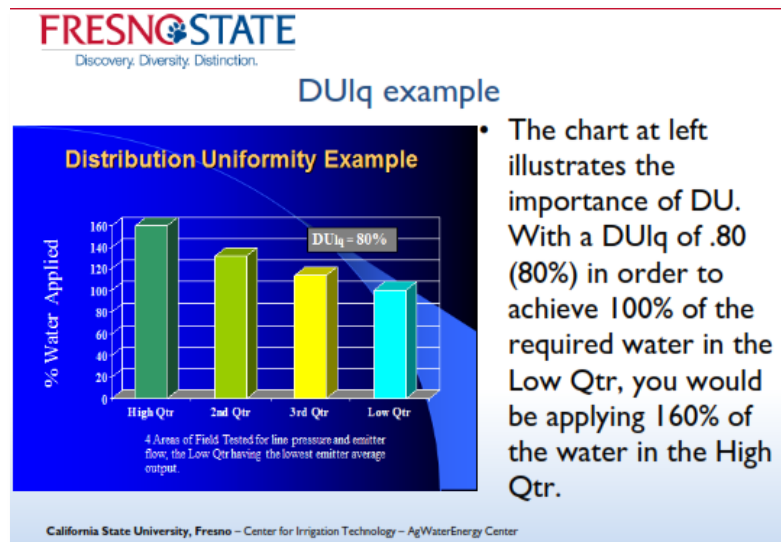




IrriGreen CIT Test Shows 40% Water Savings

Today's irrigation systems are based on decades old mechanical technology where multiple heads are installed on along the edges of a zone and spray water inward for head-to-head coverage. These systems dependent on overlapping arcs to completely cover a zone uniformly making angles and curves extremely difficult to cover properly and waste significant water.



Their overlapping arcs waste water because of the “75/25” paradigm: **75% of every zone receives too much water to ensure the remaining 25% the zone gets enough water** as illustrated by this Center for Irrigation Technology slide.

In addition to overlapping, **10-15% more water is commonly wasted due to overspray** outside the zone shape landing on sidewalks and buildings.

In 2014, Dr. Brian Horgan, turf grass specialist at the University of Minnesota, made this conclusion after comparing IrriGreen with mechanical sprinklers: **“The Catch Can method is not a suitable assessment of the IrriGreen system’s wetting ability and uniformity.”**

The IrriGreen Genius Sprinkler was tested by the Center for Irrigation Technology (CIT), Fresno State, in against mechanical sprinklers. CIT designed rectangular, square and circular shaped test plots and installed best-in-class mechanical sprinklers for each test using 6-9 mechanical sprinklers versus 1 IrriGreen sprinkler. CIT measured soil moisture (SMS) and catch can volume before and after each watering event as well as the gallons used for each test.

The IrriGreen system used 42.2% less water on a 30’ x 60’ rectangle.

For the 30’ x 60’ rectangular test plot, **go to the CIT Study, Table 1, columns CIT-2 and IRRG-2.** 6 Hunter I-20 heads used 492 gallons to achieve a 11.4% increase in soil moisture. A single IrriGreen head used 284 gallons to achieve a 11.0% increase in soil moisture.

The IrriGreen system used 36.7% less water on a 30’ circle.

For the 30’ circle test plot, **go to the CIT Study, Table1, rows CIT-6 and IRRG-6.** 8 Hunter Pro Adjustable sprays used 240 gallons to achieve a 9.6% increase in soil moisture. A single IrriGreen head used 152 gallons to achieve a 9.6% increase in soil moisture.

Note: There was an SMS probe failure during the 30’ x 30’ square test plot measurements as noted in the report.

How does IrriGreen save water?



IrriGreen multi-stream nozzle applies water evenly everywhere in any shape zone using software to calculate the surface area every 0.8 degrees of rotation. Software digitally controls the rotational speed and valve opening to deliver an equal amount of precipitation everywhere within the zone shape.

There are 14 different size/volume streams of water designed to delivering a uniform amount of water from the head to the edge of the zone. Smaller streams spray close to the head and stream sizes increase proportionally as the distance from the head increases. Water movement in the soil fills in the small gaps between the streams, much like a like drip irrigation.

The IrriGreen system evenly applies 0.05 inches of water per rotation. Users select how many inches of water per watering event (in increments of 0.05") and software calculates run times and inserts the time into the watering schedule. This precise application of water eliminates overwatering due to inaccurate calculation of application rate in mechanical systems.

In conclusion, IrriGreen digital sprinkler system eliminates water waste due to overwatering, overspray, and application rate inaccuracy.

REPORT TO: Jeffrey Woodson
IrriGreen, Inc.

FROM: Tim Jacobsen, Field Research Manager
Edward Norum, Agricultural Engineer
Center for Irrigation Technology

DATE: September 23, 2016

SUBJECT: Final report on tests conducted on IrriGreen Genius® sprinkler,
May-August, 2016

Introduction

IrriGreen has developed a unique sprinkler that waters one geographic area with a single programmable sprinkler. The IrriGreen Genius® sprinkler has 14 nozzles in the sprinkler head that can vary the water discharge to fit the geographical area it is programmed to water.

Objective

The Center for Irrigation Technology (CIT) in Fresno, California contracted to conduct a number of sprinkler distribution tests as directed by IrriGreen personnel. The specifics of the individual tests are as defined in the contract deliverables. The testing work began with 30 ft x 60 ft rectangular tests to determine that the equipment was operational. Testing also included two Smart Water Application Technologies (SWAT) configurations: a 30 ft diameter circle test and a 30 ft x 30 ft square test.

Field Testing Design and Procedures

The field testing was conducted on the Center for Irrigation Technology turf plots located on the University Agricultural Laboratory (UAL) at Fresno State between May-August 2016.

Plots #1 and #2 in the turf plot research facility were selected to evaluate the performance of the IrriGreen Genius® sprinkler. The plots were de-sodded and trenched for the installation of the IrriGreen Genius® sprinkler on April 8-9, 2016. Electrical infrastructure to support IrriGreen Genius® controllers was installed at that time.

One IrriGreen Genius® sprinkler was installed in the middle of plot #1 located 15 ft from the east and west edges and 30 ft from the north and south edges. Simultaneously, PVC was installed to conduct tests. Seven Hunter Pro Adjustable sprinklers were installed to conduct the 30 ft diameter circle SWAT test. Nine Hunter MP Rotators were installed to conduct the 30 ft x 30 ft square SWAT test. Six Hunter I-20s were installed to conduct the 30 ft x 60 ft rectangular test.

On April 14-15, 2016, Plots #1 and #2 were re-sodded with tall fescue turf grass, a perennial grass used in Fresno landscaping. The plots were grown out for five weeks in preparation for a May test start date. The standard booster pump at the pump station was replaced with a high pressure pump to provide the 65 psi static pressure recommended by IrriGreen.

Testing began on May 24, 2016. No usable data was obtained as a result of multiple problems, including pressure and flow meter issues. A pump was installed, along with a sophisticated controller, to achieve the required pressure. A pressure-regulating valve was installed at the plot to maintain consistent pressure.

Testing resumed on July 9, 2016 and was completed on August 5, 2016. The extended testing period was necessary to accommodate wind and soil moisture issues. Soil moisture was recorded with a Spectrum Technologies Field Scout, model TDR 300 equipped with 4.7-in. probes. Soil moisture was recorded as a percent of volumetric water content (VWC%) on the same grid pattern used to place the precipitation catchments and was measured before, immediately after and three hours after the conclusion of each test (reference Drawing No. 1499-2 for rain gauge and SMS reading). The probes required frequent inspection and adjustment to maintain consistent soil moisture readings. One of the probes cracked during the IrriGreen Genius® SWAT square test resulting in abnormally low readings. The test was repeated on August 5, 2016 with new probes.

Severe soil settling with elevated soil moisture occurred on the north edge of Plot #1 and required relocating the IrriGreen Genius® sprinkler to Plot #2 for the duration of the trial. The SWAT evaluation area of Plot #1 was not affected and Plot #1 continued to be utilized for the Hunter tests.

Precipitation catchments from the Irrigation Technology Center at Texas A&M were used in the SWAT testing and the 30 ft x 60 ft rectangular area tests. These catchments were installed at turf level with approximately 0.5 in. of the catchment extending above the level of the turf (see Figure 1). The catchments were installed on a 6 ft x 6 ft grid for the 30 ft x 60 ft rectangular area tests and on a 3 ft x 3 ft grid for the SWAT circle and square tests as prescribed in the SWAT testing protocol.

Data was recorded on data sheets in the field then transferred to spreadsheets. Data included readings from the catchments and soil moisture sensors. The data sheets are included in the appendix.



Figure 1. Catchments as installed on turf Plot #2 with the IrriGreen Genius® sprinkler

Table 1 provides a summary of the test runs. As reported in Table 1:

- CIT-1.** For the 30 x 60 ft rectangular test on Hunter I-20 rotors evaluated using catch cans, the application efficiency was 80.7% and the distribution uniformity was 71.4% (Appendix A-2).
- IRRG-1.** For the 30 x 60 ft rectangular test on the IrriGreen Genius® evaluated using catch cans, the application efficiency was 54.1% and the distribution uniformity was 43.0% (Appendix A-5).
- CIT-2.** For the 30 x 60 ft rectangular test on Hunter I-20 rotors evaluated using soil moisture sensors, the application efficiency was 69.8% and the distribution uniformity was 37.1% (Appendix A-3).
- IRRG-2.** For the 30 x 60 ft rectangular test on the IrriGreen Genius® evaluated using soil moisture sensors, the application efficiency was 65.1% and the distribution uniformity was 55.0% (Appendix A-6).
- CIT-3.** For the SWAT 30 x 30 ft square test on Hunter MP Rotators evaluated using catch cans, the application efficiency was 80.5% and the distribution uniformity was 73.8% (Appendix A-8).
- IRRG-3.** For the SWAT 30 x 30 ft square test on the IrriGreen Genius® evaluated using catch cans, the application efficiency was 57.7% and the distribution uniformity was 44.5% (Appendix A-11).

-
- CIT-4.** For the SWAT 30 x 30 ft square test on Hunter MP Rotators evaluated using soil moisture sensors, the application efficiency was 9.8% and the distribution uniformity was 2.3% (Appendix A-9).
- IRRG-4.** For the SWAT 30 x 30 ft square test on the IrriGreen Genius® evaluated using soil moisture sensors, the application efficiency was 41.9% and the distribution uniformity was 26.2% (Appendix A-12).
- CIT-5.** For the SWAT 30 ft diameter circular test on Hunter Pro Adjustable evaluated using catch cans, the application efficiency was 57.8% and the distribution uniformity was 47.6% (Appendix A-14).
- IRRG-5.** For the SWAT 30 ft diameter circular test on the IrriGreen Genius® evaluated using catch cans, the application efficiency was 32.5% and the distribution uniformity was 17.0% (Appendix A-17).
- CIT-6.** For the SWAT 30 ft diameter circular test on Hunter Pro Adjustable evaluated using soil moisture sensors, the application efficiency was 60.5% and the distribution uniformity was 42.7% (Appendix A-15).
- IRRG-6.** For the SWAT 30 ft diameter circular test on the IrriGreen Genius® evaluated using soil moisture sensors, the application efficiency was 60.2% and the distribution uniformity was 43.0% (Appendix A-18).

