

2020 Annual Report



WATER CONSERVATION MANAGEMENT PROGRAM

**805 East Warner Road, #104
Chandler, Arizona 85225**

Sponsored By:



2020 Annual Report
Water Conservation Management Program

Submitted to:

Arizona Department of Water Resources
1110 West Washington Street
Phoenix, Arizona 85007

Submitted by:

East Maricopa Natural Resource Conservation District
Water Conservation Management Program
805 E. Warner Road, #104
Chandler, Arizona 85225

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2020 Annual Report

Water Conservation Management Program

1.0 Introduction

The East Maricopa Natural Resource Conservation District (NRCD) re-established the Water Conservation Management Program (WCMP) in 2013, through a cooperative agreement with the Arizona Department of Water Resources (ADWR). The WCMP is managed by the East Maricopa NRCD Board of Directors in Chandler, Arizona while serving water users throughout the Phoenix Active Management Area (AMA).

2.0 Program Background

The WCMP was originally established in June 1991, through a cooperative agreement between the ADWR, Agua Fria-New River and Buckeye Valley NRCD, United States Department of Agriculture (USDA) -Natural Resource Conservation Service (NRCS) and the Maricopa County Municipal Water Conservation District No. 1 (MWD).

Shortly thereafter, the East Maricopa Water Conservation Management Program was established by a cooperative agreement between the East Maricopa NRCD, ADWR, and the NRCS.

November 1997, the two programs merged forming the Central Arizona Water Conservation Management Program. Each Water Conservation Management Program was supervised and directed by their respected NRCD Board of Directors, which consists of an NRCS District Conservationist, local agriculture water users, and WCMP team members. In 2003, the Central Arizona Water Conservation Management Program transitioned into one mobile laboratory program.

To date, the WCMP continues to successfully achieve the conservation goals of its program supporters throughout Maricopa County while the Arizona Department of Water Resources, Phoenix AMA, Conservation Assistance Fund (CAF), has provided the majority of the WCMP's funding. The CAF monies are generated from a local tax on groundwater pumping by the authority of the 1980 Ground Water Management Act. Beginning in 2006, additional grant monies were received by the WCMP from ADWR to provide management assistance with the Agriculture Best Management Practices (BMP) program.

The East Maricopa NRCD contributes substantially to the program by providing office space, supplies, field equipment, technical support, and staff time. Cooperation between the WCMP and East Maricopa NRCD strengthens the ability to achieve water conservation goals.

3.0 Techniques Used by The WCMP

Techniques used by the WCMP are designed to give the water users a “snap shot” of what is actually happening during an irrigation event. We identify irrigation management weaknesses that occur during a single irrigation event and provide practical recommendations to improve the situation, enabling water users to irrigate more efficiently. To accomplish this, program staff conduct irrigation system performance evaluations, irrigation training workshops, pump energy analyses, field topographic surveys, flow rate confirmations, and other technical irrigation water management (IWM) services. These services are free of charge, non-discriminatory, and confidential in a sense that no names are linked to the on-farm irrigation evaluation information.

An initial irrigation system performance evaluation begins by familiarizing a water user with the program and the collection of preliminary irrigation information. This information includes the objectives of the irrigation, current set times, flow rates ordered, etc. Once this information has been collected and a relationship has been established with the grower, irrigation system data is collected.

Irrigation system data collected by the WCMP includes: the field size, flow rate, slope of field (end fall and side fall), soil texture, soil moisture needs, and size of the set being irrigated. During an irrigation event, the overall management of the irrigation event is observed, water advance times are measured, and when present tail water is measured. When evaluating the performance of a sprinkler or micro-spray irrigation system, the WCMP methodically locates catchments throughout the field and pressure measurements are obtained and recorded. A typical irrigation system performance evaluation requires approximately sixteen-man hours from inception to completion.

Once the field data has been collected and analyzed, recommendations can then be made. The first step in the recommendation process is to determine the amount of water to refill the soil profile to field capacity. We estimate soil moisture at the time of the irrigation event by using the “feel and appearance” method developed by the USDA - NRCS. Using this method, we classify soil textures, estimate the Available Water Holding Capacity (AWHC), and determine the soil moisture content as a percentage of field capacity. When the amount of water needed to refill the soil profile is estimated and the amount of water applied is known, the Field Application Efficiency (FAE) determination can be made.

As soon as someone can walk onto the irrigation site after the observed irrigation event, (usually 48 – 72 hours) a measurement of moisture penetration is evaluated. This entails using a “ball probe”, a steel rod that is pushed into the soil perpendicularly that stops when the end of the wetted front is reached. Penetration depths are recorded every 100 feet along the length of the field.

An irrigation system performance evaluation summary report is compiled once all the necessary information is collected and observations are complete. The summary report is then presented to the grower with recommendations to improve the irrigation system performance with attempts to conduct follow-up irrigation evaluations. Follow up irrigation evaluations are pursued when applicable to verify implementation of the provided recommendations and their effectiveness.

4.0 Technical Activities

In the 2020 fiscal year, the WCMP conducted 40 irrigation system performance evaluations. An alphabetical list of participants can be found in “Appendix A” and a brief summary of each irrigation system performance evaluation can be found in “Appendix B”. Each summary identifies the evaluation number, whether the evaluation was a Follow Up “F”, crop being grown, type of irrigation system, soil texture, slope of field, and the date of the irrigation event. Included in the irrigation system performance evaluation summaries are the suggestions to the grower for improved IWM.

5.0 Field and Educational/Outreach Services

In the 2020 fiscal year, the WCMP conducted 20 technical services including: presentations, irrigation scheduling, topographic surveys, flow rate confirmations, and numerous other services. In addition to these technical services, the WCMP also conducted services pertaining to the Agriculture BMP Program, produced two irrigation water management newsletters, participated as the key note speaker for the USDA NRCS Irrigation Water Management Workshop held at a local farm, and coordinated an Ag BMP Workshop hosted at the Buckeye Valley NRCD office. “Appendix C” is a compilation of a brief summary of each service including copies of the newsletters and summaries of each meeting.

