

BMP Program Modifications

As recommended by Chairman Scott Riggins
with the consensus of the committee
in the April 8, 2021 meeting of the
Agricultural Water Conservation Best Management
Practices (BMP) Advisory Committee

Updated April 8, 2021

APPENDIX 4B
BEST MANAGEMENT PRACTICES PROGRAM
SECTION I: APPROVED BEST MANAGEMENT PRACTICES & POINTS

| BMP CATEGORY 1. WATER CONVEYANCE SYSTEM IMPROVEMENTS | |
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| Description: A farm's water conveyance system allows water to be conveyed from an irrigation district delivery point or a well head for irrigation of each field. This category includes water conveyance system improvements that qualify as approved BMPs. | |
| Approved Water Conveyance Improvements | |
| BMP 1.1 Concrete-Lined ditch | |
| <u>Definition:</u> A means of transporting water to farm fields via a <u>well-maintained</u> concrete-lined ditch (open channel) <u>or a lining that performs at least equivalently to a well-maintained concrete lining</u> in order to minimize transmission losses through seepage. | |
| BMP 1.2 Pipelines | |
| <u>Definition:</u> Any type of low or high-pressure pipeline (closed conduit) used to convey water to a farm field in order to reduce or eliminate water loss prior to the act of irrigation. Pipelines may be constructed of PVC, ABS, concrete, aluminum, and or steel. | |
| BMP 1.3 Drainback system | |
| <u>Definition:</u> Level irrigation system technology utilizing headland channel conveyance which is designed and maintained to "drain" excess water applications from one irrigated field to the next down gradient field. | |
| Substitute Practice: Water Conveyance Improvements | |
| <u>A new or existing water conveyance improvement method not listed above that the Director determines will likely result in a reduction in transmission losses at least equivalent to the reduction in transmission losses that would result from the implementation of one of the approved improvements described in this category.</u> <u>The Director may add an approved substitute practice to the list of Approved Best Management Practices, pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.</u> | |
| CATEGORY 1: POINT VALUE DETERMINATION | |
| An applicant for the BMP Program must select one or more of the water conveyance system improvement BMPs described above in the application for the BMP Program. A BMP may be selected only if it is being implemented on the farm at the time the application is filed. The total points for the BMP or BMPs selected in this category shall be calculated by estimating the percentage of the farm's irrigated acreage served by the selected BMP or BMPs, and then determining the point value for that percentage in the Category 1: Water Conveyance System – Point Table below. For purposes of this determination, "irrigated acreage" means those acres within the farm that will be irrigated while the applicant is regulated under the BMP Program. If the applicant selects more than one BMP in this category, an acre shall not be counted twice in determining the total percentage of the farm's irrigated acreage served by the BMPs. In this category, the maximum number of points allowed is four and the minimum number is <u>onethree</u> . | |
| CATEGORY 1: POINTS TABLE | |
| Percentage of Farm's total irrigated acreage served by the approved BMPs | Point Value |
| 60-64 | 1.0 |
| 65-69 | 1.3 |
| 70-74 | 1.8 |
| 75-79 | 2.3 |
| 80-84 | 2.8 |
| 85-89 | 3.3 |
| 90-94 | 3.8 |
| 95-100 | 4.0 |