NOTE: This test report shall not be reproduced, except in full, without written approval of the Center for Irrigation Technology director.

Table 1. Summary of test runs for CIT and Irrigreen Genius® irrigation systems (IRRG)

TEST #	TEST DATE	MFG	SYSTEM	SPEC	PLOT #	PLOT SIZE ft X ft	PLOT SHAPE	ADE-QUACY (%)	INSTR	PRES psi	GAL	AVE APP RATE	EFF APP RATE	OVER-SPRAY LOSS (%)	PATTERN LOSS (%)	APP EFF (%)	DU (%)
CIT-1	7/11	Hunter	sprinklers	I-20 2.0 nozzle	1	30 X 60	rectangle	75	catch cans	40	497	0.470 in./hr	0.411 in./hr	N/A	19.3	80.7	71.4
CIT-2	7/11	Hunter	sprinklers	I-20 2.0 nozzle	1	30 X 60	rectangle	75	SMS	40	497	11.413 delta VWC, %	9.496 delta VWC, %	N/A	30.2	69.8	37.1
IRRG-1	7/9	IrriGreen	Genius® digital sprinkler	Model # 400101	1	30 X 60	rectangle	75	catch cans	65	284	0.304 in./hr	0.194 in./hr	N/A	45.9	54.1	43.0
IRRG-2	7/9	IrriGreen	Genius® digital sprinkler	Model # 400101	1	30 X 60	rectangle	75	SMS	65	284	11.029 delta VWC%	7.890 delta VWC%	N/A	34.9	65.1	55.0
CIT-3	7/28	Hunter	sprinklers	MP rotators	1	30 X 30	square SWAT	75	catch cans	40	223	0.509 in./hr	0.441 in./hr	2.5	17.4	80.5	73.8
CIT-4*	7/28	Hunter	sprinklers	MP rotators	1	30 X 30	square SWAT	75	SMS	40	223	6.977 delta VWC%	1.435 delta VWC%	12.7	88.7	9.8	2.3
IRRG-3	8/5	IrriGreen	Genius® digital sprinkler	Model # 400101	2	30 X 30	square SWAT	75	catch cans	65	139	0.332 in./hr	0.217 in./hr	0	42.3	57.7	44.5
IRRG-4	8/5	IrriGreen	Genius® digital sprinkler	Model # 400101	2	30 X 30	square SWAT	75	SMS	65	139	9.8 delta VWC%	5.4 delta VWC%	1.3	57.6	41.9	26.2
CIT-5	7/29	Hunter	sprinklers	Pro adjustable	1	30 diam	circle SWAT	75	catch cans	40	240	1.462 in./hr	1.053 in./hr	10.7	35.2	57.8	47.6
CIT-6	7/29	Hunter	sprinklers	Pro adjustable	1	30 diam	circle SWAT	75	SMS	40	240	9.608 delta VWC%	7.263 delta VWC%	8.3	34.0	60.5	42.7
IRRG-5	7/26	IrriGreen	Genius® digital sprinkler	Model # 400101	2	30 diam	circle SWAT	75	catch cans	65	152	0.255 in./hr	0.140 in./hr	0	67.5	32.5	17.0
IRRG-6	7/26	IrriGreen	Genius® digital sprinkler	Model # 400101	2	30 diam	circle SWAT	75	SMS	65	152	9.599 delta VWC%	7.280 delta VWC%	8.9	33.9	60.2	43.0

* When using the soil moisture sensor, a reading anomaly occurred on run CIT-4. The readings show a few negative values for the Delta VWC reading. For purposes of the analysis, when this occurred the negative value was replaced by zero. For future testing, multiple replicate runs should be conducted to determine variability in soil moisture sensor readings and soil consistency.

APPENDIX

TEST	DESCRIPTION
Hunter I20 30 ft x 60 ft rectangle	Figure A-1 Field Data Sheet 7/11/16 Figure A-2 CIT-1. Catch Can Evaluation Figure A-3 CIT-2. SMS Evaluation
IrriGreen Genius® 30 ft x 60 ft rectangle	Figure A-4 Field Data Sheet 7/9/16 Figure A-5 IRRG-1. Catch Can Evaluation Figure A-6 IRRG-2. SMS Evaluation
Hunter MP Rotator SWAT 30 ft x 30 ft square	Figure A-7 Field Data Sheet 7/28/16 Figure A-8 CIT-3. Catch Can Evaluation Figure A-9 CIT-4. SMS Evaluation *
IrriGreen Genius® SWAT 30 ft x 30 ft square	Figure A-10 Field Data Sheet 8/5/16 Figure A-11 IRRG-3. Catch Can Evaluation Figure A-12 IRRG-4. SMS Evaluation
Hunter Pro Adjustable SWAT 30 ft diameter circle	Figure A-13 Field Data Sheet 7/29/16 Figure A-14 CIT-5. Catch Can Evaluation Figure A-15 CIT-6. SMS Evaluation
IrriGreen Genius® SWAT 30 ft diameter circle	Figure A-16 Field Data Sheet 7/26 Figure A-17 IRRG-5. Catch Can Evaluation Figure A-18 IRRG-6. SMS Evaluation

* **NOTE:** When using the soil moisture sensor, a reading anomaly occurred on run CIT-4. The readings show a few negative values for the Delta VWC reading. For purposes of the analysis, when this occurred the negative value was replaced by zero. For future testing, multiple replicate runs should be conducted to determine variability in soil moisture sensor readings and soil consistency.

A-1. Hunter I-20 Rotors 30 x 60 Rectangle Field Data Sheet

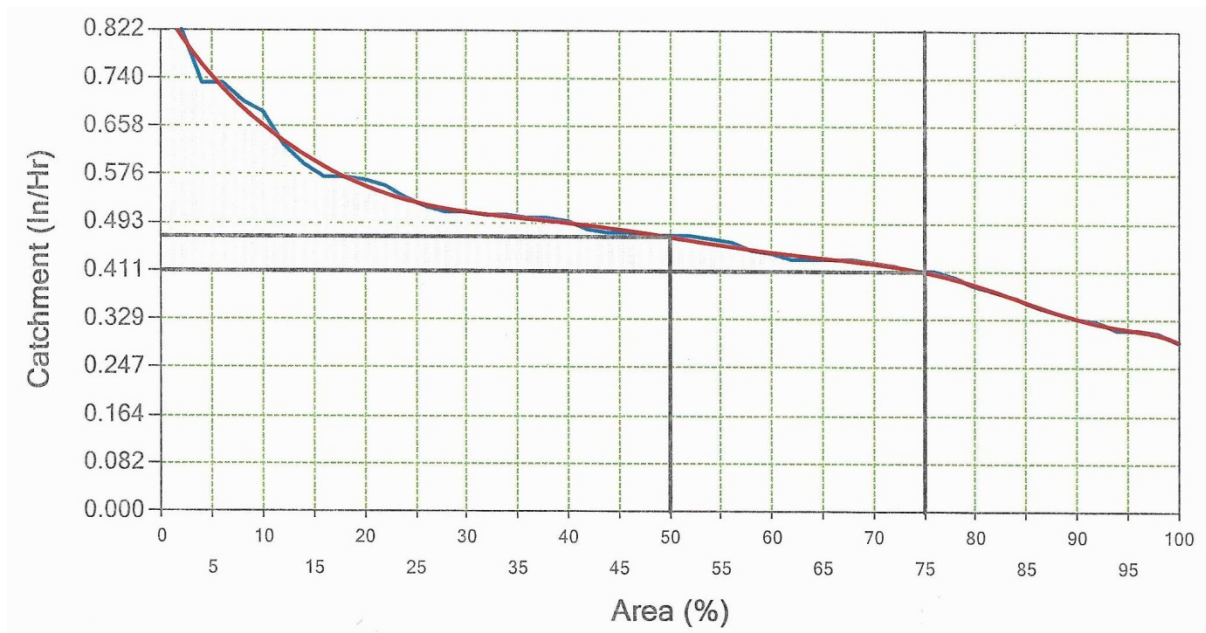
Title: Hunter I-20 30' x 60' Data Plot #1
 Date: 11-Jul-16
 Dimension: 30' x 60'
 Before VWC Ave: 33.3
 After VWC Ave: 44.8
 3 Hr VWC Ave: 46.7