6.0 Program Impact

The WCMP and its supporters strive for excellence in preserving and conserving Arizona Agriculture. In support of this, the WCMP attempts to impact as many irrigated acres as possible throughout each fiscal year. According to the 2017 USDA Census of Agriculture, 474,438 acres of Arizona Land in Maricopa County was in agriculture production of this total, 180,241 (38%) was considered irrigated land. In the 2020 Fiscal Year, the WCMP impacted

28,510 acres or approximately 15.8% of irrigated land in Maricopa County, conserving an estimated 7,749 acre feet of irrigation water or the equivalent of 2,526,174,000 gallons. According to the 2015 United States Geologic Survey (USGS) the average person uses 53,290 gallons of water per year and the average household uses approximately 108,665 gallons of water per year. Essentially, the WCMP's efforts conserve enough water to supply 23,247 households or 47,404 people a year. The impact of the WCMP, assisting agriculture water users become more efficient with their irrigation water, reaches far outside the confines of the agriculture industry.

2020 Annual Report
Water Conservation Management Program
October 1, 2020 – September 30, 2021

Work Completed:

- Completed 40 Standard Evaluations
- Completed 20 Technical Irrigation & BMP Services
- Completed 4 Outreach/Education/Promotional Activities

**Water Conservation Management Program
Program Participants**

The WCMP and its Board of Directors strongly believe in maintaining the anonymity of its cooperators. Therefore, for purposes of this report, below is an alphabetical list of WCMP cooperators who received irrigation water management services during this fiscal year. There is no correlation to this list or the random identifier numbers assigned to each irrigation water management service.

Accamazzo Company

Freeman Farms

Gable & Hardison Farms

Kerr Family Dairy

M & M Farms

Precision Farming

Rovey Farms

Sanders Farms

Tonopah Farms

Water Conservation Management Program Standard Evaluation Summaries

20-01, Alfalfa, Graded Border, Estrella Loam, 0.93'/100' Row Fall, evaluated 2/16/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 70% and irrigation efficiency (IE) of 78%. The average amount needed to refill the root zone at the time of the event was 2.9 acre inches per acre. 6.4 cfs was applied to the 145.6 acre field with a total irrigation time of 94 hours, resulting in a gross application of 4.12 acre inches per acre and a net application of 3.7 acre inches per acre as 0.42 acre inches ran off the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully declined offering any suggestions for improving irrigation efficiency at this time.

20-02, Alfalfa, Graded Border, Loam, 0.87'/100' Row Fall, evaluated 2/17/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and irrigation efficiency (IE) of 51%. The average amount needed to refill the root zone at the time of the event was 2.9 acre inches per acre. 3.8 cfs was applied to the 126.6 acre field with a total irrigation time of 191 hours, resulting in an application of 5.66 acre inches per acre. The WCMP respectfully suggested reducing set times by approximately 15 minutes to improve irrigation efficiency by approximately 5%, saving approximately 5 acre feet.

20-03, Alfalfa, Graded Border, Anthos Brios Loam, 1.03'/100' Row Fall, evaluated 2/18/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and irrigation efficiency (IE) of 118%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 3.8 cfs was applied to the 72.3 acre field with a total irrigation time of 49 hours, resulting in an application of 2.54 acre inches per acre. The WCMP respectfully suggested allowing sets to run for approximately 10 more minutes to ensure an adequate amount of water is applied to completely refill the active root zone.

20-04, Alfalfa, Graded Border, Antho Sandy Loam, 0.30'/100' Row Fall, evaluated 2/18/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 75% and irrigation efficiency (IE) of 108%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.4 acre inches per acre. 3.2 cfs was applied to the 42.6 acre field with a total irrigation time of 60.5 hours, resulting in a gross application of 4.51 acre inches per acre and a net application of 3.16 acre inches per acre as 1.35 acre inches ran off the field in the form of captured tail water. This was a good irrigation event, however, the field was slightly under irrigated. The WCMP respectfully suggested adding an additional 10 minutes to each set to ensure an adequate of water is applied to completely refill the root zone.

20-05, Alfalfa, Graded Border, Laveen Sandy Loam, 0.33'/100' Row Fall, evaluated 2/18/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 58% and irrigation efficiency (IE) of 83%. The average amount needed to refill the root zone at the time of the event was 3.2 acre inches per acre. 7.2 cfs was applied to the 33.4 acre field with a total irrigation time of 25.5 hours, resulting in a gross application of 5.50 acre inches per acre and a net application of 3.85 acre inches per acre as 1.65 acre inches ran off the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully declined offering any suggestions for improvement at this time.

20-06, Corn, Graded Border, Laveen Sandy Loam, 0.35'/100' Row Fall, evaluated 3/17/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 61% and irrigation efficiency (IE) of 88%. The average amount needed to refill the root zone at the time of the event was 2.7 acre inches per acre. 5.0 cfs was applied to the 71.6 acre field with a total irrigation time of 63 hours, resulting in a gross application of 4.40 acre inches per acre and a net application of 3.08 acre inches per acre as 1.32 acre inches ran off the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully declined offering any suggestions for improvement at this time.

20-07, Wheat, Graded Border, Contine Clay Loam, 0.05'/100' Row Fall, evaluated 3/18/2021

This standard evaluation was conducted on a wheat field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and irrigation efficiency (IE) of 75%. The average amount needed to refill the root zone at the time of the event was 1.9 acre inches per acre. 2.5 cfs was applied to the 23.8 acre field with a total irrigation time of 24 hours, resulting in an application of 2.52 acre inches per acre. The WCMP respectfully suggested scheduling irrigation events to occur when the soil has reached a MAD (maximum allowable depletion) of 50%. The WCMP offered assistance with irrigation scheduling.

20-08, Corn, Graded Border, Continue Clay Loam, 0.30'/100' Row Fall, evaluated 4/8/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 15% and an irrigation efficiency (IE) of 21%. The average amount needed to refill the root zone at the time of the event was 2.4 acre inches per acre. 5.0 cfs was applied to the 18.3 acre field with a total irrigation time of 59 hours, resulting in a gross application of 16.08 acre inches per acre and a net application of 11.26 acre inches per acres as 4.82 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested reducing set times by 4 hours to improve the irrigation efficiency approximately 10%, saving approximately 9.5 acre feet total.