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| BMP CATEGORY 2. FARM IRRIGATION SYSTEMS |
| Description: Farm irrigation systems are the methods by which a farm field is irrigated. Farm irrigation systems include slope, modified slope, level or near level, sprinkler, trickle or drip, or any combination thereof. This category includes farm irrigation systems that qualify as approved BMPs. |
| Approved Farm Irrigation Systems |
| BMP 2.1 Slope systems without uniform grades with tailwater reuse - (0.5 Point) |
| Definition: Sloped fields without uniform grades with a constructed recovery system that allows for the reuse of water that runs off the end of the field after an irrigation event. |
| BMP 2.2 Uniform slope systems without tailwater reuse - (0.5 Point) |
| Definition: Sloped fields that have been engineered to uniform grades with no means of reusing the water that runs off the end of the field after an irrigation event. |
| BMP 2.3 Uniform slope systems with tailwater reuse - (1.5 Points) |
| Definition: Sloped fields that have been engineered to uniform grades with a constructed recovery system that allows for the reuse of water that runs off the end of the field after an irrigation event. |
| BMP 2.4 Uniform slope within an irrigation district that captures and redistributes return flows - (1.5 Points) |
| Definition: Sloped fields that have been engineered to uniform grades enabling an irrigation district to collect the water that leaves a farm field after an irrigation event for distribution to another farm field. |
| BMP 2.5 Modified slope systems - (2 Points) |
| Definition: Sloped fields that have been engineered to uniform grades in the upper portion of the field, with the bottom portion generally having a field slope of 0.0 to 0.2 feet of total fall in the direction of irrigation. All irrigation water is retained on the field. |
| BMP 2.6 High pressure sprinkler systems - (2 Points) |
| Definition: Side-roll, linear, center-pivot, and solid set designs that operate at <u>mainline-nozzle</u> water pressures of 10 pounds per square inch (psi) or more. |
| <u>BMP 2.7 Non-Minimum qualifying low pressure sprinkler systems-(2.0 Points)</u> |
| <u>Definition: Linear and center pivot sprinkler designs that operate at water pressures measured at the high end of the mainlinenozzle of no greater than 10 psi and possess any of the following disqualifying conditions:</u> |
| <u>1. Field slopes beneath a sprinkler system that exceed 0.25 foot/100 feet fall along any bisecting line within a circle or in the direction of irrigation in a linear.</u> |
| <u>2. Lack of a mainline factory water filtration system that minimizes sediment and particle blockage and wear in the sprinkler regulators.</u> |
| <u>3. Lack of an automatic main water supply pump shut down system in the event of sprinkler forward travel failure.</u> |
| <u>BMP 2.8 NonMinimum-qualifying trickle irrigation systems- (2.0 Points)</u> |
| <u>Definition: Pressurized drip or subsurface irrigation system that possess any of the following disqualifying conditions:</u> |
| <u>1. A pressurized drip or subsurface irrigation system that delivers less than 90% of the original designed gallons per minute (GPM) and cannot be corrected in a way that is economically feasible. Any installed drip tape or drip lines that are over 10 years old.</u> |
| <u>2. Lack of a system to visually or through pressure measurement check all lateral and other diversion values for leakage.</u> |
| <u>3. Lack of organizational policies for management and labor that assure that all visible leaks in drip lines and related systems are repaired within 12 hours and to retain leaked water on the field. 6 hours and in no event shall leak waters leave the perimeter of the field unit.</u> |
| <u>BMP 2.7-9 Near level systems - (2.53.0 Points)</u> |
| Definition: Sloped fields that have been engineered to uniform grades between 0.2-031 to 0.5-06 <u>feetfoot per 100 feet</u> of <u>total</u> fall in the direction of irrigation over the entire length of the field. All irrigation water is retained on the field. |

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| BMP 2.8-10 Level systems - (3-4 Points) |
| Definition: Level border or level furrow system where the field slope may vary from 0.0 to 0.2-03-foot per 100 feet total of fall in the direction of irrigation over the entire length of the field. Either all irrigation water is retained on the field or a level drainback system is used. |
| BMP 2.9-11 Qualifying low pressure sprinkler systems - (4 Points) |
| Definition: Linear and center-pivot sprinkler designs that operate at water pressures measured at the nozzle high end of the mainline of no greater than 10 psi with none of the disqualifying conditions enumerated in BMP 2.7. |
| BMP 2.10-12 Qualifying Trickle irrigation systems - (4 Points) |
| Definition: Pressurized drip or subsurface irrigation capable of applying precise amounts of water to the crop root zone (also referred to as drip irrigation) with none of the disqualifying conditions enumerated in BMP 2.8. |
| <u>Substitute Farm Irrigation System</u> |
| <u>Substitute Practice: Farm Irrigation Systems - (1-4 Points)</u> |
| <u>Definition: A new or existing farm irrigation system definition, or, a different remedy for an existing BMP practice disqualification minimum qualifying condition not listed above that the Director determines will likely result in water saving efficiency on the farm at least equivalent to the water saving efficiency that would result from implementation of one of the approved BMPs described in this category. The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.</u> |
| CATEGORY 2: POINT VALUE DETERMINATION |
| An applicant for the BMP Program must select one or more of the farm irrigation systems BMPs described above in the application for the BMP Program. A BMP may be selected only if it is being implemented on the farm at the time the application is filed. The points for a BMP selected in this category shall be calculated by multiplying the points assigned to the BMP as shown above by the percentage of the farm's irrigated acreage served by the irrigation system described in the BMP. For purposes of this determination, "irrigated acreage" means those acres within the farm that will be irrigated while the applicant is regulated under the BMP Program. If the applicant selects more than one BMP in this category, an acre shall not be counted twice in determining the total percentage of the farm's irrigated acreage served by the BMPs. In this category, the maximum number of points allowed is four and the minimum number is two. |