CIT Meter Reading
 Before 9784
 After 10281
 Gal Used 497

Time
 Pressure 40 psi
 Duration 58 minutes

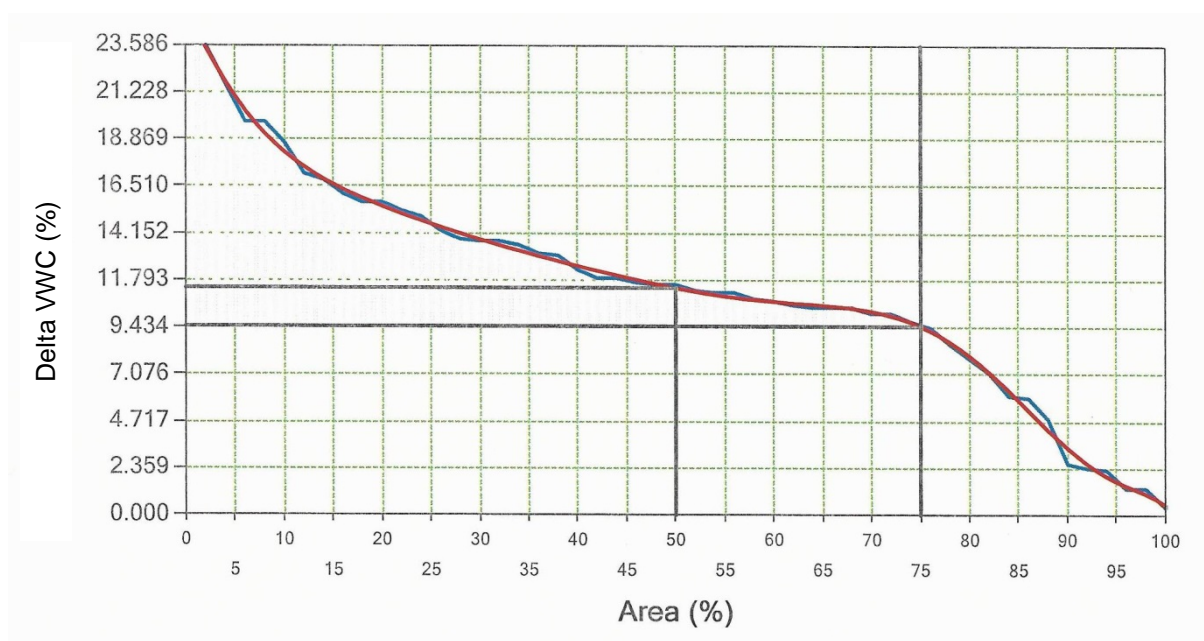
	Row									
Observation	1	2	3	4	5	6	7	8	9	10
Before VWC	37.3	33.7	23.2	20.7	22.5	29.7	17.8	24.6	22.5	26.1
After VWC	60.1	36.2	25.4	26.4	35.8	34.4	28.6	35.8	41.6	45.2
Delta VWC	22.8	2.5	2.2	5.7	13.3	4.7	10.8	11.2	19.1	19.1
3 Hour VWC	66.2	46.4	36.9	27.4	35.8	38	32.6	36.9	38	43.8
Volume (CC)	140	86	61	65	94	92	66	58	86	136
Before VWC	39.5	35.1	33.7	26.8	33	28.6	28.6	30.8	29	30.8
After VWC	60.4	53.2	45.2	43.1	43.8	42.4	40.5	43.4	45.6	46
Delta VWC	20.9	18.1	11.5	16.3	10.8	13.8	11.9	12.6	16.6	15.2
3 Hour VWC	61.2	50.7	52	43.1	43.8	39.1	41.6	45.6	45.6	41.6
Volume (CC)	125	100	93	84	75	70	82	92	99	101
Before VWC	53.2	46.3	34.4	34	34.4	31.1	28.3	31.9	29.7	25.7
After VWC	55.7	53.9	47.4	47.1	47.4	40.9	43.1	43.4	36.6	41.3
Delta VWC	2.5	7.6	13	13.1	13	9.8	14.8	11.5	6.9	15.6
3 Hour VWC	61	56.8	48.1	46	49.2	46.7	42	42.4	36.9	39.1
Volume (CC)	77	164	101	95	62	62	94	102	102	86
Before VWC	41.6	41.6	36.9	34	33	25.7	32.6	37.3	37.3	37.3
After VWC	51.8	52.5	51.4	43.1	46.3	36.9	42	47.4	47.8	48.5
Delta VWC	10.2	10.9	14.5	9.1	13.3	11.2	9.4	10.1	10.5	11.2
3 Hour VWC	54.6	53.9	53.2	40.9	38.4	38	51.8	50.7	52.5	52.1
Volume (CC)	104	114	104	94	68	73	89	100	114	111
Before VWC	58	48.5	45.2	38.4	32.6	28.6	36.2	28.6	36.2	31.5
After VWC	68.4	57.8	55	48.5	38.4	41.3	40.2	43.8	46.3	44.9
Delta VWC	10.4	9.3	9.8	10.1	5.8	12.7	4	15.2	10.1	13.4
3 Hour VWC	67.4	62.2	60.1	49.9	46.7	41.6	46	42.7	49.9	46.7
Volume (CC)	146	113	95	85	88	96	86	80	107	146

A-2. Hunter I-20 Rotors 30 x 60 Rectangle Catch Can Evaluation



Pressure (psi):	40.0
Flow Rate (gpm):	8.56
Spacing (ft):	30.0 x 60.0
Area:	Rectangle
Avg Application Rate (In/Hr):	0.470
Effective Application Rate (In/Hr):	0.411 (75%)
Overspray:	0.0%
Pattern Loss:	19.3%
Application Efficiency:	80.7%
Distribution Uniformity:	71.4%
Notes:	Project 1499(Irrg/15) July 11, 2016 Test conducted on turf plot no. 1

A-3. Hunter I-20 Rotors 30 x 60 Rectangle SMS Evaluation



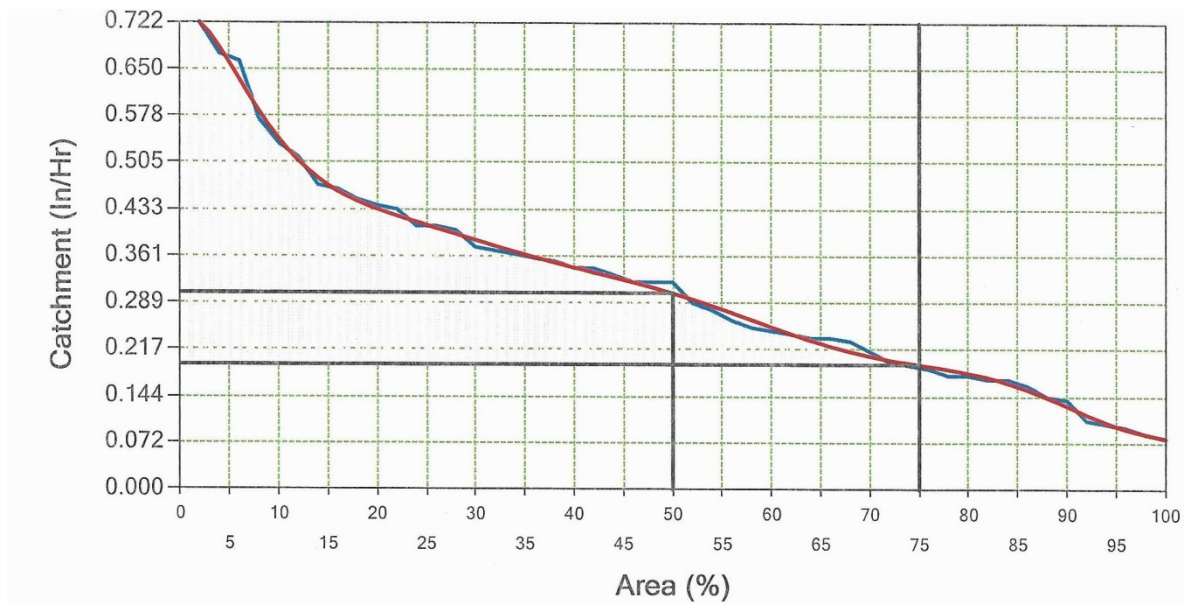
Pressure (psi):	40.0
Flow Rate (gpm):	8.56
Spacing (ft):	30.0 x 60.0
Area:	Rectangle
Average Delta VWC (%):	11.413
Effective Delta VWC (%):	9.496 (75%)
Overspray:	0.0%
Pattern Loss:	30.2%
Application Efficiency:	69.8%
Distribution Uniformity:	37.1%
Notes:	Project 1499(Irrg/15) July 11, 2016 Test conducted on turf plot no. 1

A-4. IrriGreen Genius® 30 x 60 Rectangle Field Data Sheet

Title: Genius 30' x 60' data Plot #1	CIT Meter Reading	Time	8:00 AM
Date: 9-Jul-16	Before 211496	Pressure	65 psi
Dimension: 30' x 60'	After 211780	Duration	43 minutes
Before VWC Ave: 36.2	Gal Used 284		
After VWC Ave: 47.2			
3 Hr VWC Ave: 45.7			

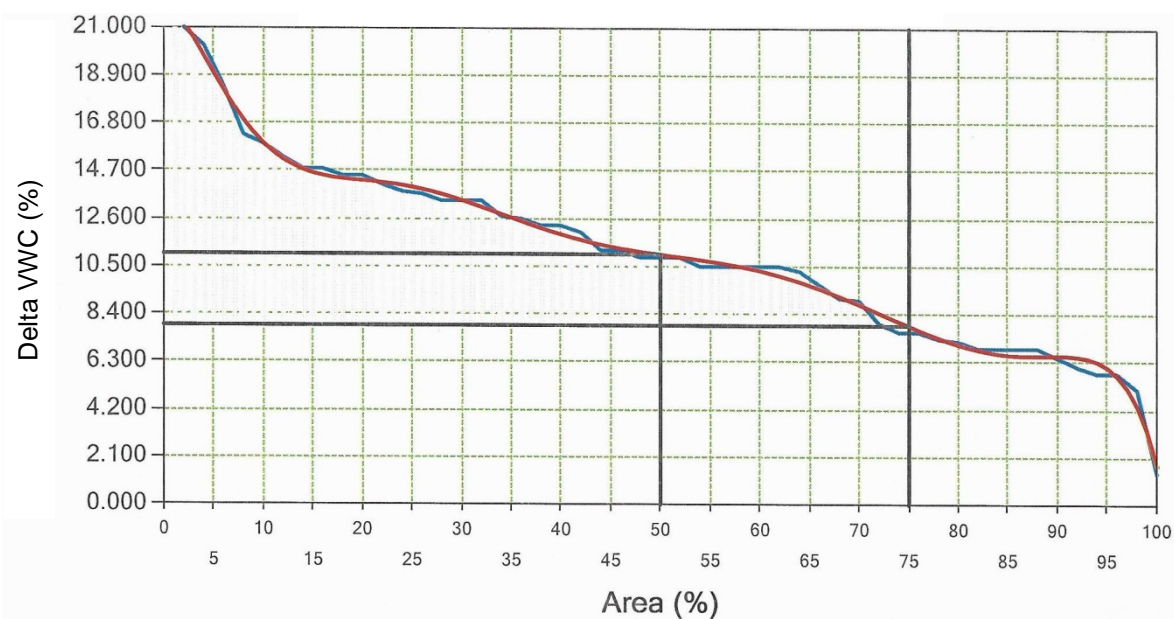
	Row									
Observation	1	2	3	4	5	6	7	8	9	10
Before VWC	46	39.1	35.8	27.2	26.8	23.2	20.7	32.6	31.1	37.3
After VWC	60.8	52.8	43.4	33.3	41.3	39.1	27.2	47.9	36.9	38.7
Delta VWC	14.8	13.7	7.6	6.1	14.5	15.9	6.5	15.3	5.8	1.4
3 Hour VWC	60.1	47.8	40.9	42.7	36.2	38.7	31.5	38.4	35.8	40.9
Volume (CC)	30	76	19	15	43	45	64	66	46	70
Before VWC	41.6	36.2	38	26.8	27.2	33.3	27.5	38.7	35.1	40.5
After VWC	48.5	46.7	51.4	39.5	47.4	43.8	43.8	52.5	40.9	47.8
Delta VWC	6.9	10.5	13.4	12.7	20.2	10.5	16.3	13.8	5.8	7.3
3 Hour VWC	53.6	47.1	46	35.8	44.9	40.9	43.6	45.6	42.4	45.2
Volume (CC)	54	100	107	60	18	124	67	126	87	44
Before VWC	53.2	38.7	35.1	35.1	39.5	36.9	33.7	31.9	21.7	32.2
After VWC	63.7	51	56.1	45.6	50.7	51	48.5	42.4	35.1	41.3
Delta VWC	10.5	12.3	21	10.5	11.2	14.1	14.8	10.5	13.4	9.1
3 Hour VWC	63.7	50.7	47.4	44.9	50.5	46.3	44.9	42	34.7	39.5
Volume (CC)	40	96	88	64	26	82	84	135	81	44
Before VWC	48.9	46.3	34	33.3	38	33	32.6	42	41.6	37.3
After VWC	56.1	53.2	47.4	45.6	48.1	42	51	47.1	49.2	49.9
Delta VWC	7.2	6.9	13.4	12.3	10.1	9	18.4	5.1	7.6	12.6
3 Hour VWC	60.1	54.3	47.4	45.2	43.4	40.5	44.9	47.1	47.8	43.8
Volume (CC)	36	76	60	49	69	27	60	68	33	52
Before VWC	55.4	49.9	52.8	42.4	29.3	27.2	40.5	34	40.5	26.8
After VWC	66.3	56.8	67.3	52.1	36.2	38.1	48.5	46	51.4	38
Delta VWC	10.9	6.9	14.5	9.7	6.9	10.9	8	12	10.9	11.2
3 Hour VWC	60.7	56.8	63.3	51.8	35.1	37.3	44.2	45.6	47.8	43.4
Volume (CC)	20	75	47	36	37	16	33	32	62	32

