IRRIGATION SYSTEM EVALUATION

Grower: Grower Name
Crop: Strawberries
Locations: Field 1, Field 2, Field 3
Evaluators: Evaluator Name
Contact: Contact Name
Job No.: IWM-XXX
Date: 7/30/2014
Location: Location
County: County

Co-sponsors:

Department of Water Resources
State of California

Santa Barbara County
Flood Control and Water Conservation District

USDA Natural Resources Conservation Service

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IRRIGATION SYSTEM EVALUATION SUMMARY

Landowner: Grower Name
Sites Tested: Field 1, Field 2, Field 3
Crop: Strawberries

Evaluation Description
This Irrigation System Evaluation is intended to evaluate the irrigation system for uniform water application and provide suggestions for improving irrigation efficiency.

Distribution Uniformity
Distribution uniformity is a percentage that is used to evaluate the efficiency of an irrigation system and compare to other systems. Industry standard for drip irrigation systems is 85%. The DU for all of the sites tested are shown on the chart.

Annual Water Demand
Annual water demand is based off of specific recommendations for your site. The graph above compares recommended water application for an industry standard 85% DU system, the average recommended water application for the existing systems, and the average water application rates based on the current scheduling.

Potential Cost Savings
Potential cost savings are based on the annual amount of money that can be saved by upgrading the system to improve water use efficiency or adjusting scheduling to meet demands with less water. The savings is shown for each site tested and is based on the cost of the potential water saved.
### TABLE 1: SUMMARY OF POTENTIAL ANNUAL COST SAVINGS

<table>
<thead>
<tr>
<th>Test Location</th>
<th>Test Number</th>
<th>Distribution Uniformity for Tested Area</th>
<th>Estimated Impacted Acres</th>
<th>Estimated potential Cost Savings / year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field 1</td>
<td>IWM-XXX</td>
<td>88</td>
<td>2.00</td>
<td>$10</td>
</tr>
<tr>
<td>Field 2</td>
<td>IWM-XXX</td>
<td>81</td>
<td>2.00</td>
<td>$30</td>
</tr>
<tr>
<td>Field 3</td>
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<td>75</td>
<td>2.00</td>
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<tr>
<td>Totals</td>
<td></td>
<td></td>
<td>6.00</td>
<td>$60</td>
</tr>
</tbody>
</table>

### POTENTIAL COST SAVINGS
The table above represents potential cost saving if the irrigation system and scheduling are improved per site.

### POTENTIAL IMPROVEMENTS
Potential improvements that could be implemented on the system are listed below. Site specific recommendations.
SYSTEM OBSERVATIONS

Field 1
Strawberries
IWM-XXX

The measured distribution uniformity (DU) of the sprinkler irrigation systems for the above area was 88 percent, compared to a standard of 75 percent which has been accepted as a reasonable level of performance by the irrigation industry and the American Society of
SYSTEM OBSERVATIONS

Field 2
Strawberries
IWM-XXX

The measured distribution uniformity (DU) of the sprinkler irrigation systems for the above area was 88 percent, compared to a standard of 75 percent which has been accepted as a reasonable level of performance by the irrigation industry and the American Society of
SYSTEM OBSERVATIONS

Field 3
Strawberries
IWM-XXX

The measured distribution uniformity (DU) of the sprinkler irrigation systems for the above area was 88 percent, compared to a standard of 75 percent which has been accepted as a reasonable level of performance by the irrigation industry and the American Society of
Sprinkler Irrigation Flow Catch Worksheet

CATCH WORKSHEET

The intent of the flow catch worksheet is to record and analyze flow catch testing. The flow catch method requires catch cans to be placed at random locations throughout the field to catch irrigation water. The volume of water is measured in each catch can and then the volumes are analyzed to determine important characteristics about how the system is working including irrigation application rate and distribution uniformity.

CATCHES

The catches section of the worksheet is used to record up to 60 catch can measurements from field testing. Your test for this site used 3 catch cans. The smallest volume collected was 7 ml and the largest volume collected was 12 ml.

PRESSURES

The pressure section of the worksheet contains pressures recorded during the catch test. While pressures are not directly related to the irrigation application of distribution uniformity calculations they do provide good information for system analysis that can help to identify problems and develop solutions. Your test for this site included 2 pressure readings. The smallest pressure reading was 8 psi and the largest pressure reading was 10 psi.

INPUTS

Inputs include information about test that are necessary for the calculation of application rate and distribution uniformity.

