**2020 Annual WERA–1022 Meeting**

**Meteorological and Climate Data to Support ET-Based Irrigation Scheduling, Water Conservation, and Water Resources Management**

**Western Education\Extension and Research Activity**

**Attendees:** Saleh Taghvaeian, Troy Peters, Stacia Conger, Niel Allen, Allan Andales, Amir Haghverdi, Steve Evett, Chris Henry, Biswanath Dari, David Yates, Edward Martin, Jama Hamel, Jonathan Aguilar, Paul Colaizzi, Vasudha Sharma, Vivek Sharma, Suat Irmak, Gary Marek, Haimanote Bayabil.

**Minutes**

The meeting started at noon CDT on September 28, 2020 with introductions of participants. Ed Martin mentioned that the current program expires on 9/30/2022, so a renewal request must be submitted by 1/15/2022. He will also need state reports from members, covering 10/1/2019 through 9/30/2020. Ed also talked about a new project (WDC-026) that is composed of climatologists interested in agricultural applications and in working with growers. This is a new project and different than WERA-102. After these introductory remarks, the state reports were presented. We should consider trying to organize a joint meeting with WERA 102 (Climate group).

Troy Peters (Washington State University)

Troy presented on his continuing work with the Irrigation Scheduler App. New features of the app make it more user-friendly and less data-intensive. He also mentioned the newly created Microsoft Teams for discussing irrigation related topics among irrigation researchers. Other activities by his team included use of UAVs for remote sensing of ET based on the METRIC model and investigating the conditions under which LESA/LEPA systems would be beneficial to Washington growers.

Niel Allen (Utah State University)

Niel explained his efforts on comparing furrow and drip irrigated onion in Utah. Furrow irrigated onion used more water, had larger ET, and yielded more. There is a perception among growers that drip irrigated onion yields better, but that’s if the system is capable of providing enough water to keep up with the demand, even far from the water sources. Niel also discussed his projects on documenting water depletion.

Stacia Conger (Louisiana State University)

The area under furrow irrigation has been increasing in LA, reaching 91% according to the USDA surveys. This may be due to reaching the end of life for many center pivots that were purchased 20-30 years ago and not having financial resources to invest in pivots. Irrigation water use has also been increasing in recent years, despite having wetter than normal conditions. Stacia has been also testing and modifying an irrigation scheduling spreadsheet that requires the minimum amount of input data. In addition, she has started a project on soil moisture sensor placement in irrigated sugarcane.

Saleh Taghvaeian (Oklahoma State University)

Saleh mentioned the Kc Task Committee that is active under ASCE-EWRI’s ET in Irrigation & Hydrology Committee. He also presented on research and demonstration projects on use of sensor-based technologies for irrigation management. At a research farm in southwest OK, soil moisture sensors did not provide reliable readings for irrigation scheduling due to high clay content and high salinity. Canopy temperature sensors were not useful either since the cotton canopy never closed and the signal was always contaminated due to the underlying soil.

Steve Evett (USDA-ARS Bushland)

A study was conducted at USDA-ARS Bushland to compare crop coefficients under MESA versus SDI. SDI resulted in reduced evaporative loss in early and mid-season and higher yields. Kc for SDI systems should be 10-15% less than MESA.

Gary Marek (USDA-ARS Bushland)

Compared Kcs of legacy and modern corn hybrids. Modern hybrids are planted earlier. When Kcs were plotted against growing degree days, legacy and modern hybrids had similar Kc values.

Jama Hamel (USBR)

Some AgriMet sites are reaching 40 years of data collection. AgriMet has recently been dealing with funding issues. Despite these issues, AgriMet has been active in maintaining the large number of sites and in collaborating with national and international projects, including training of Iraqi engineers.

Suat Irmak (University of Nebraska)

Network of flux towers (Bowen ratio and Eddy Covariance) established in Nebraska since 2004 (NEBFLUX). Measurement of many additional parameters and documentation of management practices take place at these sites, which include a wide range of surface covers: agricultural crops (irrigated and dryland), cover crops, natural vegetation. Studies on the impacts of climate change on crop water use in the great plains. Large network of demonstration sites to test and transfer technologies. Developed a smart phone app back in 2006, one of the first irrigation apps that was developed. NAWMN has over 1,800 collaborating producers and has achieved tremendous water and energy conservation saving. The results have been used to justify the need for Hatch support.

Jonathan Aguilar (Kansas State University)

Research on cotton performance, water use, and irrigation because it has experience rapid expansion in KS due to smaller water requirement and a good fit in crop rotation. With a very limited water source (one inch), the best stage to apply irrigation was the matchhead square. They also continued research on Mobile Drip Irrigation (MDI). MDI had 35% less soil evaporation compared to overhead sprinkler before canopy closure. At Water Technology farms, MDI outperformed other types in terms of the yield. Jonathan also explained the latest version of their irrigation scheduler: KanSched 4.

Allan Andales (Colorado State University)

Allan presented on their work on improving irrigation management of sugar beet and estimating its Kc. Their studies showed significant differences between FAO-56 Kc curves and those modified based on field data. He also discussed the progress with their online irrigation scheduler, WISE.

Vasudha Sharma (University of Minnesota)

Vasu described the extent of irrigation and recent trends in MN. She also talked about the Irrigation Management Assistant Tool, an ET-based irrigation scheduler, as they have received funding to expand it and to incorporate feedback from growers. Another study she is involved with looks at the interacting effects of irrigation and nitrogen application on crop water productivity and water quality.

Amir Haghverdi (University of California Riverside)

Amir has been conducting research on irrigation management and water use of turfgrass and other land covers for urban landscapes. Different species were compared in terms of remotely sensed vegetation indices as impacted by different levels of irrigation applications. Amir also discussed their work on a statistical tool to delineate zones for agricultural variable rate irrigation.