

# 2022 Annual Report



## WATER CONSERVATION MANAGEMENT PROGRAM

520 North Camino Mercado, Suite 112  
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**Sponsored By:**



**2022 Annual Report  
Water Conservation Management Program**

*Submitted to:*

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Phoenix, Arizona 85007

*Submitted by:*

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Water Conservation Management Program  
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# **2022 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 Casa Grande, 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 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 2022 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 2022 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 a guest on the Arizona Farm Bureau Insta Gram Live program, and participated as committee leader during the Arizona Association of Conservation District’s summer conference. “Appendix C” is a compilation of a brief summary of each service including copies of the newsletters and summary of the workshop.

#### **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 2022 Fiscal Year, the WCMP impacted 20,540 acres or approximately 11% of irrigated land in Maricopa County, conserving an estimated 7,879 acre feet of irrigation water or the equivalent of 2,567,380,029 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 23,626 households or 48,177 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.

**2022 Annual Report**  
**Water Conservation Management Program**  
October 1, 2022 – September 30, 2023

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.

Arlington Valley Farms

Zinke Farms

Freeman Farms

Gable & Hardison Farms

Kerr Family Farms

Precision Farming

Sanders Farms

Sandlebay Farms

Tonopah Farms

Win Gate Farms



## **Water Conservation Management Program Standard Evaluation Summaries**

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### **22-01, Rye Grass, Graded Border, Laveen Sandy Loam, 0.4'/100' Row Fall, evaluated 11/21/2022**

This standard evaluation was conducted on a rye grass 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 51% and an irrigation efficiency (IE) of 60%. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 8.8 cfs was applied to the 55.4 acre field with a total irrigation time of 49.5 hours, resulting in a gross application of 7.86 acre inches per acre and a net application of 6.68 acre inches per acre as 1.18 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested reducing the flow rate to 6 cfs and applying it all on one border for a total set time of 1.25 hours to potentially improve irrigation efficiency by 26%.

### **22-02, Rye Grass, Graded Border, Laveen Sandy Loam, 0.4'/100' Row Fall, evaluated 11/21/2022**

This standard evaluation was conducted on a rye grass 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 44% and an irrigation efficiency (IE) of 51%. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 8.8 cfs was applied to the 38.9 acre field with a total irrigation time of 40.8 hours, resulting in a gross application of 9.19 acre inches per acre and a net application of 7.81 acre inches per acre as 1.38 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested adding an additional border to the irrigated set area and target a 2.5 hour set time to potentially improve irrigation efficiency by approximately 20%.

### **22-03, Rye Grass, Graded Border, Laveen Sandy Loam, 0.4'/100' Row Fall, evaluated 11/23/2022**

This standard evaluation was conducted on a rye grass 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 67% and an irrigation efficiency (IE) of 78%. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 8.8 cfs was applied to the 70.0 acre field with a total irrigation time of 48 hours, resulting in a gross application of 6.0 acre inches per acre and a net application of 5.1 acre inches per acre as 0.9 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully declined offering suggestions to improve irrigation performance at this time. This was a good irrigation event.

### **22-04, Rye Grass, Graded Border, Laveen Sandy Loam, 0.4'/100' Row Fall, evaluated 11/25/2022**

This standard evaluation was conducted on a rye grass 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 53% and an irrigation efficiency (IE) of 62%. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 10.0 cfs was applied to the 31.5 acre field with a total irrigation time of 24 hours, resulting in a gross application of 7.61 acre inches per acre and a net application of 6.47 acre inches per

acre as 1.14 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested adding a border to the existing set size to reduce runoff and improve opportunity time, distribution uniformity, and irrigation efficiency.

**22-05, Rye Grass, Graded Border, Laveen Sandy Loam, 0.4'/100' Row Fall, evaluated 11/25/2022**

This standard evaluation was conducted on a rye grass 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 44%. The average amount needed to refill the root zone at the time of the event was 4.0 acre inches per acre. 10.0 cfs was applied to the 61.2 acre field with a total irrigation time of 65 hours, resulting in a gross application of 10.62 acre inches per acre and a net application of 9.03 acre inches per acre as 1.59 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested changing the sets when the waterfront has reached approximately 100 feet from the end of the field to improve irrigation efficiency.

**22-06, Alfalfa, Graded Border, Gilman Clay Loam, 0.5'/100' Row Fall, evaluated 03/24/2023**

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 55% and an irrigation efficiency (IE) of 58%. The average amount needed to refill the root zone at the time of the event was 2.3 acre inches per acre. 6.0 cfs was applied to the 67.6 acre field with a total irrigation time of 46 hours, resulting in a gross application of 4.08 acre inches per acre and a net application of 3.88 acre inches per acre as 0.2 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested reducing the set sizes to one border and targeting a total field irrigation time of 34 hours to improve irrigation efficiency by approximately 20%.

