10, 2014.
22. Ferguson, R., M. Schmer, T. Shaver, B. Wienhold, S. van Donk, **S. Irmak**, D. Rudnick, N. Ward, V. Jin, D. Francis, A. Bereuter and L. Hendrickson. 2013. Variable rate irrigation and nitrogen fertilization of maize across landscape positions. *Proc. Int. Soc. of Precision Agric.* (J. Stafford, Ed.) pp. 729-736.
23. McKinney, M.B., D.E. Eisenhauer**, S. Irmak**, J. E. Gilley, W.L. Kranz and D.L. Martin. 2012. Dynamics of depression storage during sprinkler irrigation and precipitation events. *Proc. of the 2012 Annual ASABE International Conference*. Dallas, TX, July 29-August 3, 2012.
24. Safa, B., T. Arkebauer, A. Suyker and **S. Irmak**. 2012. Modeling carbon dioxide flux over a cropland using artificial neural networks. *Proc. 30th Conference on Agricultural and Forest Meteorology; First Conference on Atmospheric Bio-Geosciences*. Am. Meteorological Society. May 30, 2012. Boston, MA.
25. Ferguson, F., T. Shaver, N. Ward, **S. Irmak**, S. Van Donk, D. Rudnick, B. Wienhold, M. Schmer, V. Jin, D. Francis, V. Adamchuk and L. Hendrickson. 2012. Landscape influences on soil nitrogen supply, and water holding capacity for irrigated corn. *Proc. Int. Soc. Precision Ag*. July 15-18, Indianapolis, IN, USA.
26. **Irmak, S.** 2012. Effective water management strategies to improve crop water productivity. *Proc. 6th World Water Forum*. March 12-16, 2012. Marseille, France.
27. Zoubek, G., **S. Irmak,** J. Rees and B. VanDeWalle. 2012. Nebraska Agricultural Water Management Network. *Proc. 24th Annual CPIC,* Colby, KS. February 21-22, 2012. Colby, Kansas.
28. Deck, J., D. Eisenhauer and **S. Irmak**. 2010. Infiltration and run-off under center pivots with no-till planting. Paper No. 9215. *Proc. 5th Decennial Irrig. Conf. ASABE and Irrig. Assoc.* December 5-8, Phoenix, AZ.

29. Eisenhauer, D.E., J.H. Deck, **S. Irmak**, P. Jasa and D.L. Martin. 2010. Green and Ampt infiltration parameters under no-till center pivots. Paper No. 9245. *Proc. 5th Decennial Irrigation Conference. ASABE and Irrigation Association*. December 5-8, Phoenix, AZ.
30. Eisenhauer, D., J. Deck and **S. Irmak**. 2010. Deep percolation under center pivots with no-till. Paper No. 9257. *Proc. 5th Decennial Irrigation Conf. ASABE and Irrig. Assoc.* December 5-8, Phoenix, AZ.
31. Irmak, A., I. Ratcliffe, P. Ranade, **S. Irmak**, J. Kjaersgaard, B. Kamble, R. Choragudi, K. G. Hubbard, R. Singh, D. Mutiibwa and N. Healey. 2010. Seasonal Evapotranspiration Mapping Using Landsat Visible and Thermal Data with an Energy Balance Approach in Central Nebraska. *Proc. Remote Sensing and Hydrology*. Jackson Hole, Wyoming, USA, September 2010.
32. Irmak, A., I. Ratcliffe, **S. Irmak**, P. Ranade, J. Kjaersgaard, B. Kamble, K. Hubbard and D. Mutiibwa. 2010. Growing season evapotranspiration with satellite remote sensing procedure. Am. Geophysical Union (AGU) Annual Int. Meeting. December 14-18. San Francisco, California, USA. (Abstract).
33. Akasheh, O.Z., A. Irmak, **S. Irmak**, I. Ratcliffe, R. Singh, P. Ranade and P.H. Gowda. 2010. Comparison of evapotranspiration from two remote sensing-based surface energy models in south central Nebraska. *Proc. Remote Sensing and Hydrology*. Jackson Hole, WY, USA, Sept. 2010; IAHS Publ. 3XX, 2011.
34. Irmak, A., I. Ratcliffe, P. Ranade, **S. Irmak**, J. Kjaersgaard, B. Kamble, R. Choragudi, K. G. Hubbard, R. Singh, D. Mutiibwa and N. Healey. 2010. Seasonal Evapotranspiration Mapping Using Landsat Visible and Thermal Data with an Energy Balance Approach in Central Nebraska. *Proc. Remote Sensing and Hydrology*. Jackson Hole, Wyoming, USA, September 2010; IAHS Publ. 3XX, 2011.
35. Ferguson, R., G. Slater, D. Krull and **S. Irmak**. 2009. Nitrate leaching potential from slow and controlled release nitrogen fertilizer application to irrigated corn. *Proc. North Central Extension-Industry Soil Fertility Conference*. November 12-13, Des Moines, IA.
36. Torrion, J., T. Setiyono, J. Specht, K. Cassman, R. Ferguson, D. Walters and **S. Irmak**. 2009. Predicting soybean root growth by water depletion in the soil profile. *2009 ASA AIM*, Nov. 1-5, 2009, Pittsburg, PA.
37. Akasheh, O., A. Kilic, D. Martin, **S. Irmak**, T. Awada, X. Zhou, J. Huddle. 2009. Mapping the riparian vegetation using multiple hyperspectral and thermal infrared airborne imagery over the Republican River, Nebraska. *AGU Fall Meeting*. 1-0815. December 14-18. San Francisco, CA.
38. Hay, C.H., and **S. Irmak**. 2009. Bayesian model averaging for accounting for model selection uncertainty with an application for predicting net radiation. ASABE paper No. 09-. *2009 ASABE Annual International Conference*. Grand Sierra Resort and Casino, Reno, NV, June 21-24, 2009.
39. Hay, C., and **S. Irmak**. 2009. Recursive and explicit combination methods for calculating reference evapotranspiration. *Proc. Environmental and Water Res. Congress*. May 12-16, 2009. Kansas City, MO.
40. Shock, C., **S. Irmak**, B. Sanden, L. Lima and K. Taylor. 2008. Grower adoption of Granular Matrix Sensors. American Society of Agronomy International Meeting. Soil and Water Management and Conservation Division. October 5-9, 2008. Houston, TX. Technical abstract (Abstract ID# 45774).
41. Van Donk, S., D.L. Martin, **S. Irmak**, S. Melvin and J. Petersen. 2008. Effect of crop residue on soil water content and yield of sprinkler-irrigated corn. ASABE Paper No. 08-4724. 2008 *ASABE Annual International Conference*. Rhode Island, Providence, June 29-July 2, 2008.
42. Hay, C.H., and **S. Irmak**. 2008. Surface energy balance and surface coefficients of a corn field during non-growing periods. *Proc. 2008 World EWRI Congress*. May 12-16, 2008. Honolulu, Hawaii.
43. **Irmak, S**., D. Mutiibwa, A. Irmak, T. Arkebauer, A. Weiss, D. Martin and D. Eisenhauer. 2007. Scaling up leaf stomatal resistance to canopy resistance. ASABE Paper No. 07-2297. *ASABE Annual International Conference*. Minneapolis, MN, June 17-20, 2007.
44. Lagos, L.O., D.L. Martin, **S. Irmak** and X. Zhou. 2007. Evaluating evapotranspiration with SWAT, a distributed watershed model, and the FAO56 Penman-Monteith method. ASABE Paper No. 07-2294. 2007 *ASABE Annual International Conference*. Minneapolis, MN, 17-20 June 2007.
45. Yang, H., K. Cassman, **S. Irmak** and D. Walters. 2007. Corn water use efficiency with deficit irrigation in high-yielding settings. *Proc. 2007 ASA Ann. Int. Meeting*. November 4-8, 2007. New Orleans, LO.
46. **Irmak, S**., G.L. Zoubek, J.M. Rees and B.S. VanDeWalle. 2007. Nebraska Agricultural Water Management Demonstration Network. *Proc. of the NACAA AM/PIC Conference*. Grand Rapids, MI.
47. Singh, R., A. Irmak, **S. Irmak** and D. Martin. 2007. The satellite-remote sensing-based estimation of land surface evapotranspiration in Great Plains. *Proc. ASCE-EWRI Word Environmental Water Resources Congress*. May 15-19, 2007. Tampa, FL.
48. Ferguson, R., and **S. Irmak**. 2006. In-season nitrogen management for subsurface drip-irrigated corn in Nebraska. *Proc. 36th North Central Extension-Industry Soil Fertility Conf*. Nov. 7-8, Des Moines, IA.
49. Ferguson, R.B., and **S. Irmak**. 2006. In-season nitrogen management of sub-surface drip irrigated corn. *In* ASA-CSSA-SSSA 2006 International Meetings. Indianapolis, IN.

50. Payero, J.O., D.D. Tarkalson and **S. Irmak**. 2006. Yield response of corn to timing of a limited seasonal irrigation depth (150 mm) with subsurface drip irrigation. *Proc. of the ASCE-EWRI World Environmental and Water Resources Congress*. May 21-25, 2006. Qwest Center, Omaha, NE.
51. Payero, J.O., D.D. Tarkalson and **S. Irmak**. 2006. Corn yield response to different irrigation depths with subsurface drip irrigation. *Proc. ASCE-EWRI World Environmental and Water Resources Congress*. May 21-25, 2006. Qwest Center, Omaha, NE.
52. Haman D.Z., C. Cornejo, T.H. Yeager and **S. Irmak**. 2005. Use of MPBS for container production of perennial plants. *ASAE Annual International Conference*. Paper No: 054058. American Society of Agricultural Engineers, 2950 Niles Road, Saint Joseph, MI 49085-9659 USA.
53. Dukes, M., **S. Irmak** and J. Jacobs. 2004. An automatic system for recording evaporation from ET_{gauges}. ASAE AIM, Ottawa, Ontario, Canada. August 1-4, 2004. ASAE Paper No. 042191. St. Joseph, MI.
54. **Irmak, S.,** and D.Z. Haman. 2001. Evaluation of the FAO56-Penman-Monteith equation for humid climates. ASAE Paper No. 01-2096. ASAE, St. Joseph, MI.
55. **Irmak, S.,** and D.Z. Haman. 2000. Performance of the Watermark Granular Matrix Sensor in sandy soils. ASAE Paper No. 00-2037. Amer. Soc. Agric. Engr., St. Joseph, MI.
56. **Irmak, S.**, D.Z. Haman, A.G. Smajstrla and R. Bastug. 1999. Measurement of soil water potential using soil hygrometer for irrigation timing of corn. ASAE Paper No. 99-2236. St. Joseph, MI.
57. **Irmak, S.**, D.Z. Haman and A.G. Smajstrla. 1999. Continuous water content measurements with time-domain reflectometry for sandy soils. *Proc. Soil and Crop Science Soc. Florida* 58:77-81.
58. Haman, D.Z., T.H. Yeager and **S. Irmak**. 1999. MPB System for increased efficiency of irrigation in ornamental plant production. *The Irrigation Association Conference*. p. 223-228. Orlando, FL
59. Irmak, A., J.W. Jones, J.W. Hansen, **S. Irmak** and C.D. Stanley. 1998. The effects of antitranspirant on tomato growth and yield. *Annual International Agronomy Meetings*, Baltimore, 18-22 Oct. (abstract).
60. Haman, D.Z., T.H. Yeager, **S. Irmak** and C. Larsen. 1998. Container plant production in MPBS. 43:113-116. *Southern Nursery Association Research Conference. Atlanta,* GA.

2.1.7. REFEREED EXTENSION/EDUCATION PUBLICATIONS

1. Nogueira, L., C. Walters, E. O'Donnell, E.W.F. Peterson and S. Irmak. 2023. Deficit Irrigation Management for Irrigated Corn in Nebraska: Economically Viable? *Cornhusker Economics*. April 12, 2023. https://agecon.unl.edu/deficit-irrigation-management-irrigated-corn-nebraska-economically-viable.
1. Kukal, M.S., and **S. Irmak**. 2023. Resiliency against agricultural droughts and excess water. Penn State Extension. https://extension.psu.edu/resiliency-against-agricultural-droughts-and-excess-water. January 23, 2023.
2. Kukal, M.S., K.A. Imhoff and **S. Irmak**. 2023. Crop loss and climate-risk in Pennsylvania: What does insurance loss data tell us about climate risks to agricultural production? Penn State Extension. https://extension.psu.edu/crop-loss-and-climate-risk-in-pennsylvania. March 9, 2023.
3. **Irmak, S**. 2019. Perspectives and considerations for soil moisture sensing technologies and soil water content- and soil matric potential-based irrigation trigger values. Extension NebGuide 3045. 8 pp. https://extensionpubs.unl.edu/publication/ec3045/2019/pdf/view/ec3045-2019.pdf.
4. **Irmak, S**. 2019. Soil-water potential and soil water content concepts and measurement methods. Extension Circular EC3046. 18 pp. https://extensionpubs.unl.edu/publication/ec3046/2019/pdf/view/ec3046-2019.pdf.
5. Barnes, S. Knezevic, N. Lawrence, **S. Irmak**, O. Rodriguez and A. Jhala. September 9, 2019. Pre-emergence herbicide delays the critical time of weed removal in Nebraska popcorn. cropwatch.unl.edu/2019/pre-emergence-herbicide-delays-critical-time-weed-removal-nebraska-popcorn.
6. Specht, J., T. Hoegemeyer, G. Graef, L. Ruff, J. Torrion, P. Grassini, J. Edreira, F.A. Tenorio, B. Farmaha, J. Miller, T. Shaver, C. Wortman, C. Shapiro, B. Krienke, S. Knezevic, A. Jhala, G. Krueger, R. Werle, C. Procter, H. Blanco, R. Elmore, **S. Irmak**, R. Wright, T. Hunt, L. Giesler, T. Ziems, M. Shulski, A. Dutcher, S. Cooper, K. Glewen, N. Mueller, J. Rees and L. Thompson. 2019. Nebraska Soybean and Corn Pocket Field Guide. Extension Bulletin. pp. 378. https://nebraskasoybeans.org/wp-content/uploads/2019/06/58960-25_NE_SoybeanGuide_NoCrops-1.pdf.
7. Krienke, B., R. Ferguson, **S. Irmak**, D. Rudnick, C. Shapiro, T. Shaver, K. Gleven, B. Maharjan, C. Wortmann and M. Naser. 2019. Profit and nitrogen use efficiency gain using sensor-guided fertigation. *Proc. of the Crop Production Clinics*. https://cropwatch.unl.edu/cpc-proceedings-2019.
8. **Irmak, S.** 2019. Change in climate variables and their impacts on agricultural productivity. *Miller Journal*. 109(1):52-55. http://www.millermagazine.com/issue_109/52/.