A-5. IrriGreen Genius® 30 x 60 Rectangle Catch Can Evaluation



Pressure (psi):	65.0
Flow Rate (gpm):	6.60
Spacing (ft):	30.0 x 60.0
Area:	Rectangle
Avg Application Rate (In/Hr):	0.304
Effective Application Rate (In/Hr):	0.194 (75%)
Overspray:	0.0%
Pattern Loss:	45.9%
Application Efficiency:	54.1%
Distribution Uniformity:	43.0%
Notes:	Project 1499(Irrg/15) July 9, 2016 Test conducted on turf plot no. 1

A-6. IrriGreen Genius® 30 x 60 Rectangle SMS Evaluation



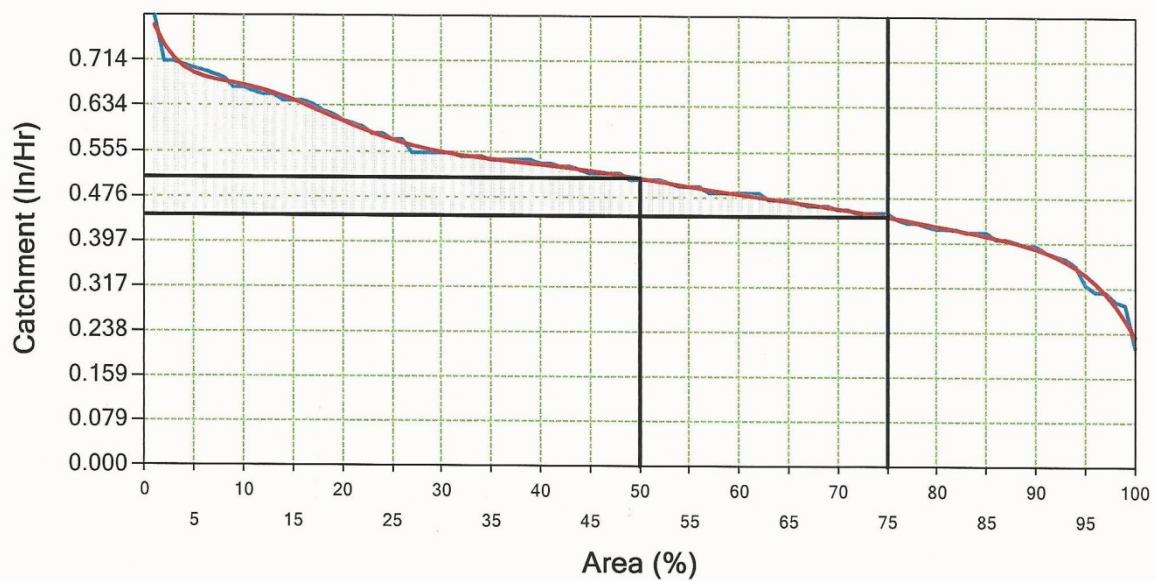
Pressure (psi):	65.0
Flow Rate (gpm):	6.60
Spacing (ft):	30.0 x 60.0
Area:	Rectangle
Average Delta VWC (%):	11.029
Effective Delta VWC (%):	7.890 (75%)
Overspray:	0.0%
Pattern Loss:	34.9%
Application Efficiency:	65.1%
Distribution Uniformity:	55.0%
Notes:	Project 1499(Irrg/15) July 9, 2016 Test conducted on turf plot no. 1

A-7. Hunter MP Rotator SWAT 30 x 30 Square Field Data Sheet

Title: Hunter Rotator Square SWAT Test Plot #1 CIT Meter Reading
 Date: 28-Jul-16 Before 12339
 Dimension: 30' x 30' After 12562
 Before VWC Ave: 33.5 Gal Used 223
 After VWC Ave: 37.7
 3 Hr VWC Ave: 37.3
 Time 8:00 AM
 Pressure 40 psi
 Run Time 40 minutes
 Application "
 Wind from SW
 106° F air temp at noon

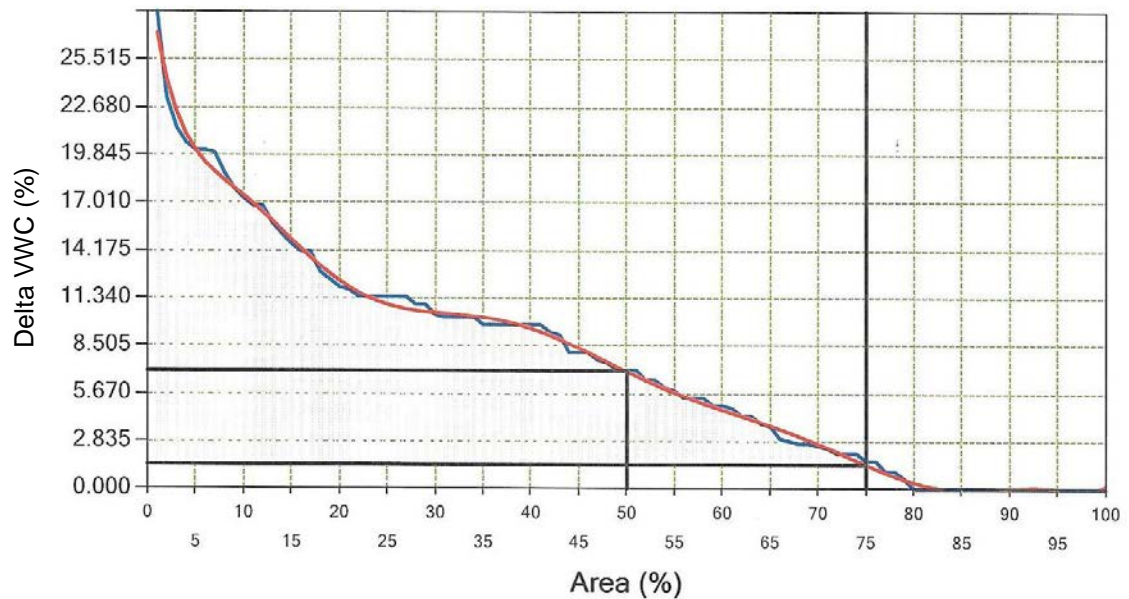
Observation	Row											
	1	2	3	4	5	6	7	8	9	10	11	12
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0
Before VWC	17	13.8	18.1	26.4	27.2	29.7	27.9	26.7	22.5	24.3	26.1	31.1
After VWC	15.6	14.2	18.9	29	25.4	29.7	23.9	23.2	22.5	27.2	22.5	30.8
Delta VWC	-1.4	0.4	0.8	2.6	-1.8	0	-4	-3.5	0	2.9	-3.6	-0.3
3 Hour VWC	30.4	19.2	14.9	24.6	19.2	34	30.1	29.7	20	29.3	26.1	33.7
Volume (CC)	20	87	69	80	70	73	95	56	90	76	66	0
Before VWC	14.2	22.5	25.4	26.8	30.1	30.4	23.9	38.6	37.3	35.1	34.4	34
After VWC	21.4	23.6	30.8	31.1	33.7	25.7	23.9	33	38.7	38.4	36.9	46.3
Delta VWC	7.2	1.1	5.4	4.3	3.6	-4.7	0	-5.6	1.4	3.3	2.5	12.3
3 Hour VWC	23.6	27.9	31	34	34	25.7	29	26.8	36.6	40.5	29.3	38
Volume (CC)	10	115	84	92	73	75	74	78	95	70	37	0
Before VWC	17.4	23.9	30.1	28	27.2	21.9	25.4	24.4	35.8	33.7	35.5	38
After VWC	27.5	34	37.7	36.6	32.6	23.9	31.9	36.9	37.7	40.2	37.3	36.9
Delta VWC	10.1	10.1	7.6	8.6	5.4	2	6.5	12.5	1.9	6.5	1.8	-1.1
3 Hour VWC	25	21.7	32.2	36.9	30.8	29	29	39.8	38.7	42.7	40.9	36.2
Volume (CC)	5	122	138	105	84	78	96	114	109	80	54	0
Before VWC	13.1	33.3	30.1	22.2	25.7	39	39.7	38	37.3	34.8	38	45.2
After VWC	27.9	30.8	36.2	35.5	30.7	30.8	33.3	41.3	42.4	39.5	44.2	44.2
Delta VWC	14.8	-2.5	6.1	13.3	5	-8.2	-6.4	3.3	5.1	4.7	6.2	-1
3 Hour VWC	15.2	30.8	24.6	35.1	26.8	27.5	34	43.1	38	37.3	41.3	38
Volume (CC)	10	94	112	124	84	96	116	121	91	78	65	0
Before VWC	16.7	28.3	29.7	36.6	30.4	39.1	38	34.4	36.6	34.4	38.4	39.1
After VWC	18.9	24.3	30.4	30.3	34	46	38	40.9	44.2	42.7	44.9	39.8
Delta VWC	2.2	-4	0.7	-6.3	3.6	6.9	0	6.5	7.6	8.3	6.5	0.7
3 Hour VWC	21.7	27.9	34.8	32.2	33	48.1	41.6	45.6	46	44.5	42.4	40.3
Volume (CC)	7	96	84	96	88	88	111	102	88	79	72	0
Before VWC	23.2	26.1	34.4	37.7	41.3	33.7	34.8	42.7	33	36.2	37.7	38.7
After VWC	32.6	33.7	31.9	39.1	48.1	41.6	41.6	44.5	44.2	40.2	42	37.7
Delta VWC	9.4	7.6	-2.5	1.4	6.8	7.9	6.8	1.8	11.2	4	4.3	-1
3 Hour VWC	31.1	30.3	40.1	47.4	42	43.8	26	38.4	48	40.9	36.9	34
Volume (CC)	12	90	72	79	73	62	72	90	94	86	51	0
Before VWC	22.1	23.6	37.2	35.8	40.5	35.5	38.4	38.7	36.9	40.2	35.5	35.8
After VWC	27.5	33	45.2	49.2	48.1	46.7	45.2	45.2	46.3	46.7	39.1	34
Delta VWC	5.4	9.4	8	13.4	7.6	11.2	6.8	6.5	9.4	6.5	3.6	-1.8
3 Hour VWC	31.1	30.3	40.1	47.4	42	43.8	26	38.4	48	40.9	36.9	34
Volume (CC)	44	86	82	100	84	80	100	86	78	84	50	0
Before VWC	34	36.8	36.2	36.6	39.8	39.8	36.2	41.3	39.8	34.4	35.5	37.3
After VWC	33.3	38.4	40.9	48.1	44.5	47.1	48.1	45.2	40.5	42	43.1	36.6
Delta VWC	-0.7	1.6	4.7	11.5	4.7	7.3	11.9	3.9	0.7	7.6	7.6	-0.7
3 Hour VWC	29.7	35.1	40.9	47	46.7	47.8	46.7	42.7	38	40.5	36.3	34.8
Volume (CC)	52	94	112	120	81	92	106	108	102	82	54	0
Before VWC	28.6	27.5	26.1	41.3	38.7	43.1	40.9	44.2	40.2	42.4	43.1	37.3
After VWC	30.4	34	36.6	41.3	52.8	49.9	54.6	47.4	41.3	37.3	32.2	35.1
Delta VWC	1.8	6.5	10.5	0	14.1	6.8	13.7	3.2	1.1	-5.1	-10.9	-2.2
3 Hour VWC	40.9	38.7	42	46.7	44.6	50.7	43.8	47.8	47.4	43.8	38.4	35.1
Volume (CC)	55	123	124	93	82	94	116	114	93	90	64	0
Before VWC	33.3	32.6	35.8	40.9	35.5	38.7	36.9	36.6	39.5	26.8	25.4	25.7
After VWC	26.4	28.3	38.7	36.9	45.2	46	50.3	42	40.9	43.8	40.9	34.8
Delta VWC	-6.9	-4.3	2.9	-4	9.7	7.3	13.4	5.4	1.4	17	15.5	9.1
3 Hour VWC	27.2	35.5	39.8	39.8	42	44.9	50.7	47.1	42.7	45.2	46	29
Volume (CC)	15	119	112	94	95	88	104	96	75	68	68	0
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0