**22-07, Alfalfa, Graded Border, Cashion Clay Loam, 0.6'/100' Row Fall, evaluated 03/27/2023**

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 80% and an irrigation efficiency (IE) of 84%. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 6.0 cfs was applied to the 76.8 acre field with a total irrigation time of 48 hours, resulting in a gross application of 3.75 acre inches per acre and a net application of 3.56 acre inches per acre as 0.19 acre inches per acre left the field in the form of captured tail water. This was a good irrigation event. The WCMP declined offering suggestions to improve irrigation efficiency at this time.

**22-08, Corn, Graded Border, Gilman Loam, 0.1'/100' Row Fall, evaluated 04/25/2023**

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 108% and an irrigation efficiency (IE) of 127%. The average amount needed to refill the root zone at the time of the event was 2.2 acre inches per acre. 10.5 cfs was applied to the 74.9 acre field with a total irrigation time of 14.5 hours, resulting in a gross application of 2.03 acre inches per acre and a net application of 1.73 acre inches per acre as 0.30 acre inches per acre left the field in the form of captured tail water. This was a deficit irrigation. The WCMP respectfully suggested holding sets for an additional 15 minutes each to ensure an adequate amount of water is applied to refill the entire root zone across the field.

### **22-09, Corn, Graded Border, Estrella Loam, 0.1'/100' Row Fall, evaluated 04/26/2023**

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 68% and an irrigation efficiency (IE) of 80%. The average amount needed to refill the root zone at the time of the event was 2.4 acre inches per acre. 10.5 cfs was applied to the 74.5 acre field with a total irrigation time of 25 hours, resulting in a gross application of 3.52 acre inches per acre and a net application of 3.00 acre inches per acre as 0.52 acre inches per acre left the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully declined offering suggestions to improve irrigation efficiency.

### **22-10, Corn, Graded Border, Mohall Loam, 0.1'/100' Row Fall, evaluated 04/26/2023**

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 40% and an irrigation efficiency (IE) of 47%. The average amount needed to refill the root zone at the time of the event was 2.7 acre inches per acre. 12.5 cfs was applied to the 66.9 acre field with a total irrigation time of 36 hours, resulting in a gross application of 6.73 acre inches per acre and a net application of 5.72 acre inches per acre as 0.99 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested changing sets when the water is approximately 50 – 100 feet from the bottom of the field which should improve irrigation efficiency by approximately 10% or 5 acre feet.

### **22-11, Corn, Graded Border, Mohall Loam, 0.1'/100' Row Fall, evaluated 04/26/2023**

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 36% and an irrigation efficiency (IE) of 42%. The average amount needed to refill the root zone at the time of the event was 2.7 acre inches per acre. 12.5 cfs was applied to the 66.1 acre field with a total irrigation time of 40 hours, resulting in a gross application of 7.56 acre inches per acre and a net application of 6.43 acre inches per acre as 1.13 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested changing sets when the water is approximately 50 – 100 feet from the bottom of the field which should improve irrigation efficiency by approximately 5% or 5.5 acre feet.

### **22-12, Corn, Graded Border, Glenbar Clay Loam, 0.1'/100' Row Fall, evaluated 05/12/2023**

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 73% and an irrigation efficiency (IE) of 73%. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 4.3 cfs was applied to the 35.2 acre field with a total irrigation time of 34 hours, resulting in a gross application of 4.11 acre inches per acre and a net application of 4.11 acre inches per acre as no tailwater left the irrigated field. This was a good irrigation event. The WCMP respectfully declined offering suggestions to improve irrigation efficiency.

### **22-13, Corn, Graded Border, Gilman Clay Loam, 0.1'/100' Row Fall, evaluated 05/12/2023**

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 75% and an irrigation efficiency (IE) of 75%. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 4.5 cfs was applied to the 40.4 acre field with a total irrigation time of 36 hours, resulting in a gross application of 4.01 acre inches per acre and a net application of 4.01 acre inches per acre as no tailwater left the irrigated field. This was a good irrigation event. The WCMP respectfully declined offering suggestions to improve irrigation efficiency.

#### **22-14, Corn, Graded Border, Glenbar Clay Loam, 0.1'/100' Row Fall, evaluated 05/13/2023**

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 85% and an irrigation efficiency (IE) of 85%. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 6.5 cfs was applied to the 25.7 acre field with a total irrigation time of 14 hours, resulting in a gross application of 3.54 acre inches per acre and a net application of 3.54 acre inches per acre as no tailwater left the irrigated field. This was a good irrigation event. The WCMP respectfully declined offering suggestions to improve irrigation efficiency.

#### **22-15, Wheat, Contine Clay Loam, Linear Sprinkler, evaluated 05/15/2023**

This standard evaluation was conducted on a wheat field using a linear sprinkler 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 94% and a distribution uniformity (DU) of 44%. The average amount needed to refill the root zone at the time of the event was 1.5 acre inches per acre. 7.3 cfs was applied to the 55.0 acre field with a total irrigation time of 60 hours, resulting in an application of 1.6 acre inches per acre. The WCMP respectfully suggested replacing sprinkler nozzles to improve distribution uniformity that is affected by friction loss with increased distance from the pump.

