IRRIGATION SCHEDULING IN FLOWER CROPS

FAQI
Flower Association of Queensland Inc.

RURAL WATER USE EFFICIENCY
IRRIGATION FUTURES
Improving irrigation management for a profitable and sustainable future

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IRRIGATION SCHEDULING

IRRIGATION SCHEDULING

HOW OFTEN AND HOW MUCH WATER IS APPLIED TO A CROP

FACTORS AFFECTING IRRIGATION SCHEDULING

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

SOIL TYPE/ SUBSTRATE CHARACTERISTICS

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

SOIL TYPE/ SUBSTRATE CHARACTERISTICS

IRRIGATION SYSTEM FACTORS

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

SOIL TYPE/ SUBSTRATE CHARACTERISTICS

IRRIGATION SYSTEM FACTORS

SCHEDULING TECHNIQUES – PULSING

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

SOIL TYPE/ SUBSTRATE CHARACTERISTICS

IRRIGATION SYSTEM FACTORS

SCHEDULING TECHNIQUES – PULSING

SCHEDULING TOOLS

FACTORS AFFECTING IRRIGATION SCHEDULING

WEATHER CONDITIONS – EVAPORATION & RAINFALL

CROP FACTORS/CROP COEFFICIENTS

SOIL TYPE/ SUBSTRATE CHARACTERISTICS

IRRIGATION SYSTEM FACTORS

SCHEDULING TECHNIQUES – PULSING

SCHEDULING TOOLS

OTHER FACTORS

WEATHER CONDITIONS

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

COMBINED EFFECT OF:

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

COMBINED EFFECT OF:

WIND SPEED

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

COMBINED EFFECT OF:

WIND SPEED

RELATIVE HUMIDITY

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

COMBINED EFFECT OF:

WIND SPEED

RELATIVE HUMIDITY

TEMPERATURE

WEATHER CONDITIONS

EVAPORATION/EVAPOTRANSPIRATION

COMBINED EFFECT OF:

WIND SPEED

RELATIVE HUMIDITY

TEMPERATURE

SOLAR RADIATION

EVAPORATION

EVAPORATION

MEASURED USING AN EVAPORATION PAN

EVAPOTRANSPIRATION

EVAPOTRANSPIRATION

CALCULATED FROM MEASURED WEATHER DATA

EVAPOTRANSPIRATION

CALCULATED FROM MEASURED WEATHER DATA

$$ET_o = \frac{0.408\Delta\,(R_n - G)\; +\; \gamma \frac{900}{T + 273} u_2 (e_s - e_a)}{\Delta + \gamma(1 + 0.34\,u_2)}$$

WHERE EVAPORATION/EVAPOTRANSPIRATION DATA COMES FROM

WHERE EVAPORATION/EVAPOTRANSPIRATION DATA COMES FROM

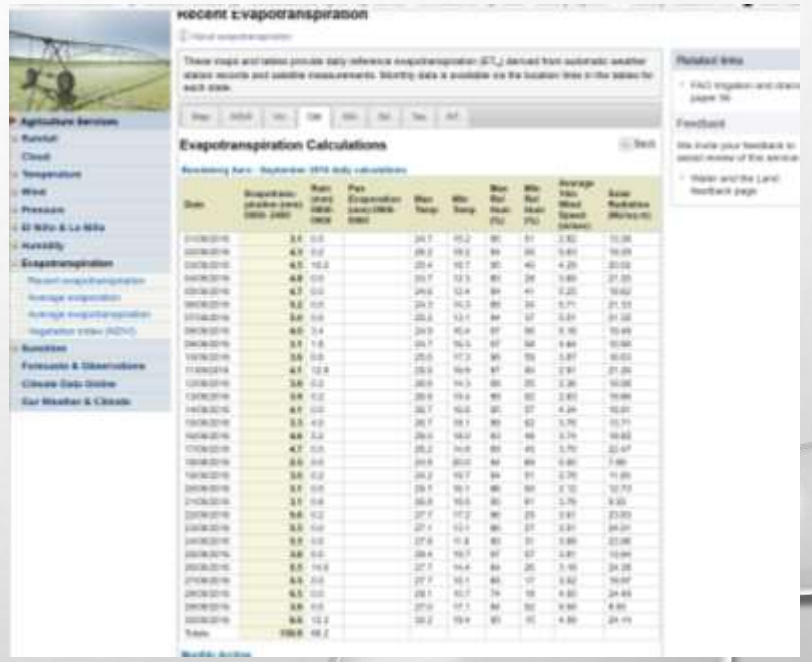
FROM ONSITE WEATHER STATION

WHERE EVAPORATION/EVAPOTRANSPIRATION DATA COMES FROM

FROM ONSITE WEATHER STATION

OR

FROM BOM WEBSITE



CALCULATE THE AMOUNT OF WATER REQUIRED

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CROP COEFFICIENTS – FROM EVAPOTRANSPIRATION

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CROP COEFFICIENTS – FROM EVAPOTRANSPIRATION

APPROXIMATES CROP WATER USE COMPARED TO EVAPORATION RATE

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CROP COEFFICIENTS – FROM EVAPOTRANSPIRATION

APPROXIMATES CROP WATER USE COMPARED TO EVAPORATION RATE

CROP FACTOR OF 0.8 = CROP USES 80% OF THE EVAPORATION

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CROP COEFFICIENTS – FROM EVAPOTRANSPIRATION

APPROXIMATES CROP WATER USE COMPARED TO EVAPORATION RATE

CROP FACTOR OF 0.8 = CROP USES 80% OF THE EVAPORATION

Evaporation	5 mm/day
Crop factor	0.8
Crop water use	4 mm/day

CALCULATE THE AMOUNT OF WATER REQUIRED

CROP FACTOR – FROM PAN EVAPORATION

CROP COEFFICIENTS – FROM EVAPOTRANSPIRATION

APPROXIMATES CROP WATER USE COMPARED TO EVAPORATION RATE

CROP FACTOR OF 0.8 = CROP USES 80% OF THE EVAPORATION

Evaporation	5 mm/day
Crop factor	0.8
Crop water use	4 mm/day

SHOULD ONLY BE USED AS A GUIDE

RAINFALL

RAINFALL

NEEDS TO BE MEASURED

RAINFALL

NEEDS TO BE MEASURED

REQUIRED IF USING INDIRECT MEASURING SCHEDULING TOOLS

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL HAS DIFFERENT PROPERTIES TO SUBSTRATES

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL HAS DIFFERENT PROPERTIES TO SUBSTRATES

LIMITATIONS

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL HAS DIFFERENT PROPERTIES TO SUBSTRATES

LIMITATIONS

INFILTRATION RATE OF SOIL

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL HAS DIFFERENT PROPERTIES TO SUBSTRATES

LIMITATIONS

INFILTRATION RATE OF SOIL

ABSORPTION RATE OF SUBSTRATES

SOIL/ SUBSTRATE CHARACTERISTICS

SOIL HAS DIFFERENT PROPERTIES TO SUBSTRATES

LIMITATIONS

INFILTRATION RATE OF SOIL

ABSORPTION RATE OF SUBSTRATES

MOISTURE HOLDING

SOIL INFILTRATION RATES

SOIL INFILTRATION RATES

WATER MOVING FROM THE SOIL SURFACE INTO THE SOIL PROFILE

SOIL INFILTRATION RATES

WATER MOVING FROM THE SOIL SURFACE INTO THE SOIL PROFILE

SOIL TEXTURE – SANDS HIGHER THAN CLAYS

SOIL INFILTRATION RATES

WATER MOVING FROM THE SOIL SURFACE INTO THE SOIL PROFILE

SOIL TEXTURE – SANDS HIGHER THAN CLAYS

SOIL MOISTURE CONTENT – DRIER SOILS HAVE HIGHER INFILTRATION RATES

SOIL INFILTRATION RATES

WATER MOVING FROM THE SOIL SURFACE INTO THE SOIL PROFILE

SOIL TEXTURE – SANDS HIGHER THAN CLAYS

SOIL MOISTURE CONTENT – DRIER SOILS HAVE HIGHER INFILTRATION RATES

SOIL STRUCTURE – COMPACTED SOILS IMPEDE INFILTRATION

SOIL INFILTRATION RATES

WATER MOVING FROM THE SOIL SURFACE INTO THE SOIL PROFILE

SOIL TEXTURE – SANDS HIGHER THAN CLAYS

SOIL MOISTURE CONTENT – DRIER SOILS HAVE HIGHER INFILTRATION RATES

SOIL STRUCTURE – COMPACTED SOILS IMPEDE INFILTRATION

SOIL SURFACE CONDITIONS – MULCHES IMPROVE INFILTRATION

SOIL INFILTRATION RATES

EXCEEDING INFILTRATION RATE LEADS TO RUNOFF

SOIL INFILTRATION RATES

EXCEEDING INFILTRATION RATE LEADS TO RUNOFF

LOSS OF WATER

SOIL INFILTRATION RATES

EXCEEDING INFILTRATION RATE LEADS TO RUNOFF

LOSS OF WATER

EROSION

SOIL INFILTRATION RATES

EXCEEDING INFILTRATION RATE LEADS TO RUNOFF

LOSS OF WATER

EROSION

ENVIRONMENTAL IMPACTS

SOIL INFILTRATION RATE

LOW < 15 mm/hr

MEDIUM 15 TO 50 mm/hr

HIGH > 50 mm/hr

SUBSTRATE ABSORPTION RATE

SUBSTRATE ABSORPTION RATE

WATER BEING ABSORBED INTO THE PARTICLES OF SUBSTRATES

SUBSTRATE ABSORPTION RATE

WATER BEING ABSORBED INTO THE PARTICLES OF SUBSTRATES

SUBSTRATE COMPONENTS – BARK < COIR

SUBSTRATE ABSORPTION RATE

WATER BEING ABSORBED INTO THE PARTICLES OF SUBSTRATES

SUBSTRATE COMPONENTS – BARK < COIR

SUBSTRATE MOISTURE CONTENT – DRIED SUBSTRATE MAY BE WATER REPELLENT

SUBSTRATE ABSORPTION RATE

WATER BEING ABSORBED INTO THE PARTICLES OF SUBSTRATES

SUBSTRATE COMPONENTS – BARK < COIR

SUBSTRATE MOISTURE CONTENT – DRIED SUBSTRATE MAY BE WATER REPELLENT

PROPERTIES CHANGE OVER TIME

SUBSTRATE ABSORPTION RATE

EXCEEDING ABSORPTION RATES

SUBSTRATE ABSORPTION RATE

EXCEEDING ABSORPTION RATES

LOSS OF WATER AS EXCESS DRAINAGE

SUBSTRATE ABSORPTION RATE

EXCEEDING ABSORPTION RATES

LOSS OF WATER AS EXCESS DRAINAGE

INCREASED LEACHING OF NUTRIENTS

SUBSTRATE ABSORPTION RATE

EXCEEDING ABSORPTION RATES

LOSS OF WATER AS EXCESS DRAINAGE

INCREASED LEACHING OF NUTRIENTS

ENVIRONMENTAL IMPACTS

SUBSTRATE ABSORPTION RATE

BARK < 15 mm/hr

BARK + WETTING AGENT < 20 mm/hr

COIR < 25 mm/hr

MOISTURE HOLDING OF SOIL/ SUBSTRATES

MOISTURE HOLDING OF SOIL/ SUBSTRATES

AMOUNT OF WATER HELD IN SOIL/SUBSTRATE

MOISTURE HOLDING OF SOIL/ SUBSTRATES

AMOUNT OF WATER HELD IN SOIL/SUBSTRATE

EACH SOIL TYPE/SUBSTRATE IS DIFFERENT

MOISTURE HOLDING OF SOIL/ SUBSTRATES

AMOUNT OF WATER HELD IN SOIL/SUBSTRATE

EACH SOIL TYPE/SUBSTRATE IS DIFFERENT

HOW OFTEN AND HOW MUCH TO APPLY

IRRIGATION SYSTEM FACTORS

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE - MAR

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE - MAR

DISTRIBUTION UNIFORMITY - DU

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE – MAR mm/hr

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE – MAR mm/hr

How quickly the water is applied

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE – MAR mm/hr

How quickly the water is applied

IF EXCEEDS SOIL INFILTRATION RATE RUNOFF OCCURS

IRRIGATION SYSTEM FACTORS

MEAN APPLICATION RATE – MAR mm/hr

How quickly the water is applied

IF EXCEEDS SOIL INFILTRATION RATE RUNOFF OCCURS

IF EXCEEDS SUBSTRATES ABSORPTION RATE EXCESSIVE DRAINAGE OCCURS

IRRIGATION SYSTEM FACTORS

DISTRIBUTION UNIFORMITY - % DU

IRRIGATION SYSTEM FACTORS

DISTRIBUTION UNIFORMITY - % DU

UNIFORMITY OF IRRIGATION ACROSS THE IRRIGATED AREA

IRRIGATION SYSTEM FACTORS

DISTRIBUTION UNIFORMITY - % DU

UNIFORMITY OF IRRIGATION ACROSS THE IRRIGATED AREA

% DU	Extra minutes of irrigation per hour of irrigation
70	27
75	20
80	15
85	11
90	7
95	3

SCHEDULING TECHNIQUES

SCHEDULING TECHNIQUES

PULSING

SCHEDULING TECHNIQUES

PULSING

MULTIPLE SHORT APPLICATIONS TO REDUCE THE VOLUME OF WATER APPLIED AT ONE TIME

SCHEDULING TECHNIQUES

PULSING

MULTIPLE SHORT APPLICATIONS TO REDUCE THE VOLUME OF WATER APPLIED AT ONE TIME

USEFUL FOR DRIPPERS

SCHEDULING TECHNIQUES

PULSING

MULTIPLE SHORT APPLICATIONS TO REDUCE THE VOLUME OF WATER APPLIED AT ONE TIME

USEFUL FOR DRIPPERS

MAY HAVE APPLICATIONS FOR SPRINKLERS IN CERTAIN SITUATIONS

SCHEDULING TOOLS

SHOVEL OR AUGER

DAILY EVAPORATION/ WEB TOOLS

TENSIOMETERS

GYPSUM BLOCKS

CAPACITANCE PROBES

TIME DOMAIN REFLECTOMETRY

RADIOACTIVE REFLECTION

WETTING FRONT DETECTOR

SCHEDULING TOOLS

SHOVEL OR AUGER

SCHEDULING TOOLS

SHOVEL OR AUGER

ADVANTAGES

SCHEDULING TOOLS

SHOVEL OR AUGER

ADVANTAGES

LOW COST

SCHEDULING TOOLS

SHOVEL OR AUGER

ADVANTAGES

LOW COST

ABILITY TO SAMPLE MULTIPLE SITES

SCHEDULING TOOLS

SHOVEL OR AUGER

DISADVANTAGES

SCHEDULING TOOLS

SHOVEL OR AUGER

DISADVANTAGES

PERSONAL OPINION - SUBJECTIVE

SCHEDULING TOOLS

SHOVEL OR AUGER

DISADVANTAGES

PERSONAL OPINION - SUBJECTIVE

CAN'T COMPARE PREVIOUS RESULTS

SCHEDULING TOOLS

SHOVEL OR AUGER

DISADVANTAGES

PERSONAL OPINION - SUBJECTIVE

CAN'T COMPARE PREVIOUS RESULTS

CAN'T GET CONTINUOUS RESULTS

SCHEDULING TOOLS

SHOVEL OR AUGER

DISADVANTAGES

PERSONAL OPINION - SUBJECTIVE

CAN'T COMPARE PREVIOUS RESULTS

CAN'T GET CONTINUOUS RESULTS

HARD TO ESTABLISH WATER USE PATTERNS

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

SCHEDULING TOOLS

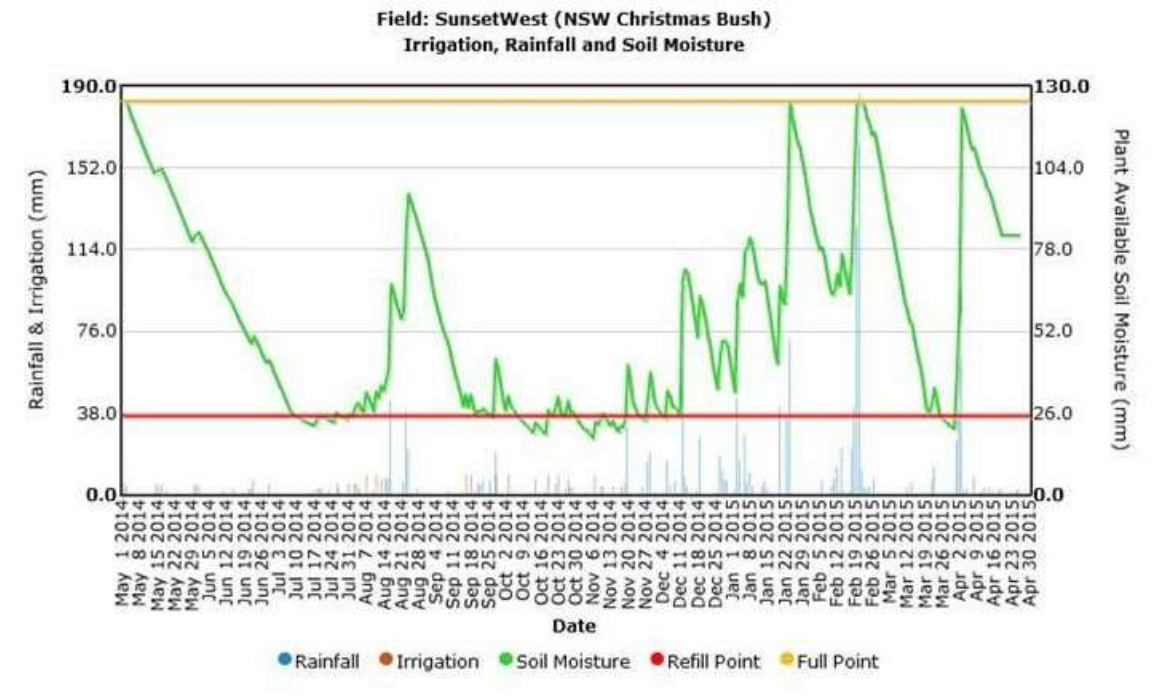
DAILY EVAPORATION/WEB TOOLS

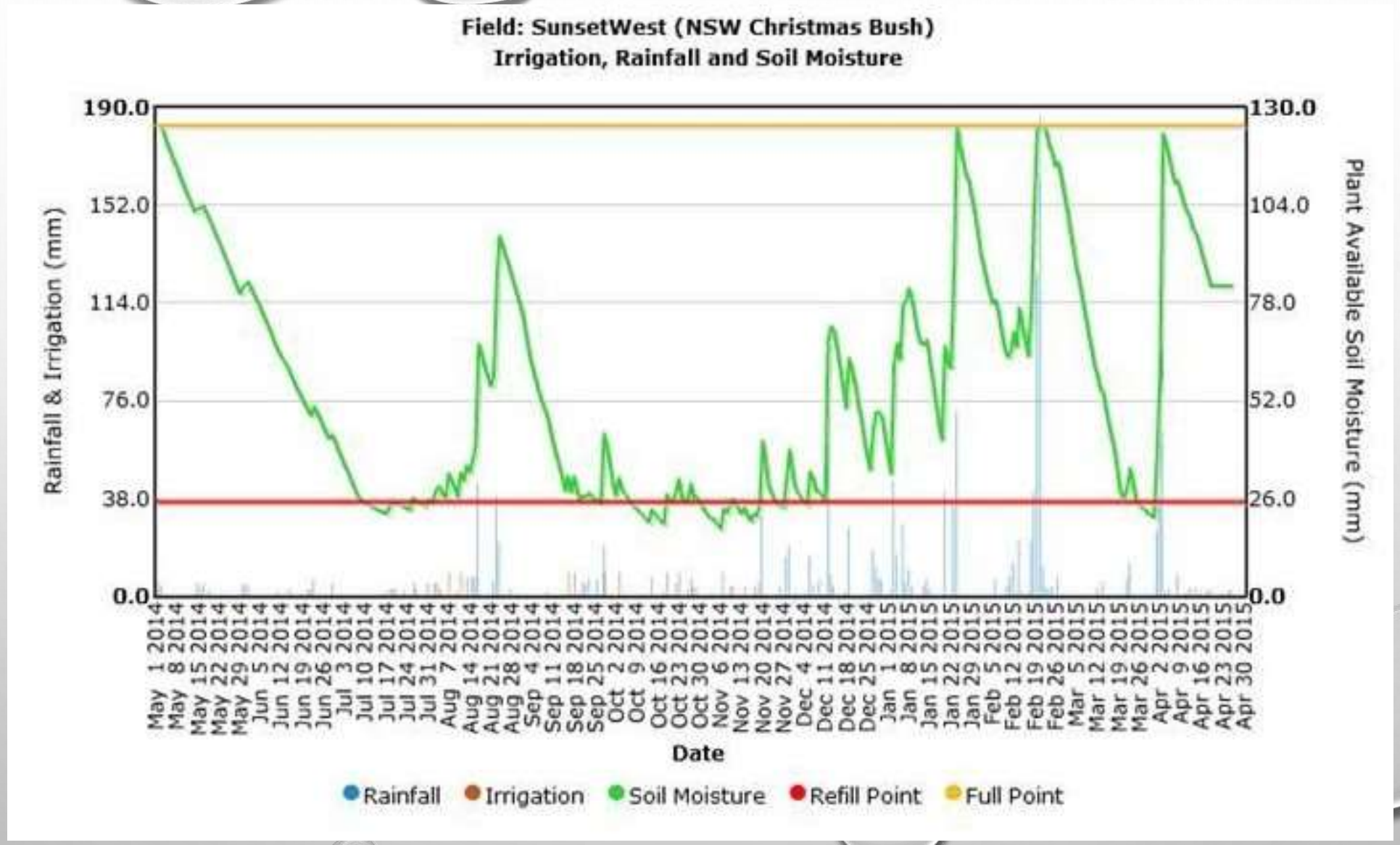
SCHEDULING IRRIGATION DIARY - SID

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

SCHEDULING IRRIGATION DIARY - SID




Field: SunsetWest (NSW Christmas Bush)
Irrigation, Rainfall and Soil Moisture
Rainfall & Irrigation (mm)
Plant Available Soil Moisture (mm)
190.0
152.0
114.0
76.0
38.0
0.0
130.0
104.0
78.0
52.0
26.0
0.0
May 1 2014
May 8 2014
May 15 2014
May 22 2014
May 29 2014
Jun 5 2014
Jun 12 2014
Jun 19 2014
Jun 26 2014
Jul 3 2014
Jul 10 2014
Jul 17 2014
Jul 24 2014
Jul 31 2014
Aug 7 2014
Aug 14 2014
Aug 21 2014
Aug 28 2014
Sep 4 2014
Sep 11 2014
Sep 18 2014
Sep 25 2014
Oct 2 2014
Oct 9 2014
Oct 16 2014
Oct 23 2014
Oct 30 2014
Nov 6 2014
Nov 13 2014
Nov 20 2014
Nov 27 2014
Dec 4 2014
Dec 11 2014
Dec 18 2014
Dec 25 2014
Jan 1 2015
Jan 8 2015
Jan 15 2015
Jan 22 2015
Jan 29 2015
Feb 5 2015
Feb 12 2015
Feb 19 2015
Feb 26 2015
Mar 5 2015
Mar 12 2015
Mar 19 2015
Mar 26 2015
Apr 2 2015
Apr 9 2015
Apr 16 2015
Apr 23 2015
Apr 30 2015
Date
Rainfall
Irrigation
Soil Moisture
Refill Point
Full Point

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

ADVANTAGES

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

ADVANTAGES

LOW COST

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

ADVANTAGES

LOW COST

USEFUL FOR SCHEDULING NEXT IRRIGATION

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

ADVANTAGES

LOW COST

USEFUL FOR SCHEDULING NEXT IRRIGATION

RESULTS DIRECTLY RELATE TO WEATHER CONDITIONS

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

ADVANTAGES

LOW COST

USEFUL FOR SCHEDULING NEXT IRRIGATION

RESULTS DIRECTLY RELATE TO WEATHER CONDITIONS

CAN LOOK BACK AT HISTORY

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

DISADVANTAGES

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

DISADVANTAGES

RELIES ON ESTIMATES OF WATER USE

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

DISADVANTAGES

RELIES ON ESTIMATES OF WATER USE

NEED TO BE CLOSE TO A WEATHER STATION

SCHEDULING TOOLS

DAILY EVAPORATION/WEB TOOLS

DISADVANTAGES

RELIES ON ESTIMATES OF WATER USE

NEED TO BE CLOSE TO A WEATHER STATION

ONLY SUITABLE FOR CROPS IN SOIL

SCHEDULING TOOLS

TENSIOMETERS

SCHEDULING TOOLS

TENSIOMETERS

ADVANTAGES

SCHEDULING TOOLS

TENSIOMETERS

ADVANTAGES

LOW COST

SCHEDULING TOOLS

TENSIOMETERS

ADVANTAGES

LOW COST

MULTI-DEPTH

SCHEDULING TOOLS

TENSIOMETERS

ADVANTAGES

LOW COST

MULTI-DEPTH

CAN BE LOGGED AND RESULTS COMPARED

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

HIGH LABOUR IF NOT LOGGED

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

HIGH LABOUR IF NOT LOGGED

FREQUENT READING FOR GOOD DATA

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

HIGH LABOUR IF NOT LOGGED

FREQUENT READING FOR GOOD DATA

HIGH MAINTENANCE

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

HIGH LABOUR IF NOT LOGGED

FREQUENT READING FOR GOOD DATA

HIGH MAINTENANCE

MUST BE INSTALLED CORRECTLY

SCHEDULING TOOLS

TENSIOMETERS

DISADVANTAGES

HIGH LABOUR IF NOT LOGGED

FREQUENT READING FOR GOOD DATA

HIGH MAINTENANCE

MUST BE INSTALLED CORRECTLY

HARD TO ESTABLISH WATER USE PATTERNS

SCHEDULING TOOLS

GYPSUM BLOCKS

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

LOW COST

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

LOW COST

ACCURATE

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

LOW COST

ACCURATE

LOGGABLE

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

LOW COST

ACCURATE

LOGGABLE

MULTIPLE DEPTHS

SCHEDULING TOOLS

GYPSUM BLOCKS

ADVANTAGES

LOW COST

ACCURATE

LOGGABLE

MULTIPLE DEPTHS

BETTER IN FINELY TEXTURED SOILS THAN TENSIOMETERS

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

REPLACE AFTER 2-3 SEASONS

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

REPLACE AFTER 2-3 SEASONS

HIGH LABOUR IF NOT LOGGED

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

REPLACE AFTER 2-3 SEASONS

HIGH LABOUR IF NOT LOGGED

CALIBRATION NEEDED

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

REPLACE AFTER 2-3 SEASONS

HIGH LABOUR IF NOT LOGGED

CALIBRATION NEEDED

SOIL PROFILE DISTURBED DURING INSTALLATION

SCHEDULING TOOLS

GYPSUM BLOCKS

DISADVANTAGES

REPLACE AFTER 2-3 SEASONS

HIGH LABOUR IF NOT LOGGED

CALIBRATION NEEDED

SOIL PROFILE DISTURBED DURING INSTALLATION

HARD TO ESTABLISH WATER USE PATTERNS

SCHEDULING TOOLS

CAPACITANCE PROBES

SCHEDULING TOOLS

CAPACITANCE PROBES

A NUMBER OF DIFFERENT UNITS AVAILABLE

RANGE FROM SIMPLE READING LIKE TENSIOMETER TO DATA LOGGING AND REMOTE ACCESS.

SCHEDULING TOOLS

CAPACITANCE PROBES

ADVANTAGES

SCHEDULING TOOLS

CAPACITANCE PROBES

ADVANTAGES

ACCURATE

SCHEDULING TOOLS

CAPACITANCE PROBES

ADVANTAGES

ACCURATE

CONTINUOUS LOGGING DATA

SCHEDULING TOOLS

CAPACITANCE PROBES

ADVANTAGES

ACCURATE

CONTINUOUS LOGGING DATA

MULTI-SITES, MULTI-DEPTH

SCHEDULING TOOLS

CAPACITANCE PROBES

DISADVANTAGES

SCHEDULING TOOLS

CAPACITANCE PROBES

DISADVANTAGES

LIMITED SITES AND DEPTHS

SCHEDULING TOOLS

CAPACITANCE PROBES

DISADVANTAGES

LIMITED SITES AND DEPTHS

DOWNLOADING DATA

SCHEDULING TOOLS

CAPACITANCE PROBES

DISADVANTAGES

LIMITED SITES AND DEPTHS

DOWNLOADING DATA

REQUIRES SKILL TO INSTALL AND INTERPRET

SCHEDULING TOOLS

TOOLS FOR SUBSTRATES

SCHEDULING TOOLS

TOOLS FOR SUBSTRATES

DIRECT SOIL MOISTURE MEASURING EQUIPMENT UNSUITABLE

SCHEDULING TOOLS

TOOLS FOR SUBSTRATES

DIRECT SOIL MOISTURE MEASURING EQUIPMENT UNSUITABLE

ESTIMATES OF WATER USE OR WEIGHING CONTAINERS

SCHEDULING TOOLS

OTHER FACTORS

OTHER FACTORS

TIME OF USE TARIFFS

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

SYSTEM CONTROL - MANUAL OR AUTOMATIC

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

SYSTEM CONTROL - MANUAL OR AUTOMATIC

KEEPING FOLIAGE DRY

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

SYSTEM CONTROL - MANUAL OR AUTOMATIC

KEEPING FOLIAGE DRY

DOWNTIME FOR REPAIR AND MAINTENANCE

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

SYSTEM CONTROL - MANUAL OR AUTOMATIC

KEEPING FOLIAGE DRY

DOWNTIME FOR REPAIR AND MAINTENANCE

WATER AVAILABILITY

OTHER FACTORS

TIME OF USE TARIFFS

SELF-GENERATED SOLAR POWER

OTHER ACTIVITIES - SPRAYING AND HARVESTING

SYSTEM CONTROL - MANUAL OR AUTOMATIC

KEEPING FOLIAGE DRY

DOWNTIME FOR REPAIR AND MAINTENANCE

WATER AVAILABILITY

WATER QUALITY

MORE INFORMATION

FAQI
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IRRIGATION FUTURES
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