APPLICATION RATE

Application rate is the amount of irrigation water applied over a period of time calculated from the results of the catch cans test. The catch values are converted from ml to inches per hour so that they can be more easily compared to precipitation rates and recommended irrigation rates. See the scheduling sheet for this site for more information on recommended irrigation rates. Volumes in the test area at high application rates are an indication of the uniformity of the system. Turf in areas of low application rate requires more irrigation time than the average amount of time to stay healthy. Turf in areas of high application rate may be constantly wet if scheduling is set for the average application rate. Minimizing the difference between high and low application rates will result in a healthier turf and more efficient water use.

DISTRIBUTION UNIFORMITY

Distribution uniformity is a single percentage that is used to evaluate the efficiency of an irrigation system. It is found by dividing the average of the lowest quarter of catch volumes by the average of all catch volumes. The distribution uniformity value allows for uniform comparison between all systems, or an analysis of performance of the system over time. A low distribution uniformity value may be a cause for concern that the system is not functioning as intended. It can be used to estimate scheduling requirements by adjusting irrigation duration to meet the requirements of the areas with lower irrigation application rates. The DU for this set was calculated at 88%.

APPLICATION EFFICIENCY

Application efficiency is a single percentage that is used to evaluate the efficiency of an irrigation system’s scheduling and uniformity. It is found by dividing the average depth of irrigation by the average crop root depth. The application efficiency value allows for uniform comparison between all efficiencies. It can be used to quickly evaluate the uniformity and scheduling of a system with respect to crop demand. The AE for this set was calculated at 82%.

WATER DESTINATION GRAPH

The water destination graph offers a graphical representation of where irrigation water is going on this site. Wet root areas are the goal of an irrigation system. Dry roots may indicate under watering. Wetness under roots is water that is not being used by the turf and is considered wasted by the irrigation system. Good irrigation systems minimize dry root areas and wet areas under the roots.
### Sprinkler Irrigation Flow Catch Worksheet

<table>
<thead>
<tr>
<th>Location</th>
<th>Date</th>
<th>Irrigation System</th>
<th>Field 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2.0 acres</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catch (ml)</th>
<th>Pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO 1</td>
<td>STA 1</td>
</tr>
<tr>
<td>NO 2</td>
<td>STA 2</td>
</tr>
<tr>
<td>NO 3</td>
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</tr>
<tr>
<td>NO 9</td>
<td>STA 9</td>
</tr>
<tr>
<td>NO 10</td>
<td>STA 10</td>
</tr>
</tbody>
</table>

#### Water Destination Graph

- **Wet root**
- **Dry root**
- **Wet under root**
- **Dry under root**

**NOTES:**

**CATCH WORKSHEET**

The intent of the flow catch worksheet is to record and analyze flow catch testing. The flow catch method requires catch cans to be placed at random locations throughout the field to catch irrigation water. The volume of water is measured in each catch can and then the volumes are analyzed to determine important characteristics about how the system is working including irrigation application rate and distribution uniformity.

**CATCHES**

The catches section of the worksheet is used to record up to 60 catch can measurements from field testing. Your test for this site used 3 catch cans. The smallest volume collected was 7 ml and the largest volume collected was 12 ml.

**PRESSURES**

The pressure section of the worksheet contains pressures recorded during the catch test. While pressures are not directly related to the irrigation application or distribution uniformity calculations they do provide good information for system analysis that can help to identify problems and develop solutions. Your test for this site included 2 pressure readings. The smallest pressure reading was 10 psi and the largest pressure reading was 10 psi.

**INPUTS**

Inputs include information about the test that are necessary for the calculation of application rate and distribution uniformity.

**APPLICATION RATE**

Application rate is the amount of irrigation water applied over a period of time calculated from the results of the catch can test. The catch values are converted from ml to inches per hour so that they can be more easily compared to precipitation rates and irrigation rates. See the scheduling sheet for more information on recommended irrigation rates. Variance in the low and high application rates is an indication of the uniformity of the system. Turf in areas of low application rate is stressed and brown. Turf in areas of high application rate is wetter than the average area in this site. Their water destination graph for this site is shown below.

**DISTRIBUTION UNIFORMITY**

Distribution uniformity is a single percentage that is used to evaluate the efficiency of an irrigation system. It is found by dividing the average of the lowest quarter of catch volumes by the average of all catch volumes. The distribution uniformity value allows for uniform comparison between all set efficiencies. In addition, it can be used to estimate scheduling requirements by adjusting irrigation duration to meet the requirements of the areas with lower irrigation application rates. The DU for this set was calculated at 81%. Industry standard for turf sprinkler irrigation systems is 75%.