#### **22-16, Alfalfa, Graded Border, Dateland Loam, 0.45'/100' Row Fall, evaluated 06/06/2023**

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 92% and an irrigation efficiency (IE) of 109%. The average amount needed to refill the root zone at the time of the event was 3.6 acre inches per acre. 6.9 cfs was applied to the 56 acre field with a total irrigation time of 31.5 hours, resulting in a gross application of 3.89 acre inches per acre and a net application of 3.31 acre inches per acre as 0.58 acre inches per acre left the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully suggested paying close attention to set times and possibly increasing them as this field was close to being deficit irrigated.

#### **22-17, Alfalfa, Graded Border, Dateland Loam, 0.55'/100' Row Fall, evaluated 06/07/2023**

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 80% and an irrigation efficiency (IE) of 94%. The average amount needed to refill the root zone at the time of the event was 3.2 acre inches per acre. 10 cfs was applied to the 62.5 acre field with a total irrigation time of 25 hours, resulting in a gross application of 4 acre inches per acre and a net application of 3.4 acre inches per acre

as 0.6 acre inches per acre left the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully suggested scheduling irrigation events when the soil has reached a maximum allowable depletion of 50% to utilize the entire amount of water that was applied from the previous irrigation event.

**22-18, Alfalfa, Graded Border, Gilman Loam, 0.2'/100' Row Fall, evaluated 06/13/2023**

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 84% and an irrigation efficiency (IE) of 94%. The average amount needed to refill the root zone at the time of the event was 3.6 acre inches per acre. 10 cfs was applied to the 67.3 acre field with a total irrigation time of 28.5 hours, resulting in a gross application of 4.23 acre inches per acre and a net application of 3.81 acre inches per acre as 0.42 acre inches per acre left the field in the form of captured tail water. This was a good irrigation event. The WCMP respectfully declined offering suggestions to improve irrigation efficiency.

**22-19, Alfalfa, Graded Border, Gadsen Clay Loam, 0.2'/100' Row Fall, evaluated 06/13/2023**

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 an irrigation efficiency (IE) of 88%. The average amount needed to refill the root zone at the time of the event was 3.4 acre inches per acre. 8 cfs was applied to the 57.5 acre field with a total irrigation time of 32.5 hours, resulting in a gross application of 4.52 acre inches per acre and a net application of 3.85 acre inches per acre as 0.67 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully suggested targeting set times of 3 hours to improve irrigation efficiency approximately 10%.

**22-20, Alfalfa, Graded Border, Gadsen Clay Loam, 0.15'/100' Row Fall, evaluated 06/15/2023**

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 79% and an irrigation efficiency (IE) of 79%. The average amount needed to refill the root zone at the time of the event was 4.4 acre inches per acre. 8 cfs was applied to the 69.3 acre field with a total irrigation time of 48 hours, resulting in a gross application of 5.54 acre inches per acre and a net application of 5.54 acre inches per acre as no water left the irrigated area. This was a good irrigation event. The WCMP respectfully suggested targeting a total field irrigation time of 40 hours to improve irrigation efficiency by approximately 15%.

**22-21F, Alfalfa, Graded Border, Cashion Clay Loam, 0.6'/100' Row Fall, evaluated 06/30/2023**

This standard, follow up, 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 101% and an irrigation efficiency (IE) of 107%. 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 76.8 acre field with a total irrigation time of 48 hours, resulting in a gross application of 3.75 acre inches per acre and a net application of 3.56 acre inches per acre as 0.19 acre inches per acre left the field in the form of captured tail water. This was a deficit irrigation. The WCMP respectfully suggested holding sets for an additional 15 minutes to ensure an adequate amount of water is applied to refill the entire root zone across the field.

### **22-22, Alfalfa, Graded Border, Mohall Sandy Loam, 0.3'/100' Row Fall, evaluated 07/03/2023**

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. 14.0 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 per acre left the field in the form of captured tail water. The WCMP respectfully suggested targeting a field irrigation time of 17.5 hours to potentially improve irrigation efficiency by 18%.

### **22-23, Alfalfa, Graded Border, Gilman Loam, 0.4'/100' Row Fall, evaluated 07/05/2023**

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. 14.0 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 per acre left the field in the form of captured tail water. The WCMP respectfully declined offering suggestions for improved irrigation efficiency at this time. This was a good irrigation event for this field.

### **22-24, Alfalfa, Graded Border, Mohall Loam, 0.2'/100' Row Fall, evaluated 07/05/2023**

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 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 a gross application of 3.54 acre inches per acre and a net application of 3.54 acre inches per acre as no tailwater left the irrigated field. The WCMP respectfully suggested targeting a total field irrigation time of 19.5 to potentially improve irrigation efficiency by 13%.

### **22-25, Alfalfa, Graded Border, Mohall Loam, 0.2'/100' Row Fall, evaluated 07/06/2023**

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 48% 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 a gross application of 8.91 acre inches per acre and a net application of 8.91 acre inches per acre as no tailwater left the irrigated field. The WCMP respectfully suggested reducing the flow rate to 8 cfs and irrigating only one border at a time for approximately 1.75 hours to potentially improve irrigation efficiency by 35%.