20-09, Corn, Graded Border, Continue Clay Loam, 0.30'/100' Row Fall, evaluated 4/8/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 24% and an irrigation efficiency (IE) of 28%. The average amount needed to refill the root zone at the time of the event was 2.4 acre

inches per acre. 5.0 cfs was applied to the 36.3 acre field with a total irrigation time of 72 hours, resulting in a gross application of 9.93 acre inches per acre and a net application of 8.44 acre inches per acres as 1.44 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested targeting set times of 6 hours to improve the irrigation efficiency approximately 10%, saving approximately 20.5 acre feet total.

20-10, Sudan, Graded Border, Continue Clay Loam, 0.91'/100' Row Fall, evaluated 4/12/2021

This standard evaluation was conducted on a sudan field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 37% and an irrigation efficiency (IE) of 41%. The average amount needed to refill the root zone at the time of the event was 2.4 acre inches per acre. 8.8 cfs was applied to the 32.3 acre field with a total irrigation time of 24 hours, resulting in a gross application of 6.5 acre inches per acre and a net application of 5.5 acre inches per acres as 0.65 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested reducing set times by 15 minutes to improve the irrigation efficiency approximately 5%, saving approximately 2 acre feet total.

20-11, Sudan, Graded Border, Continue Clay Loam, 0.91'/100' Row Fall, evaluated 4/12/2021

This standard evaluation was conducted on a sudan field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 58% and an irrigation efficiency (IE) of 64%. The average amount needed to refill the root zone at the time of the event was 2.4 acre inches per acre. 8.8 cfs was applied to the 46.4 acre field with a total irrigation time of 22 hours, resulting in a gross application of 4.15 acre inches per acre and a net application of 3.73 acre inches per acres as 0.42 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested targeting a total field irrigation time of 17.5 hours to improve the irrigation efficiency approximately 10% and saving approximately 2.9 acre feet total.

20-12, Alfalfa, Graded Border, Estrella Loam, 1.00'/100' Row Fall, evaluated 5/6/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 43% and an irrigation efficiency (IE) of 61%. The average amount needed to refill the root zone at the time of the event was 3.8 acre inches per acre. 6.0 cfs was applied to the 73.3 acre field with a total irrigation time of 108 hours, resulting in a gross application of 8.84 acre inches per acre and a net application of 6.19 acre inches per acres as 2.65 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested transitioning to a two border set versus the current one border set, this would increase opportunity time, reduce tail water, and improve irrigation efficiency approximately 5-10%.

20-13, Alfalfa, Graded Border, Valencia Fine Sandy Loam, 1.00'/100' Row Fall, evaluated 5/6/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 57% and an irrigation efficiency (IE) of 81%. The average amount needed to refill the root zone at the time of the event was 3.8 acre inches per acre. 3.4 cfs was applied to the 74.2 acre field with a total irrigation time of 147 hours, resulting in a gross application of 6.68 acre inches per acre and a net application of 4.67 acre inches per acres as 2.01 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested a target irrigation set time of approximately 4.5 hours to improve irrigation efficiency by approximately 10%.

20-14F, Alfalfa, Graded Border, Gilman Fine Sandy Loam, 0.87'/100' Row Fall, evaluated 5/8/2021

This follow up, standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 39% and an irrigation efficiency (IE) of 43%. The average amount needed to refill the root zone at the time of the event was 2.9 acre inches per acre. 7.1 cfs was applied to the 126.6 acre field with a total irrigation time of 132 hours, resulting in a gross application of 7.43 acre inches per acre and a net application of 6.68 acre inches per acres as 0.75 inches ran off the field in the form of captured tail water. The application per acre is similar to the original evaluation conducted on this field, however, if the irrigation event occurred when the soil reached a Maximum Allowable Depletion (MAD) of 50%, the irrigation efficiency would have improved. The WCMP respectfully suggested irrigating when the soil has reached 50% depletion.

20-15, Corn, Graded Border, Laveen Loam, 0.05'/100' Row Fall, evaluated 5/22/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 62%. The average amount needed to refill the root zone at the time of the event was 2.7 acre inches per acre. 5.0 cfs was applied to the 53.9 acre field with a total irrigation time of 47 hours, resulting in an application of 4.36 acre inches per acre. The WCMP respectfully declined providing suggestions for improvement on this field. This was a good irrigation event.

20-16, Corn, Graded Border, Laveen Loam, 0.05'/100' Row Fall, evaluated 5/24/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 88%. The average amount needed to refill the root zone at the time of the event was 2.7 acre inches per acre. 6.0 cfs was applied to the 72.3 acre field with a total irrigation time of 37 hours, resulting in an application of 3.07 acre inches per acre. This was a good irrigation event. The WCMP respectfully declined providing suggestions for improvement on this field.

20-17, Corn, Graded Border, Laveen Loam, 0.05'/100' Row Fall, evaluated 5/24/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 89%. The average amount needed to refill the root zone at the time of the event was 2.4 acre inches per acre. 6.0 cfs was applied to the 75.9 acre field with a total irrigation time of 34 hours, resulting in an application of 2.69 acre inches per acre. This was a good irrigation event. The WCMP respectfully declined providing suggestions for improvement on this field.

20-18, Corn, Graded Border, Laveen Loam, 0.07'/100' Row Fall, evaluated 6/2/2021

This standard evaluation was conducted on a corn field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 62%. The average amount needed to refill the root zone at the time of the event was 2.8 acre inches per acre. 5.0 cfs was applied to the 74 acre field with a total irrigation time of 66.5 hours, resulting in an application of 4.49

acre inches per acre. The WCMP respectfully suggested scheduling irrigation events to occur when the soil has reached a Maximum Allowable Depletion (MAD) of 50% to improve irrigation efficiency by approximately 10%.

20-19, Alfalfa, Graded Border, Gilman Loam, 0.1'/100' Row Fall, evaluated 7/23/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 82%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 11.0 cfs was applied to the 51.4 acre field with a total irrigation time of 22 hours, resulting in an application of 4.71 acre inches per acre. The WCMP respectfully declined offering suggestions for improvement at this time. This was a good irrigation event.

20-20, Alfalfa, Graded Border, Gilman Loam, 0.1'/100' Row Fall, evaluated 7/24/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 71%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 11.0 cfs was applied to the 18.4 acre field with a total irrigation time of 9 hours, resulting in an application of 5.39 acre inches per acre. The WCMP respectfully suggested targeting a total field irrigation time of 8 hours to improve irrigation efficiency by approximately 10%.