**APPLICATION EFFICIENCY**

Application efficiency is a single percentage that is used to evaluate the efficiency of an irrigation system’s scheduling and uniformity. It is found by dividing the average catch rate by the average crop root depth. The application efficiency value allows for uniform comparison between all set efficiencies. In addition, it can be used to quickly evaluate the uniformity and scheduling of a system with respect to crop demand. The AE for this set was calculated at 73%.

**WATER DESTINATION GRAPH**

The water destination graph offers a graphical representation of where irrigation water is going on this site. It shows areas that are stressed or irrigated too much. These spots may indicate under watering or over watering. Areas that are always wet may indicate problems with the system such as fugitive irrigation or retaining pools of water. Water destination graphs are essential for evaluating the performance of an irrigation system.
Sprinkler Irrigation Flow Catch Worksheet

**Catch (ml)**

<table>
<thead>
<tr>
<th>STA 1</th>
<th>STA 2</th>
<th>STA 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO 1</td>
<td>NO 1</td>
<td>NO 1</td>
</tr>
<tr>
<td>NO 2</td>
<td>NO 2</td>
<td>NO 2</td>
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<tr>
<td>NO 3</td>
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<td>NO 5</td>
</tr>
<tr>
<td>NO 6</td>
<td>NO 6</td>
<td>NO 6</td>
</tr>
</tbody>
</table>

**Pressure (psi)**

<table>
<thead>
<tr>
<th>STA 1</th>
<th>STA 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

**Inputs**

- Catch Duration (min) = 1.00
- Plant Rows per Bed = 1.00
- Row Spacing (ft) = 1.00
- Drip Lines per Bed = 1.00
- Emitter Spacing (in) = 1.00
- Bed Width (ft) = 1.00

**Outputs**

- Mean Catch: 9 ml
- Mean Pressure: 9 psi
- Net Application Rate: 0.22 in/hr
- Max. Application Rate: 0.38 in/hr
- Min. Application Rate: 0.15 in/hr

**Application Rate**

Application rate is the amount of irrigation water applied over a period of time calculated from the results of the catch can test. The catch values are converted from ml to inches per hour so that they can be easily compared to precipitation rates and recommended irrigation rates. See the scheduling sheet for more information on recommended irrigation rates. Variances in the low and high application rates are an indication of the uniformity of the system. Turf in areas of low application rate may turn brown if scheduling is set for the average application rate. Turf in areas of high application rate may turn less irrigation than the average used in this test. These spots may be efficiently watered by adjusting irrigation duration to meet the requirements of the areas with lower irrigation application rates. The DU for this set was calculated at 75%, which is industry standard for turf sprinkler irrigation systems.

**Distribution Uniformity (DU)**

The DU is a single percentage that is used to evaluate the efficiency of an irrigation system. It is found by dividing the average of the lowest quartile of catch volumes by the average of all catch volumes. The distribution uniformity value allows for uniform comparison between all irrigation systems. Turf in areas of low application rate may turn less irrigation than the average used in this test. These spots may be efficiently watered by adjusting irrigation duration to meet the requirements of the areas with lower irrigation application rates. The DU for this set was calculated at 75%, which is industry standard for turf sprinkler irrigation systems.

**Application Efficiency (AE)**

Application efficiency is a single percentage that is used to evaluate the efficiency of an irrigation system’s scheduling and uniformity. It is found by dividing the average depth of irrigation by the average crop root depth. The application efficiency value allows for uniform comparison between all irrigation systems. Turf in areas of low application rate may turn less irrigation than the average used in this test. These spots may be efficiently watered by adjusting irrigation duration to meet the requirements of the areas with lower irrigation application rates. The AE for this set was calculated at 72%.
**Inputs:**
- **Crop Type:** Strawberries
- **Application Rate (in/hr):** 0.25
- **Root Depth (in):** 3
- **MAD (%):** 50
- **Soil Type:** Sandy Loam
- **Soil WHC (in/in):** 0.15
- **System Efficiency (%):** 88
- **System ECw (mmhos/cm):** 0.9
- **Crop ECe (mmhos/cm):** 1.5