### **22-26, Alfalfa, Graded Border, Brios Sandy Loam, 0.71'/100' Row Fall, evaluated 07/14/2023**

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 68% and an irrigation efficiency (IE) of 85%. The average amount needed to refill the root zone at the time of the event was 3.8 acre inches per acre. 6.3 cfs was applied to the 36.7 acre field with a total irrigation time of 33.25 hours, resulting in a gross application of 5.67 acre inches per acre and a net application of 4.53 acre inches per acre as 1.14 acre inches per acre left the field in the form of captured tail water. The WCMP respectfully declined offering suggestions to improve irrigation efficiency at this time. This was a good irrigation event for this field.

**22-27, Alfalfa, Graded Border, Brios Sandy Loam, 0.7'/100' Row Fall, evaluated 07/14/2023**

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 69% and an irrigation efficiency (IE) of 69%. The average amount needed to refill the root zone at the time of the event was 3.8 acre inches per acre. 5 cfs was applied to the 33.4 acre field with a total irrigation time of 37.5 hours, resulting in a gross application of 5.61 acre inches per acre and a net application of 5.61 acre inches per acre as no tailwater left the irrigated field. The WCMP respectfully suggested reducing set times by approximately 10 minutes to potentially improve irrigation efficiency approximately 13%.

**22-28, Alfalfa, Graded Border, Mohall Loam, 0.3'/100' Row Fall, evaluated 07/21/2023**

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 82% and an irrigation efficiency (IE) of 82%. 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 a gross application of 4.91 acre inches per acre and a net application of 4.91 acre inches per acre as no tailwater left the irrigated field. The WCMP respectfully declined offering suggestions to improve irrigation efficiency at this time. This was a good irrigation event.

**22-29, Alfalfa, Graded Border, Mohall Loam, 0.1'/100' Row Fall, evaluated 07/22/2023**

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 125% and an irrigation efficiency (IE) of 125%. 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 a gross application of 3.2 acre inches per acre and a net application of 3.2 acre inches per acre as no tailwater left the irrigated field. This field was deficit irrigated. The WCMP respectfully suggested holding sets for an additional 15 minutes each to ensure an adequate amount of water is being applied to completely refill the active root zone across the entire set area.

**22-30, Alfalfa, Graded Border, Mohall Loam, 0.1'/100' Row Fall, evaluated 07/25/2023**

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%. 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 3.36 acre inches per acre and a net application of 3.27 acre inches per

acre as 0.36 acre inches per acre left the field in the form of captured tail water. This field was deficit irrigated. The WCMP respectfully suggested holding the sets for an additional 30 minutes to ensure an adequate amount of water is applied to refill the entire active root zone across the set area. Additionally, the WCMP suggested scheduling irrigation events when the soil has reached a maximum allowable depletion of 50%.

**22-31, Alfalfa, Graded Border, Mohall Loam, 0.2'/100' Row Fall, evaluated 07/26/2023**

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 per acre left the field in the form of captured tail water. The WCMP respectfully suggested reducing set times by approximately 15 minutes to potentially improve irrigation efficiency by approximately 14%.

**22-32, Alfalfa, Graded Border, Mohall Sandy Loam, 0.05'/100' Row Fall, evaluated 07/28/2023**

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 68% 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 a gross application of 6.3 acre inches per acre and a net application of 6.3 acre inches per acre as no tailwater left the irrigated field. The WCMP respectfully suggested targeting a total field irrigation time of 36.75 hours to potentially improve irrigation efficiency by approximately 8%.

**22-33, Alfalfa, Graded Border, Mohall Sandy Loam, 0.05'/100' Row Fall, evaluated 07/28/2023**

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%. 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 per acre left the field in the form of captured tail water. This was a deficit irrigation. The WCMP respectfully suggested adding approximately 15 minutes to each set to ensure an adequate amount of water is applied to completely refill the active root zone across the entire irrigated area.

**22-34, Alfalfa, Graded Border, Vint Loam, 0.2'/100' Row Fall, evaluated 08/12/2023**

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 33% and an irrigation efficiency (IE) of 33%. The average amount needed to refill the root zone at the time of the event was 3.9 acre inches per acre. 7.2 cfs was applied to the 36.7 acre field with a total irrigation time of 60 hours, resulting in a gross application of 11.76 acre inches per acre and a net application of 9.41 acre inches per acre as 2.35 acre inches per acre left the field as uncaptured tailwater. The WCMP respectfully suggested targeting a set time of 6 hours each to potentially reduce the application approximately 1.5 acre inches per acre.



**22-35, Alfalfa, Graded Border, Glenbar Clay Loam, 0.2'/100' Row Fall, evaluated 08/12/2023**

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 96% and an irrigation efficiency (IE) of 121%. The average amount needed to refill the root zone at the time of the event was 4.3 acre inches per acre. 7.2 cfs was applied to the 25.8 acre field with a total irrigation time of 16 hours, resulting in a gross application of 4.46 acre inches per acre and a net application of 3.57 acre inches per acre as 0.89 acre inches per acre left the field in the form of captured tail water. This field was deficit irrigated. The WCMP respectfully suggested holding the sets for an additional 10 minutes to ensure an adequate amount of water is applied to refill the entire active root zone across the set area.