9. **Irmak, S.** 2018. Subirrigation in agricultural fields. Extension Circular EC3038. 5 pp. https://extensionpubs.unl.edu/publication/ec3038/subirrigation-in-agricultural-fields.
10. **Irmak, S.** 2018. Long-term (1893-2012) changes in monthly, growing season and annual precipitation trends and magnitudes in central Nebraska. Extension Circular EC717. 12 pp. https://extensionpubs.unl.edu/publication/ec717/long-term-1893-2012-changes-in-monthly-growing-season-and-annual-precipitation-trends-and-magnitudes-in-central-nebraska.
11. Kukal, M., and **S. Irmak**. 2018. Patterns and magnitudes of spatial and temporal changes in precipitation and aridity across 800 Great Plains Counties. Extension Circular EC3025. 17 pp. https://extensionpubs.unl.edu/publication/ec3025/patterns-and-magnitudes-of-spatial-and-temporal-changes-in-precipitation-and-aridity-across-800-great-plains-counties-ec3025.
12. Lo, T.H., D. Rudnick, Y. Ge, D.M Heeren, **S. Irmak**, J.B. Barker, X. Qiao and T. Shaver. 2018. Ground-based thermal sensing for irrigation management. Extension NebGuide G2301. 7 pp. https://extensionpubs.unl.edu/publication/g2301/ground-based-thermal-sensing-of-field-crops-and-its-relevance-to-irrigation-management-g2301.
13. Martin, D., W. Kranz, T. Smith, **S. Irmak**, C. Burr and R. Yoder. 2018. Center pivot irrigation handbook. Extension Circular EC3017. 134 pp. http://extensionpublications.unl.edu/assets/pdf/ec3017.pdf.
14. Krienke, B., A. Dutcher, R. Ferguson, **S. Irmak**, B. Maharjan, C. Wortmann and H. Yang. 2018. Consequences of fall-applied nitrogen. Nebraska Extension CropWatch. p. 1-4. Issue: November 9, 2018. https://cropwatch.unl.edu/2018/consequences-fall-applied-n.
15. **Irmak, S.** 2017. Evapotranspiration basics and estimating crop evapotranspiration from reference evapotranspiration and crop-specific coefficients. Extension NebGuide G1994. 9 pp. https://extensionpubs.unl.edu/publication/g1994/estimating-crop-evapotranspiration-from-reference-evapotranspiration-and-crop-coefficients.
16. **Irmak, S.** 2017. Simplified forms of deep percolation below the crop root zone estimation method for silt-loam soils. Extension Circular EC3015. 7 pp. https://extensionpubs.unl.edu/publication/ec3015/simplified-forms-of-deep-percolation-estimation-method-below-the-crop-root-zone-for-silt-loam-soils.
17. **Irmak, S.** 2017. Simplified forms of surface run-off estimation method for silt-loam soils. Extension Circular EC3016. 5 pp. https://extensionpubs.unl.edu/publication/ec3016/simplified-forms-of-surface-runoff-estimation-method-for-silt-loam-soils.
18. Kukal, M., and **S. Irmak**. 2017. Spatial and temporal changes in grass-reference evapotranspiration across 800 US Great Plains counties from 1968 to 2013. Extension Circular EC3022. 11 pp. https://extensionpubs.unl.edu/publication/ec3022/spatial-and-temporal-changes-in-grass-reference-evapotranspiration-ec3022.
19. Van DeWalle, B., A. Nygren, C. Burr, G. Zoubek and **S. Irmak**. 2017. Agricultural water management guide. http://cropwatch.unl.edu/Agricultural_Water_Management_Guide/index.html.
20. Rees, J., J. Specht, R. Elmore, L. Giesler, T. Hunt, **S. Irmak**, A. Jhala, R. Klein, N. Mueller, C. Shapiro, A. Vyhnalek and R. Wright. 2017. Planting soybean after soybean (Part 1): Planting considerations. Nebraska Extension, CropWatch. April 13, 2017. http://cropwatch.unl.edu/2017/planting-soybean-after-soybean-part-1-planting-considerations.
21. Rees, J., R. Elmore, L. Giesler, T. Hunt, **S. Irmak**, A. Jhala, R. Klein, N. Mueller, C. Shapiro, J. Specht, A. Vyhnalek and R. Wright. 2017. Planting soybean after soybean (Part 2): In-season management considerations. CropWatch. April 13, 2017. http://cropwatch.unl.edu/2017/planting-soybean-after-soybean-part-2-season-management-considerations.
22. **Irmak, S**., V. Sharma and K. Djaman. 2016. Winter wheat (*Triticum aestivum* L.) evapotranspiration (crop water use) and crop coefficients. Extension Circular EC3005. 7 pp. https://extensionpubs.unl.edu/publication/ec3005/winter-wheat-triticum-aestivum-l-evapotranspiration-crop-water-use-and-crop-coefficients-ec3005.
23. Kukal, M., and S**. Irmak**. 2016. Observed space and time changes in air temperatures and daily temperature range for the counties in the U.S. Great Plains from 1968 to 2013. Extension Circular EC3009. 12 pp. https://extensionpubs.unl.edu/publication/ec3009/observed-space-and-time-changes-in-air-temperatures-and-daily-temperature-range-for-the-counties-in-the-u-s-great-plains.
24. Rudnick, D., **S. Irmak**, A. Haghverdi, C.A. Burr, T.M. Shaver and T.J. Door. 2016. Soil-water sensors for irrigation management. Extension Circular EC3002. 9 pp. https://extensionpubs.unl.edu/publication/ec3002/2016/pdf/view/ec3002-2016.pdf.
25. **Irmak, S.**, J. Payero, B. VanDeWalle, J. Rees, G. Zoubek, D. Martin, W. Kranz, D. Eisenhauer and D. Leininger. 2016. Principles and operational characteristics of Watermark granular matrix sensor to

measure soil water status and its practical applications for irrigation management in various soil textures. Extension Circular EC783. 14 pp. https://extensionpubs.unl.edu/publication/ec783/2014/pdf/view/ec783-2014.pdf.

26. **Irmak, S**. 2016. Impacts of extreme heat stress and increased soil temperature on plant growth and development. UNL Extension, CropWatch. June 21, 2016. http://cropwatch.unl.edu/2016/impacts-extreme-heat-stress-and-increased-soil-temperature-plant-growth-and-development.
27. Rees, J., T. Jackson-Ziems, T. Williams, T. Hoegemeyer, P. Grassini, R. Elmore, K. Glewen, **S. Irmak** and J. McMechan. 2016. Harvest 2016 — When corn yields are below expectations. October 14, 2016. http://cropwatch.unl.edu/2016/harvest-2016-when-corn-yields-are-below-expectation.
28. Sharma, V., and **S. Irmak.** 2015. Spatial and temporal corn evapotranspiration across Nebraska. Extension Circular EC2010. 9 pp. https://extensionpubs.unl.edu/publication/ec2010/spatial-and-temporal-variation-of-corn-evapotranspiration-across-nebraska.
29. **Irmak, S**., and K. Djaman. 2015. Basic soil and water resources and irrigation engineering/agricultural water management and related terminology. Extension Circular EC2009. 26 pp. https://extensionpubs.unl.edu/publication/ec2009/2015/pdf/view/ec2009-2015.pdf.
30. Rudnick, D., and **S. Irmak**. 2015. E^{3}A-IE.I: Irrigation Efficiency. Multi-state Extension publication series. No. B1264. UNL, MSU, UWY and Western SARE Sustainable Agriculture Research & Education. 28 pp.
31. Kranz, W., C. Burr, B. Farmaha, P. Grassini, G. Hergert, **S. Irmak**, D. Martin, A. Nygren, C. Shapiro, T. Shaver and G. Zoubek. 2015. Irrigation and nitrogen management: User education/certification program. Extension Circular EC2008. 117 pp. https://extensionpubs.unl.edu/publication/ec2008/irrigation-and-nitrogen-management.
32. Henning, J., S. Slack, M. Harrington, R. Shepard, B. Benham, T. Blewett, D. Devlin, V. Dupuis, C. Evensen, A. Fares, A. Gold, J. Hafer, **S. Irmak**, M. McFarland, S. Megdal, N. Mesner, T. Obreza, M. O'Neill, D. Osmond, D. Parker, P. Rees, P. Robinson, A. Shober, M. Silitonga, D. Swackhamer, D. LaDon Swann and R. Waskom. 2014. National Initiative on the Improvement of U.S. Water Security: Recommendations of the National Water Working Group, representing the Land Grant Institutions. Prepared by Association of Public and Land-Grant Universities (APLU); Extension Committee on Organization and Policy (ECOP); and Experiment Station Committee on Organization and Policy (ESCOP). August 2014. p. 1-20.
33. Kranz, W., **S. Irmak**, D. Martin, T. Shaver and S. Van Donk. 2014. Variable rate application of irrigation water with center pivots. UNL Extension Circular EC2000. https://extensionpubs.unl.edu/publication/ec2000/variable-rate-application-of-irrigation-water-with-center-pivots.
34. **Irmak, S**. 2014. Plant growth and yield as affected by wet soil conditions due to flooding or over-irrigation. Extension NebGuide G1904. 4 pp. https://extensionpubs.unl.edu/publication/g1904/plant-growth-and-yield-as-affected-by-wet-soil-conditions-due-to-flooding-or-over-irrigation.
35. **Irmak, S.** 2014. Potential (reference) and actual evapotranspiration trends across U.S. High Plains in relation to irrigation development and climate change. Extension Circular EC712.
36. **Irmak, S**., L. Odhiambo, W. Kranz and D. Eisenhauer. 2014. Irrigation efficiency and uniformity, and crop water use efficiency. Extension Circular EC732. 8 pp. https://extensionpubs.unl.edu/publication/ec732/irrigation-efficiency-and-uniformity-and-crop-water-use-efficiency.
37. Martin, D.L., **S. Irmak**, W.L. Kranz, S. Van Donk, T. Smith and J. Shanahan. 2014. Crop water use. Crop Insight. 24(8):1-3. Pioneer-DuPont Agronomy Sciences.
38. Martin, D.L., **S. Irmak**, W.L. Kranz, S. van Donk, T. Smith and J. Shanahan. 2014. Measuring soil water content. Crop Insight. 24(7):1-4. Pioneer-DuPont Agronomy Sciences.
39. Rees et al. 2014. Nebraska On-Farm Research Network: Grower's interactive guide to on-farm research. UNL Extension publication.
40. Martin, D.L., T. Smith, W.L. Kranz, **S. Irmak**, S. van Donk and J. Shanahan. 2014. Soil water management. Crop Insight. 24(6):1-4. Pioneer-DuPont Agronomy Sciences.
41. **Irmak, S**., and D. Rudnick. 2014. Corn irrigation management under water-limiting conditions. Extension Circular EC2007. https://extensionpubs.unl.edu/publication/ec2007/corn-irrigation-management-under-water-limiting-conditions.
42. **Irmak, S**., and D. Rudnick. 2014. Corn soil-water extraction and effective rooting depth in a silt-loam soil. Extension NebGuide G2245. https://extensionpubs.unl.edu/publication/g2245/corn-soil-water-extraction-and-effective-rooting-depth-in-a-silt-loam-soil.