A-8. Hunter MP Rotator SWAT 30 x 30 Square Catch Can Evaluation



Pressure (psi):	40.0
Flow Rate (gpm):	5.57
Spacing (ft):	30.0 x 30.0
Area:	Square
Avg Application Rate (In/Hr):	0.509
Effective Application Rate (In/Hr):	0.441 (75%)
Overspray:	2.5%
Pattern Loss:	17.4%
Application Efficiency:	80.5%
Distribution Uniformity:	73.8%
Notes:	Project 1499(Irrg/15) July 28, 2016 Test conducted on turf plot no. 1

A-9. Hunter MP Rotator SWAT 30 x 30 Square SMS Evaluation



Pressure (psi):	40.0
Flow Rate (gpm):	5.57
Spacing (ft):	30.0 x 30.0
Area:	Square
Average Delta VWC (%):	6.977
Effective Delta VWC (%):	1.435 (75%)
Overspray:	12.7%
Pattern Loss:	88.7%
Application Efficiency:	9.8%
Distribution Uniformity:	2.3%
Notes:	Project 1499(Irrg/15) July 28, 2016 Test conducted on turf plot no. 1

A-10. IrriGreen Genius® SWAT 30 x 30 Square Field Data Sheet

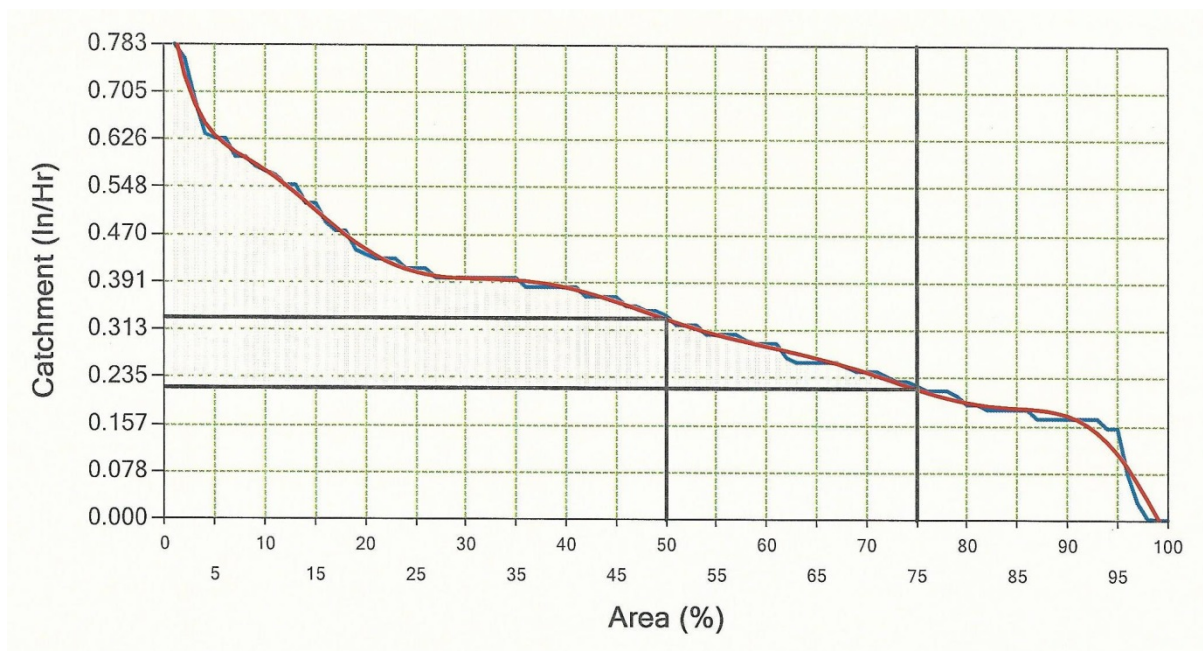
Title: Genius Square SWAT Test Plot #2
 Date: 5-Aug-16
 Dimension: 30' x 30'
 Before VWC Ave: 39.3
 After VWC Ave: 44.5
 3 Hr VWC Ave: 40.9

CIT Meter Reading
 Before 213457
 After 213596
 Gal Used 139

Time 6:15 AM
 Pressure 65
 Run Time 30 minutes
 Rotations 7
 Application "
 Application rate