**22-36, Alfalfa, Graded Border, Glenbar Loam, 0.2'/100' Row Fall, evaluated 08/14/2023**

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 52%. The average amount needed to refill the root zone at the time of the event was 3.6 acre inches per acre. 7.2 cfs was applied to the 72.9 acre field with a total irrigation time of 70 hours, resulting in a gross application of 6.91 acre inches per acre and a net application of 5.53 acre inches per acre as 1.38 acre inches per acre left the field in the form of uncaptured tailwater. The WCMP respectfully suggested reducing set times to approximately 2 hours per set to potentially reduce the application amount by 1.5 acre inches per acre.

**22-37, Alfalfa, Graded Border, Gilman Loam, 0.15'/100' Row Fall, evaluated 08/16/2023**

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 92% and an irrigation efficiency (IE) of 98%. The average amount needed to refill the root zone at the time of the event was 3.0 acre inches per acre. 7.2 cfs was applied to the 39.8 acre field with a total irrigation time of 18 hours, resulting in a gross application of 3.26 acre inches per acre and a net application of 2.93 acre inches per acre as 0.33 acre inches per acre left the field in the form of captured tailwater. The WCMP respectfully declined offering suggestions to improve irrigation efficiency on this field at this time. This was a good irrigation event.

**22-38, Alfalfa, Graded Border, Gilman Loam, 0.15'/100' Row Fall, evaluated 08/17/2023**

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 37% and an irrigation efficiency (IE) of 46%. The average amount needed to refill the root zone at the time of the event was 3.6 acre inches per acre. 7.2 cfs was applied to the 67.4 acre field with a total irrigation time of 92 hours, resulting in a gross application of 9.82 acre inches per acre and a net application of 7.86 acre inches per acre as 1.96 acre inches per acre left the field in the form of captured tailwater. The WCMP respectfully suggested targeting set times of 3 hours to potentially reduce the application amount to 8 acre inches per acre.

**22-39, Alfalfa, Graded Border, Gilman Loam, 0.15'/100' Row Fall, evaluated 08/17/2023**

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 125% and an irrigation efficiency (IE) of 156%. 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 67.4 acre field with a total irrigation time of 24 hours, resulting in a gross application of 2.56 acre inches per acre and a net application of 2.05 acre inches per acre as 0.41 acre inches per acre left the field in the form of captured tailwater. This field was deficit irrigated. The WCMP respectfully suggested targeting set times of 2.5 hours to ensure an adequate amount of water is applied to completely refill the active root zone across the entire irrigated area.

**22-40, Sorghum, Graded Border, Laveen Loam, 0.05'/100' Row Fall, evaluated 08/23/2023**

This standard evaluation was conducted on a sorghum 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 89% 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 a gross application of 2.69 acre inches per acre and a net application of 2.69 acre inches per acre as no water left the irrigated area. The WCMP respectfully declined offering suggestions to improve irrigation efficiency on this field at this time. This was a good irrigation event.

## **Water Conservation Management Program Technical Irrigation & BMP Service Summaries**

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### **S22-01, Technical Service, 10/6/2022**

A grower contacted the WCMP requesting a flow rate confirmation. The WCMP met the grower on site. All questions and concerns were addressed. The portable Fuller Form Weir was successfully used to obtain the flow measurement. Flow rates were reported back to the grower in gallons per minute and cubic feet per second.

### **S22-02, Technical Service, 10/26/2022**

A grower contacted the WCMP requesting flow rate measurements on newly serviced irrigation wells. The WCMP met the grower on site. All questions and concerns were addressed. The portable weir was used to obtain the measurements. Flow rates were reported back to the grower in gallons per minute and cubic feet per second.

### **S22-03, Technical Service, 12/8/2022**

A grower contacted the WCMP to discuss water allotments, crop water requirements, and to review the practicality of his upcoming cropping plan. The WCMP addressed all questions and concerns with the grower. Additional resources were provided to the grower that may be able to provide cost share assistance and other options available to sustain his operation moving forward.

### **S22-04, Technical Service, 04/23/2023**

A grower contacted the WCMP requesting a flow rate measurement. The grower was concerned that the amount that was ordered was not being delivered. The WCMP met the grower on site and discussed his concerns and addressed all questions. A fuller form weir was used to obtain the flow rate. The information was provided to the grower in both gallons per minute (GPM) and cubic feet per second (CFS).

### **S22-05, Technical Service, 05/1/2023**

A grower contacted the WCMP requesting a field slope determination. The grower is concerned that his field no longer has a uniform grade. The WCMP met the grower on site and all questions and concerns were addressed. The WCMP utilized a portable laser to obtain row fall and side fall data. The information was provided back to the grower. The grower was left to make the decision whether the field grade needed to be touched up or not.

### **S22-06, Technical Service, 05/12/2023**

A grower contacted the WCMP requesting a flow rate measurement of a split head. The WCMP met the grower on site and all questions and concerns were addressed. The water delivery was being split four different ways and the grower wanted to know how much water was flowing in each split. The WCMP used the fuller form weir to obtain the measurements. The information was provided back to the grower in gallons per minute (GPM) and cubic feet per second (CFS).