43. **Irmak, S**., and V. Sharma. 2014. Spatial and temporal variability of precipitation across Nebraska. Extension Circular EC2002. https://extensionpubs.unl.edu/publication/ec2002/spatial-and-temporal-variability-of-precipitation-across-nebraska.
44. **Irmak, S**., and V. Sharma. 2014. Monthly, seasonal and annual spatial and temporal variability of reference (potential) evapotranspiration across Nebraska. Extension Circular EC2003. https://extensionpubs.unl.edu/publication/ec2003/monthly-seasonal-and-annual-spatial-and-temporal-variability-of-reference-potential-evapotranspiration-across-nebraska.
45. **Irmak, S.** 2013. Long-term (1893-2012) changes in air temperature, relative humidity and vapor pressure deficit (atmospheric evaporative demand) in central Nebraska. Extension Circular EC716. https://extensionpubs.unl.edu/publication/ec716/long-term-1893-2012-changes-in-air-temperature-relative-humidity-and-vapor-pressure-deficit-atmospheric-evaporative-demand-in-central-nebraska.
46. Skaggs, K.E., and **S. Irmak**. 2013. Climate change impact on air temperature, daily temperature range, growing degree days and spring and fall frost days in Nebraska. Extension Circular EC715. https://extensionpubs.unl.edu/publication/ec715/climate-change-impact-on-air-temperature-daily-temperaturerange-growing-degree-days-and-spring-and-fall-frost-datesin-nebraska.
47. Grassini, P., H. Yang, **S. Irmak**, J. Rees, C. Burr and K. Cassman. 2012. Yield gaps and input-use efficiency of high-yield irrigated corn in Nebraska. Extension Circular EC106. https://extensionpubs.unl.edu/publication/ec106/yield-gaps-and-input-use-efficiency-of-high-yield-irrigated-corn-in-nebraska.
48. Grassini, P., H. Yang, **S. Irmak**, J.M. Rees and K.G. Cassman. 2012. Evaluation of water productivity and irrigation efficiency in Nebraska corn production. Extension Circular EC105. https://extensionpubs.unl.edu/publication/ec105/evaluation-of-water-productivity-and-irrigation-efficiency-in-nebraska-corn-production.
49. **Irmak, S**., and K. Skaggs. 2011. Variability of reference evapotranspiration across NE. Extension Circular EC733. https://extensionpubs.unl.edu/publication/ec733/variability-of-reference-evapotranspiration-across-nebraska.
50. Hoffman, G.J., **S. Irmak**, W.L. Kranz, C.D. Yonts, D.L. Martin and S. Van Donk. 2010. Water quality criteria for irrigation. Extension Circular EC782. https://extensionpubs.unl.edu/publication/ec782/water-quality-criteria-for-irrigation.
51. **Irmak, S.** 2009. Magnitude and trends of reference evapotranspiration rates in south central Nebraska: Daily, monthly, growing season total, and annual total. Extension Circular EC765. https://extensionpubs.unl.edu/publication/ec765/magnitude-and-trends-of-reference-evapotranspiration-rates-in-south-central-nebraska.
52. Kranz, W. **S. Irmak,** S. Van Donk, C. Yonts and D. Martin. 2008. Irrigation management for corn. Extension NebGuide G1850. https://extensionpubs.unl.edu/publication/g1850/irrigation-management-for-corn.
53. Kranz, W., D. Martin, **S. Irmak,** S. Van Donk and C.D. Yonts. 2008. Minimum center pivot design capacities in Nebraska. Extension NebGuide G1851. https://extensionpubs.unl.edu/publication/g1851/minimum-center-pivot-design-capacities-in-nebraska.
54. **Irmak, S.** 2007. Drip irrigation design and management considerations for windbreaks. Extension NebGuide G1739. https://extensionpubs.unl.edu/publication/g1739/drip-irrigation-design-and-management-considerations-for-windbreaks.
55. **Irmak, S.,** D. Hay, B. Anderson, W. Kranz and C. Yonts. 2007. Irrigation management and crop characteristics of alfalfa. Extension NebGuide G1778. https://extensionpubs.unl.edu/publication/g1778/irrigation-management-and-crop-characteristics-of-alfalfa.
56. Kranz, W.L., **S. Irmak**, D. L. Martin and C.D. Yonts. 2007. Flow control devices for center pivot irrigation systems. Extension NebGuide G888. https://extensionpubs.unl.edu/publication/g888/flow-control-devices-for-center-pivot-irrigation-systems.
57. Kranz, W.L., **S. Irmak**, D.L. Martin and C.D. Yonts. 2007. Converting center pivot sprinkler packages: System considerations. Extension NebGuide G1124. https://extensionpubs.unl.edu/publication/g1124/converting-center-pivot-sprinkler-packages.
58. Kranz, W.L., D.L. Martin, C.D. Yonts, **S. Irmak**, S. van Donk and T. Dorn. 2007. Comparing fuel sources for irrigation. UNL CropWatch. https://cropwatch.unl.edu/comparing-fuel-sources-irrigation.
59. _____2006. Ten easy ways to boost profit $20/acre. Extension Circular EC196.
60. Payero, J., C. Yonts, **S. Irmak** and D. Tarkalson. 2005. Subsurface drip irrigation: Advantages and disadvantages. Extension Circular EC776.

61. https://extensionpubs.unl.edu/publication/ec776/advantages-and-disadvantages-of-subsurface-drip-irrigation.
62. **Irmak, S.**, J.O. Payero and D.L. Martin. 2005. Modified atmometers (ET_{gage}) for irrigation management. Extension NebGuide, G05-1579. https://extensionpubs.unl.edu/publication/g1579/using-modified-atmometers-etgage-for-irrigation-management.
63. **Irmak, S.** and D.Z. Haman. 2003. Evapotranspiration: Reference or potential? Institute of Food and Agricultural Sciences, IFAS, University of Florida. Extension Publication No: ABE343-AE256.

2.1.8. SMART PHONE APPS DEVELOPMENT

1. ***CropWater App.*** 2010 (lead author). The CropWater App was developed for iPhone and iPad provides an easy way to estimate soil water status based on Watermark soil matric potential sensors installed at soil depths of 1, 2 and 3 ft. With these sensor readings, the app will estimate the crop water used as well as what available soil water remains in the profile for major soil types. The user can also see historic sensor readings and graph the data. https://itunes.apple.com/us/app/crop-water/id557926049?mt=8.

2. ***CornSoyWater App.*** 2015 (co-author). This web-based and mobile app helps irrigators determine in real-time the available soil-water in a field and makes suggestions about when to irrigate. Using real-time weather data and field-specific crop information provided by the user, the app uses simulation to track (from planting to current date) crop water use, water inputs from rainfall and irrigation, soil-water to the maximum rooting depth and crop water stress. http://hprcc-agrono.unl.edu/cornsoywater/.

2.1.9. REFEREED EXTENSION/EDUCATION AND OUTREACH ARTICLES/NEWSLETTERS/ POPULAR MAGAZINE ARTICLES

1. Kukal, M, and **S. Irmak**. 2023. Can We Predict Available Water Capacity from Long-Term Soil Moisture Data? CSA News, December 2023. https://acsess.onlinelibrary.wiley.com/doi/ftr/10.1002/csan.21170.
2. **Irmak, S**. 2022. "Corn Sweat" Is on the Rise — And It May Make Farm Work Less Safe. November 22, 2022. Ambrook Research. https://ambrook.com/research/corn-sweat-farmers-farmworkers-midwest.
3. **Irmak, S.** 2020. Using and Conserving Water: The basics of a practice as old as farming itself. CornsTalk. Aril 2020. https://necornstalk.com/using-and-conserving-water/.
4. **Irmak, S.** 2019. Listen to the land. *Progressive Farmer*. February 2019. p. 20-23.
5. **Irmak, S**., and M.S. Kukal. 2019. UNL researchers: Gap growing between irrigated, rain-fed crop yields. Kearney Hub. August 17, 2019. https://www.kearneyhub.com/news/state/unl-researchers-gap-growing-between-irrigated-rain-fed-crop-yields/article_e0738ac0-c09b-11e9-a709-72f1e3d18f3.html.
6. **Irmak, S**. 2019. Roadmap for agricultural productivity. https://www.aa.com.tr/tr/ekonomi/tarimsal-uretkenlik-icin-yol-haritasi-onerisi/1368994. *Anadolu Agency News; Turkiye Newspaper and World Newspaper*. January 19, 2019.
7. **Irmak, S**., and M. Kukal. 2018. *Featuring 2018-Nebraska's Year in Review: Excellence in the Physical Sciences*. https://news.unl.edu/newsrooms/today/article/2018-nebraskas-year-in-review/.
8. **Irmak, S**. and M. Kukal. 2018. Climate change: Longer growing season, more heat – 115 years of data. *AgFax*. July 2, 2018. https://agfax.com/2018/07/02/climate-change-longer-growing-season-more-heat-115-years-of-data/.
9. **Irmak, S**., and M.S. Kukal. June 19, 2018. 115 years of data reveal longer U.S. growing season, temp trends. *The Voice News*. p. B5.
10. **Irmak, S**., and M. Kukal. June 29, 2018. 115 years of data reveal longer U.S. growing season, temp trends. https://news.unl.edu/newsrooms/today/article/115-years-of-data-reveal-longer-us-growing-season-temp-trends/.
11. **Irmak, S**., and M. Kukal. March 22, 2018. Climate effects on crop yields can vary locally, across crops. news.unl.edu/newsrooms/today/article/study-climate-effects-on-ag-yields-vary-by-location-crop/.
12. Krienke, B., R. Ferguson, **S. Irmak**, D. Rudnick, T. Shaver, C. Shapiro, K. Glewen and M. Naser. 2018. Feasibility of sensor-based nitrogen fertigation management in corn. *CropWatch*. January 8, 2018.
13. Rudnick, D., J. Chávez, J. Aguilar, **S. Irmak**, J. Bordovsky and C. Burr. 2017. Advances in irrigation technology. *Colorado Water*. November-December 2017. p. 29-32.
14. **Irmak, S**. 2017. Monitoring every drop: Technology, coupled with education, helps to conserve irrigation water. *UNL-IANR Strategic Discussions for Nebraska*. Vol. 5, August 2017. p. 98-100.

15. **Irmak, S**. 2016. Retaking the Field: The Case for a Surge in Agricultural Research: Knowledge Transfer: Helping Farmers Save Enough Water to Double Nebraska's Largest Lake. *Supporters of Agricultural Research (SoAR) Foundation*. p. 24.
16. **Irmak, S.** Impacts of extreme heat stress and increased soil temperature on plant growth and development. *CropWatch-UNL Extension*. June 24, 2016.
17. **Irmak, S**. A. Yong and N. Umphlett. 2015. Heavy rainfall events usually not ideal for groundwater recharge. *Ed*. T. Harris. *Nebraska Farmer*. July 16, 2015.
18. **Irmak, S.** Building more efficient irrigation systems farm by farm. *UNL-IANR Strategic Discussions for Nebraska*. Vol. 5, August 2014. p. 54.
19. **Irmak, S.** A Network that works for irrigators. *Prairie Farmer*. February 27, 2014.
20. **Irmak, S**. UNL Research and Extension help agricultural producers manage a changing climate. *UNL-IANR Strategic Discussions for Nebraska*. Vol. 3, 2012.
21. **Irmak, S.** Conservation agriculture is a means to sustainable agriculture. *Conservation Agriculture Systems Innovation*. June 22, 2012. California.
22. **Irmak, S**. UNL research and Extension help agricultural producers manage a changing climate. *UNL-IANR Strategic Discussions for NE: Opportunities for NE Food Scarcity*. Vol. 3 (Aug. 2012), pp. 44-45.
23. **Irmak, S.** "Water" We know about water? *Cornstalk-Nebraska Corn Board*. May 2010.
24. Torrion, J., T. Setiyono, J. Specht, K. Cassman, **S. Irmak**, K. Hubbard, and M. Shulski. SoyWater: An irrigation decision aid for Nebraska soybean producers. *Crop Watch*, April 2010.
25. **Irmak, S.** Changing the face of irrigation. *Hastings Tribune*. March 2010. pp. 3-6.
26. **Irmak, S.** Cut back on water. *Nebraska Farmer*. December 2009.
27. **Irmak, S.** Dueling pivots. *Nebraska Farmer*. December 2009.
28. **Irmak, S.** Too much water can reduce yields. *Nebraska Farmer*. IE8, November 2009.
29. **Irmak, S**. Saving energy and water can be easy with soil moisture sensor technology. *Corn and Soybean Digest*. April 2009. pp. 51&54.
30. **Irmak, S**. "Precision watering." *Nebraska Farmer*. December 2008.
31. **Irmak, S**. "Network saves big on water." *Nebraska Farmer*. December 2008.
32. **Irmak, S.**, G. Zoubek, and N. Klocke. Farming with less water. *The Furrow Magazine*. Summer 2008.
33. **Irmak, S.** Nighttime impacts crop yields. *The Furrow Magazine*. Spring 2008.
34. **Irmak, S.**, and K. Cassman. Corn producers can raise yields while reducing water use. *Cornstalk: A publication of the Nebraska Corn Board*. Winter (November-December) 2007.
35. **Irmak, S.** Harvest more bushels per gallon irrigated. *Irrigation View*. November 2007.
36. **Irmak, S.** Deficit irrigation. *Successful Farming*, October 2007.
37. Zoubek. G., and **S. Irmak**. Agricultural water management. *Acreage and Small Farm Insight*, June 2007.
38. **Irmak, S.** 2007. On-site evapotranspiration measurement saves water and money. *NE Farmer*. Jan. 2007:7.
39. **Irmak, S.** 2006. Center pivot set up to study crop water stress. *Nebraska Farmer*. April 2006:22.
40. Leininger, D., and **S. Irmak**. 2006. WATER-TIP update. *UBBNRD, Blueprint Newsletter*. July 2006:8.
41. Leininger, D., and **S. Irmak**. Nebraska Agricultural Water Management Demonstration Network. *Upper Big Blue Natural Resources District, Blueprint Newsletter*. April 2006:8.
42. Leininger, D., and **S. Irmak**. WATER-TIP Project. *UBBNRD, Blueprint Newsletter*. January 2006:6.
43. **Irmak, S.** Water management with subsurface drip irrigation. *Midwest Messenger/Bullseye. August* 2005.
44. Haman, D.Z., **S. Irmak** and T.H. Yeager. 2002. A new production system for container plants may decrease the time it takes to grow a plant and use less water. *American Nurseryman*. 10(1):54-56.
45. **Irmak, S.** 2001. New system to save water for container-grown nursery plants. *Gator Engineering*. University of Florida, Spring 2001:9-10.

2.1.10. PUBLICATION CITATIONS/DOWNLOADS, *H INDEX* and i_{10} *INDEX*

Irmak, Suat: *h Index* = 71; i_{10} *Index* = 236. A total of 67,000 downloads with 6,321 metadata page hits by 5,898 national and international institutions in 182 countries (Fig. 1) with 3,543 referrers for only those listed in Google Scholar with 17,285 citations.