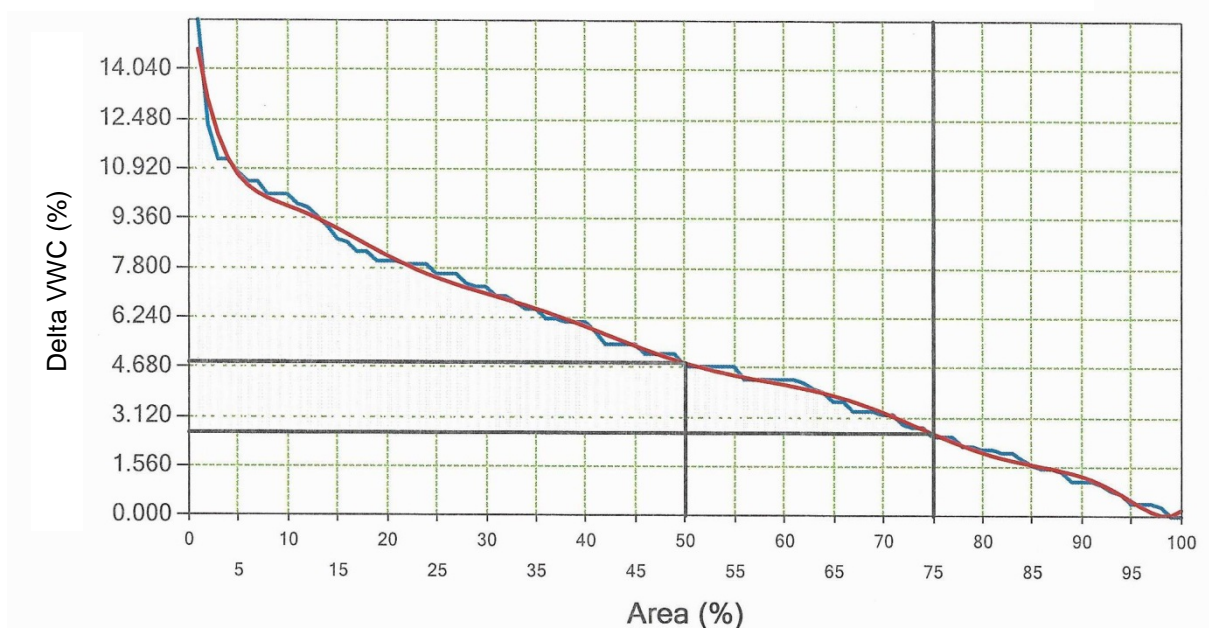
Observation	Row												Average
	1	2	3	4	5	6	7	8	9	10	11	12	
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0	
Before VWC	42	39.1	36.6	37.3	38.7	40.2	39.1	34	35.5	34.8	34	36.2	36.9
After VWC	38.7	39.1	45.2	42.7	40.9	42.2	45.2	43.1	38.7	36.8	36.2	35.1	41.0
Delta VWC	-3.3	0	8.6	5.4	2.2	2	6.1	9.1	3.2	2	2.2	-1.1	4.1
3 Hour VWC	33.7	34.4	39.5	40.9	41.6	39.5	43.1	39.8	40.2	36.6	36.9	31.1	39.3
Volume (CC)	0	4	62	32	40	24	68	33	28	34	29	0	
Before VWC	41.6	42.4	46	42	42.7	44.3	41.3	40.5	40.5	43.8	40.9	34	42.4
After VWC	39.8	42.7	48.9	50.7	48.5	51	51.8	47.8	48.5	48.1	48.5	36.9	48.7
Delta VWC	-1.8	0.3	2.9	8.7	5.8	6.7	10.5	7.3	8	4.3	7.6	2.9	6.2
3 Hour VWC	34	43.8	46	47.1	48.5	48.5	47.4	43.1	43.8	44.2	41.3	37.3	45.4
Volume (CC)	0	24	52	58	78	58	46	56	54	20	99	0	
Before VWC	44.9	40.2	42.4	48.1	40.2	41.6	39.8	33.7	37.3	39.8	36.6	35.5	40.0
After VWC	42.4	46.7	48.5	51.4	48.1	46.7	40.9	43.8	40.5	49.6	47.8	36.6	46.4
Delta VWC	-2.5	6.5	6.1	3.3	7.9	5.1	1.1	10.1	3.2	9.8	11.2	1.1	6.4
3 Hour VWC	36.9	40.9	49.2	48.9	42.4	44.2	41.3	39.5	40.2	45.2	40.5	34	43.2
Volume (CC)	0	22	50	52	30	24	72	22	34	52	64	0	
Before VWC	42.4	46.3	40.2	40.5	39.1	40.5	35.5	37.3	34.4	36.9	39.5	39.1	39.0
After VWC	40.9	47.4	48.1	46.7	49.2	48.1	42.7	45.2	44.9	44.9	40.5	38.4	45.8
Delta VWC	-1.5	1.1	7.9	6.2	10.1	7.6	7.2	7.9	10.5	8	1	-0.7	6.8
3 Hour VWC	38	41.3	42	40.5	46.7	43.8	38.4	41.6	40.9	42	40.5	33.3	41.8
Volume (CC)	0	78	45	22	31	20	46	40	25	54	38	0	
Before VWC	39.1	40.5	40.2	42	42.4	42.4	40.9	38.4	35.5	39.1	37.7	39.5	39.9
After VWC	39.8	40.9	44.5	47.4	46.7	43.1	44.2	43.8	43.8	41.6	44.9	38.6	44.1
Delta VWC	0.7	0.4	4.3	5.4	4.3	0.7	3.3	5.4	8.3	2.5	7.2	-0.9	4.2
3 Hour VWC	37.7	38	44.9	47.4	40.5	44.5	42.4	41.6	37.3	41.3	40.5	35.8	41.8
Volume (CC)	0	22	48	35	30	50	102	38	90	48	34	0	
Before VWC	39.5	36.2	36.6	34.8	40.2	41.6	39.8	42.4	41.3	38	42.7	36.6	39.4
After VWC	38.4	44.5	52.2	47.1	41.6	46.3	40.9	44.9	37.3	42.7	44.5	38.7	44.2
Delta VWC	-1.1	8.3	15.6	12.3	1.4	4.7	1.1	2.5	-4	4.7	1.8	2.1	4.8
3 Hour VWC	36.9	38.4	38.4	41.3	38.7	43.8	39.8	35.5	34.4	39.1	38	33.7	38.7
Volume (CC)	0	38	50	52	10	25	82	22	34	42	22	0	
Before VWC	42.4	38.4	37.7	39.1	39.8	40.2	39.8	37.7	39.8	37.3	39.5	44.2	38.9
After VWC	39.8	42.7	40.5	43.8	43.1	43.8	41.3	47.4	40.2	47.4	43.8	43.8	43.4
Delta VWC	-2.6	4.3	2.8	4.7	3.3	3.6	1.5	9.7	0.4	10.1	4.3	-0.4	4.5
3 Hour VWC	36.9	36.6	37.3	39.1	40.5	35.8	39.8	46	39.8	42	40.2	36.2	39.7
Volume (CC)	0	22	38	83	50	24	50	92	52	34	42	0	
Before VWC	45.2	40.5	39.1	41.3	40.5	44.5	45.2	42	39.1	38.4	39.1	43.8	41.0
After VWC	44.2	40.9	44.2	45.2	46.7	48.7	46.8	44.5	46.7	43.8	45.2	40.5	45.3
Delta VWC	-1	0.4	5.1	3.9	6.2	4.2	1.6	2.5	7.6	5.4	6.1	-3.3	4.3
3 Hour VWC	34.4	38.4	39.8	42.4	37.7	42.4	41.6	38.4	41.3	40.5	41.6	38.4	40.4
Volume (CC)	0	24	52	32	48	44	28	28	56	62	75	0	
Before VWC	41.3	38.7	38	41.6	40.9	40.9	39.5	35.5	40.5	39.5	38.4	39.8	39.4
After VWC	35.8	42.7	43.1	48.5	47.4	44.5	44.2	46.7	45.6	44.2	42.7	38.4	45.0
Delta VWC	-5.5	4	5.1	6.9	6.5	3.6	4.7	11.2	5.1	4.7	4.3	-1.4	5.6
3 Hour VWC	33.3	38.4	39.1	40.5	44.2	42.4	39.1	42	37.3	31.6	38.4	34.8	39.3
Volume (CC)	0	36	28	48	52	76	48	52	50	68	57	0	
Before VWC	40.2	34.4	31.9	34.4	36.2	38	36.9	36.2	37.7	38.7	34	34.8	35.8
After VWC	38.6	42.4	42.7	43.8	40.9	44.9	39	39	39.8	39.5	35.5	33.3	40.8
Delta VWC	-1.6	8	10.8	9.4	4.7	6.9	2.1	2.8	2.1	0.8	1.5	-1.5	4.9
3 Hour VWC	40.5	44.2	40.5	44.2	43.1	40.2	34	35.1	33.3	38.4	37.3	31.9	39.0
Volume (CC)	0	56	82	74	72	42	40	46	32	52	40	0	
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0	

A-11. IrriGreen Genius® SWAT 30 x 30 Square Catch Can Evaluation



Pressure (psi):	65.0
Flow Rate (gpm):	4.63
Spacing (ft):	30.0 x 30.0
Area:	Square
Avg Application Rate (In/Hr):	0.332
Effective Application Rate (In/Hr):	0.217 (75%)
Overspray:	0.0%
Pattern Loss:	42.3%
Application Efficiency:	57.7%
Distribution Uniformity:	44.5%
Notes:	Project 1499(Irrg/15) August 5, 2016 Test conducted on turf plot no. 2

A-12. IrriGreen Genius® SWAT 30 x 30 Square SMS Evaluation



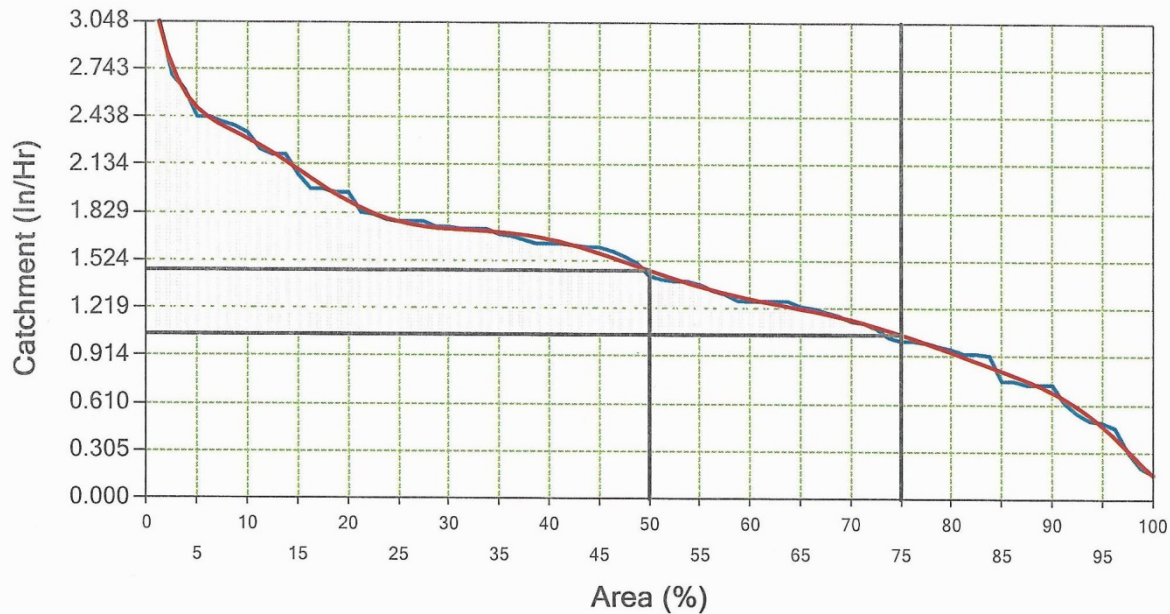
Pressure (psi):	65.0
Flow Rate (gpm):	4.63
Spacing (ft):	30.0 x 30.0
Area:	Square
Average Delta VWC (%):	4.828
Effective Delta VWC (%):	2.615 (75%)
Overspray:	1.3%
Pattern Loss:	58.7%
Application Efficiency:	40.7%
Distribution Uniformity:	25.1%
Notes:	Project 1499(Irrg/15) August 5, 2016 Test conducted on turf plot no. 2

A-13. Hunter Pro Adjustable SWAT 30 ft Diameter Circle Field Data Sheet

Title: Hunter Pro Adj Circle SWAT Test Plot #1 CIT Meter Reading Time 6:29 AM
 Date: 29-Jul-16 #3 Before 12754 Pressure 40
 Dimension: 30' x 30' pro adjustable After 12994 Run Time 20 minutes
 Before VWC Ave: 29.8 circular Gal Used 240 Application "
 After VWC Ave: 47.8
 3 Hr VWC Ave: 45.6

