SUAT IRMAK, Ph.D., P.E., F. AAAS; F. ASABE; F. ASCE-EWRI
Professor and Department Head
The Penn State University, Department of Agricultural and Biological Engineering
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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 and Department Head, The Penn State University, Department of Agricultural and Biological Engineering (July 1, 2021-current)
- Harold W. Eberhard Distinguished Professor, University of Nebraska (UNL) (01/01/2013-June 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)
- Leadership Resources-Leadership Program Graduate (02/01/2020-08/30/2020)
- LEAD-21 Leadership Program Class 13 Graduate (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 Eng. Dept., University of Florida (06/1996- 09/1998)
- Research and Teaching Assistant, Agric. Structures and Irrigation Eng. Dept., 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

1.1.1. PUBLISHED REFEREED JOURNAL ARTICLES

1. 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.

2. **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. *Journal of Natural Resources and Agricultural Ecosystems*. 3(3):101-120. https://doi.org/10.13031/jnrae.16332.
3. **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.
4. **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.
5. **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.
6. **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.
7. 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.
8. Irmak, S., **S. Irmak** and J. Kaur. 2025. Sprayable bio-based polymer conserved soilwater, 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.
9. 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.
10. **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.
11. **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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.

19. 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.
20. 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.
21. **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.
22. **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.
23. **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.
24. **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.
25. 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.
26. 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.
27. 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.
28. 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*. 2023:1-18. https://doi.org/10.1002/agj2.21247.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. **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.
36. **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.
37. **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.

38. **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.
39. **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.
40. **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.
41. **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.
42. 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.
43. 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.
44. 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.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. 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.
51. 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.
52. **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.
53. **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.
54. 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.
55. 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.

56. 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.
57. 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.
58. 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.
59. 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.
60. 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.
61. Wei-Zhen, L., 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.
62. 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.
63. 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.
64. 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.
65. 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.
66. 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.
67. 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.
68. 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.
69. 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.
70. 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.
71. 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.

72. 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.
73. 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.
74. 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.
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1.1.8. 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 feet. 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-agron0.unl.edu/cornsoywater/.

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

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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.

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

Irmak, Suat: *h Index* = 69; i_{10} *Index* = 229. A total of 67,000 downloads with 5,860 metadata page hits by 5,343 national and international institutions in 181 countries (Fig. 1) with 3,343 referrers for only those listed in Google Scholar with 16,354 citations.

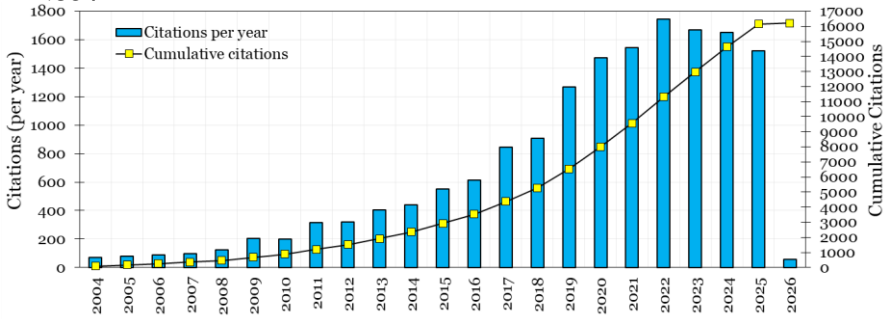

Figure 1. Annual total and cumulative citations (June 15, 2004-January 5, 2026) of my papers by national and international scientific, research, education and government institutions (Source: Google Scholar).

1.2. AWARDS/HONORS/RECOGNITION

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

1. **"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/surface energy balance, climate science, agricultural science, technology transfer to citizens, and for educating next generation scientists. Washington, DC, June 7, 2025.

2. **"ASABE PRESIDENTIAL CITATION"** honors individuals for making outstanding contributions and providing leadership to the American Society of Agricultural and Biological Engineers (ASABE). Anaheim, CA. July 31, 2024.

3. **"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.

4. **"Top Viewed Article"** among scientific work published in Irrigation and Drainage (Wiley) between January 1, 2023 and December 31, 2023, for the article titled "*Soybean crop coefficients under different seeding rates and full and limited irrigation and rainfed management*."

5. **"**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.

6. **"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.

7. **"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.

8. **"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.

9. **"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 (virtual).

10. **"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.

11. **"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.

12. **"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 (virtual).

13. **"2021 ASABE STANDARDS DEVELOPMENT AWARD"** (New Standard). ANSI/ASABE S627 NOV2020, Weather-Based Landscape Irrigation Control Systems. July 17, 2021 (virtual).

14. **"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.

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

16. **"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.

17. **"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.

18. **"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.

19. **"2019 UNIVERSITIES COUNCIL ON WATER RESOURCES EDUCATION AND PUBLIC SERVICE AWARD**" for the North Central Region Water Network. June 4, 2019.

20. **"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.

21. **"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.

22. **"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.

23. **"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.

24. **"2018 ASABE EDUCATIONAL BLUE RIBBON AWARD"** for Agricultural Water Management Network (NAWMN) Educational Website. July 30, 2018. Detroit, MI.

25. **"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.

26. **"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.

27. "**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.

28. **"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.

29. **"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.

30. **"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.

31. **"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.

32. **"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.*

33. **"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.*

34. **"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.

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

36. **"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.

37. **"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.

38. "**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.

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

40. "**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.

41. "**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.

42. "**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.

43. "**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.

44. "**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.

45. "**2014 ASABE JOHN DEERE GOLD MEDAL AWARD**" presented by the American Society of Agricultural and Biological Engineers (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***).

46. "**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***).

47. "**2014 ASABE SUPERIOR PAPER AWARD**" presented by the American Society of Agricultural and Biological Engineers (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.

48. "**EXCELLENCE IN MULTISTATE RESEARCH AWARD**" Presented by the Western Association of Agricultural Experiment Station Directors and U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) and the Experiment Station Committee on Organization and Policy for the outstanding progress and impacts of the Regional Committee W2128 Microirrigation for Sustainable Water Use. The award was given to one committee out of 200 national committees. July 13, 2014, Lake Tahoe, NV.

49. **"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.

50. **"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.

51. "**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.

52. **"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.

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

54. **"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.

55. **"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.

56. **"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.

57. **"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***.

58. **"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.

59. **"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.

60. **"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.

61. **"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.

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

63. **"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.

64. **"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.

65. **"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.

66. **"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.

67. **"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.***

68. **"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.

69. **"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.

70. **"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.

71. **"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.

72. **"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.

73. 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.

1.2.2. 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.

3. TEACHING AND HIGHER EDUCATION ACCOMPLISHMENTS

3.1. GRADUATE STUDENTS

3.1.1. PH.D. STUDENTS IN PROGRESS (Major Advisor)

1. Aysan Ezati (***major advisor***). Topic TBD. Dept. Agricultural and Biological Engineering, Penn State.

3.1.2. PH.D. STUDENTS IN PROGRESS (Graduate Committee Member)

1. Fan Wu. Dissertation topic TBD. Department of Meteorology and Atmospheric Science, Penn State.

3.1.3. 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, 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. Graduated in December 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. 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. 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. 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. 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. Graduated in May 2018.
9. Parminder Chahal (graduate committee member). Water stress and water uptake of various weed species. Dept. of Agron. & Hort. 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. Graduated in December 2017.
11. Angela Bastidas (graduate committee member). Inter-seeding cover crops in a corn system. Dept. of Agron. & Horticulture. Graduated in December 2017.
12. Maxwel Oliveira (graduate committee member). Efficacy of weed control methods. Dept. of Agron. & Horticulture. Graduated in December 2017.
13. Bruno Patias Lena (***co-advisor***). Evapotranspiration and crop coefficient of Jatropha. Funded by FAPESP. Luiz de Queiroz College of Agric. of University of Sao Paulo, Brazil. Graduated in May 2017.
14. Debalin Sarangi (graduate committee member). Water use of glyphosate-resistant weed species. Dept. of Agron. & Horticulture. 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. 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. Graduated in August 2015.
17. Nick Ward (graduate committee member). Variable nitrogen management. Dept. of Agron. & Horticulture. 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. Graduated in August 2015.
19. Vivek Sharma (***major advisor***). Remote sensing approach for the assessment and quantification of evapotranspiration. Funded 100% from my research grant. Dept. of Biol. Sys. Eng. 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. Graduated in December 2013.
21. Ryan Rapp (graduate committee member). Strategies for controlling invasive weed species. Dept. of Agron. & Horticulture. 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. 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. 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. 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. 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. 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. & Hort. Graduated in December 2008.

3.1.4. MS STUDENTS IN PROGRESS (Major Advisor)

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

3.1.5. MS STUDENTS IN PROGRESS (Graduate Committee Member)

3.1.6. MS STUDENTS COMPLETED (Major Advisor)

1. Sevgi Saylak (***co-advisor***). *Characterization of salt and drought tolerance in sunflowers*. Dept. of Agronomy and Horticulture. Graduated in January 2022.
2. Jasmine Mausbach (***co-advisor***). Evaluating evapotranspiration and management of glyphosate-resistant palmer amaranth (*Amaranthus Palmeri S*. Watson). Dept. Agron. and Hort. Graduated in Dec. 2021.
3. 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. Graduated in May 2020.
4. 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. Graduated in May 2019.
5. 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. Graduated in August 2018.
6. 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. Graduated in May 2016.
7. Zhu Yan (***major advisor***). *Soil moisture sensor performance*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng. Graduated in May 2016.
8. Kevin Achieng (***major advisor***). Evapotranspiration estimation in the Middle Republican NRD (left to Montana State Univ. before finishing his MS.). 2017.
9. 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. Graduated in December 2015.
10. 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. Graduated in August 2014.
11. 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. Graduated in December 2013.
12. 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. Graduated in December 2013.
13. 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. Graduated in May 2013.
14. 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. Graduated in May 2011.
15. Michael Burgert ***(major advisor).*** *Large scale implementation of rrigation management tools/strategies for maize*. Funded 100% from my research grant. Dept. of Biol. Sys. Eng. Graduated in May 2009.
16. 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. Graduated in December 2007.

3.1.7. MS STUDENTS COMPLETED (Graduate Committee Member)

1. Varshini Kumanan. *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. *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. Suresh Pradhyun Kashyap. *High-frequency unmanned aircraft flights for crop canopy imaging during diurnal moisture stress*. Dept. of Biol. Sys. Eng. Graduated in December 2021.
4. Isabella Presotto Possignolo. *Irrigation scheduling using canopy temperature*. Dept. of Biol. Sys. Eng. Graduated in May 2020.
5. Emily O'Donnel. *Irrigation management, environment and profits*. Dept. of Agricultural Economics. Graduated in August 2018.
6. Putri Sukmahartati. *Hydrologic analyses using soil classifications in Indonesia*. Department of Civil and Environmental Engineering. Graduated in December 2017.
7. Rigoberto Wong. *Irrigation control system using soil information transmitted wirelessly from underground nodes to a moving gateway*. Dept. Comp. Sci. and Eng. Graduated in August 2017.
8. Matt J. Nelson. *Impact of using spatially distributed soils information on flood hydrograph simulation with HEC-HMS*. Civil Engineering Department. Graduated in May 2017.
9. Nuwan Wijewardane. *Development of multi-sensor for soil organic carbon measurements*. Dept. of Biol. Sys. Eng. Graduated in August 2016.
10. Clint Aegerter. *Modeling and satellite remote sensing of the meteorological impacts of irrigation*. Earth and Atmospheric Sciences. Graduated in August 2016.
11. Justin Gibson. *Quantification of recharge rates of agricultural fields.* Funded 100% from my research grant. Dept. of Earth and Atmospheric Sciences. Graduated in December 2015.
12. Dilshad Brar. *Conservation of energy using variable frequency drive for center pivot irrigation systems in Nebraska*. Dept. of Biol. Sys. Eng. Graduated in August 2015.
13. Gustavo Bosch Rubia. *Land use and water and soil management impacts on groundwater recharge in loess regions of south central Nebraska*. Dept. of Biol. Sys. Eng. Graduated in August 2015.
14. Andrew Volkmer. *Quantification of surface run-off from tilled and untilled fields.* Funded 100% from my research grant as a PI. Dept. of Biol. Sys. Eng. Graduated in August 2014.
15. Alister Bryson. *Irrigation practices influence on West Nile Virus of Great Plains Ecosystems.* Medical and Veterinary Entomology. Dept. of Entomology. Graduated in May 2014.
16. Michael McKinney. *Tillage management impacts on surface soil hydrologic properties.* Funded 100% from my research grant. Dept. of Biol. Sys. Eng. Graduated in August 2012.
17. Isaac Mortensen. *Optimization of deficit irrigation.* Graduated in May 2011. Dept. of Biol. Sys. Eng.
18. Jessica Deck. *Measurement of surface run-off and infiltration for tilled and untilled fields.* Funded 100% from my research grant. Dept. of Biol. Sys. Eng. Graduated in December 2010.
19. Venkata Mannam (*graduate committee member*). *Weed water uptake dynamics*. Dept. of Agron. & Horticulture. Graduated in December 2010.
20. Pari Ranade. *Developing irrigation management decisions using a functional crop growth model.* School of Natural Resources. Graduated in May 2009.
21. Travis Yonts. *Modeling hydrology of conservation terraces.* Dept. of Biol. Sys. Eng. Graduated in Aug. 2006.

3.2. 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)

3.3. 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.

3.4. 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.).

4. <u>PROFESSIONAL SERVICE ACCOMPLISHMENTS</u>

4.1. PROFESSIONAL SERVICE FOR FEDERAL AND STATE AGENCIES

4.1.1. 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.

4.1.2. 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

4.1.3. 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.

4.1.4. 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.

5.1.5. ACADEMIC PROGRAM REVIEW

1. University of Minnesota, University of Arizona.

5.1.6. 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.

5.1.7. LEADERSHIP AND MEMBERSHIP IN NATIONAL/INTERNATIONAL PROFESSIONAL ORGANIZATIONS

1. The Council for Agricultural Science and Technology (2021-current)
2. Chair of the ASABE International Evapotranspiration Symposium (04/2018-11/30/2022).
3. Organizing Committee for the 1st International Biosystems Engineering Congress (09/2019) (Hatay, Turkiye)
4. Organization Committee for the 3rd Food and Agriculture Policy Conference (11/2019) (Adana, Turkiye)
5. ASABE Global Water Security Conference Leadership and Planning and Organizing Committee Co-Chair (2017-2018) (Hyderabad, India).
6. American Association for the Advancement of Science (AAAS) (2016-current).
7. Associate Editor, Soil and Water Division, ASABE (2013-2018).
8. Organizer of hybrid evapotranspiration session in the ASABE Annual Conference (2015).
9. 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. To develop 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 (e.g., water quantity and quality issues) following their tripartite mission of research, education and Extension.
10. Planning committee for the ASABE International Evapotranspiration Symposium (2014).
11. Chair-elect. ASABE SW-244 Irrigation Management Committee. (07/2013-current).
12. 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).
13. ASABE-Gunlogson Design Competition Judge (2012-current).
14. ASABE Fountain Wars Judge (2013-current)
15. Young Extension Professional Award Committee (08/2010-2012).

16. 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).
17. Chair-elect: American Society of Civil Engineers, Environmental and Water Resources Institute (ASCE-EWRI) Evapotranspiration in Irrigation and Hydrology Task Committee (2007-2009).
18. ASCE-EWRI Standardization of Reference Evapotranspiration and Crop Coefficient Task Committees (10/2001-present).
19. Nebraska representative for the Regional Committee W-2128 on Microirrigation for Sustainable Water Use. (06/2009-06/2021).
20. ASABE-SW-244/Standardization Committee for ASAE EP505 Weather Station Instrumentation and Measurement and Reporting Practices for Automated Weather Stations (07/2007-current).
21. ASABE-SW-241 Sprinkler Irrigation Committee (05/2008-current).
22. ASABE-SW-242 Surface Irrigation Committee (05/2008-current).
23. ASABE-SW-245 Microirrigation Committee. May 2007-current).
24. 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).
25. 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).
26. American Society of Agricultural and Biological Engineers (ASABE) (1997-current).
27. Assistant Judge of the ASABE Educational Award Competition (2006- current).
28. American Society of Civil Engineers (Full member) (2002-current).
29. United States Committee on Irrigation and Drainage (USCID) (2002-present).
30. Registered Professional Engineer of Turkish Society of Agricultural Engineers (1992-present).
31. Nebraska section of the ASABE (12/1/2004-06/2021).

4.2. UNIVERSITY SERVICE

4.2.1. 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-current) 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 and leader, Nebraska Agricultural Water Management Network (NAWMN; http://water.unl.edu/web/cropswater/nawmdn).
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, upper-rank administration 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).

5. OTHER ACCOMPLISHMENTS

5.1. MEDIA REPORTS

5.1.1. 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.

6. INTERNATIONAL PROGRAMS/ACTIVITIES

A total of 38 international programs and activities with Netherlands, South Korea, India. China, Turkey, Brazil, Argentina, Sweden, France, Vietnam, Australia, Iraq, Honduras and Chile. Descriptions and date of each activity are available, if needed.

7. 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.

8. 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.

9. 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.

10. 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.