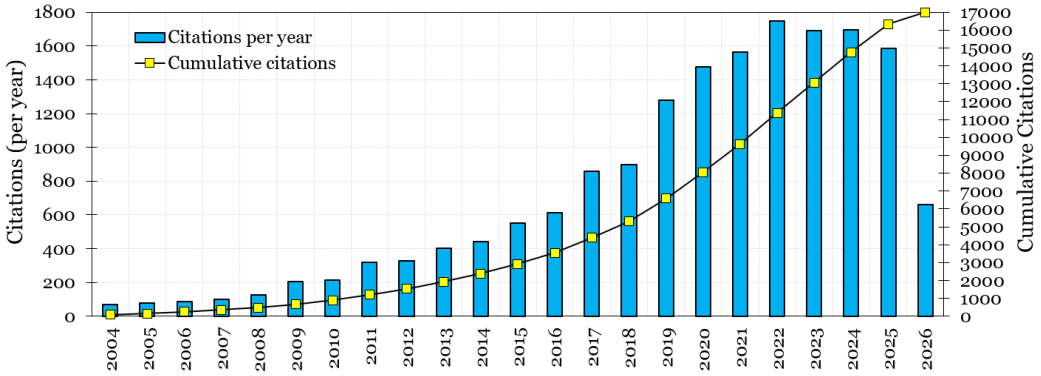


Figure 1. Annual total and cumulative citations (June 15, 2004-July 20, 2026) of my papers by national and international scientific, research, education and government institutions (Source: Google Scholar).

3. AWARDS/HONORS/RECOGNITION

3.1. NATIONAL/INTERNATIONAL AWARDS/RECOGNITIONS (*Major awards capitalized*)

1. "**ROYCE J. TIPTON AWARD**" presented by the American Society of Civil Engineers-Environmental and Water Resources Institute (ASCE-EWRI)-Irrigation and Drainage Council in recognition of outstanding researchers/scientists who has made significant contributions to the advancement of science of irrigation and drainage engineering and management. 2026 World Environmental and Water Resources Congress. July 2026, Mobile, AL.

2. **"Top Viewed Article Award"** for "*Comparison of AquaCrop and CERES-Maize models for simulating maize phenology, grain yield, evapotranspiration and water productivity under different irrigation and nitrogen levels*." *Irrigation and Drainage*. 73(3):1052-1068. doi.org/10.1002/ird.2917. May 14, 2026.

3. **"Top Cited Article Award"** for "*Comparison of AquaCrop and CERES-Maize models for simulating maize phenology, grain yield, evapotranspiration and water productivity under different irrigation and nitrogen levels*." *Irrigation and Drainage*. 73(3):1052-1068. doi.org/10.1002/ird.2917. April 9, 2026.

4. **"FELLOW OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE (AAAS)."** The Fellowship symbolizes the honor that AAAS bestows upon Fellows whose efforts on behalf of the advancement of science and its applications in service to society have distinguished them among their peers. Irmak was honored for his distinguished contributions and exemplary accomplishments in soil-water resources engineering, irrigation engineering, evapotranspiration and surface energy balance, climate science, agricultural science, technology transfer to citizens and for educating next generation scientists. Washington, DC, June 7, 2025.

5. **"ASABE PRESIDENTIAL CITATION"** honors individuals for making outstanding contributions and providing leadership to the ASABE. Anaheim, CA. July 31, 2024.

6. **"ASABE PRESIDENTIAL RECOGNITION"** *for providing leadership as a chair of an ASABE conference*. ASABE Annual International Conference "*Chair of the 2nd Global Evapotranspiration Symposium: Advances, Challenges, and Future Needs in Measurements, Modeling, and Applications."* Anaheim, CA. July 29, 2024.

7. **"Top Viewed Article"** among scientific work published in Irrigation and Drainage between Jan. 1, 2023 and Dec. 31, 2023, for the article "*Soybean crop coefficients under different seeding rates and full and limited irrigation and rainfed management*." *Irrigation and Drainage*. 73:151-179. doi.org/10.1002/ird.2854.

8. **"**Honored for being in the top 15 of all authors for the most read articles published in the Journal of Irrigation and Drainage Engineering, ASCE.**"** September 10, 2022.

9. **"ASABE SUPERIOR PAPER AWARD"** for the paper titled "*Evaluation of soil moisture sensing technologies in silt loam and loamy sand soils: Assessment of performance, temperature sensitivity, and site- and sensor-specific calibration*." July 18, 2022. Houston, TX.

10. **"FELLOW OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS-ENVIRONMENTAL AND WATER RESOURCES INSTITUTE (ASCE-EWRI)"** for recognition in their field and by their peers as a leader in water resources and/or environmental engineering.

11. **"ASABE ADS/HANCOR SOIL AND WATER ENGINEERING AWARD."** Honors and recognizes a member of ASABE who has made significant contributions to the advancement of soil and water engineering in teaching, research, planning, design, construction, management or development of materials. These contributions include in the form of published literature, notable performance, or special actions which have served to advance the science of soil and water engineering. July 17, 2021.

12. **"ASABE NETAFIM AWARD FOR ADVANCEMENTS IN MICROIRRIGATION."** Honors and recognizes an ASABE member who provides excellence in research, development, extension, education or industry who has made significant contributions in the ability to utilize and adapt microirrigation technology at an appropriate scale for any given level of production technology. The award recognizes engineering excellence in the design, development, evaluation, operation, or management of microirrigation systems and/or efforts that increase the adoption of this efficient irrigation method. July 17, 2021.

13. **"2021 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for the article "*Long-term (1893-2012) Changes in Monthly, Growing Season, and Annual Precipitation Trends and Magnitudes*." July 17, 2021.

14. **"Second Place Award in Research Communications"** presented by the Weed Sci. Society of America (WSSA) for the project titled "*Evapotranspiration of Palmer Amaranth in corn, soybean, and fallow under subsurface drip and center-pivot irrigation systems*." WSSA Ann. Conf. (virtual). February 19, 2021.

15. **"2021 ASABE STANDARDS DEVELOPMENT AWARD"** (Revision). ANSI/ASAE S436.2 JUN2020, Field Test Procedure for Determining Irrigation Water Distribution Uniformity of Center Pivot and Lateral Move Systems. July 17, 2021.

16. **"2021 ASABE STANDARDS DEVELOPMENT AWARD"** (New Standard). ANSI/ASABE S627 NOV2020, Weather-Based Landscape Irrigation Control Systems. July 17, 2021.

17. **"FELLOW OF THE AMERICAN SOCIETY OF AGRICULTURAL AND BIOLOGICAL ENGINEERS (ASABE)."** ASABE's highest honor and is awarded to a member of unusual professional distinction, with outstanding and extraordinary qualifications and experience in the discipline. Irmak is honored for his global impact in advancing agricultural science, engineering and education in irrigation engineering, evapotranspiration, and surface energy balance measurements and modeling, climate change impact on agricultural productivity and water resources, understanding crop physiology, biophysics vs environment interactions. July 14, 2020.

18. **"Most Downloaded Elsevier Agricultural Water Management Article"** for "*Propagation of soil moisture sensing uncertainty into estimation of total soil water, evapotranspiration and irrigation decision-making*." December 2020.

19. **"Water and Energy Flux Measurement, Modeling and Network (NEBFLUX; Irmak, 2010)"** was highlighted in the cover page of Elsevier's J. Agrosystems, Geosciences and Environment. October 8, 2020.

20. **"2019 AMERICAN SOCIETY OF AGRONOMY EXCELLENCE FOR EXTENSION EDUCATION MATERIALS IN EXTENSION EDUCATION COMMUNITY AWARD"** in the category of Digital Communications. November 13, 2019. San Antonio, TX.

21. **"2019 ASABE STANDARD DEVELOPMENT AWARD"** for the Committee STC-01-ANSI/ASABE S632-1-Precision Agriculture Irrigation Language: Core Concepts, Processes, and Objects, and ANSI/ASABE S632-3-Precision Agriculture Irrigation Language: Irrigation System Operations. July 8, 2019. Boston, MA.

22. **"2019 UNIVERSITIES COUNCIL ON WATER RESOURCES EDUCATION AND PUBLIC SERVICE AWARD**" for the North Central Region Water Network. June 4, 2019.

23. **"Among 10 Most Downloaded Articles in Ad Hoc Networks Journal"** for the article "*Internet of Underground Things in Precision Agriculture: Architecture and Technology Aspect."* February 1, 2019.

24. **"2018 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for the article "*Evapotranspiration (ET) basics and estimating crop ET from reference ET and crop specific coefficients*." July 30, 2018. Detroit, MI.

25. **"2018 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for the refereed article "*Simplified forms of deep percolation estimation method below the crop root zone for silt-loam soils*." July 30, 2018. Detroit, MI.

26. **"2018 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for the refereed article "*Simplified forms of surface runoff estimation method for silt-loam soils*." July 30, 2018. Detroit, MI.

27. **"2018 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for Agricultural Water Management Network (NAWMN) Educational Website. July 30, 2018. Detroit, MI.

28. **"GLOBAL WATER SECURITY OF AGRICULTURE AND NATURAL RESOURCES CONFERENCE CERTIFICATE OF APPRECIATION**" Presented by the ASABE and Indian Society of Agricultural Engineers for contributions as a Committee Co-Chair. October 3-6, Hyderabad, India.

29. **"One of the Most Popular Authors in the Civil and Environmental Engineering Commons."** Of the 30,316 authors in the US, my scientific papers received some of the highest downloads. January 5, 2018.

30. "**2017 USDA-NIFA NATIONAL WATER & ENERGY CONSERVATION AWARD**" for the USDA-NIFA Multistate Project W-3128 (Scaling Microirrigation Technologies to Address the Global Water Challenge). The award honors a significant achievement in the conservation of water and energy relating to irrigation procedures, equipment, methods and techniques. November 9, 2017. Orlando, FL.

31. **"2017 ASABE EDUCATIONAL AIDS BLUE RIBBON AWARD"** presented by the ASABE for the refereed publication "*Observed space and time changes in air temperatures and daily temperature range for the counties in the US Great Plains from 1968 to 2013*." July 17, 2017. Spokane, WA.

32. **"2017 ASABE STANDARDS DEVELOPMENT AWARD**" for the standard "*ANSI/ASABE S626 SEP2016, Landscape Irrigation System Uniformity and Application Rate Testing"* by the ASABE NRES-246 Turf and Landscape Committee. July 17, 2017. Spokane, WA.

33. **"2017 BEST PAPER AWARD"** in the Journal of Irrigation and Drainage Engineering for the refereed journal article "*Inter-annual variation in long-term center pivot-irrigated maize evapotranspiration (ET) and various water productivity response indices: Part I. Grain yield, actual and basal ET, irrigation-yield production functions, ET-yield production functions, and yield response factors*." Presented by the Irrigation and Drainage Council of the ASCE-EWRI, Sacramento, CA. May 23, 2017.

34. **"2017 BEST PAPER AWARD"** in the J. Irrigation and Drainage Engineering for the refereed journal article "*Inter-annual variation in long-term center pivot-irrigated maize evapotranspiration (ET) and various water productivity response indices: Part II. Irrigation water use efficiency (IWUE), crop WUE, evapotranspiration WUE, irrigation-evapotranspiration use efficiency, and precipitation use efficiency*." Presented by the Irrigation and Drainage Council of the ASCE-EWRI, Sacramento, CA. May 23, 2017.

35. **"First Place Poster"** presented by the Weed Science Society of America (WSSA) for research poster titled "Effect of degree of water stress on the growth and fecundity of Palmer Amaranth" by Chahal, P., **S. Irmak** and A. Jhala. February 9, 2017. *Tucson, AZ.*

36. **"Most Viewed Refereed Journal Article"** for the refereed journal article "*Reference (potential) evapotranspiration: Part I. Comparison of temperature, radiation, and combination-based energy balance*

equations in humid, subhumid, arid, semiarid and Mediterranean-type climates." *J. Irrigation and Drainage Engineering, ASCE*.

37. **"2016 ASABE EDUCATIONAL AIDS BLUE RIBBON AWARD"** presented by the Am. Soc. Agric. and Biological Engineers (ASABE) for the refereed publication "*Basic soil and water resources and irrigation engineering/agricultural water management and related terminology*." July 18, 2016. Orlando, FL.

38. Nominated for the "**NATIONAL ACADEMY OF SCIENCES PRIZE IN FOOD AND AGRICULTURAL SCIENCES**" by UNL Chancellor Ronnie Green. September 30, 2016.

39. **"2016 ASABE EDUCATIONAL AIDS BLUE RIBBON AWARD"** presented by the American Society of Agricultural and Biological Engineers (ASABE) for the refereed publication "*Spatial and temporal corn evapotranspiration across Nebraska*." July 18, 2016. Orlando, FL.

40. **"2016 BEST PAPER AWARD"** in the Journal of Irrigation and Drainage Engineering for the refereed journal article "*Impact of nitrogen fertilizer on maize evapotranspiration crop coefficients under fully irrigated, limited irrigated and rainfed settings*." Presented by the Irrigation and Drainage Council of the ASCE-EWRI, West Palm Beach, FL. May 25, 2016.

41. "**Most Viewed Refereed Journal Article**" for the refereed journal article "*Large-scale spatial and temporal variability in evapotranspiration, crop water use efficiency, and evapotranspiration water use efficiency for irrigated and rainfed maize and soybean*." *J. Irrigation and Drainage Eng.,* March 2016.

42. "**Research Highlights for Selected Journal Articles**" for the refereed journal article published in the *Journal of Irrigation and Drainage Engineering*, ASCE. April 2016.