**S22-07, Technical Service, 05/14/2023**

A grower contacted the WCMP requesting a flow rate measurement being delivered to a sprinkler system. The WCMP met the grower on site and all questions and concerns were addressed. The WCMP used the fuller form weir to obtain the measurement. The information was provided back to the grower in gallons per minute (GPM) and cubic feet per second (CFS).

**S22-08, BMP Service, 05/25/2023**

A grower contacted the WCMP inquiring about the 5<sup>th</sup> Management Plan BMP enrollment process. The process was explained to the grower. The grower also asked if the WCMP can assist with the enrollment process. The grower will be contacting the WCMP next spring to begin the BMP enrollment process.

**S22-09, Technical Service, 7/3/2023**

A grower contacted the WCMP to assist with determining when to irrigate next. The WCMP met the grower on site and all questions and concerns were addressed. The WCMP used a JMC probe to core the root zone and assess the soil moisture level. An estimate of when to irrigate the field was provided to the grower.

**S22-10, Technical Service, 7/3/2023**

A grower contacted the WCMP requesting a flow rate measurement. The WCMP met the grower on site and all questions and concerns were addressed. The water delivery was being split into two different heads of water and the grower wanted to be sure they were evenly split. The Fuller Form weir was successfully used to obtain the flow measurements. The results were reported to the grower in cubic feet per second and gallons per minute.

**S22-11, Technical Service, 7/25/2023**

A grower contacted the WCMP requesting assistance with scheduling an upcoming irrigation event. The WCMP met the grower on site and addressed all concerns and questions. A historical consumptive use chart was provided to the grower and instructions on how to use it. The grower, using the information from the consumptive use chart, was able to estimate when the next irrigation event should occur on his field.

**S22-12, BMP Service, 7/29/2023**

A grower contacted the WCMP to inquire about the Ag BMP program. The grower was curious about when the 5<sup>th</sup> management plan would be effective and when he should start the application process. The grower's questions were addressed and he was encouraged to call back next summer to start the process.

**S22-13, Technical Service, 8/11/2023**

A grower contacted the WCMP requesting a soil moisture check on an alfalfa field. The grower was trying to determine whether another irrigation event was required prior to harvest. The WCMP met the grower on site and addressed all questions and concerns. The grower accompanied the WCMP in the field to observe the soil cores and the soil moisture level. The grower determined that he did not want to irrigate an additional time prior to harvest.

**S22-14, Technical Service, 8/11/2023**

A grower requested assistance with irrigation scheduling. The WCMP met with the grower and discussed all

the parameters involved with irrigation scheduling including the irrigator's formula. The grower was also given a copy of the historical consumptive use chart for that crop. The grower stated that he felt fairly comfortable with the process moving forward.

**S22-15, Technical Service, 8/15/2023**

A grower requested assistance with determining the slope of a field. The grower stated that the field has not been touched up with a laser in some time and is not sure whether it needs to be or not. The WCMP used a portable laser to obtain the field slope data. The data was provided and reviewed with the grower. The grower was left to decide whether the field needed to be lasered or not.

**S22-16, Technical Service, 8/16/2023**

A grower requested assistance verifying his irrigation cycle across his farm. The WCMP addressed all questions and concerns with the grower. Current soil moisture levels were determined and an irrigation cycle was determined that coincided with what the grower had already anticipated.

**S22-17, Technical Service, 8/21/2023**

The WCMP was asked to measure irrigation wells that had recently been serviced. The WCMP used the Fullerform Weir to obtain the two measurements and provided the results of the measurements to the grower in cubic feet per second, gallons per minute, and miner's inches.

**S22-18, Technical Service, 8/23/2023**

A grower contacted the WCMP inquiring about different tillage practices and the effects they have on water management. The WCMP identified the grower's short and long term goals he was trying to accomplish with his tillage practices. The pro's and con's of the practices were discussed as they pertained to the soil and their effects on water management. The grower was left to decide what practices would best fit his operation.

**S22-19, Technical Service, 8/30/2023**

A grower requested the measurement of a recently installed sump pump. The WCMP met the grower at the site. The measurement was successfully taken using the Fuller Form Weir. The flow rate was reported back to the grower cubic feet per second, gallons per minute, and miner's inches.

**S22-20, Technical Service, 9/14/2023**

A grower requested assistance measuring a recently serviced irrigation well. The WCMP met the grower on site to discuss the various methods of water measurement. The WCMP successfully used the Fuller Form Weir to measure the well. The results were provided to the grower in cubic feet per second, gallons per minute, and miner's inches.

## Water Conservation Management Program Outreach/Education/Promotional Activities

Newsletter, Common Irrigation Terms, 5/2023

# Water Conservation Management Program

NEWSLETTER

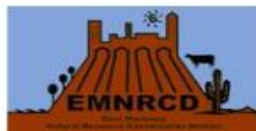
May 2023

WCMP, your free irrigation management services provider, is on call to provide you with irrigation services that help improve irrigation efficiency. Through a cooperative effort between the East Maricopa Natural Resource Conservation District and the Arizona Department of Water Resources, the WCMP has been established to assist in sustaining production agriculture in the Phoenix AMA. The WCMP provides water measurement, slope determination, irrigation scheduling assistance, irrigation system evaluations, AG BMP enrollment, and practical recommendations to help improve irrigation efficiency.