20-21, Alfalfa, Graded Border, Gilman Loam, 0.1'/100' Row Fall, evaluated 7/25/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 41%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 11.0 cfs was applied to the 7.1 acre field with a total irrigation time of 6 hours, resulting in an application of 9.36 acre inches per acre. The WCMP respectfully suggested targeting a total field irrigation time of 4.5 hours to improve irrigation efficiency by approximately 10% - 15%.

20-22, Alfalfa, Graded Border, Gilman Loam, 0.10'/100' Row Fall, evaluated 7/25/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 85%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 11.0 cfs was applied to the 106.6 acre field with a total irrigation time of 44 hours, resulting in an application of 4.54 acre inches per acre. The WCMP respectfully declined offering suggestions for improvement at this time. This was a good irrigation event.

20-23, Alfalfa, Graded Border, Mariposa Sandy Loam, 0.60'/100' Row Fall, evaluated 8/4/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 91% and an irrigation efficiency (IE) of 101%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.5 cfs was applied to the 37 acre field with a total irrigation time of 21 hours, resulting in a gross application of 4.25 acre inches per acre and a net application of 3.83 acre inches per acre as 0.42 inches ran off the

field in the form of captured tail water. The WCMP respectfully suggested adding an additional 10 minutes to each set to ensure an adequate amount of water is applied to refill the active root zone completely.

20-24, Alfalfa, Graded Border, Perryville Gravely Loam, 0.60'/100' Row Fall, evaluated 8/5/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 74% and an irrigation efficiency (IE) of 82%. The average amount needed to refill the root zone at the time of the event was 3.4 acre inches per acre. 7.5 cfs was applied to the 36.4 acre field with a total irrigation time of 22 hours, resulting in a gross application of 4.53 acre inches per acre and a net application of 4.07 acre inches per acres as 0.46 inches ran off the field in the form of captured tail water. The WCMP respectfully declined offering suggestions for improvement at this time. This was a good irrigation event.

20-25, Alfalfa, Graded Border, Coolidge Sandy Loam, 0.60'/100' Row Fall, evaluated 8/6/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 158%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.4 acre inches per acre. 7.5 cfs was applied to the 35.3 acre field with a total irrigation time of 10 hours, resulting in an application of 2.13 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested adding an additional 45 minutes to each set to adequately refill the active root zone.

20-26, Alfalfa, Graded Border, Antho Sandy Loam, 0.60'/100' Row Fall, evaluated 8/7/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 181%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.5 cfs was applied to the 38.8 acre field with a total irrigation time of 11 hours, resulting in an application of 2.13 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested adding an additional hour to each set to adequately refill the active root zone.

20-27, Alfalfa, Graded Border, Laveen Loam, 0.60'/100' Row Fall, evaluated 8/7/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 132%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.5 cfs was applied to the 28.2 acre field with a total irrigation time of 11 hours, resulting in an application of 2.92 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested targeting 1.75 hour sets to adequately refill the active root zone.

20-28, Alfalfa, Graded Border, Perryville Gravely Loam, 0.60'/100' Row Fall, evaluated 8/8/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 38% and an irrigation efficiency (IE) of 54%. The average amount needed to refill the root zone at the time of the event was 3.4 acre inches per acre. 7.5 cfs was applied to the 38.2 acre field with a total irrigation time of 46 hours, resulting in a gross

application of 9.04 acre inches per acre and a net application of 6.33 acre inches per acres as 2.71 inches ran off the field in the form of captured tail water. The WCMP respectfully suggested reducing set times by one hour to improve irrigation efficiency by approximately 20% and save approximately 6 acre feet.

20-29, Alfalfa, Graded Border, Coolidge Sandy Loam, 0.60'/100' Row Fall, evaluated 8/10/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 187%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.5 cfs was applied to the 36.4 acre field with a total irrigation time of 10 hours, resulting in an application of 2.06 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested targeting a total field irrigation time of 20 hours to adequately refill the active root zone.

20-30, Alfalfa, Graded Border, Coolidge Sandy Loam, 0.60'/100' Row Fall, evaluated 8/10/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 178%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.5 cfs was applied to the 38.2 acre field with a total irrigation time of 11 hours, resulting in an application of 2.06 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested targeting a total field irrigation time of 22 hours to adequately refill the active root zone.

20-31, Alfalfa, Graded Border, Mohall Loam, 0.30'/100' Row Fall, evaluated 8/25/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 82%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 14 cfs was applied to the 68.5 acre field with a total irrigation time of 24 hours, resulting in an application of 4.91 acre inches per acre. The WCMP respectfully declined offering any suggestions for improvement at this time. This was a good irrigation event.

20-32, Alfalfa, Graded Border, Mohall Loam, 0.10'/100' Row Fall, evaluated 8/25/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 125%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 9 cfs was applied to the 67.5 acre field with a total irrigation time of 24 hours, resulting in an application of 3.2 acre inches per acre. This field was deficit irrigated. The WCMP respectfully suggested adding an additional 15 minutes to each set to ensure an adequate amount of water is applied to refill the entire active root zone.

20-33, Alfalfa, Graded Border, Mohall Loam, 0.10'/100' Row Fall, evaluated 8/27/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 110% and an irrigation efficiency (IE) of 122%, a deficit irrigation. The average amount needed to refill the root zone at the time of the

event was 4.0 acre inches per acre. 9 cfs was applied to the 89.1 acre field with a total irrigation time of 36 hours, resulting in a gross application of 3.63 acre inches per acre and a net application of 3.27 acre inches per acre as 0.36 acre inches left the field as captured tail water. This field was deficit irrigated. The WCMP respectfully suggested scheduling irrigation events when the soil reaches a maximum allowable depletion of 50%, reducing the amount of water needed to refill the root zone. Additionally, the WCMP suggested adding 30 minutes to each set to ensure an adequate amount of water is applied to refill the entire active root zone.

20-34, Alfalfa, Graded Border, Mohall Loam, 0.20'/100' Row Fall, evaluated 8/29/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 52% and an irrigation efficiency (IE) of 58%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 10 cfs was applied to the 43 acre field with a total irrigation time of 35.5 hours, resulting in a gross application of 8.26 acre inches per acre and a net application of 7.43 acre inches per acre as 0.83 acre inches left the field as captured tail water. The WCMP respectfully suggested reducing set times by approximately 15 minutes to improve irrigation efficiency approximately 14%.