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| BMP CATEGORY 3. IRRIGATION WATER MANAGEMENT PRACTICES |
| Description: Irrigation water management practices include management practices that, when implemented properly, will increase a farm's overall efficiency of water application in a growing season. This category includes irrigation water management practices that qualify as approved BMPs. |
| Approved Irrigation Water Management Practices |
| BMP 3.1 Laser or GPS touch-up - (1 Point) |
| Definition: Annual re-establishment of precision laser or GPS grades to ensure good advancement of applied irrigation water. Must be applied to a minimum of 20 percent of the near level and level basin acreage irrigated the prior year. |
| BMP 3.2 Low pressure sprinkler system annual maintenance - (1.0 Point) |
| <u>Definition: Annual maintenance program on all individual sprinkler systems serving irrigated acreage within a BMP regulated irrigation right. This annual maintenance regime must be a dealer or factory specified broadly based inspection and replacement program performed by a dealer, qualified service agent, or by a BMP operator under the guidelines so specified.</u> |
| BMP 3.3 Trickle irrigation advanced maintenance drip tape or line replacement program - (1.0 Point) |
| <u>Definition: Drip Tape or Drip lines begin being replaced 510 years after installation on 20% of all irrigated acreage served by trickle irrigation within a BMP regulated irrigation right. Every year thereafter for another 4</u> |

years 20% more of all drip tape or drip lines is replaced. At the end of 105 years all original drip tape & lines have been replaced.

A BMP Program Participant implementing this BMP may apply to the Director to extend the replacement timelines in this BMP by providing flow test results demonstrating that the system delivers at least 90% of the original designed gallons per minute (GPM). The initial application for a timeline extension may be made no earlier than 9 years after the initial installation of the drip tape or drip line. The Director may add up to 2 years to the replacement timeline, and the timeline may be extended multiple times.