**Outputs:**
- **Leaching Requirement:** 0.14
- **Maximum Irrigation Duration:** 0.6 Hours

<table>
<thead>
<tr>
<th>Month</th>
<th>85% DU (in/day)</th>
<th>System DU (85%) (in/day)</th>
<th>Hours</th>
<th>Days</th>
<th>Week</th>
<th>Water Applied (in/day)</th>
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</thead>
<tbody>
<tr>
<td>Jan</td>
<td>0.00</td>
<td>0.00</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Feb</td>
<td>0.00</td>
<td>0.00</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Mar</td>
<td>0.00</td>
<td>0.00</td>
<td>1.0</td>
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<td>0.50</td>
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<tr>
<td>Apr</td>
<td>0.01</td>
<td>0.01</td>
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<td>2.0</td>
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<td>0.50</td>
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<tr>
<td>May</td>
<td>0.02</td>
<td>0.02</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Jun</td>
<td>0.02</td>
<td>0.02</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Jul</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Aug</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Sep</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Oct</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Nov</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
<tr>
<td>Dec</td>
<td>0.01</td>
<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.25</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Irrigation Scheduling Analysis**

**Annual Irrigation Rate Analysis**

**Notes:**
- **Scheduling Sheet:** This scheduling sheet is intended to provide a comparison of the irrigation schedule currently being used by the system with recommended values for your area. Some site specific factors are not taken into account in this analysis and any changes to irrigation schedule should be accompanied by regular evaluation of the turf health. However, the guidelines provided can be a very useful tool in increasing water use efficiency and potentially reducing the amount of water needed for irrigation.

- **Inputs:** Inputs for the scheduling sheet are used to adjust recommendations for site specific factors. Different regions generally have different water use demands for turf based on local climate factors. Root depth, MAD, soil type, and Soil WHC are all used to determine how much water the soil around the roots can hold and how frequently irrigations are required. MAD stands for maximum allowable depletion and represents the minimum percentage of water depleted in the soil before irrigation water is applied. Soil WHC stands for the water holding capacity of a specific soil type. The greater the water holding capacity the more water can be stored in a specific volume of soil. ECw values are used to evaluate the salts in the system and the tolerance of the turf to salt. This is used to evaluate the need for extra irrigation time to leach the salts through the root zone.

- **Output:** The output section provides guidelines for leaching as well as an analysis of the recommended versus existing irrigation schedule. The leaching requirement represents the percentage of extra water needed to flush salts through the root zone. The maximum leaching duration represents the maximum time the irrigation system can be used before the average application rate leads to water infiltrating below the root zone. The scheduling sheet compares recommended irrigation volumes for a system with an industry standard 75% distribution uniformity, and the distribution uniformity of the existing system with the actual irrigation scheduling used in the system. These values are represented graphically in the chart below.

**Irrigation Scheduling Analysis**

This graph represents a comparison between the recommended water application rate for an industry standard 75% DU system, the recommended water application rate for the existing system, and the water application rate based on the user's current scheduling.

**Annual Irrigation Rate Analysis**

This graph represents the annual recommended water use for the crop under ideal conditions, an industry standard 75% DU system, and the existing system.
Owner: Grower Name | IWMI File Number: IWMI-XXX
Area: 2.00 acres | Date: 1/1/1901
Location: Field 2 | Irrigation System: Sprinkler

INPUTS:
- Region: Strawberries
- Application Rate (in/hr): 0.22
- Root Depth (in): 3
- MAD (%): 50
- Soil Type: Sandy Loam
- System Efficiency (%): 81
- Soil WHC (in/in): 0.15
- Crop ECe (mmhos/cm): 1.5

OUTPUT:
- Leaching Requirement: 0.14
- Maximum Irrigation Duration: 0.7 Hours

<table>
<thead>
<tr>
<th>Month</th>
<th>85% DU (in/day)</th>
<th>System DU (85%) (in/day)</th>
<th>Hours</th>
<th>Day</th>
<th>Week</th>
<th>Water Applied (in/day)</th>
<th>(in/wk)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>2.0</td>
<td>0.22</td>
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<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
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<tr>
<td>Mar</td>
<td>0.02</td>
<td>0.02</td>
<td>1.0</td>
<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
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<td>0.01</td>
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<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
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<tr>
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<td>0.01</td>
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<td>0.22</td>
<td>0.44</td>
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<td>0.01</td>
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<td>2.0</td>
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<td>0.44</td>
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<td>Jul</td>
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<td>0.01</td>
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<td>2.0</td>
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<td>0.44</td>
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<tr>
<td>Aug</td>
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<td>0.01</td>
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<td>0.44</td>
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<td>0.22</td>
<td>0.44</td>
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<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
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<tr>
<td>Nov</td>
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<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
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<tr>
<td>Dec</td>
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<td>0.01</td>
<td>1.0</td>
<td>2.0</td>
<td>0.22</td>
<td>0.44</td>
<td></td>
</tr>
</tbody>
</table>