20-35, Alfalfa, Graded Border, Mohall Sandy Loam, 0.05'/100' Row Fall, evaluated 8/29/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 68%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 8 cfs was applied to the 52.1 acre field with a total irrigation time of 41 hours, resulting in an application of 6.3 acre inches per acre. The WCMP respectfully suggested targeting a total field irrigation time of 36.75 hours to potentially improve irrigation efficiency by approximately 8%.

20-36, Alfalfa, Graded Border, Mohall Sandy Loam, 0.15'/100' Row Fall, evaluated 8/30/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 104% and an irrigation efficiency (IE) of 115%, a deficit irrigation. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 10 cfs was applied to the 64.7 acre field with a total irrigation time of 25 hours, resulting in a gross application of 3.86 acre inches per acre and a net application of 3.48 acre inches per acre as 0.38 acre inches left the field as captured tail water. This field was under irrigated. The WCMP respectfully suggested scheduling irrigation events to occur when the soil has reached a maximum allowable depletion of 50% of the total water holding capacity.

20-37, Alfalfa, Graded Border, Mohall Sandy Loam, 0.30'/100' Row Fall, evaluated 9/2/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 36% and an irrigation efficiency (IE) of 48%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 14 cfs was applied to the 28.4 acre field with a total irrigation time of 24 hours, resulting in a gross application of 11.83 acre inches per acre and a net application of 8.87 acre inches per acre as 2.96 acre inches left the field as captured tail water. The WCMP respectfully suggested targeting a total field irrigation time of 17.5 hours (1.25 hour sets) to potentially improve irrigation efficiency by approximately 18%.

20-38, Alfalfa, Graded Border, Gilman Loam, 0.40'/100' Row Fall, evaluated 9/3/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) of 54% and an irrigation efficiency (IE) of 72%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 14 cfs was applied to the 84.7 acre field with a total irrigation time of 48 hours, resulting in a gross application of 7.93 acre inches per acre and a net application of 5.95 acre inches per acre as 1.98 acre inches left the field as captured tail water. The WCMP respectfully declined offering any suggestions for improvement at this time. This was a good irrigation event.

20-39, Alfalfa, Graded Border, Mohall Loam, 0.20'/100' Row Fall, evaluated 9/3/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 43%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 13 cfs was applied to the 35.4 acre field with a total irrigation time of 27 hours, resulting in an application of 9.91 acre inches per acre. The WCMP respectfully suggested targeting a total field irrigation time of 19.5 hours (1.5 hour sets) to potentially improve irrigation efficiency by approximately 13%.

20-40, Alfalfa, Graded Border, Mohall Loam, 0.20'/100' Row Fall, evaluated 9/3/2021

This standard evaluation was conducted on an alfalfa field using a graded border irrigation system. The WCMP discussed all necessary concerns and questions with the grower prior to the evaluation and all field notes were recorded. The results of the evaluation are as follows: field application efficiency (FAE) and an irrigation efficiency (IE) of 48%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 13 cfs was applied to the 49.6 acre field with a total irrigation time of 34 hours, resulting in an application of 8.91 acre inches per acre. The WCMP respectfully suggested reducing water delivery to 8 cfs and apply the entire amount on one border at a time for 1.75 hours. This strategy can potentially improve irrigation efficiency by approximately 35%.

Water Conservation Management Program

Technical Irrigation & BMP Service Summaries

S20-01, Technical Service, 10/16/2020

The WCMP met with a grower to discuss historical consumptive use of crops. The grower is considering transitioning his cropping patterns from high input crops to less input crops. The advantages and disadvantages of growing various crops on his operation were discussed including the efficiency of the system, system adaptations that may need to be made, the importance of irrigation scheduling, and the availability of water now and in the future.

S20-02, Technical Service, 11/9/2020

A grower contacted the WCMP to request a flow rate measurement. The WCMP met the grower on site and addressed any questions and concerns about how the flow rate is determined. The WCMP ensured all conditions and specifications were adequate for use of the Fullerform Weir. The weir was used to obtain the measurement. The measured flow rate was reported to the grower in cubic feet per second and gallons per minute.

S20-03, BMP Service, 12/18/2020

A grower contacted the WCMP to inquire about the AG BMP program. The grower is intending to convert an antiquated micro-spray irrigation system to a flood system and wanted to know more details about the enrollment and qualification process. His questions were addressed, a field visit and standard evaluations have been scheduled.

S20-04, BMP Service, 02/17/2021

A grower contacted the WCMP inquiring about the advantages and disadvantages regarding enrollment into the AG BMP program. The discussion involved information about the cropping pattern, the irrigation system, and any concerns about water availability the grower may have had. The enrollment process and the qualifications were addressed. The grower is very interested in the program, however, will need to get in touch with the landowner to obtain permission to apply for enrollment.

S20-05, Technical Service, 02/18/2021

A grower requested the measurement of an irrigation well that had recently been serviced. The WCMP met with the grower at the well site and addressed concerns and questions. The Fullerform Weir was used to obtain the measurement. The measured flow rate was reported to the grower in cubic feet per second and gallons per minute.

S20-06, Technical Service, 02/18/2021

A grower requested the measurement of two irrigation wells that are combined into one delivery. The WCMP met with the grower on-site and addressed any concerns or questions. It was determined that the Fullerform Weir could be used to obtain the measurement. The measured flow rate was reported to the grower in cubic feet per second and gallons per minute.

S20-07, Technical Service, 2/20/2021

A grower requested assistance scheduling his upcoming irrigation on a grain crop. The WCMP met with the grower at the field and provided him with a crop consumptive use chart. The chart was discussed in detail until the grower was confident with its use. The soil was also probed to identify soil textures and current percent soil moisture depletion. Given the tools provided to the grower by the WCMP, he was able to identify when his next irrigation event should occur.

S20-08, BMP Service, 3/25/2021

A grower inquired about the BMP, the enrollment process, and the minimum standards required. Some of the operation's management practices were discussed as well as how the irrigation system is designed. The grower was informed that landowner affidavits, providing permission to enroll into the BMP, are required. A field meeting is scheduled to begin the application process. The grower will contact the landowners prior to a scheduled field meeting with the WCMP.