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| BMP 3.2-4 Alternate row irrigation - (1 Point) |
| Definition: The practice of irrigating every other cultivated row during either single or multiple irrigation events to minimize the surface area of applied water. Annually, must be used on at least 20 percent of the acreage irrigated in row crops for at least one irrigation. |
| BMP 3.3-5 Furrow checks - (1 Point) |
| Definition: Manually applied or installed devices placed in rows to raise the water level in the row reducing the velocity to prevent erosion and enhance infiltration rates. Annually, must be used on at least 20 percent of irrigated acreage for at least one irrigation. |
| BMP 3.4-6 Angled rows/<u>Angled borders</u>/contour farming - (1 Point) |
| Definition: Annual practice of reducing row fall through row angling, <u>border angling</u> , and/or contouring to enhance water advancement and infiltration rates. This practice may also minimize or eliminate tailwater runoff. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 3.5-7 Surge irrigation - (1 Point) |
| Definition: The practice of applying irrigation water to a field by intermittent surges or pulses of water rather than by a continuous flow rate. The irrigation water advances down the field (or furrow), in stages, allowing uniform water penetration and avoiding tailwater runoff. A gradual sealing and soil conditioning occurs with each progressive surge allowing a more efficient water application. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 3.6-8 Temporary sprinklers - (1 Point) |
| Definition: Utilization of portable, roller and/or solid set sprinkler system for meeting pre-irrigation needs, seedling germination to establish a crop, and/or pre-harvest irrigation for maintaining crop quality. This practice reduces water use when compared to conventional flood irrigation techniques that require excessive water applications for seedling germination and/or crop quality. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 3.7-9 Participation in an educational irrigation water management program - (1 Point) |
| Definition: Enrollment in a private, <u>governmental</u> , or ADWR-sponsored educational irrigation water management program that includes irrigation water management topics such as soil water replacement needs, application rates, and irrigation scheduling. Must participate in such a program throughout the entire crop season annually. |
| BMP 3.8-10 Participation in an <u>consultant or irrigation district sponsored</u> irrigation scheduling service - (1 Point) |
| Definition: Enrollment in <u>Participation with</u> a <u>private or governmental</u> consultant or ADWR-sponsored irrigation scheduling service that provides recommendations on soil moisture monitoring, soil water replacement needs, irrigation application rates, and irrigation scheduling dates based on soil moisture monitoring or real-time evapotranspiration data. Must participate in such a program throughout the entire crop season annually. |
| BMP 3.9-11 Participation in an irrigation district program to increase the flexibility of water deliveries - (1 Point) |
| Definition: Enrollment in a cooperative program set up by the irrigation district to assist a farmer with timely irrigation deliveries and shut off, constant flow rates, and other water order guidelines developed by the irrigation district. Must participate in such a program throughout the entire crop season annually. |
| BMP 3.10-12 Measure flow rates to determine the amount of water applied - (1 Point) |
| Definition: Measure flow rates to determine the amount of water applied for each irrigation event on each field for the purpose of achieving good application efficiencies. |

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| BMP 3.11-13 Soil moisture monitoring - (1 Point) |
| Definition: Use of a number of accepted methods to monitor/measure soil moisture for the purpose of determining soil water replacement needs, application rates, and irrigation scheduling on each field (accepted methods may include core sampling, resistance blocks, neutron probe, tensiometers) throughout the entire crop season. |
| BMP 3.12-14 Computer based modeling using meteorological data - (1 Point) |
| Definition: Use of a computer-based irrigation scheduling program that incorporates real-time meteorological data (e.g. AZMET <u>or other qualified services</u>) for the purpose of determining irrigation event schedules on each field throughout the entire crop season. |

APPENDIX 4B

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Substitute Irrigation Water Management Practices

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| Substitute Practice: <u>Irrigation Water Management</u> - (1 Point) |
| Definition: A new or existing irrigation water management practice not listed above that the Director determines will likely result in water savings <u>or efficiency</u> on the farm at least equivalent to the water savings <u>or efficiency</u> that would result from implementation of one of the approved BMPs described in this category. <u>The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.</u> |

CATEGORY 3: POINT VALUE DETERMINATION

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| An applicant for the BMP Program must select one or more of the irrigation water management BMPs described above in the application for the BMP Program. A BMP may be selected only if it will be implemented on an annual basis while the applicant is regulated under the BMP Program. In this category, the maximum number of points allowed is four and the minimum number is <u>onetwo</u> . |
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| BMP CATEGORY 4. AGRONOMIC MANAGEMENT PRACTICES |
| Description: Agronomic management practices include combinations of plant and soil management practices that, if implemented properly, will conserve water over the length of the growing season. This category includes agronomic management practices that qualify as approved BMPs. |
| Approved Agronomic Management Practices |
| BMP 4.1 Crop rotation - (1 Point) |
| Definition: Periodic rotation of crop types on a given farm field to ensure the non-degradation of soil tilth. Annually, at least 20 percent of the acreage irrigated the prior year needs to be rotated to a different crop. |
| BMP 4.2 Crop residue management - (1 Point) |
| Definition: Crop residue should be left on the soil surface or incorporated to a shallow depth into the soil profile to increase soil nutrients, soil water holding capacities, and increase the available soil moisture to a crop. Annually, must be employed on at least 20 percent of the total irrigated acreage. |
| BMP 4.3 Soil and water quality testing - (1 Point) |
| Definition: Annual soil testing to determine: 1) residual amounts of fertilizer, 2) soil salinity for leaching needs, and 3) water intake rates and water holding capacity. Soil testing is required on at least 50 percent of the irrigated acreage. Water quality testing for needs such as estimating leaching requirements or avoiding potential injury to crops. Testing must include a "blend" analysis of irrigation water used from all sources. |
| BMP 4.4 Pre-irrigation surface conditioning - (1 Point) |
| Definition: Mechanical means (i.e. driving rows, soil torpedoes, etc.) by which rows or borders are prepared prior to an initial irrigation to smooth flow of water to avoid unwanted deep percolation during dry conditions or to enhance water advancement rates. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 4.5 Transplants - (1 Point) |
| Definition: Use of established seedlings transplanted into a field. This practice eliminates excessive applications of water to germinate crops in the field from seeds. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 4.6 Mulching - (1 Point) |