**Call today to experience the value of the WCMP 480.466.2968**

### COMMON IRRIGATION TERMS

<b>Field Capacity</b>	=	The maximum amount of water that a particular soil texture can hold
<b>Available Water Holding Capacity (AWHC)</b>	=	The amount of water in the root zone between plant wilting point and field capacity
<b>Transpiration</b>	=	Water movement up through a plant's roots and the evaporation of that moisture from its leaves, stems, and flowers
<b>Evaporation</b>	=	The conversion of a liquid to a gas
<b>Evapotranspiration (ET)</b>	=	The sum of transpiration and evaporation
<b>Field Application Efficiency (FAE)</b>	=	The ratio between the amount of water needed to refill the soil profile and the amount applied
<b>Irrigation Efficiency (IE)</b>	=	The ratio between the amount of water beneficially used by the crop and how much was applied
<b>Distribution Uniformity (DU)</b>	=	How uniformly water is applied to an area being irrigated
<b>Consumptive Use (CU)</b>	=	The sum of the amount of water lost to evaporation and the amount of water drawn up into the plant through the roots and transpiring through the leaves during crop growth
<b>Soil Texture</b>	=	The proportion of sand, silt, and clay particles that make up a given soil
<b>Opportunity Time</b>	=	The amount of time that water is observable on the surface of a given area



#### Common Conversions

1 gallon = 8.3 pounds  
1 cubic foot = 7.48 gallons = 62.4 pounds  
450 gallons per minute (gpm) = 1 cubic foot per second  
1 cubic foot per second (cfs) = 1 acre-inch per hour  
1 acre-inch = 27,000 gallons = 1 acre flooded 1 inch deep  
1 acre foot = 12 acre-inches = 43,560 cubic feet = 325,900 gallons  
1 gallon = 3.785 liters = 0.003785 cubic meters  
1 cubic meter = 1000 liters = 264.2 gallons



## Farm Bureau – Insta Gram Live Interview: “The WCMP and Water Conservation”, July 2023

The WCMP was invited to participate in the Arizona Farm Bureau’s Insta Gram Live – Talk to Farmer program to discuss the WCMP and water conservation in the agriculture community. The WCMP and the association with ADWR was discussed. Services provided by the WCMP were also discussed and how the services impact irrigation efficiency. The WCMP demonstrated how a Fuller Form Weir works as well as how and why a portable laser is used when evaluating an irrigation system. The WCMP has been invited back by the Arizona Farm Bureau to participate in another event, in the near future.



## **Arizona Association of Conservation Districts – Summer Meeting – August 7<sup>th</sup>**

The WCMP was asked to attend and participate in the AACD's summer meeting. The WCMP was tasked with chairing the Cropland and Water Conservation Committee to discuss water issues facing the agriculture community in Arizona. The WCMP, the services provided, and the association with ADWR were introduced to committee attendees. Irrigation challenges and successes in the Phoenix AMA were discussed. Committee attendees shared similar stories and concerns. Strategies to mitigate irrigation efficiency challenges including management practices and system design and operation were discussed. A long-term plan was informally developed to help guide IWM practices that accommodate anticipated challenges in the future. The WCMP has been asked to attend local meetings with various groups around the state to discuss strategies and methods that help improve irrigation efficiency and sustain agriculture.



# Water Conservation Management Program

NEWSLETTER

September 2023

## Irrigation Systems

The challenge of conserving every drop of water possible has forced Arizona producers to search out every available advancement in water conservation. Three irrigation systems that have proven very successful are flood, sprinkler, and sub surface drip. When these systems are managed to their efficiency potential, producers realize maximum water conservation while maintaining or improving crop production and quality.



Flood systems, when designed properly, target application amounts determined, and irrigations scheduled to occur when the soil has reached a Maximum Allowable Depletion, flood systems can reach an irrigation efficiency as high as 85%.

Center pivot sprinkler systems can reach irrigation efficiencies as high as 90%. Timing of irrigation events are based on daily crop water use versus soil moisture depletion. Distribution uniformity is also a critical component to sprinkler systems to ensure an equal amount of water is applied across the entire irrigated area.



Drip systems can reach irrigation efficiencies as high as 95%. Similar to sprinklers, drip irrigation events are scheduled based on crop water usage versus soil moisture depletion. Distribution uniformity is an additional management component to ensure an equal amount of water is applied across the entire irrigated area.

The WCMP specializes in evaluating the performance of irrigation systems. If you are having challenges achieving the highest irrigation efficiency possible for your system, do not hesitate to call. The WCMP is your technical irrigation services specialists. The WCMP can help you achieve 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

**Call the WCMP today!  
480.466.2968**

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**



**Fiscal Year 2022**  
**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
22-01	450	0.5	225	\$55.00	\$12,375.00	\$25.00	\$11,250.00
22-02	450	0.5	225	\$55.00	\$12,375.00	\$25.00	\$11,250.00
22-03	450	0.5	225	\$55.00	\$12,375.00	\$25.00	\$11,250.00
22-04	450	0.5	225	\$55.00	\$12,375.00	\$25.00	\$11,250.00
22-05	450	0.5	225	\$55.00	\$12,375.00	\$25.00	\$11,250.00
22-06	240	0.5	120	\$54.00	\$6,480.00	\$18.00	\$4,320.00
22-07	240	0.5	120	\$54.00	\$6,480.00	\$18.00	\$4,320.00
22-08	320	0.5	160	\$34.00	\$5,440.00	\$30.00	\$9,600.00
22-09	480	0.25	120	\$54.00	\$6,480.00	\$10.00	\$4,800.00
22-10	480	0.25	120	\$54.00	\$6,480.00	\$10.00	\$4,800.00
22-11	320	0.5	160	\$34.00	\$5,440.00	\$30.00	\$9,600.00
22-12	650	0.5	325	\$54.00	\$17,550.00	\$30.00	\$19,500.00
22-13	650	0.5	325	\$54.00	\$17,550.00	\$30.00	\$19,500.00
22-14	650	0.5	325	\$54.00	\$17,550.00	\$30.00	\$19,500.00
22-15	650	0.5	325	\$54.00	\$17,550.00	\$30.00	\$19,500.00
22-16	640	0.25	160	\$34.00	\$5,440.00	\$8.00	\$5,120.00
22-17	640	0.25	160	\$34.00	\$5,440.00	\$8.00	\$5,120.00
22-18	450	0.5	225	\$38.00	\$8,550.00	\$15.00	\$6,750.00
22-19	450	0.5	225	\$38.00	\$8,550.00	\$15.00	\$6,750.00
22-20	450	0.5	225	\$38.00	\$8,550.00	\$15.00	\$6,750.00
22-21	480	0.5	240	\$54.00	\$12,960.00	\$18.00	\$8,640.00
22-22	900	0.33	297	\$50.00	\$14,850.00	\$12.00	\$10,800.00
22-23	900	0.33	297	\$50.00	\$14,850.00	\$12.00	\$10,800.00
22-24	900	0.33	297	\$50.00	\$14,850.00	\$12.00	\$10,800.00
22-25	900	0.33	297	\$50.00	\$14,850.00	\$12.00	\$10,800.00
22-26	240	0.125	30	\$50.00	\$1,500.00	\$5.00	\$1,200.00
22-27	240	0.125	30	\$50.00	\$1,500.00	\$5.00	\$1,200.00
22-28	450	0.33	148.5	\$54.00	\$8,019.00	\$15.00	\$6,750.00
22-29	450	0.33	148.5	\$54.00	\$8,019.00	\$15.00	\$6,750.00
22-30	600	0.33	198	\$54.00	\$10,692.00	\$15.00	\$9,000.00
22-31	600	0.33	198	\$54.00	\$10,692.00	\$15.00	\$9,000.00
22-32	600	0.33	198	\$54.00	\$10,692.00	\$15.00	\$9,000.00
22-33	600	0.5	300	\$54.00	\$16,200.00	\$15.00	\$9,000.00
22-34	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-35	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-36	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-37	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-38	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-39	480	0.33	158.4	\$45.00	\$7,128.00	\$15.00	\$7,200.00
22-40	240	0.125	30	\$44.00	\$1,320.00	\$5.00	\$1,200.00
<b>Totals</b>	<b>20540</b>	<b>0.38</b>	<b>7879.4</b>	<b>\$48.73</b>	<b>\$389,167.00</b>	<b>\$17.08</b>	<b>\$336,400.00</b>

\*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".





22-37 Knowing  
22-39 Evaluation results

22-38 The analysis  
22-40 Unavailable

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

22-01 Nothing  
22-03 More follow up  
22-05 Seasonal study  
22-07 Irrigation scheduling  
22-09 More evals  
22-11 It's a good service  
22-13 Nothing  
22-15 More time with us  
22-17 Nothing  
22-19 Unavailable  
22-21F Not that I can think of  
22-23 I don't know  
22-25 It's good how it is  
22-27 Nothing  
22-29 It's good now  
22-31 Nothing  
22-33 Don't change it  
22-35 Doing a good job  
22-37 Nothing comes to mind  
22-39 Nothing

22-02 More evals  
22-04 More time  
22-06 Nothing  
22-08 I don't know  
22-10 Season long study  
22-12 Nothing, it's good  
22-14 Not that I can think of  
22-16 Nothing  
22-18 Unavailable  
22-20 Unavailable  
22-22 It's a good program  
22-24 Nothing I can think of  
22-26 N/A  
22-28 More fields  
22-30 Appreciate the information  
22-32 Can't think of anything  
22-34 Great program  
22-36 Can't think of anything  
22-38 Not off top of my head  
22-40 Unavailable

7. If you had the power to make the funding decision for the WCMP 2023 program year, would you vote in favor of funding the WCMP?

**YES - 36**

**NO -**

**Unavailable - 4**