S20-09, Technical Service, 5/8/2021

A grower requested a flow rate measurement of an irrigation well. The WCMP met the grower at the pump site, discussed concerns about the well, and the grower's questions were addressed. The WCMP utilized the Fullerform weir to obtain the measurement. The flow rate was reported to the grower in cubic feet per second and gallons per minute.

S20-10, Technical Service, 6/2/2021

A grower requested assistance with measuring water delivery splits on the farm. The WCMP met the grower on site and identified the most ideal locations to use the Fullerform Weir to obtain the measurements. The measured flow rates were recorded and provided back to the grower in cubic feet per second and gallons per minute.

S20-11, BMP Service, 6/29/2021

A grower contacted the WCMP inquiring about the BMP program. The WCMP addressed enrollment questions the grower had regarding the process. The WCMP provided the grower with a BMP enrollment packet and application. The WCMP also offered the grower assistance completing the application. The grower is intending to complete landowner affidavits and then contact the WCMP for assistance with the remainder of the application.

S20-12, Technical Service, 7/14/2021

A grower requested assistance with determining soil moisture levels in alfalfa fields. The WCMP met the grower on site and identified the fields in question. The WCMP used the JMC soil probe to probe the soil and with the feel and appearance method, determined the percent of soil moisture present. The findings were recorded and provided to the grower.

S20-13, Technical Service, 7/14/2021

A grower requested assistance with scheduling an upcoming irrigation event on an alfalfa field. The WCMP met the grower on site. The WCMP provided the grower a copy of the historical consumptive use chart for alfalfa. The WCMP also used a hand auger to investigate the soil profile with the grower that included soil characteristics and current soil moisture levels. The grower was instructed on how to use the information to schedule irrigation events. The grower was able to identify when the next irrigation event should occur.

S20-14, Technical Service, 7/23/2021

A grower requested assistance determining how deep an irrigation went into the soil. The WCMP met the grower on site approximately 5 days after the irrigation event. The WCMP used the hand auger to determine how deep the water had gone into the soil. It was determined that the irrigation event did not fully refill the active root zone, only reaching a depth of 2.5 feet. These findings were recorded and provided back to the grower.

S20-15, Technical Service, 7/23/2021

A grower requested assistance with determining how long a field, and sets within the field, should be irrigated to achieve a target irrigation amount. The WCMP reviewed the Irrigator's Formula with the grower and how it can be used to help determine different aspects of an irrigation event. The grower was eventually able to use the formula to determine how long the irrigation should last on the field in question to achieve his desired application amount.

S20-16, Technical Service, 7/27/2021

A grower requested assistance with determining an irrigation well flow rate. The WCMP met the grower on site, who states the well had just been serviced. The WCMP determined the best possible location to use the Fullerform Weir to obtain the measurement. The measurement was obtained, recorded, and reported to the grower in cubic feet per second and gallons per minute.

S20-17, Technical Service, 8/30/2021

A grower requested assistance determining how deep an irrigation went into the soil. The WCMP met the grower on site approximately 5 days after the irrigation event. The WCMP used the hand auger to determine how deep the water had gone into the soil. It was confirmed that the irrigation event did not fully refill the active root zone, only reaching a depth of 2 feet. These findings were recorded and provided back to the grower.

S20-18, Technical Service, 8/30/2021

A grower requested assistance confirming irrigation water delivery flow rate. The WCMP met the grower on site and determined the most ideal location to use the Fullerform Weir to obtain the measurement. The findings were recorded and reported to the grower in cubic feet per second and gallons per minute.

S20-19, Technical Service, 9/2/2021

A grower requested flow rate measurements to confirm he was splitting the delivery equally between two fields. The WCMP met the grower on site and identified locations to use the Fullerform Weir to obtain the measurements. The flow rates were recorded and reported to the grower in cubic feet per second and gallons per minute.

S20-20, BMP Service, 9/27/2021

A grower requested assistance with submitting his BMP enrollment application. The WCMP reviewed the application with the grower. After confirming the application was complete, the WCMP agreed to submit the application on behalf of the grower. The grower was informed that the application had been submitted and awaiting word back from the department.

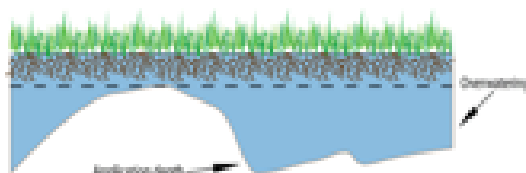
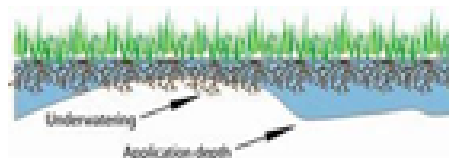
Water Conservation Management Program

NEWSLETTER

MARCH 2021

DISTRIBUTION UNIFORMITY

Distribution Uniformity (DU) is a measure of how uniformly water is applied to an irrigated area. Distribution uniformity, although not a measure of efficiency, is a key irrigation system performance component that directly effects crop production, quality, and profitability. If water is not distributed evenly or uniformly, areas receiving less water will have reduced plant health and crop yields. For example, if one inch of water is applied in one part of the field and only half an inch is applied in another part of the field, the result is poor DU.



To offset this, irrigators typically resort to applying more water to the entire irrigated area to ensure adequate depths are achieved in the under irrigated areas. Avoiding water related plant stress which would otherwise lead to a reduction in production and quality.

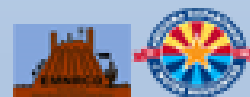
Water volume, furrow length, field slope, soil intake rates, and irrigation duration are key irrigation system components that effect DU. A change to any of these can affect it and the field's overall irrigation efficiency. A comprehensive irrigation system performance evaluation assesses these components of the irrigation system and identifies practical strategies for improvement if applicable. Contact the WCMP today to begin realizing the potential of your irrigation system!

WCMP SERVICES

- ➔ Irrigation System Performance Evaluations
- ➔ Flow Rate Measurement
- ➔ Ag BMP Enrollment
- ➔ Irrigation Scheduling Assistance
- ➔ Topographic Survey
- ➔ Soil Texture & Water Holding Capacity Identification
- ➔ Root Depth Determination
- ➔ Field & Set-Size Measurement

The WCMP provides irrigation services that help improve irrigation efficiency and save you money. Through a cooperative effort between the East Maricopa Natural Resource Conservation District and the Arizona Department of Water Resources, the WCMP is a free irrigation management services program helping to sustain production agriculture in the Phoenix AVA. The WCMP provides water measurement, slope determination, irrigation scheduling assistance, irrigation system evaluations, pump energy analyses, and practical recommendations to help improve irrigation efficiency.