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| Definition: Use of organic matter (apart from or in addition to crop residues) or plastic sheets to cover plant beds (plastic mulch) and/or use of plastic material laid over hoops suspended above the plant beds (floatable row covers) to reduce evaporation losses. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 4.7 Shaping furrow or bed - (1 Point) |
| Definition: Use of mechanical means such as a row former to make the bed profile shallower to minimize time of infiltration and minimize the wetted surface area along the rows. Annually, must be used on at least 20 percent of irrigated acreage. |
| BMP 4.8 Planting in bottom of furrow, bed, or border - (1 Point) |
| Definition: Practice of planting in the bottom of the furrow, <u>bed, or border</u> -as opposed to planting along the top of <u>the formed irrigation rows and beds</u> to minimize impacts of salt build up and wetting (subbing) requirements for germination. Annually, must be used on at least 20 percent of irrigated acreage. |

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| BMP 4.9 Chemical maintenance of trickle irrigation system – (1 Point) |
| <u>Definition: Chemical usage in a trickle irrigation system to control or eliminate calcification and/or organic growth in the system. Annually, must be used on at least 20 percent of irrigated acreage.</u> |
| BMP 4.910 Use of polyacrylamide in applied irrigation - (1 Point) |
| <u>Definition: Improving irrigation efficiency by applying polyacrylamide to the irrigation water. This compound is a flocculating agent which removes suspended soil from the water and allows the soil to stay in place, reducing soil erosion in the furrow or border and improving the soil uptake of water.</u> |
| Substitute Practice: Agronomic Management (1 Point) |
| <u>Definition: A new or existing agronomic management practice not listed above that the Director determines will likely result in water savings <u>or efficiency</u> on the farm at least equivalent to the water savings <u>or efficiency</u> that would result from implementation of one of the approved BMPs described in this category. <u>The Director may add an approved substitute practice to the list of Approved Best Management Practices pursuant to the procedure set forth in Section II of this appendix. A copy of the most recent list of additional BMPs shall be posted on the ADWR's website and shall be on file with ADWR.</u></u> |
| CATEGORY 4: POINT VALUE DETERMINATION |
| An applicant for the BMP Program must select one or more of the agronomic management BMPs described above in the application for the BMP Program. A BMP may be selected only if it will be implemented on an annual basis while the applicant is regulated under the BMP Program. In this category, the maximum number of points allowed is four and the minimum number is one <u>two</u> . |

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BEST MANAGEMENT PRACTICES PROGRAM
SECTION II: PROCEDURE FOR ADDING A BEST MANAGEMENT PRACTICE TO THE LIST OF APPROVED BEST MANAGEMENT PRACTICES

An applicant for or participant in the Best Management Practices Program may apply to the Director to implement a Substitute Practice, as described in each BMP Category in Section I of this appendix. Upon receipt of an application, the Director shall review the application and may request additional information from the applicant. The Director may seek information from other sources, such as the Agricultural Water Conservation Best Management Practices Advisory Committee, as deemed necessary to determine if the Substitute Practice should be approved.

If the Director approves the application for a Substitute Practice, the Director may add the substitute practice to the list of Approved Best Management Practices set forth in Section I of this appendix by posting the modified list of Approved Best Management Practices on ADWR's web site and filing the modified list within ADWR's active management area office.