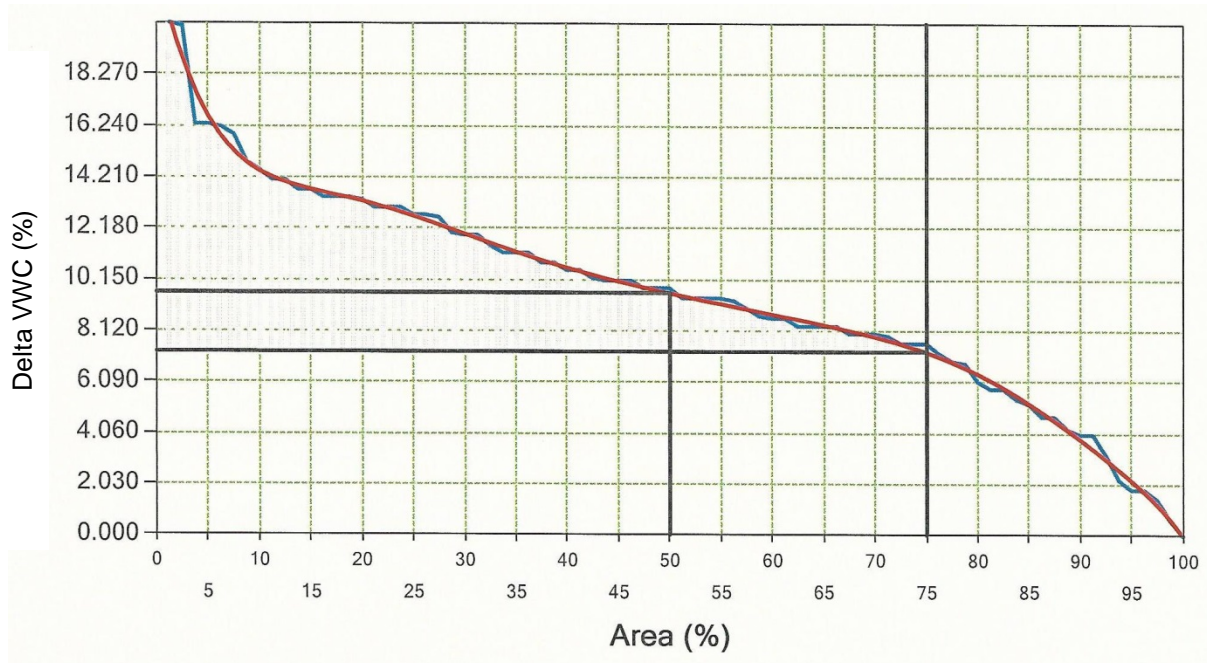
Observation	1	2	3	4	5	6	7	8	9	10	11	12	Average
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Volume (CC)	0	0	0	0	0	4	0	0	0	0	0	0	
Before VWC	N/A	16.2	11.6	23.7	24	14.7	13.5	14.7	12.8	12.2	12.6	16.5	16.7
After VWC	N/A	23.6	23.8	45.6	34.4	30.1	30.4	38.7	30.8	26.1	23.2	26.4	33.4
Delta VWC	N/A	7.4	12.2	21.9	10.4	15.4	16.9	24	18	13.9	10.6	9.9	16.7
3 Hour VWC	N/A	22.5	17.8	42.7	36.2	27.9	29.7	36.9	25.7	23.6	24.3	30.1	32.7
Volume (CC)	0	0	0	134	66	27	43	142	61	5	2	0	
Before VWC	N/A	12	25	28.2	24	18.4	14.5	27.6	30.2	23	24.6	28.9	23.9
After VWC	N/A	24.3	49.3	50.3	43.1	34.4	29.3	47.8	53.6	47.8	45.6	44.5	44.5
Delta VWC	N/A	12.3	24.3	22.1	19.1	16	14.8	20.2	23.4	24.8	21	15.6	20.6
3 Hour VWC	N/A	22.5	39.8	44.9	41.6	34	31.1	43.8	44.2	45.2	38.2	48.9	40.6
Volume (CC)	0	23	99	146	110	80	64	154	212	194	93	4	
Before VWC	N/A	25.6	29.5	32.2	27.6	26.9	24.6	33.8	32.8	32.8	32.2	34.4	30.0
After VWC	N/A	36.9	47.1	51.4	48.1	46	44.9	51.4	51.8	52.3	51	50.7	49.1
Delta VWC	N/A	11.3	17.6	19.2	20.5	19.1	20.3	17.6	19	19.5	18.8	16.3	19.1
3 Hour VWC	N/A	35.8	42.4	46	44.5	44.5	46.7	46.7	48.1	48.1	47.1	48.1	45.9
Volume (CC)	0	39	81	90	147	141	140	159	203	209	141	13	
Before VWC	N/A	28.2	22	27.3	26.3	27.3	31.5	37.7	37.1	35.7	34.1	31.6	30.7
After VWC	N/A	43.1	41.6	50.7	50.3	48.1	51.8	57.2	53.2	54.6	53.9	52.1	50.5
Delta VWC	N/A	14.9	19.6	23.4	24	20.8	20.3	19.5	16.1	18.9	19.8	20.5	19.7
3 Hour VWC	N/A	42.4	44.2	40.2	42.4	45.2	49.9	46.7	49.9	51.4	51	51	46.3
Volume (CC)	0	48	87	191	191	142	116	150	170	212	227	14	
Before VWC	N/A	22.7	22.4	27.3	25.9	32.2	29.9	33.8	35.1	34.1	33.8	37.1	29.7
After VWC	N/A	42	44.5	46.7	44.9	45.6	49.6	51	52.1	52.1	51.8	53.2	48.0
Delta VWC	N/A	19.3	22.1	19.4	19	13.4	19.7	17.2	17	18	18	16.1	18.3
3 Hour VWC	N/A	40.5	41.3	46.3	42.4	48.1	44.5	48.1	48.1	48.5	48.9	50.3	45.7
Volume (CC)	0	110	121	172	110	88	64	119	171	180	235	85	
Before VWC	N/A	26.6	21.4	30.2	35.1	29.9	30.8	33.1	33.8	33.8	35.4	34.4	31.0
After VWC	N/A	44.5	42.4	48.9	51.4	50.7	49.9	53.2	52.8	52.1	52.1	52.5	49.8
Delta VWC	N/A	17.9	21	18.7	16.3	20.8	19.1	20.1	19	18.3	16.7	18.1	18.8
3 Hour VWC	N/A	42.4	39.8	42.4	51.8	50.3	48.5	48.9	47.4	46.7	50.3	47.8	46.9
Volume (CC)	0	140	121	107	144	54	40	110	158	207	265	150	
Before VWC	N/A	21.4	29.2	37.1	34.1	34.8	35.1	33.8	35.1	34.1	37.7	24.6	33.2
After VWC	N/A	39.5	47.8	53.6	51.8	51.8	52.1	52.1	49.9	51	49.2	37.7	49.9
Delta VWC	N/A	18.1	18.6	16.5	17.7	17	17	18.3	14.8	16.9	11.5	13.1	16.6
3 Hour VWC	N/A	41.3	44.2	46.3	51	50.3	50.3	45.6	49.6	49.2	48.1	37.7	47.6
Volume (CC)	3	83	110	110	114	106	95	154	142	107	88	23	
Before VWC	20.1	28.6	28.6	36.4	36.1	38.7	35.1	35.1	34.1	37.7	31.8	33.5	35.2
After VWC	30.1	41.6	51.8	51.4	51.8	52.8	50.3	52.5	50.7	49.6	43.1	42.7	51.4
Delta VWC	10	13	23.2	15	15.7	14.1	15.2	17.4	16.6	11.9	11.3	9.2	16.1
3 Hour VWC	23	42.7	43.8	51.8	50.7	52.1	51	50.3	51.4	48.5	41.6	42.4	50.0
Volume (CC)	8	21	66	105	151	150	142	154	151	104	56	0	
Before VWC	21.4	20.7	24.6	31.2	36.4	34.4	36.1	35.5	33.1	31.5	30.5	27.6	32.9
After VWC	26.8	34.8	39.8	53.6	54.6	52.5	51.8	53.2	52.1	50.7	46.3	38.4	51.0
Delta VWC	5.4	14.1	15.2	22.4	18.2	18.1	15.7	17.7	19	19.2	15.8	10.8	18.2
3 Hour VWC	29.7	38	40.9	52.1	53.6	51.8	53.2	54.6	50.3	50.7	46.3	34.8	50.9
Volume (CC)	0	4	64	98	155	131	122	135	150	138	73	0	
Before VWC	12.9	18.1	23	32.8	35.4	34.8	36.1	33.5	29.9	31.8	23	16.8	35.0
After VWC	23.2	27.5	32.6	46.7	49.9	50.3	52.5	48.9	48.1	51.4	34.8	32.6	50.4
Delta VWC	10.3	9.4	9.6	13.9	14.5	15.5	16.4	15.4	18.2	19.6	11.8	15.8	15.5
3 Hour VWC	22.7	23.1	25.2	44.5	51.4	48.1	49.2	51.4	42.7	45.2	31.9	24.3	50.0
Volume (CC)	0	0	0	102	124	81	44	85	74	0	0	0	
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0	

A-14. Hunter Pro Adjustable SWAT 30 ft Diameter Circle Catch Can Evaluation



Pressure (psi):	40.0
Flow Rate (gpm):	12.00
Spacing (ft):	30.0 diameter
Area:	Circular
Avg Application Rate (In/Hr):	1.462
Effective Application Rate (In/Hr):	1.053 (75%)
Overspray:	10.7%
Pattern Loss:	35.2%
Application Efficiency:	57.8%
Distribution Uniformity:	47.6%
Notes:	Project 1499(Irrg/15) July 29, 2016 Test conducted on turf plot no. 1

A-15. Hunter Pro Adjustable SWAT 30 ft Diameter Circle SMS Evaluation



Pressure (psi):	40.0
Flow Rate (gpm):	12.00
Spacing (ft):	30.0 diameter
Area:	Circular
Average Delta VWC (%):	9.608
Effective Delta VWC (%):	7.263 (75%)
Overspray:	8.3%
Pattern Loss:	34.0%
Application Efficiency:	60.5%
Distribution Uniformity:	42.7%
Notes:	Project 1499(Irrg/15) July 29, 2016 Test conducted on turf plot no. 1

A-16. IrriGreen Genius® SWAT 30 ft Diameter Circle Field Data Sheet

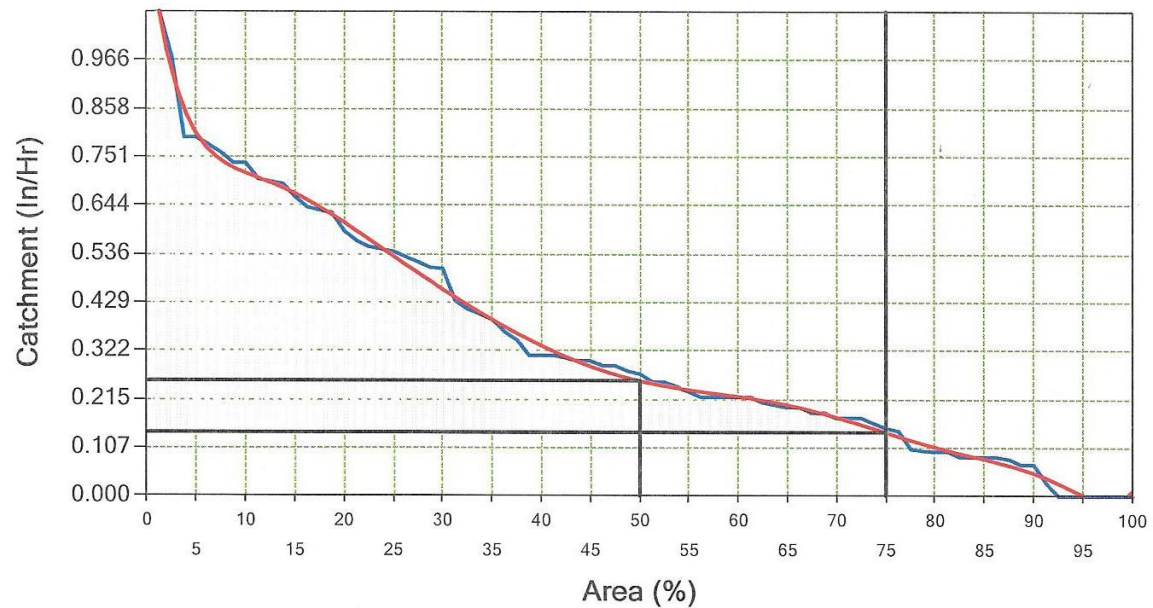
Title: Genius Circle SWAT Test Plot #2
 Date: 26-Jul-16
 Dimension: 30' x 30'
 Before VWC Ave: 31.7
 After VWC Ave: 41.2
 3 Hr VWC Ave: 38.3

CIT Meter Reading
 Before 213305
 After 213457
 Gal Used 152

Time 6:04 AM
 Pressure 65
 Run Time 40 minutes
 Rotations 8
 Application "

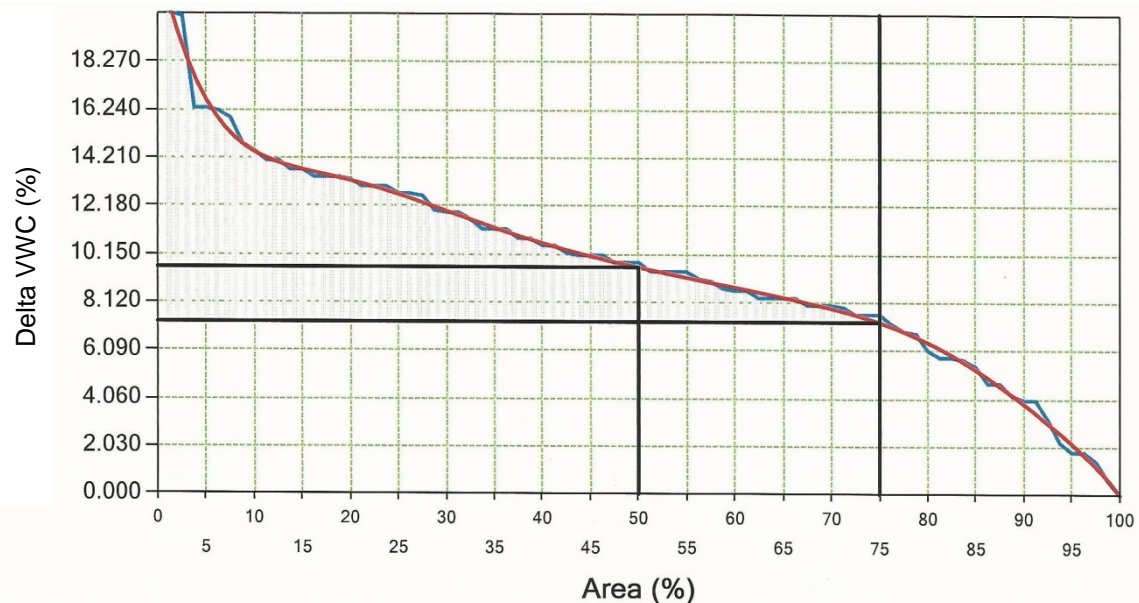
Observation	1	2	3	4	5	6	7	8	9	10	11	12
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0
Before VWC	20.7	30.8	31.9	34.4	38	35.1	35.8	27.2	27.9	29.3	26.8	29
After VWC	33	31.1	34	38.4	46.7	45.2	44.9	41.3	25	28.6	27.9	27.5
Delta VWC	12.3	0.3	2.1	4	8.7	10.1	9.1	14.1	-2.9	-0.7	1.1	-1.5
3 Hour VWC	32.6	26.8	28.3	32.2	41.6	38.4	42.4	27.5	16.7	22.5	17.4	26.4
Volume (CC)	0	0	0	0	0	15	44	0	0	0	0	0
Before VWC	33.3	35.8	38.7	38.4	41.3	37.7	34.8	25	32.2	35.1	33	30.1
After VWC	28.6	32.2	44.5	49.6	47.1	47.8	44.9	34.8	39.8	44.5	34	31.9
Delta VWC	-4.7	-3.6	5.8	11.2	5.8	10.1	10.1	9.8	7.6	9.4	1	1.8
3 Hour VWC	34.4	36.6	47.1	45.2	46	47.8	40.2	34.8	40.9	36.6	34.9	29.7
Volume (CC)	0	0	17	38	88	53	30	92	135	0	0	0
Before VWC	39.5	35.5	39.5	43.8	35.1	35.8	32.2	21.1	30.8	35.1	34	31.9
After VWC	33.3	30.8	47.8	52.1	42.7	46	45.2	26.8	37.7	39.8	33.7	35.1
Delta VWC	-6.2	-4.7	8.3	8.3	7.6	10.2	13	5.7	6.9	4.7	-0.3	3.2
3 Hour VWC	32.2	28.9	45.2	40.2	34	38	36.2	19.9	32.2	34	29	30.8
Volume (CC)	0	0	63	34	15	12	17	120	52	50	0	0
Before VWC	41.3	39.5	37.7	39.1	36.9	34.4	29.3	29	26.8	27.5	27.9	27.6
After VWC	40.9	47.1	44.5	43.1	44.9	42.7	43.8	33.2	28.6	39.5	40.9	29
Delta VWC	-0.4	7.6	6.8	4	8	8.3	14.5	4.2	1.8	12	13	1.4
3 Hour VWC	39.5	45.2	40.5	45.2	44.5	39.1	40.9	27.9	29	31.9	36.2	31.9
Volume (CC)	0	36	32	12	50	169	128	70	32	68	0	0
Before VWC	24.6	32.2	33	38.4	34	31.9	33	27.9	25	27.5	29	27.5
After VWC	27.9	40.5	38.4	39	38.7	45.2	44.9	42.7	37.7	37.3	42.7	31.1
Delta VWC	3.3	8.3	5.4	0.6	4.7	13.3	11.9	14.8	12.7	9.8	13.7	3.6
3 Hour VWC	30.1	44.5	41.3	43.1	40.5	43.1	39.5	42	34	38.7	38.7	29.7
Volume (CC)	0	111	94	15	30	54	272	174	25	36	127	0
Before VWC	27.2	33	25.4	27.2	32.6	30.4	27.5	33.7	31.1	25	27.9	23.6
After VWC	30.1	41.6	36.6	38.4	43.1	43.8	43.8	37.7	39.1	37.7	43.8	27.9
Delta VWC	2.9	8.6	11.2	11.2	10.5	13.4	16.3	4	8	12.7	15.9	4.3
3 Hour VWC	33	39.8	38.9	34.4	44.9	44.5	40.9	36.2	36.9	34	39.8	24.6
Volume (CC)	0	128	121	42	38	34	132	52	47	30	95	0
Before VWC	29.3	33	28.3	32.6	34	28.3	26.4	30.1	23.9	35.5	29.3	30.8
After VWC	32.6	40.2	39.1	34.8	45.6	39.1	36.9	50.3	33.3	36.9	42.7	33.3
Delta VWC	3.3	7.2	10.8	2.2	11.6	10.8	10.5	20.2	9.4	1.4	13.4	2.5
3 Hour VWC	28.6	38	38	36.6	38.7	38.4	38.7	38.4	32.6	29.3	38.7	28.6
Volume (CC)	0	5	38	109	138	115	48	138	26	72	96	0
Before VWC	30.8	29.3	23.2	23.2	28.6	24.3	33	30.8	30.1	27.5	28.3	26.1
After VWC	28.6	33.7	39.5	36.9	41.6	40.5	40.9	42.7	42.7	35.5	30.4	24.6
Delta VWC	-2.2	4.4	16.3	13.7	13	16.2	7.9	11.9	12.6	8	2.1	-1.5
3 Hour VWC	31.9	30.9	38.4	37.7	37.3	39.8	39.8	44.2	38.7	33.7	27.9	21.4
Volume (CC)	0	0	75	110	102	30	88	15	60	44	0	0
Before VWC	27.9	26.1	24.3	22.1	33.7	34	32.2	27.9	33.7	26.1	20.3	24.3
After VWC	31.1	30.8	33.3	42.4	39.8	43.8	41.6	42	36.9	39.5	22.1	21
Delta VWC	3.2	4.7	9	20.3	6.1	9.8	9.4	14.1	3.2	13.4	1.8	-3.3
3 Hour VWC	28.6	30.8	38	36.6	42.7	40.2	42.7	37.7	36.9	23.9	23.9	22.4
Volume (CC)	0	0	0	54	38	28	38	90	40	54	0	0
Before VWC	18.5	23.9	20.3	38.4	45.6	37.7	34.4	32.2	26.1	14.9	16	12
After VWC	20.9	21	26.1	39.8	55	46.3	36.2	27.9	27.2	13.4	13.8	13.1
Delta VWC	2.4	-2.9	5.8	1.4	9.4	8.6	1.8	-4.3	1.1	-1.5	-2.2	1.1
3 Hour VWC	24.3	24.6	26.1	34	38.9	39.6	36.6	29.3	23.2	13	13.4	13.4
Volume (CC)	0	0	0	0	0	14	18	0	0	0	0	0
Before VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
After VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Delta VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3 Hour VWC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume (CC)	0	0	0	0	0	0	0	0	0	0	0	0

A-17. IrriGreen Genius® SWAT 30 ft Diameter Circle Catch Can Evaluation



Pressure (psi):	65.0
Flow Rate (gpm):	3.8
Spacing (ft):	30.0 diameter
Area:	Circular
Avg Application Rate (In/Hr):	0.255
Effective Application Rate (In/Hr):	0.140 (75%)
Overspray:	0.0%
Pattern Loss:	67.5%
Application Efficiency:	32.5%
Distribution Uniformity:	17.0%
Notes:	Project 1499(Irrg/15) July 26, 2016 Test conducted on turf plot no. 2

A-18. IrriGreen Genius® SWAT 30 ft Diameter Circle SMS Evaluation



Pressure (psi):	65.0
Flow Rate (gpm):	3.8
Spacing (ft):	30.0 diameter
Area:	Circular
Average Delta VWC (%):	9.599
Effective Delta VWC (%):	7.820 (75%)
Overspray:	8.9%
Pattern Loss:	33.9%
Application Efficiency:	60.2%
Distribution Uniformity:	43.0%
Notes:	Project 1499(Irrg/15) July 26, 2016 Test conducted on turf plot no. 2