Call today to experience the value of the WCMP 480.466.2968



Call the WCMP today!
480.466.2968

IRRIGATION RESOURCES

East Maricopa NRCO
605 E. Warner Road #104
Chandler, AZ 85225
480.466.1076
www.ecmrco.org

ADWR
3550 N. Central Ave.
Phoenix, AZ 85018
602.771.6000
www.fwdmnc.org

USDG NRCO
605 E. Warner Road #104
Chandler, AZ 85225
480.466.1076
www.usdganrc.org

WCMP / NRCS Irrigation Water Management Workshop, July 7, 2021

The USDA NRCS asked the WCMP to participate in an Irrigation Water Management Workshop. The WCMP gladly accepted the request and secured an on-farm location to hold the event for NRCS employees. The WCMP discussed irrigation systems commonly found in central Arizona, the advantages and disadvantages of each system, and the designed irrigation efficiency of each. The WCMP also taught the attendees about the Irrigator's Formula and its uses in water management as a tool to help water users in their strides to be as efficient with their irrigation water as possible. At the conclusion of the two-hour workshop, the attendees were mobilized to different sites on the farm where they were able to see irrigation events in real time that utilize ports and siphon tubes.



WCMP / ADWR Ag BMP Workshop, September 16, 2021

The WCMP implemented an Ag BMP Workshop to provide a forum for water users to gain information regarding the BMP program. The WCMP coordinated with ADWR and the Buckeye Valley NRCD to help facilitate the workshop. Representatives from the department agreed to present real time information about the BMP, how it will change in the near future, and what that means for current and future enrollees. The Buckeye Valley NRCD graciously agreed to provide their office and facilities to house the workshop. 20 attendees participated in the workshop including agency personnel as well as water users who are either currently in the BMP or who are considering applying for enrollment.



Water Conservation Management Program

NEWSLETTER

September 2021

“How much water did I apply?”

The Irrigator’s Formula

Estimating the amount of water applied to an irrigated area is a fairly easy process when 3 out of 4 factors is known. The Irrigator’s Formula, $Q \times T = D \times A$, can be used to estimate any of the 4 variables in the equation.

“Q” is the flow rate in cubic feet per second (CFS); “T” is the time, in hours, water ran onto the irrigated area; “D” is the depth of water applied in acre-inches per acre; “A” is the area, in acres, water is applied to.

To determine how much water was applied, use the Irrigator’s Formula and solve for the unknown value “D” (depth of water applied). For example, suppose you are irrigating a 10 acre field with a flow rate of 6 cfs and the irrigation time for this event was 10 hours. How much water have you applied?

$$6.0 \text{ cfs (Q)} \times 10 \text{ (Time in hours)} = d \text{ (inches applied)} \times 10 \text{ acres (Area irrigated)}$$

$$(6 \text{ cfs (Q)} \times 10 \text{ hours (T)}) / 10 \text{ acres (A)} = (D) \text{ acre inches applied}$$

$$6 = D, \text{ acre-inches applied}$$

“How long do I need to irrigate?”

By choosing a target amount of water to apply, you can use the same equation and solve for time (“T”) rather than the depth/amount applied (“D”). For example, suppose you want to apply 4 acre-inches of water per acre, the area you want to irrigate is 10 acres, and you have a flow rate of 5 cfs.

$$5.0 \text{ cfs (Q)} \times t \text{ (time in hours)} = 4 \text{ (“D” the amount applied)} \times 10 \text{ acres (A)}$$

$$T = (4 \text{ acre-inches} \times 10 \text{ acres}) / 5 \text{ cfs}$$

$$T = 8 \text{ hours}$$

Using the Irrigator’s Formula to solve for Time, we now have a target time to irrigate for to apply the target amount of water per acre. In this example, 8 hours will apply approximately 4 acre-inches of water per acre.

WCMP SERVICES

- ◆ Irrigation System Performance Evaluations
- ◆ Flow Rate Measurement
- ◆ Ag BMP Enrollment
- ◆ Irrigation Scheduling Assistance
- ◆ Topographic Survey
- ◆ Soil Texture & Water Holding Capacity Identification
- ◆ Root Depth Determination
- ◆ Field & Set Size Measurement

Call the WCMP today!
480.466.2968

IRRIGATION RESOURCES

East Maricopa NRCD
805 E. Warner Road #104
Chandler, AZ 85225
480.988.1078
www.emnrcd.org

ADWR
3550 N. Central Ave
Phoenix, AZ 85012
602.771.8500
www.adwr.state.az.us

USDA NRCS
805 E. Warner Road #104
Chandler, AZ 85225
480.988.1078
www.nrcs.usda.gov

The WCMP provides irrigation services that help improve irrigation efficiency and save you money. Through a cooperative effort between the East Maricopa Natural Resource Conservation District and the Arizona Department of Water Resources, the WCMP is a free irrigation management services program helping to sustain production agriculture in the Phoenix AMA. The WCMP provides water measurement, slope determination, irrigation scheduling assistance, irrigation system evaluations, pump energy analyses, and practical recommendations to help improve irrigation efficiency.