Irrigation Scheduling Analysis

Annual Irrigation Rate Analysis

NOTES:

SCHEDULING SHEET
This scheduling sheet is intended to provide a comparison of the irrigation schedule currently being used by the system with recommended values for your area. Some site specific factors are not taken into account in this analysis and any changes to irrigation schedule should be accompanied by regular evaluation of the turf health. However, the guidelines provided can be a very useful tool in increasing water use efficiency and potentially reducing the amount of water needed for irrigation.

INPUTS
Inputs for the scheduling sheet are used to adjust recommendations for site specific factors. Different regions generally have different water use demands for turf based on local climate factors. Root depth, MAD, soil type, and soil WHC are all used to determine how much water the soil around the roots can hold and how frequently irrigations are required. MAD stands for maximum allowable depletion and represents the minimum percentage of water desired in the soil before irrigation water is applied. Soil WHC stands for the water holding capacity of a specific soil type. The greater the water holding capacity the more water can be stored in a specific volume of soil. ECw values are used to evaluate the salts in the system and the tolerance of the turf to salt. This is used to evaluate the need for extra irrigation time to leach the salts through the root area.

OUTPUT
This output section provides guidelines for irrigation as well as an analysis of the recommended versus existing irrigation schedule. The leaching requirement represents the percentage of extra water needed to flush salts through the root zone. The maximum irrigation duration represents the maximum time the irrigation system can be used before the average application rate leads to water infiltrating below the root zone. The scheduling sheet compares recommended irrigation volumes for a system with an industry standard 75% distribution uniformity, and the distribution uniformity of the existing system with the actual irrigation scheduling used in the system. These values are represented graphically in the chart below.

IRRIGATION SCHEDULING ANALYSIS
This graph represents a comparison between the recommended water application rate for an industry standard 75% DU system, the recommended water application rate for the existing system, and the water application rate based on the user's current scheduling.

ANNUAL IRRIGATION RATE ANALYSIS
This graph represents the annual recommended water use for the crop under ideal conditions, an industry standard 75% DU system, and the existing system.
Irrigation Scheduling

INPUTS:
- Region: Strawberries
- Application Rate (in/hr): 0.22
- Root Depth (in): 3
- MAD (%): 50
- Soil Type: Sandy Loam
- Soil WHC (in/in): 0.15
- Crop ECe (mmhos/cm): 1.5

OUTPUT:
- Leaching Requirement: 0.14
- Maximum Irrigation Duration: 0.7 Hours

Month | 85% DU | System DU (75%) | Hours | Days | Week | Water Applied
--- | --- | --- | --- | --- | --- | ---
Jan | 0.00 | 0.03 | 0.01 | 0.04 | 1.0 | 2.0 | 0.22 | 0.44
Feb | 0.02 | 0.03 | 0.01 | 0.04 | 1.0 | 2.0 | 0.22 | 0.44
Mar | 0.02 | 0.18 | 0.03 | 0.18 | 1.0 | 2.0 | 0.22 | 0.44
Apr | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
May | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Jun | 0.02 | 0.16 | 0.02 | 0.08 | 1.0 | 2.0 | 0.22 | 0.44
Jul | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Aug | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Sep | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Oct | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Nov | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44
Dec | 0.02 | 0.06 | 0.01 | 0.07 | 1.0 | 2.0 | 0.22 | 0.44

NOTES:
- SCHEDULING SHEET
- The scheduling sheet is intended to provide a comparison of the irrigation schedule currently being used by the system with recommended values for your area. Some site-specific factors are not taken into account in this analysis, and any changes to irrigation schedule should be accompanied by regular evaluation of the turf health. However, the guidelines provided can be a very useful tool in increasing water use efficiency and potentially reducing the amount of water needed for irrigation.

INPUTS
- Inputs for the scheduling sheet are used to adjust recommendations for site-specific factors. Different regions generally have different water use demands for turf based on local climate factors. Root depth, MAD, soil type, and soil WHC are all used to determine how much water the soil around the roots can hold and how frequently irrigations are required. MAD stands for maximum allowable depletion and represents the minimum percentage of water depleted in the soil before irrigation water is applied. Soil WHC stands for the water holding capacity of a specific soil type. The greater the water holding capacity, the more water can be stored in a specific volume of soil. ECw values are used to evaluate the salts in the system and the tolerance of the turf to salt. This is used to evaluate the need for extra irrigation time to leach the salts through the root zone.