43. "**IRRIGATION ASSOCIATION PARTNER OF THE YEAR AWARD**" that honors a person or group making exceptional contributions or distinctive accomplishments to irrigation. The award was presented for the Center Pivot Irrigation Program that was established and executed in partnership between UNL Extension, NE DNR and NET. November 12, 2015. Long Beach, CA.

44. "**First Place Award**" for the poster presentation titled "*Effect of water stress on growth and seed production of glyphosate–resistant and –susceptible common Waterhemp*." Sarangi, D. (Presenter), S.Z. Knezevic, J.L. Lindquist, **S. Irmak** and A.J. Jhala. Presented by WSSA. February 12, 2015. Lexington, KY.

45. "**Second Place Award**" at the 2015 ASABE AIM for the paper titled "S*oil water dynamics and evapotranspiration of cover crop mixtures in seed maize-cover crop rotation fields*." Presented by the ASABE-AABFEIO. July 29, 2015. New Orleans, LA.

46. "**USDA-NIFA NATIONAL INNOVATIVE PROGRAMS AND PARTNERSHIP AWARD**" for the Agricultural Water Management Network for its groundbreaking water management work and contributions in advancing agricultural science. The network has transferred high-quality research and data on soil water status and crop-water use measurements to farmers and their advisers; fostered adoption of new or newer irrigation water-management technologies to help farmers increase water-use efficiency, reduced energy consumption and protected agro-ecosystem services; developed new water, soil and crop management tools; and enhanced communication between growers, crop consultants, academics and state and federal agencies. The award was presented by the USDA Undersecretary Dr. Catherine Woteki and the USDA-NIFA Director Dr. Sonny Ramaswamy. October 23, 2014. Washington, D.C.

47. "**NASA CERTIFICATE OF SERVICE APPRECIATION**" in recognition of valuable contribution and outstanding support to the Advanced Information Systems Technology (AIST) Program and the NASA Earth Science Technology Office. Presented by Dr. George J. Komar, NASA Earth Science and Technology Office Associate Director and Program Manager. October 2014.

48. "**2014 ASABE JOHN DEERE GOLD MEDAL AWARD**" by the ASABE for achievements through engineering for improved manipulation, use and conservation of soil-water resources, and that has resulted in

applications of a new concept, product, art or science that advanced the development of agriculture. Montreal, Canada. July 16, 2014 (***youngest researcher to receive this award in ASABE history since 1907***).

49. "**2014 ASABE HEERMANN SPRINKLER IRRIGATION AWARD**" presented by ASABE in recognition of exceptional contributions in research, development, extension, and education that have made significant contributions to the enhancement of productivity and efficiency of sprinkler irrigated agriculture. Montreal, Canada. July 16, 2014 (***youngest researcher to receive this award in ASABE history since 1907***).

50. "**2014 ASABE SUPERIOR PAPER AWARD**" presented by the ASABE for the refereed journal article titled "*Development and evaluation of ordinary least squares regression models for predicting irrigated and rainfed maize and soybean yields*" published in *Transactions of the ASABE*. Montreal, Canada. July 16, 2014.

51. "**EXCELLENCE IN MULTISTATE RESEARCH AWARD**" Presented by the Western Association of Agricultural Experiment Station Directors and UDA-NIFA and the Experiment Station Committee on Organization and Policy for outstanding progress and impacts of the Regional Committee W2128 Microirrigation for Sustainable Water Use. July 13, 2014, Lake Tahoe, NV.

52. **"2013 ASCE HONORABLE PAPER AWARD"** presented by the Irrigation and Drainage Council of the ASCE-EWRI for the refereed journal article titled "*Dynamics of nocturnal, daytime, and sum-of-hourly evapotranspiration and other surface energy fluxes over non-stressed maize canopy*" published in *J. Irrigation and Drainage Engineering*. Cincinnati, OH. May 19, 2013.

53. **"2013 ASABE EDUCATIONAL AIDS BLUE RIBBON AWARD"** presented by ASABE for the publication titled "*Evaluation of water productivity and irrigation efficiency in Nebraska corn production*." July 21, 2013. Kansas City, MO.

54. "**Most Viewed Refereed Journal Article**" "*Actual crop evapotranspiration and alfalfa- and grass-reference crop coefficients of maize under full and limited irrigation and rainfed conditions*" published in the *J. Irrigation and Drainage Engineering*. ASCE-EWRI. December 2013, Reston, VA.

55. **"NATIONAL FINALIST IN THE "SEARCH FOR EXCELLENCE IN THE CROP PRODUCTION CATEGORY OF NACAA AWARDS PROGRAM**" for the Nebraska Agricultural Water Management Network (NAWMN) impact and accomplishments. NACAA 97th Annual Conference, July 15-19, 2012, SC.

56. "**OUTSTANDING SERVICE AS PAST CHAIR OF THE EVAPOTRANSPIRATION IN IRRIGATION AND HYDROLOGY COMMITTEE**" presented by ASCE-EWRI. May 23, 2012. Albuquerque, NM.

57. **"2011 ASABE EDUCATIONAL AIDS BLUE RIBBON AWARD"** presented by the ASABE for excellence in extension activities through the interchange of ideas on successful methods and techniques; and excellence in educational aids in agricultural engineering through the exchange of ideas and individual recognition, contribution to overall improvement in use of educational aids. August 8, 2011. Louisville, KY.

58. **"2011 ASABE SUPERIOR PAPER AWARD"** presented by the ASABE for the refereed journal article "*Nebraska Agricultural Water Management Network: Integrating Research and Extension/Outreach*" published in the *Applied Engineering in Agriculture*. August 8, 2011. Louisville, KY.

59. **"2011 HONORABLE PAPER AWARD"** presented by the Irrigation and Drainage Council of the ASCE-EWRI for the refereed journal article "*Actual and reference evaporative losses and surface coefficients of a maize field during non-growing (dormant) periods*" published in *J. Irrigation and Drainage Engineering*. Palm Springs, CA, May 18, 2011.

60. **"2010 ASABE YOUNG EXTENSION PROFESSIONAL AWARD"** recognizes outstanding success in motivating people to acquire knowledge, skills and understanding to improve agricultural operations. Irmak received the award for his exemplary leadership and outstanding contributions and impact to soil and water resources engineering through research, extension education, and outreach programs. Pittsburgh, PA. ***The first and only ASABE member to receive both New Holland Young Researcher and ASABE Young Extension Professional Award in ASABE history since its establishment in 1907***.

61. **"2010 HONORABLE PAPER AWARD"** presented by the Irrigation and Drainage Council of the ASCE-EWRI for the refereed journal article "*Variability analyses of alfalfa-reference to grass-reference evapotranspiration ration in growing and dormant seasons*" published in *J. Irrigation and Drainage Engineering, ASCE*. Providence, Rhode Island, May 18, 2010.

62. **"2010 HONORABLE PAPER AWARD"** presented by the Irrigation and Drainage Council of the ASCE-EWRI for the refereed journal article "*Reference and crop evapotranspiration in south central Nebraska: I. Comparison and analyses of grass and alfalfa-reference evapotranspiration*" published in *J. Irrigation and Drainage Engineering, ASCE.* Providence, Rhode Island, May 18, 2010.

63. **"2010 HONORABLE PAPER AWARD"** presented by the Irrigation and Drainage Council of the ASCE-EWRI for the refereed journal article "*Reference and crop evapotranspiration in south central Nebraska: II. Measurement and estimation of actual evapotranspiration*" published in *J. Irrigation and Drainage Engineering, ASCE*. Providence, Rhode Island, May 18, 2010.

64. **"EXCELLENCE IN AGRICULTURE AWARD**" for Nebraska Agricultural Water Management Demonstration Network (NAWMDN). Presented at the 95th National Association of County Agricultural Agents (NACAA) Annual Meeting and Professional Development Conference, July 11-15, 2010. Tulsa, OK.

65. "**New Faces of Agricultural and Biological Engineering Recognition**" by the American Society of Agricultural and Biological Engineers (ASABE). St. Joseph, MI.

66. **"ENGINEER OF THE YEAR AWARD"** presented by the Nebraska Section of the American Society of Agricultural and Biological Engineers (ASABE) for outstanding achievement of an individual in the Agricultural and Biological Engineering field. October 2009. Hastings, NE.

67. **"ASABE NATIONAL AWARD IN THE INNOVATIVE EXTENSION METHODS AND IMPACT ASSESSMENT"** presented by ASABE for the *Nebraska Agricultural Water Management Demonstration Network (NAWMDN)*. June 2009, Reno, NV.

68. **"NATIONAL FINALIST AT THE EXTENSION PROGRAM POSTER COMPETITION"** for the poster presentation "Nebraska Agricultural Water Management Demonstration Network." The National Association of County Agricultural Agents (NACAA) Annual Meeting, September 23, 2009. Portland, OR.

69. **"MOST POPULAR ENVIRONMENTAL AND WATER RESOURCES PAPER"** for the refereed journal article "*Actual and reference evaporative losses and surface coefficients of a maize field during non-growing (dormant) periods*" published in the *J. Irrigation and Drainage Eng.,* ASCE-EWRI, June 2009.

70. **"NEW HOLLAND YOUNG RESEARCHER AWARD"** presented by the ASABE for recognition of dedicated use of scientific methodology to seek out facts or principles significant to the agricultural and biological engineering profession. Rhode Island, Providence, July 2, 2008. ***The first and only ASABE member who received both New Holland Young Researcher and ASABE Young Extension Professional Award in ASABE history since its establishment in 1907.***

71. **"2008 ASABE EDUCATIONAL AIDS COMPETITION BLUE RIBBON AWARD"** in the Educational Publications Category for the publication "*Drip Irrigation Design and Management Considerations for Windbreaks*." G07-525. Rhode Island, Providence, July 2, 2008.

72. **"MOST POPULAR ENVIRONMENTAL AND WATER RESOURCES PAPER"** for the refereed journal article "*Application of SEBAL Model for Mapping Evapotranspiration and Estimating Surface Energy Fluxes*" in the *J. Irrigation and Drainage Engineering*, *134(3):273-285*. ASCE-EWRI, June 2008.

73. **"2006 ASABE EDUCATIONAL AIDS COMPETITION BLUE RIBBON AWARD"** in the Educational Publications Category for the publication "*Using Modified Atmometers (ET_{gage}) for Irrigation Management.*" Extension NebGuide, G05-1579. Portland, OR, 2006.

74. **"EXCELLENT SERVICE AWARD"** presented by the ASCE-EWRI for recognition of excellent service to the 2006 ASCE-EWRI World Environmental and Water Resources Congress through hard work, support and organization of the "Irrigation and Drainage Engineering" track Omaha, NE, 2006.

75. **"BEST PAPER AWARD"** in the *J. Irrigation and Drainage Engineering* for the refereed journal article titled "*Solar and Net Radiation-Based Equations to Estimate Reference Evapotranspiration*." Presented by the Irrigation and Drainage Council of the ASCE. Anchorage, Alaska, 2005.

76. Recognized by the American Society of Agricultural Engineers for *being in the top 5% of the technical reviewers for showing exceptional quality in technical refereed manuscript review* for the society journals, 2004.

3.2. REGIONAL/LOCAL AWARDS/RECOGNITIONS *(Major awards capitalized)*

1. **"THE PENN STATE UNIVERSITY-COLLEGE OF AGRICULTURAL SCIENCES 2023 HIGH IMPACT RESEARCH PUBLICATION AWARD"** in the Impact Area of Climate Smart Agriculture and Forestry. University Park, PA. November 1, 2023.

2. "**UNIVERSITY OF FLORIDA, AGRICULTURAL AND BIOLOGICAL ENGINEERING DEPARTMENT 2022 DISTINGUISHED ALUMNI AWARD**" for professional excellence and outstanding service to the profession. Gainesville, FL. April 20, 2022.

3. **"2020 NEBRASKA SECTION ASABE OUTSTANDING CONTRIBUTION TO AGRICULTURE AWARD."** September 18, 2020. Lincoln, NE.

4. **"2020 UNL COLLEGE OF ENGINEERING HOLLING FAMILY DISTINGUISHED TEACHING, ADVISING AND MENTORING AWARD"** in recognition of effectiveness as an adviser and mentor as well as effectiveness as a teacher. April 30, 2020. Lincoln, NE.

5. **"2020 GAMMA SIGMA DELTA-THE HONOR SOCIETY OF AGRICULTURE–THE EXTENSION AWARD OF MERIT AWARD."** UNL-IANR. January 26, 2020. Lincoln, NE.

6. "**2019 HOLLING FAMILY SENIOR FACULTY EXCELLENCE IN TEACHING AWARD**" in recognition of providing an exemplary educational environment. UNL-IANR. March 12, 2019. Lincoln, NE.

7. "**2018 UNL SERVICE AWARD**" September 25, 2018. Lincoln, NE.

8. "**2018 UNL COLLEGE of ENGINEERING FACULTY SERVICE AWARD**" for outstanding service to the academic unit, college and university, as well as profession and community. April 5, 2018. Lincoln, NE.

9. "**UNL College of Engineering Research Fair 1st Place Award**" for the poster "*Irrigation-limited yield gaps in the US: Trends and variability post-1950"* by M. Kukal and **S. Irmak**. April 10, 2018. Lincoln, NE.

10. **"2018 UNL DIVISION OF STUDENT AFFAIRS, THE PARENTS ASSOCIATION AND TEACHING COUNCIL'S CONTRIBUTIONS TO STUDENTS AWARD."** Recognized for making significant difference in student's life. February 2, 2018. Lincoln, NE.

11. "**2017 UNL COLLEGE OF ENGINEERING IMPACTFUL RESEARCH AWARD.**" November 9, 2017. Lincoln, NE.

12. "**UNL COLLEGE OF ENGINEERING LAGERSTROM AWARD**" presented to the Biological Systems Engineering Department based on department's outstanding accomplishments in providing service to its students, the College, the University, and the broader community. April 2016. Lincoln, NE.

13. **"INNOVATIVE EXTENSION SPECIALIST AWARD"** for outstanding contributions in programming. The award recognizes leadership in developing and carrying out programs in cooperation with Extension Educators and other Extension Specialists. UNL Extension, November 13, 2014. Kearney, NE.

14. "**1st Place Award in Poster Presentation**" for the poster titled "Soil-water dynamics, evapotranspiration and single and basal crop coefficients of cover crop mixtures in seed maize-cover crop rotation fields." 6th DWFI Conference. October 23, 2014. Seattle, WA.

15. **"2014 UNL COLLEGE OF ENGINEERING RESEARCH AND CREATIVE ACTIVITY AWARD"** for recognition of activities associated with investigation or experimentation aimed at the discovery and/or interpretation of facts and development of creative works or new products. April 15, 2014. Lincoln, NE.

16. **"2013 OMTVEDT INNOVATION AWARD"** in recognition of exceptional service for leadership and significant contributions to the initial development of partnerships and programs in the Institute of Agriculture and Natural Resources. September 6, 2013. Lincoln, NE.

17. **"Third Place Award"** for poster presentation titled "Impact of water and nitrogen management on maize yield, crop water productivity, and evapotranspiration-nitrogen use efficiency index." Daugherty Water for Food Institute Conference. May 6, 2013. Lincoln, NE.

18. **"First Place Award"** for poster titled "Developing *CornSoyWater*: An online irrigation decision aid for corn and soybean." Daugherty Water for Food Inst. Conf. May 7, 2013. Lincoln, NE.

19. Honored with the **"HAROLD W. EBERHARD DISTINGUISHED PROFESSORSHIP.**" University of Nebraska-Lincoln. January 1, 2013. Lincoln, NE.

20. **"CERTIFICATE OF APPRECIATION IN RECOGNITION OF SERVICE TO NEBRASKA NATIONAL GUARD AGRIBUSINESS DEVELOPMENT TEAMS (ADT1-4) SERVING IN AFGHANISTAN."** Presented by Lynn M. Heng (NE ADT2 Commander); William J. Pruisa (NE ADT3 Commander); and Donald E. Kneifl (NE ADT4 Commander). October 2012. Lincoln, NE.

21. **"2011 UNL EXTENSION EXCELLENCE IN TEAM PROGRAMMING AWARD"** (Team Leader) presented by the UNL Extension to recognize the importance of interdisciplinary team efforts in achieving the goals of UNL Extension in terms of problem identification, team strategy, grant success, productivity, and impact and the output of the team in relation to inputs. November 9, 2011. Kearney, NE.

22. **"OUTSTANDING YOUNG SCIENTIST AWARD."** UNL Chapter of Sigma Xi (Scientific Research Society) for "N*ovel contributions to understanding and optimizing water use in agriculture*." April 2008. Lincoln, NE.

23. **"2007 HOLLING FAMILY TEACHING EXCELLENCE AWARD."** Presented by the UNL-IANR and the Nebraska College of Technical Agriculture (NCTA). The award is given to outstanding faculty within NU's IANR and NCTA for their innovation, impact, and program quality in teaching. Lincoln, NE, 2007.

24. **"2007 DISTINGUISHED EXTENSION NEW EMPLOYEE AWARD"** for recognition of outstanding extension programming. Grand Island, NE, 2007.

25. Gamma Sigma Delta (The Honor Society of Agriculture) "*in recognition of high scholarship, outstanding achievement or service*." Lincoln, NE, 2007.

26. Ph.D. Dissertation entitled "A New Irrigation-Plant Production System for Water Conservation in Ornamental Nurseries" was *nominated for the "Outstanding Ph.D. Dissertation of the University of Florida"* to compete in the South-Eastern United States Conference. Gainesville, FL, 2003.

27. **"YOUNG RESEARCHER AWARD"** presented by the Florida section of the American Society of Agricultural Engineers, Key West, FL, 2002.

28. **"UNIVERSITY OF FLORIDA PRESIDENTIAL RECOGNITION AWARD"** in recognition of outstanding achievement and contributions to the University of Florida. Presented by the University of Florida President Charles E. Young. Gainesville, FL, 2000.

29. Gamma Sigma Delta (The Honor Society of Agriculture) "*in recognition of high scholarship, outstanding achievement and service*." Gainesville, FL, 2000.

30. Competitive graduate student travel scholarship. College of Engineering, Univ. of FL, Gainesville, FL, 2000.

31. Competitive graduate student travel scholarship. College of Engineering, Univ. of FL, Gainesville, FL, 1999.

32. Florida Gamma Beta Chapter of Alpha Epsilon; The Honor Society of Agricultural, Food and Biological Engineering, Gainesville, FL, 1999.

33. "**SECOND PRIZE WINNER**" for a Poster Presentation in Engineering and Math." The 1999 Graduate Student Forum of the University of Florida. Gainesville, FL, 1999.

34. **"OUTSTANDING GRADUATE STUDENT AWARD (1998-1999)**" presented by Agric. and Biological Eng. Dept., Institute of Food and Agricultural Sciences (IFAS), Univ. of Florida. Gainesville, FL, 1999.

35. **"OUTSTANDING ACADEMIC ACHIEVEMENT AWARD**" presented by the College of Engineering, University of Florida. Gainesville, FL, 1999.

36. **"SECOND PRIZE WINNER**" for a Poster Presentation in Ecology and Environmental Sciences." The 1998 Graduate Student Forum of the University of Florida. Gainesville, FL, 1998.

37. Graduate Research Assistantship and fellowship, University of Florida, Agricultural and Biological Engineering Department. Gainesville, FL, 1999-2002.

4. TEACHING AND GRADUATE EDUCATION ACCOMPLISHMENTS

4.1. GRADUATE STUDENTS

4.1.1. PH.D. STUDENTS IN PROGRESS

1. Aysan Ezati (***major advisor***). *Fraction of transpirable soil water in the conterminous united states: variability, trends, drivers, and predictability*. Dept. of Agric. and Biological Eng., Penn State.
2. Ahmad Zamzami (*graduate committee member*). *Development of a stress and growth monitoring system using non-destructive methods and machine learning on lettuce*. Dept. of Agric. and Biological Eng., Penn State.
3. Weiqun Wang (*graduate committee member*). *Multi-sensor fusion and deep learning for pre-symptomatic detection of mushroom disease: a case study of dry bubble*. Dept. Agric. and Biological Eng., Penn State.
4. Juan Arguijo (*graduate committee member*). Development of a robotic system for automated apple tree leaf detection and plant phenotyping**.** Dept. of Agric. and Biological Eng., Penn State.
5. Fan Wu (*graduate committee member*). *Improving surface energy balance and boundary layer modeling through land-surface remote sensing for air* quality applications. Dept. of Meteorology and Atmospheric Science, Penn State.

4.1.2. PH.D. STUDENTS COMPLETED

1. Mandeep Singh (*graduate committee member*). *Evapotranspiration of various weed species in maize and soybean cropping systems under subsurface drip and center pivot irrigation methods*. Dept. of Agronomy and Horticulture, University of Nebraska-Lincoln (UNL). Graduated in May 2024.
2. Carolyn Sheline (*graduate committee member*). *Designing solar-powered drip irrigation systems considering optimal irrigation operation, methods to maximize crop productivity and reduce system cost in small to medium scale farm context*. Massachusetts Institute of Technology (MIT). Graduated in December 2023.
3. Jasreman Singh (*graduate committee member*). Design and evaluation of unmanned aerial system based wireless sensor network for irrigation management. Dept. of Biol. Sys. Eng., UNL. Graduated in Dec. 2021.

4. Ali T. Mohammed (***major advisor***). Maize growth, yield, water productivity and evapotranspiration response to different irrigation methods and amounts and different timing and methods of nitrogen applications. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2020.
5. Rupinder Sandhu (***major advisor***). Performance analysis of AquaCrop and Hybrid-Maize models in estimating crop yield, water use and plant phenological and physiological variables. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in December 2019.
6. Meetpal Kukal (***major advisor***). Coupled water and light use and efficiency in four row crops under optimal growth conditions. Funded 100% from my grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2019.
7. Ethann Barnes (*graduate committee member*). Controlling weeds in popcorn production and pollen flow from popcorn to field corn. Dept. of Agron. & Horticulture, UNL. Graduated in May 2019.
8. Vasudha Sharma (***major advisor***). Fundamentals of variable rate irrigation and fertigation in comparison to fixed rate irrigation and conventional fertilizer management. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2018.
9. Parminder Chahal (*graduate committee member*). Water stress and water uptake of various weed species. Dept. of Agron. & Horticulture, UNL. Graduated in May 2018.
10. Abdul Salam (*graduate committee member*). Pulses in the sand: long range and high data rate communication techniques for next generation wireless underground networks. Dept. of Comp. Sci. and Eng., UNL. Graduated in December 2017.
11. Angela Bastidas (*graduate committee member*). Inter-seeding cover crops in a corn system. Dept. of Agron. & Horticulture, UNL. Graduated in December 2017.
12. Maxwel Oliveira (*graduate committee member*). Efficacy of weed control methods. Dept. of Agron. & Horticulture, UNL. Graduated in December 2017.
13. Bruno Patias Lena (***major advisor***). Evapotranspiration and crop coefficient of Jatropha. Funded by FAPESP. Luiz de Queiroz College of Agric. of Univ. of Sao Paulo, Brazil, and UNL. Graduated in May 2017.
14. Debalin Sarangi (*graduate committee member*). Water use of glyphosate-resistant weed species. Dept. of Agron. & Horticulture, UNL. Graduated in August 2016.
15. Brian T. Krienke (*graduate committee member*). Assessing factors influencing maize yield response to nitrogen using remote sensing technologies. Dept. of Agron. & Horticulture, UNL. Graduated in May 2016.
16. Daran Rudnick (***major advisor***). Maize evapotranspiration, stomatal resistances, crop water productivity, and economic analysis for various nitrogen fertilizer rates. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2015.
17. Nick Ward (*graduate committee member*). Variable nitrogen management. Dept. of Agron. & Horticulture, UNL. Graduated in August 2015.
18. Babak Safa (*graduate committee member*). Net ecosystem exchange (NEE) simulation in maize using artificial neural networks. Dept. of Agron. & Horticulture, UNL. Graduated in August 2015.
19. Vivek Sharma (***major advisor***). Remote sensing for the assessment and quantification of evapotranspiration. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL Graduated in Dec. 2014.
20. Xin Dong (*graduate committee member*). Underground-wireless sensors network. Dept. of Computer Science and Engineering. Dept. of Computer Sci. and Eng., UNL Graduated in December 2013.
21. Ryan Rapp (*graduate committee member*). Strategies for controlling invasive weed species. Dept. of Agron. & Horticulture, UNL. Graduated in December 2011.
22. Denis Mutiibwa (***major advisor***). Identifying the changes in climatic trends and fingerprints in land use/landcover change in the High Plains of the USA. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL Graduated in August 2011.
23. Isa Kabenge (***major advisor***). Surface energy fluxes and stomatal and canopy resistance of Phragmites-dominated cottonwood and willow plant communities in the Platte River Basin in central NE. Funded 50% from my grant and 50% departmental funding. Dept. of Biol. Sys. Eng., UNL Graduated in May 2011.
24. Koffi Djaman (***major advisor***). Evapotranspiration, crop coefficients, and yield relationships for maize under full and deficit irrigation settings. Fulbright Scholarship (2008-2009) and funded 100% from my research grant (2010-2011). Dept. of Biol. Sys. Eng., UNL Graduated in December 2011.
25. Ramesh Singh (*graduate committee member*). Application of satellite remote sensing techniques to estimate surface energy fluxes. Dept. of Biol. Sys. Eng., UNL Graduated in May 2009.
26. Nathan Utt (***major advisor***). Halted his Ph.D. program after the second year due to family challenges.
27. Octavio Lagos (***co-advisor***). Watershed scale modeling of water and energy balance. 100% grant funded. Dept. of Biol. Sys. Eng., UNL Graduated in December 2008.
28. Akwasi Abunyewa (*graduate committee member*). Skip row for efficient utilization of nitrogen and water for grain sorghum production. Dept. of Agron. & Horticulture, UNL. Graduated in December 2008.

4.1.3. MS STUDENTS IN PROGRESS

1. Matt Drudik (***major advisor***). *Soybean evapotranspiration and productivity response to different planting date, population density and variety*. Dept. of Agronomy and Horticulture, UNL.

4.1.4. MS STUDENTS COMPLETED

1. Varshini Kumanan (*graduate committee member*). *Variability and drivers of system-level nitrogen use efficiency and surplus across conterminous United States*. Dept. Agricultural and Biological Eng., Penn State. Graduated in May 2024.
2. Kelly Kosiarski (*graduate committee member*). *From wastewater to feed: Understanding the occurrence of PFAS in crops irrigated with reclaimed wastewater.* Dept. Agricultural and Biological Eng., Penn State. Graduated in May 2024.
3. Sevgi Saylak (***co-advisor***). *Characterization of salt and drought tolerance in sunflowers*. Dept. of Agronomy and Horticulture, UNL. Graduated in January 2022.
4. Suresh Pradhyun Kashyap (*graduate committee member*). *High-frequency unmanned aircraft flights for crop canopy imaging during diurnal moisture stress*. Dept. of Biol. Sys. Eng., UNL Graduated in December 2021.
5. Jasmine Mausbach (***co-advisor***). Evaluating evapotranspiration and management of glyphosate-resistant palmer amaranth (*Amaranthus Palmeri S*. Watson). Dept. Agron. and Hort., UNL. Graduated in Dec. 2021.
6. Trevor Hinn ***(major advisor)***. *Soybean productivity, soil-water, evapotranspiration and water use efficiency response to variable and fixed (uniform) rate irrigation management*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2020.
7. Isabella Presotto Possignolo (*graduate committee member*). *Irrigation scheduling using canopy temperature*. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2020.
8. Kiran Sharma ***(major advisor)***. *In-field soil moisture sensor performance of various FDR and TDR-type sensors in coarse- and fine-textured soils*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL Graduated in May 2019.
9. Sahil Sharma (***co-advisor***). *Use of long-term weather data and spatially delineated field attributes to predict water and energy conservation from variable rate irrigation*. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2018.
10. Emily O'Donnel (*graduate committee member*). *Irrigation management, environment and profits*. Dept. of Agric. Economics, UNL. Graduated in August 2018.
11. Putri Sukmahartati (*graduate committee member*). *Hydrologic analyses using soil classifications in Indonesia*. Department of Civil and Environmental Engineering, UNL. Graduated in December 2017.
12. Rigoberto Wong (*graduate committee member*). *Irrigation control system using soil information transmitted wirelessly from underground nodes to a moving gateway*. Dept. Comp. Sci. and Eng., UNL. Graduated in August 2017.
13. Matt J. Nelson (*graduate committee member*). *Impact of using spatially distributed soils information on flood hydrograph simulation with HEC-HMS*. Civil Eng. Dept., UNL. Graduated in May 2017.
14. Kevin Achieng (***major advisor***). Evapotranspiration estimation in the Middle Republican NRD (left to Montana State Univ. before finishing his MS). 2017. Dept. of Biol. Sys. Eng., UNL.
15. Nuwan Wijewardane (*graduate committee member*). *Development of multi-sensor for soil organic carbon measurements*. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2016.
16. Clint Aegerter (*graduate committee member*). *Modeling and satellite remote sensing of the meteorological impacts of irrigation*. Earth and Atmospheric Sciences, UNL. Graduated in August 2016.
17. Rupinder Sandhu (***major advisor***). *Soybean productivity response to water under different population densities and irrigation levels*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2016.
18. Zhu Yan (***major advisor***). *Soil moisture sensor performance.* Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2016.
19. Meetpal Kukal (***major advisor***). *Long-term spatio-temporal analyses of maize and soybean evapotranspiration and water productivity in the Great Plains*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in December 2015.

20. Justin Gibson (*graduate committee member*). *Quantification of recharge rates of agricultural fields*. Funded 100% from my research grant. Dept. of Earth and Atmospheric Sciences, UNL. Graduated in Dec. 2015.
21. Dilshad Brar (***co-advisor***). *Conservation of energy using variable frequency drive for center pivot irrigation systems in Nebraska*. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2015.
22. Gustavo Bosch Rubia (*graduate committee member*). *Land use and water and soil management impacts on groundwater recharge in loess regions of south central Nebraska*. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2015.
23. Vasudha Sharma ***(major advisor).*** *Soil-water dynamics, evapotranspiration, and single and basal crop coefficients of cover crop mixtures in seed maize-cover crop rotation fields*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2014.
24. Andrew Volkmer (*graduate committee member*). *Quantification of surface run-off from tilled and untilled fields*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2014.
25. Alister Bryson. *Irrigation practices influence on West Nile Virus of Great Plains Ecosystems*. Medical and Veterinary Entomology. Dept. of Entomology, UNL. Graduated in May 2014.
26. Maria G. Arellano (***major advisor***). *Evaluation of combination-based energy balance, temperature and radiation-based reference (potential) evapotranspiration equations in different climates*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in December 2013.
27. Ali T. Mohammed (***major advisor***). *Yield and water use efficiency response of drought-tolerant and conventional maize hybrids under different irrigation levels and populations in different climatic gradients*. Dept. of Biol. Sys. Eng., UNL. Graduated in December 2013.
28. Daran Rudnick ***(major advisor).*** *Impact of water and nitrogen management on maize productivity and development of new nitrogen water use efficiency index*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2013.
29. Michael McKinney (*graduate committee member*). *Tillage management impacts on surface soil hydrologic properties*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in Aug. 2012.
30. Vivek Sharma ***(major advisor).*** *Quantification of net irrigation requirements and application of GIS and geographically-weighted regression to evaluate spatial non-stationarity relationships between precipitation vs. irrigated and rainfed maize and soybean yields*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2011.
31. Isaac Mortensen (*graduate committee member*). *Optimization of deficit irrigation*. Graduated in May 2011. Dept. of Biol. Sys. Eng.
32. Jessica Deck (*graduate committee member*). *Measurement of surface run-off and infiltration for tilled and untilled fields*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in Dec. 2010.
33. Venkata Mannam (*graduate committee member*). *Weed water uptake dynamics*. Dept. of Agron. & Horticulture, UNL. Graduated in December 2010.
34. Michael Burgert ***(major advisor).*** *Large scale implementation of irrigation management tools/strategies for maize*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in May 2009.
35. Pari Ranade (*graduate committee member*). *Developing irrigation management decisions using a functional crop growth model*. School of Natural Resources, UNL. Graduated in May 2009.
36. Denis Mutiibwa ***(major advisor).*** *Scaling-up leaf stomatal resistance to canopy resistance using photosynthetic photon flux density*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng., UNL. Graduated in December 2007.
37. Travis Yonts (*graduate committee member*). *Modeling hydrology of conservation terraces*. Dept. of Biol. Sys. Eng., UNL. Graduated in August 2006.

4.1.5. INTERNATIONAL AND NATIONAL UNDERGRADUATE INTERN STUDENTS

1. Raissa Urujeni (May 5 - July 30, 2018). Rwanda Undergraduate Internship Program, Rwanda.
2. Jean Claude Irakudunda (May 2017-August 2017). Rwanda Undergraduate Internship Program, Rwanda.
3. Christian Uwineza (May 2017-August 2017). Rwanda Undergraduate Internship Program, Rwanda.
4. Sean Krebs (May 2017-current). UNL Biological Systems Engineering. Nebraska.
5. Trevor Hinn (May 2016-current). UNL Biological Systems Engineering. Nebraska.
6. Maria (Zhao) Bin (July-August, 2015) Northwest Agricultural and Forestry University, China
7. Kevin (Zhou) Zou (July-August, 2015) Northwest Agricultural and Forestry University, China
8. Caroline Salles (Brazil-May –September, 2015)
9. Arthur Santos (Brazil-May-August 2015)

10. Liza Freitas (Brazil-May – September, 2014)
11. Danielle Pessoa Cordeiro (Brazil-May – September, 2014)
12. Chunshan Hu (China-Northwest Agriculture and Forestry Univ., 2 months, 2013)
13. Gao Yujing (China-Northwest Agriculture and Forestry Univ., 2 months, 2013)
14. Henrique Castro (Brazil- College of Agric., Luiz de Queiroz, Univ. of Sao Paulo - Brazil, 3 months, 2013)
15. Lucas R.L. Vaz (Brazil- Universidade Dederal De Minas Gerais, Instituto De Ciências Agrárias, 2013)
16. Shen Changyue (China-Northwest Agriculture and Forestry Univ., 3 months, 2012)
17. Wang Xiaowen (China-Northwest Agriculture and Forestry Univ., 3 months, 2012)
18. Liao Zhihao (China-Northwest Agriculture and Forestry Univ., 3 months, 2012)
19. Zhu Yan (China-Northwest Agriculture and Forestry Univ., 3 months, 2012)
20. Chen Xi (China-Northwest Agriculture and Forestry Univ., 3 months, 2012)

4.1.6. HONOR UNDERGRAUATE STUDENTS AND SENIOR DESIGN PROJECT STUDENTS

1. C. Wei-Jian (***major advisor***). *UV inactivation of salmonella*. Dept. of Biol. Sys. Eng. 2007-2008.
2. Michael Schaal (***major advisor***). *High pressure processing*. Dept. of Biol. Sys. Eng. 2009-2010.
3. Robert Wilson (***co-advisor***). Evaluation of soil moisture sensors utilized in the NRCS-SCAN program. Dept. of Biol. Sys. Eng. 2009-2010.

4.1.7. FORMER STUDENTS AND POST-DOCS SUPERVISION/ADVISING AND THEIR CURRENT EMPLOYMENTS

1. Ali T. Mohammed, former MS and Ph.D. student and post-doc. Supervised from 5/2020 to current. Supported 100% from my grants (**faculty member** at the University of Arizona).
2. Meetpal S. Kukal, former MS and Ph.D. student and post-doc. Supervised from 5/2019 to current. Supported 100% from my grants (**faculty member** at the University of Idaho).
3. Rupinder Sandhu, former MS and Ph.D. student and post-doc. Supervised from 12/2019 to 07/2020. Supported 100% from my grants (Bayer Crop Science).
4. Vasudha Sharma, former MS and Ph.D. student. Supervised from 04/2012 to 05/2018. Funded 100% from my grants from 2012 to 2018 (**faculty member** at the University of Minnesota).
5. Lameck Odhiambo, former post-doc and research assistant and assoc. professor. Supervised from 07/2008 to 09/2016. Funded 100% from my grants from 07/2008 to 09/2016 (**faculty member** at UNL).
6. Vivek Sharma, former MS and Ph.D. student and post-doc. Supported 100% from my grants. Supervised from 12/2014 to 4/1/2016 (**faculty member** at the University of Florida).
7. Dilshad Brar, Research Technologist. Supported 100% from my grants. Supervised from 2015 to 2016.
8. Jyoti Padhi, post-doc. Supported 100% from my grants. Supervised from 7/2014 to 08/2015 (**faculty member** at KIT University, India).
9. Daran R. Rudnik, former MS and P.D. student. Supported 100% from my grants (**faculty member** at Kansas State University).
10. Matt Drudik, Research Technician. Supported 100% from my grants. Supervising from 04/2014 to current.
11. Adriano Diotto, former Ph.D. student and post-doc. Supported 100% from my grants. Supervised from 05/2013 to 12/2015 (**faculty member** at University of Lavras-UFLA, Brazil).
12. Ed Barnes, Research Technician. Supported 100% from my grants. Supervised from 05/2013 to 05/2015.
13. Isa Kabenge, former Ph.D. student (**faculty member** at the Makerere Univ., Uganda).
14. Denis Mutiibwa, former MS and Ph.D. student and post-doc. Supported 100% from my grants. Supervised from 08/2011 to 01/2013 (scientist at the USDA-Beltsville, Maryland).
15. Koffi Djaman, former Ph.D. student and post-doc. Supported 100% from my grants. Supervised from 12/2011 to 12/2013 (**faculty member** at New Mexico State University).
16. William Rathje, Research Technician: Supported 50% from my grants. Supervised from 04/2004 to 01/2013.
17. Jessica Torrion, Former Research Assistant Professor. Supported 100% from my grants. Supervised from 4/2013 to 01/2014 (**faculty member** at Montana State University).
18. Gaby Arellano, former MS student. Research Technologist. Supported 100% from my grants. Supervised from 06/2007 to 05/2009 (Western Landroller-Flowserve Pump Division, Hastings, NE).
19. Octavio Lagos, former Ph.D. student (**faculty member** at the Universidad de Concepcion, Chile).
20. Mike Burgert, former MS student. Research Technologist. Supported 100% from my grants. Supervised from 06/2007 to 05/2009 (USDA-NRCS).

21. Kari Skaggs, Research Technologist. Supported 100% from my grants. Supervised from 06/2009 to 01/2014 (Nebraska State Government).
22. Sumantra Chatterjee, post-doc. Supported 100% from my grants. Supervised from 09/2009 to 04/2013.
23. Christopher H. Hay, post-doc. Supported 100% from my grants. Supervised from 07/2007 to 07/2009 (**faculty member** at South Dakota State Univ.).

5. PROFESSIONAL SERVICE ACCOMPLISHMENTS

5.1. PROFESSIONAL SERVICE FOR FEDERAL AND STATE AGENCIES

5.1.2. SERVICE AS PROFESSIONAL AND SCIENTIFIC EXPERT

1. Worked as a scientific expert in a United States Supreme Court multi-state litigation case for two years related to water resources, agricultural crop production, irrigation engineering, and related topics.
2. Worked on a panel with one of the NE Natural Resources Districts on irrigation water allocation program.
3. Served as a Scientific Expert with the USDA Office of Scientific Quality Reviews for reviewing and evaluating USDA ARS 5-year research programs.

5.1.3. PEER-REVIEW OF REFEREED JOURNAL PUBLICATIONS

1. Nature Scientific Reports, 2011- present
2. Journal of Applied Meteorology and Climatology, 2005- present
3. Water Resources Research, 2005-present
4. Agricultural and Forest Meteorology, 2006-present
5. Transactions of the ASABE, 2001- present
6. Journal of Irrigation and Drainage Engineering, 2002- present
7. Applied Engineering in Agriculture, 2001- present
8. Agricultural Water Management, 2002- present
9. Irrigation Science, 2003- present
10. Great Plains Research, 2006- present
11. Agronomy Journal, 2000- present
12. Acta Horticulturae, 2005-present
13. Soil Science Society of American Journal, 2003-present
14. Biosystems Engineering, 2006-present
15. Journal of Hydrology, 2005-present
16. Hydrology Research, 2009-present
17. Applied Geography, 2009-present
18. Atmospheric Environment, 2010-current

5.1.4. PEER-REVIEWER/PANELIST OF SCIENCE AND RESEARCH PROPOSALS

1. American Association for the Advancement of Science (AAAS) and AAAS-GIST Tech-I, 2009-present
2. National Science Foundation (NSF), Hydrologic Sciences Program, 2008-present
3. NASA Scientific Proposals Review Panels, 2008-present
4. NASA Post-doctoral Proposal Review Program Panel, 2012-current
5. USDA-AFRI, 2011-present
6. USDA Office of Scientific Quality Review (OSQR), 2010-current.
7. Global Center for Food Systems Innovation (GCFSI), 2015-present
8. US Department of State and Israel Binational Agricultural Research and Development Fund Program
9. European Science Foundation
10. Kansas EPSCOR
11. Israel Ministry of Science and Technology (2015-prsent)
12. USDA-CSREES National Research Institute, 2005-present
13. United States Geological Survey (USGS), 2006-present
14. United States Environmental Protection Agency (EPA), 2008-present
15. NE Department of Natural Resources Integrated Management Plan proposals, 2005-present
16. USDA Agricultural Research Service proposals, 2005-present.

17. Netherlands Scientific Research Council, 2009-present
18. Czech Science Foundation, Advancement of Science and Research Program, 2009-present.

5.1.5. PROMOTION AND TENURE COMMITTEE EXTERNAL REVIEWER

Iowa State, Michigan State, University of California-Davis, Virginia Tech, North Carolina State, Texas A&M University, University of Minnesota, Mississippi State, Colorado State, Purdue University, University of Illinois-Urbana Champaign, University of Florida, University of Georgia, University of Oklahoma, Utah State University, Indian Institute of Technology-Madras.

5.1.6. ACADEMIC PROGRAM REVIEW

1. University of Minnesota, University of Arizona.

5.2. TESTIMONY BEFORE FEDERAL AND STATE GOVERNMENTS and UNITED STATES SUPREME COURT

1. **Irmak, S.** December 6, 2016. Testified before NE Natural Resources Districts on irrigation water allocation program (invited). *Davenport, NE*. 40 people.
2. **Irmak, S.** February 8, 2016. Testified at the US Congress (US Senate) (invited). Role of technology in enhancing agricultural practices and productivity. US Capitol Hill. *Washington, DC.* 13 people.
3. **Irmak, S.** February 8, 2016. Testified at the US Congress (US House of Representatives) (invited). Irrigation and water resources and agricultural productivity and future potential emerging issues in US agriculture. US Capitol Hill. *Washington, DC.* 83 people.
4. **Irmak, S**. November 10, 2016. Testified before the NE State Legislators (LR 455) (invited). Change in climate variables impact on agriculture and water resources. NE State Capitol. *Lincoln, NE.* 20 people.
5. **Irmak, S.** December 14, 2016. Retained as a Scientific Expert in a United States Supreme Court multi-state litigation case on water resources, irrigation, and agricultural crop production.
6. Vuran, M., X. Dong and **S. Irmak**. October 7, 2013. Testified before the NE State Legislators (invited). Wireless underground sensor network for autonomous irrigation. State Capitol. *Lincoln, NE.* 55 people.
7. **Irmak, S.** November 28, 2012. Testified before the Unicameral Natural Resources Committee Senators and Staff Members (invited). Technology implementation in agriculture and NAWMN for enhancing crop water productivity. NE State Senate. *Lincoln, NE.* 50 people.
8. **Irmak, S.** February 20, 2007. Testified before the NE State Natural Resources Committee on upcoming legislative hearings on water resources bills (LB701 and LB493) (invited). *Lincoln, NE.* 15 people.

5.2.1. LEADERSHIP AND MEMBERSHIP IN NATIONAL/INTERNATIONAL PROFESSIONAL ORGANIZATIONS

1. PA Academy of Science (PAS) (2026-current)
2. The Council for Agricultural Science and Technology (2021-current)
3. Chair of the ASABE International Evapotranspiration Symposium (04/2018-11/30/2022).
4. Organizing Committee for the 1st International Biosystems Engineering Congress (09/2019) (Hatay, Turkiye)
5. Organization Committee for the 3rd Food and Agriculture Policy Conference (11/2019) (Adana, Turkiye)
6. ASABE Global Water Security Conference Leadership and Planning and Organizing Committee Co-Chair (2017-2018) (Hyderabad, India).
7. American Association for the Advancement of Science (AAAS) (2016-current).
8. Associate Editor, Soil and Water Division, ASABE (2013-2018).
9. Organizer of hybrid evapotranspiration session in the ASABE Annual Conference (2015).
10. Served as a scientific and technical member of the National Water Resources Working Group in 2013 and 2014. This national group developed a report titled “National Initiative on the Improvement of U.S. Water Security” that was approved by the National Association of State Universities and Land-Grant Colleges Research Directors. Developed a strategy for enhancing how Land Grant Institutions can help USDA, the Board on Agriculture Assembly [by way of the Policy Board of Director’s Budget and Advocacy Committee (BAC)] created an ad hoc national Working Group on Water Resources in Fall 2013. The members of the National Working Group developed recommendations for how Land Grant Institutions can best address U.S. Water Security (water quantity and quality issues) following their tripartite mission of research, education and Extension.

11. Planning committee for the ASABE International Evapotranspiration Symposium (2014).
12. Chair-elect. ASABE SW-244 Irrigation Management Committee. (07/2013-current).
13. Member and Chair of the M-114 New Holland Young Researcher Award Selection Committee- American Society of Agricultural and Biological Engineers (ASABE) (08/2010-09/2012).
14. ASABE-Gunlogson Design Competition Judge (2012-current).
15. ASABE Fountain Wars Judge (2013-current)
16. Young Extension Professional Award Committee (08/2010-2012).
17. Chair-elect (2009) and state of Nebraska representative for the WERA-202, Western Regional Committee on Use of Climate Information in Irrigation Scheduling (05/2004-06/2021).
18. Chair-elect: American Society of Civil Engineers, Environmental and Water Resources Institute (ASCE-EWRI) Evapotranspiration in Irrigation and Hydrology Task Committee (2007-2009).
19. ASCE-EWRI Standardization of Reference Evapotranspiration and Crop Coefficient Task Committees (10/2001-present).
20. Nebraska representative for the Regional Committee W-2128 on Microirrigation for Sustainable Water Use. (06/2009-06/2021).
21. ASABE-SW-244/Standardization Committee for ASAE EP505 Weather Station Instrumentation and Measurement and Reporting Practices for Automated Weather Stations (07/2007-current).
22. ASABE-SW-241 Sprinkler Irrigation Committee (05/2008-current).
23. ASABE-SW-242 Surface Irrigation Committee (05/2008-current).
24. ASABE-SW-245 Microirrigation Committee. May 2007-current).
25. Vice Chair: Am. Soc. of Civil Engineers, Environmental and Water Resources Institute (ASCE-EWRI) Irrigation in Hydrology Task Committee on Standardization of Reference Evapotranspiration. (2005-2007).
26. Secretary-elect: Am. Soc. of Civil Engrs., Environmental and Water Resources Institute (ASCE-EWRI) Irrigation in Hydrology Task Comm. on Standardization of Reference Evapotranspiration (2004-2007).
27. American Society of Agricultural and Biological Engineers (ASABE) (1997-current).
28. Assistant Judge of the ASABE Educational Award Competition (2006- current).
29. American Society of Civil Engineers (Full member) (2002-current).
30. United States Committee on Irrigation and Drainage (USCID) (2002-present).
31. Registered Professional Engineer of Turkish Society of Agricultural Engineers (1992-present).
32. Nebraska section of the ASABE (12/1/2004-06/2021).

5.3. UNIVERSITY SERVICE

5.3.1. LEADERSHIP and MEMBERSHIP

1. UNL Consortium for Integrated Translational Biology Leadership Committee Chair (07/2019-06/2021).
2. College of Engineering Research Committee (11/2018-06/2021).
3. College of Engineering Promotion and Tenure Committee (07/2018-09/2019).
4. BSE Department Extension Committee (07/2019-06/2021).
5. BSE Department Awards Committee (07/2019-08/2020).
6. BSE Dept. Facilities Committee (01/2018-07/2019).
7. BSE Graduate Committee (04/2006-06/2021).
8. Heuermann Lecture Speaker Selection Advisory Committee (1/2017-01/2019).
9. UNL Water Center Advisory Committee (07/2016-06/2021).
10. Lead Nebraska Representative for the North Central Region Water Network; Administrative Council and Executive Committee (06/2016-10/2019).
11. Chair of the Biological Systems Engineering Dept. Promotion and Tenure Committee (07/2015-12/2017).
12. Kermit Wagner Distinguished Professorship selection committee (2016).
13. UNL-IANR Vice Chancellor Search and Advisory Committee (09/2016-12/2016).
14. UNL Police Department-Campus Security Authority (01/2014-06/2021).
15. UNL Water Website Committee (responsible for agricultural water management) (2014-06/2021).
16. BSE Steering Committee (07/2015-06/2021).
17. Member and Secretary of the Biol. Sys. Eng. Dept. Promotion and Tenure Committee (10/2012-07/2015).
18. Irrigation Efficiency Issue Team (01/2010-06/2021)
19. UNL-IANR Consortium for Integrated Translational Biology (CITB) Leadership Team member (09/2014-06/2021) and vice chair (09/2017-06/2021).
20. UNL-IANR Phenotyping Research Facility Committee (09/2014-2021).

21. UNL Long-Term Agricultural Research (LTAR) Committee (2013-2021).
22. UNL Senate Executive Committee (05/2011-05/2012).
23. Founder, Agricultural Water Management Network (AWMN).
24. Founder, Nebraska Water and Energy Flux Measurement, Modeling and Research Network (NEBFLUX).
25. Faculty advisor for the Turkish Student Association (01/01/2011-12/31/2012).
26. Nebraska On-Farm Research Network Advisory Committee (02/2012-2021).
27. Elected to the UNL Faculty Senate Executive Committee (04/2011-04/2012).
28. Senator-elect for the UNL Faculty Senate (04/2010-05/2011).
29. IANR Outstanding Employee Award Committee faculty representative (01/2006-10/2008).
30. Member of Search and Advisory Committees to hire tenure-track faculty, administrators and full-time staff.
31. Member of the BSE Graduate Faculty (12/1/2003-06/30/2021).
32. University of Nebraska-Lincoln Extension Association (NCEA) (04/2005-06/2021).

6. OTHER ACCOMPLISHMENTS

6.1. MEDIA REPORTS

6.1.1. PRESS RELEASES ON RESEARCH AND EXTENSION

1. SCAL Field Day Discussion. Pure Nebraska-1011 NOW. KOLN/KGIN TV. August 21, 2018.
2. Irrigation management strategies (radio interview), KRVN, August 27, 2008. York, NE.
3. Evapotranspiration. *High Plains Journal-Nebraska and South Dakota Edition*. August 18, 2008.
4. Evapotranspiration measurement for water management. *The North Platte Telegraph*. August 10, 2008.
5. Evapotranspiration measurement is key to irrigation management. *McCook Daily Gazette*. August 7, 2008.
6. Subsurface drip irrigation management. Market Journal. August 6, 2008, Clay Center, NE.
7. Agricultural Water Management Network, IANR-Market Journal radio interview, May 5, 2008. Lincoln, NE.
8. Irrigation and energy conservation. High Plains/Midwest Ag. Journal, September 22, 2007.
9. New irrigation strategy saves fuel and money, KHAS-TV News, September 4, 2007.
10. Apogee Infrared Thermometers (IRTs) have been used by Dr. S. Irmak, of the University of Nebraska-Lincoln, in his Crop Water Stress Index (CWSI) research. Apogee Inst., Inc., Logan, Utah, August, 2007.
11. Nebraska Corn Board and UNL partners in water management research, NTV Nebraska-TV, July 25, 2007.
12. Irrigation research at the South Central Agricultural Laboratory, KHAS-TV News 5, June 12, 2007.
13. Central Plains Irrigation Conference Addresses Current Water Issues, February 2007.
14. Sensors, gauges provide irrigator confidence for water management. UNL-IANR Connect, August 2006.
15. Irrigation and Energy Conservation Field Day Offered at UNL's ARDC near Mead, August, 2006.
16. Subsurface drip irrigation: Installation at the South Central Agricultural Laboratory. November 6, 2004. Published as a video clip in Market Journal, UNL Extension.
17. Results from first year of subsurface drip irrigation and crop water use measurements. June 19, 2004. Published as a video clip in Market Journal, University of Nebraska-Lincoln Extension.

7. INTERNATIONAL PROGRAMS/ACTIVITIES

A total of 38 international programs and activities with Netherlands, South Korea, India, China, Turkiye, Brazil, Argentina, Sweden, France, Vietnam, Australia, Iraq, Honduras, Chile and participated as an advisor in the Fulbright Global Food Security Program with 77 Fulbright students from 50 countries. Descriptions and date of each activity are available, if needed.

8. GRANTS

Obtained $13+ million research and education grants (including from USDA, NSF, EPA) mostly as a PI. The list of grant titles, funding agency, amount, etc. are available, if needed.

9. REFEREED JOURNAL ARTICLES/BOOK CHAPTERS REVIEWED FOR SCIENTIFIC JOURNALS/BOOKS

Reviewed over 350 refereed journal articles and numerous books and book chapters as a service to the scientific community.

10. EXTERNAL TECHNICAL/SCIENTIFIC PROPOSALS REVIEWED

Reviewed over 250 scientific, research, and educational proposals for AAAS, NSF, USDA, EPA, USGS, FFAR, NASA, and other national and international institutions.

11. TECHNICAL/SCIENTIFIC/RESEARCH PRESENTATIONS

A total of 550 scientific/research and educational/outreach presentations. The location, title, date, program/conference/meeting name, and the number of participants for each presentation are available, if needed.