Call today to experience the value of the WCMP
480.466.2968



Appendix E

Grower Estimate of Water Saved and Program Benefits

Eval Number	Grower Est. Acres Affected	Grower Est Water Saved Ac-Ft/Ac	Est Total Water Saved Ac-Ft	Water Cost Per Acre Foot	Water Savings in Dollars	Grower Est Program Benefits \$/Ac	Program Benefits per Grower
20-01	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-02	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-03	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-04	600	0.33	198	\$50.00	\$9,900.00	\$10.00	\$6,000.00
20-05	600	0.33	198	\$50.00	\$9,900.00	\$10.00	\$6,000.00
20-06	600	0.33	198	\$50.00	\$9,900.00	\$10.00	\$6,000.00
20-07	0	0	0	\$44.00	\$0.00	\$0.00	\$0.00
20-08	600	0.33	198	\$50.00	\$9,900.00	\$10.00	\$6,000.00
20-09	600	0.33	198	\$50.00	\$9,900.00	\$10.00	\$6,000.00
20-10	130	0.25	32.5	\$50.00	\$1,625.00	\$15.00	\$1,950.00
20-11	130	0.25	32.5	\$50.00	\$1,625.00	\$15.00	\$1,950.00
20-12	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-13	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-14	850	0.25	212.5	\$60.00	\$12,750.00	\$12.00	\$10,200.00
20-15	500	0.25	125	\$28.00	\$3,500.00	\$12.00	\$6,000.00
20-16	500	0.25	125	\$28.00	\$3,500.00	\$12.00	\$6,000.00
20-17	500	0.25	125	\$28.00	\$3,500.00	\$12.00	\$6,000.00
20-18	450	0.5	225	\$25.00	\$5,625.00	\$15.00	\$6,750.00
20-19	450	0.5	225	\$25.00	\$5,625.00	\$15.00	\$6,750.00
20-20	450	0.5	225	\$25.00	\$5,625.00	\$15.00	\$6,750.00
20-21	450	0.25	112.5	\$25.00	\$2,812.50	\$15.00	\$6,750.00
20-22	450	0.25	112.5	\$25.00	\$2,812.50	\$15.00	\$6,750.00
20-23	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-24	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-25	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-26	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-27	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-28	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-29	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-30	800	0.1	80	\$50.00	\$4,000.00	\$2.00	\$1,600.00
20-31	900	0.33	297	\$44.00	\$13,068.00	\$15.00	\$13,500.00
20-32	900	0.33	297	\$44.00	\$13,068.00	\$15.00	\$13,500.00
20-33	1200	0.33	396	\$44.00	\$17,424.00	\$15.00	\$18,000.00
20-34	1200	0.33	396	\$44.00	\$17,424.00	\$15.00	\$18,000.00
20-35	1200	0.33	396	\$44.00	\$17,424.00	\$15.00	\$18,000.00
20-36	600	0.5	300	\$44.00	\$13,200.00	\$15.00	\$9,000.00
20-37	600	0.5	300	\$44.00	\$13,200.00	\$15.00	\$9,000.00
20-38	1200	0.33	396	\$44.00	\$17,424.00	\$15.00	\$18,000.00
20-39	1200	0.33	396	\$44.00	\$17,424.00	\$15.00	\$18,000.00
20-40	1000	0.33	396	\$44.00	\$14,520.00	\$15.00	\$15,000.00
Totals	28510	0.27	7749	\$45.08	\$348,426.00	\$10.73	\$303,650.00

*Number of acres affected is an estimate produced by program participants.

The values listed are grower estimates that indicate the acreage impacted as a result of participating with the WCMP, with the exception of "water cost per acre foot".

GROWER SURVEYS

Below are questions from the 2020 cooperators follow-up surveys, total yes and total no answers, and the written responses to the questions. The written responses provided by the participants are identified by the evaluation number randomly assigned to each program participant.

Water Conservation Management Program Follow Up Survey

In order to evaluate the effectiveness of the services provided by the WCMP and to improve the quality of services in the future, we would like you to respond to this survey with frankness and honesty. The WCMP conducted one or more irrigation system performance evaluations on your farm this year. In your opinion.....

1. ...did the WCMP adequately measure and evaluate the various components of your irrigation system?

YES - 39

NO - 0

Unavailable - 1

2. ...was the technical information presented to you in such a way that you could easily understand it?

YES - 39

NO - 0

Unavailable - 1

3. ...did the WCMP staff have the technical skills necessary to help you?

YES - 39

NO - 0

Unavailable - 1

4. ...did you apply any of the irrigation water management practices suggested by the WCMP?

YES - 39

NO - 0

Unavailable - 1

5. ...of the services provided, what was of the most value to you as a grower?

20-01 How much we were using

20-02 The applications

20-03 Irrigation efficiency

20-04 Application amounts

20-05 Efficiencies

20-06 All of it

20-07 Unavailable

20-08 The technical information in the report

20-09 How much was applied

20-10 Made me more consciousness about irrigation decisions

20-11 The work involved

20-12 Technical information

20-13 Evaluation information

20-14 Application per acre

20-15 Ways to conserve water

20-16 Amounts applied

20-17 Better ways to conserve water

20-18 The information

20-19 The amount of water we applied

20-20 All the information

20-21 Application amounts
20-22 How much water we were using
20-23 Water efficiency reports
20-24 Efficiency
20-25 Water applied
20-26 How much was put on
20-27 Amount applied
20-28 The efficiency
20-29 Our efficiencies
20-30 Our weaknesses
20-31 All the information in the reports
20-32 The applications
20-33 Ways to reduce
20-34 The scheduling
20-35 Suggestions to reduce water
20-36 The technical information
20-37 Scheduling
20-38 How to improve
20-39 The application amounts
20-40 Ideas to conserve water

6. ...what could the WCMP do differently to improve the services provided to you?

20-01 I don't know
20-02 Nothing
20-03 Nothing, it's a great service
20-04 Nothing
20-05 Can't think of anything
20-06 Nothing
20-07 Unavailable
20-08 It's good as it is
20-09 Nothing
20-10 Everything was very smooth
20-11 Services were prompted, I am very impressed
20-12 Not that I can think of
20-13 Nothing
20-14 Nothing
20-15 I don't know if there is anything
20-16 Nothing
20-17 It's a good service
20-18 Nothing
20-19 Nothing
20-20 Nothing
20-21 Nothing
20-22 Nothing
20-23 A year long study on one field
20-24 Follow ups on the same field
20-25 I don't know
20-26 I don't know
20-27 It's good as is
20-28 I like the program
20-29 Good program

- 20-30 Good information, I would like follow-up evaluations
- 20-31 It's a good program
- 20-32 It's good how it is
- 20-33 I don't know
- 20-34 Nothing
- 20-35 More follow-ups
- 20-36 Season long scheduling
- 20-37 I don't know
- 20-38 Nothing sticks out in my mind
- 20-39 It's a good program
- 20-40 Scheduling

7. If you had the power to make the funding decision for the WCMP 2020 program year, would you vote in favor of funding the WCMP for another year?

YES – 39

NO – 0

Unavailable - 1