OUTPUT
- The outputs section provides guidelines for irrigation as well as an analysis of the recommended versus existing irrigation schedule. The leaching requirement represents the percentage of extra water needed to flush salts through the root zone. The maximum irrigation duration represents the maximum time the irrigation system can be used before the average application rate leads to water infiltrating below the root zone. The scheduling sheet compares recommended irrigation volumes for a system with an industry standard 75% distribution uniformity, and the distribution uniformly of the existing system with the actual irrigation scheduling used in the system. These values are represented graphically in the chart below.

IRRIGATION SCHEDULING ANALYSIS
- This graph represents a comparison between the recommended water application rate for an industry standard 75% DU system, the recommended water application rate for the existing system, and the water application rate based on the user's current scheduling.

ANNUAL IRRIGATION RATE ANALYSIS
- This graph represents the annual recommended water use for the crop under ideal conditions, an industry standard 75% DU system, and the existing system.
### System Upgrade Cost/Benefit Estimate

The cost values below are based on average costs in this area. These costs will vary based on cost of labor and equipment and may be significantly different than the values shown here. Cost savings is based on the price of the water saved. Water savings is estimated in this sheet but will vary based on system use and

#### INPUTS:

| Field 1 Crop Demand | Water meter start | 1.2 in | Water meter end | 1000.00 acft |
| Field 2 Crop Demand | Water meter end   | 1.2 in | Water meter end | 1000.10 acft |
| Field 3 Crop Demand | Electric meter start | 1.2 in | Electric meter end | 500.0 kwh |
|                      | Electro kwh       |       | Cost per kwh     | $7.50 |
|                      | Water Cost        |       | $750.00 $/acft  |

#### Field 1: 2 acres

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Number</th>
<th>Unit Cost</th>
<th>Total Cost</th>
<th>DU Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace Drip Tape</td>
<td>EA</td>
<td>20</td>
<td>$1</td>
<td>$20</td>
<td>5%</td>
</tr>
<tr>
<td>New Controller</td>
<td>EA</td>
<td>1</td>
<td>$200</td>
<td>$200</td>
<td>2%</td>
</tr>
</tbody>
</table>

$220 94%

#### Field 2: 2 acres

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Number</th>
<th>Unit Cost</th>
<th>Total Cost</th>
<th>DU Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace Drip Hose</td>
<td>EA</td>
<td>20</td>
<td>$6</td>
<td>$120</td>
<td>5%</td>
</tr>
<tr>
<td>Replace Emitters</td>
<td>EA</td>
<td>20</td>
<td>$10</td>
<td>$200</td>
<td>5%</td>
</tr>
<tr>
<td>Upgrade Manifold</td>
<td>FT</td>
<td>1000</td>
<td>$2</td>
<td>$2,000</td>
<td>5%</td>
</tr>
</tbody>
</table>

$2,320 94%

#### Field 3: 2 acres

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Number</th>
<th>Unit Cost</th>
<th>Total Cost</th>
<th>DU Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace Drip Tape</td>
<td>EA</td>
<td>20</td>
<td>$10</td>
<td>$200</td>
<td>5%</td>
</tr>
<tr>
<td>Upgrade Manifold</td>
<td>FT</td>
<td>1000</td>
<td>$2</td>
<td>$2,000</td>
<td>5%</td>
</tr>
</tbody>
</table>

$2,200 83%

#### SUMMARY:

<table>
<thead>
<tr>
<th>Annual Cost Analysis</th>
<th>Field 1</th>
<th>Field 2</th>
<th>Field 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing water (acft)</td>
<td>0.23</td>
<td>0.25</td>
<td>0.27</td>
</tr>
<tr>
<td>Existing cost ($)</td>
<td>$173</td>
<td>$188</td>
<td>$203</td>
</tr>
<tr>
<td>Improved water (acft)</td>
<td>0.22</td>
<td>0.22</td>
<td>0.25</td>
</tr>
<tr>
<td>Improved cost ($)</td>
<td>$161</td>
<td>$162</td>
<td>$184</td>
</tr>
<tr>
<td>Cost savings ($)</td>
<td>$11</td>
<td>$26</td>
<td>$19</td>
</tr>
<tr>
<td>Breakeven time (yr)</td>
<td>20</td>
<td>91</td>
<td>117</td>
</tr>
</tbody>
</table>

#### NOTES: