

Improving Irrigation Scheduling using Advanced Evapotranspiration methods

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**9th ASIAN REGIONAL
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Irrigation & Drainage

75th IEC MEETING

1 - 7 Sept 2024 | ICC Sydney



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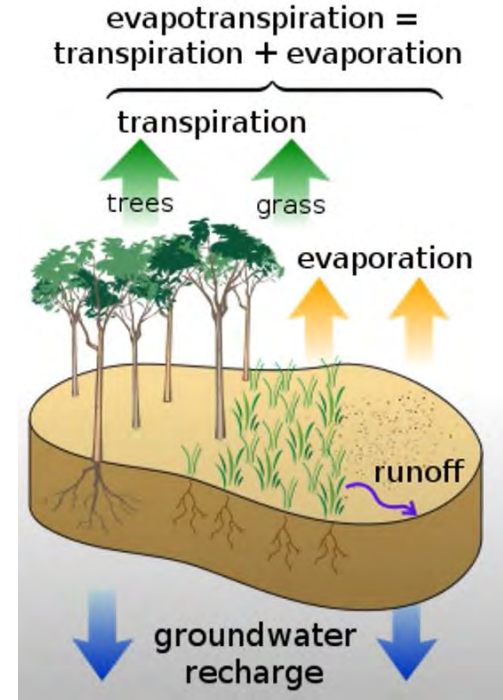


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Operations

- Know your soil
- Know your plant
- Know your system
- Performance
- Fault Finding
- Sensors

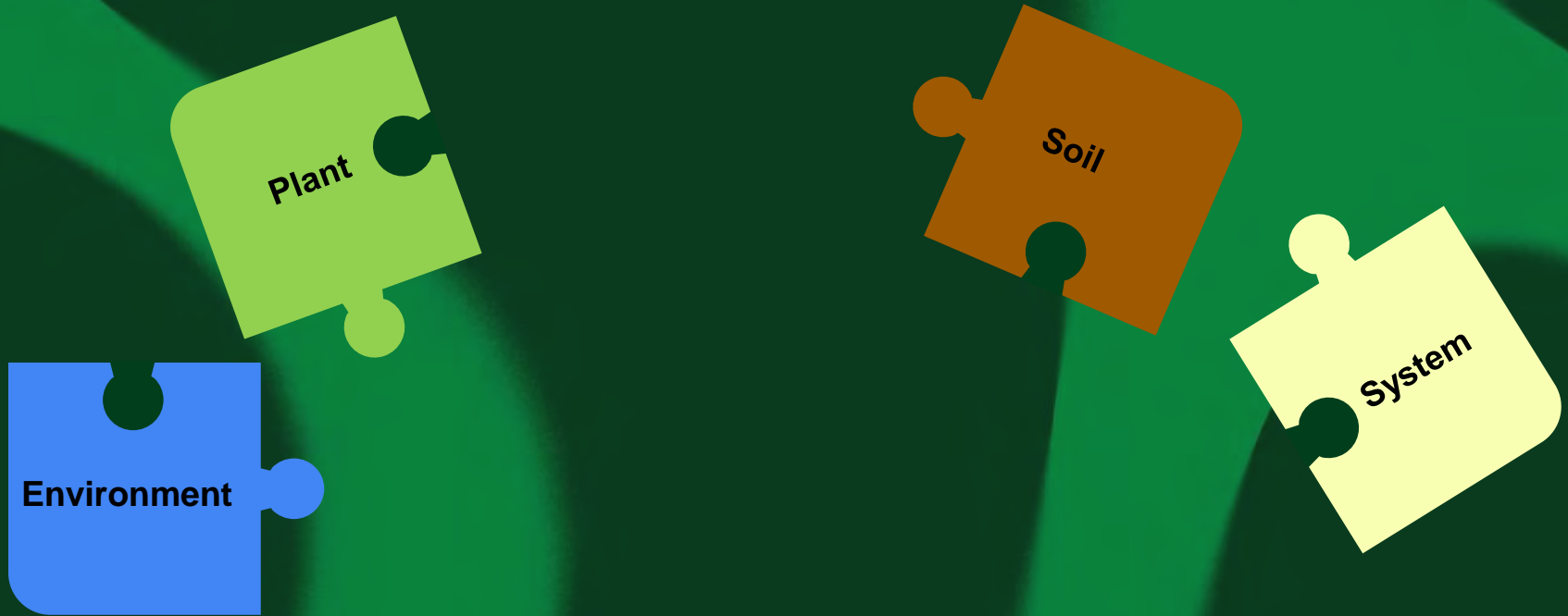


Tradition vs Tools and Technology

- Time based scheduling
 - Estimated Times
 - Over watering
- Weather sensors/stations, moisture probes/sensors
- Scheduling Software
- Communications

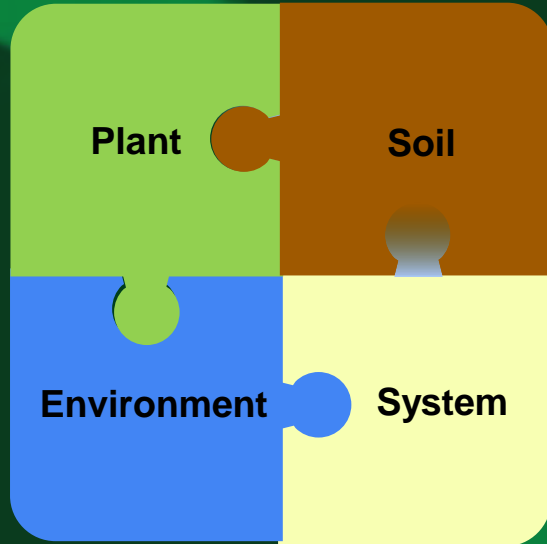


Aspects of Scheduling



Advanced ET – IQ4

IQ4 Advanced ET – A scheduling tool



Built around IA methodology for Management Allowed Depletion (MAD)

Provides a “launch pad” for collating all aspects – allows for detailed input and adjustment

Longer, less frequent irrigation – deeper roots



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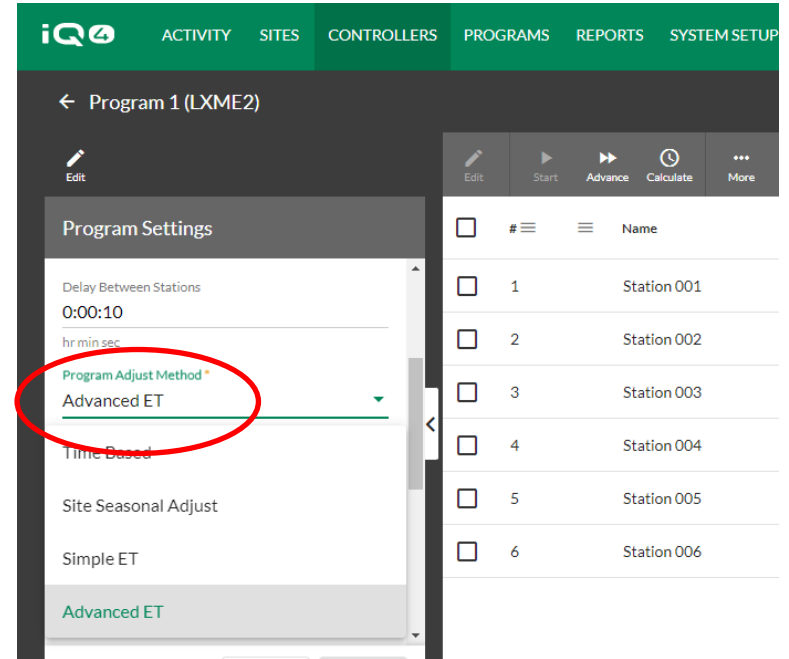
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RAIN BIRD

IQ4 Advanced ET

- Operates at a Program level
- Uses ET and specific site information to calculate when and how long to irrigate
- Dynamic
- ET management is a proven effective tool to reduce water use



IQ4 Advanced ET - Configuration

- Weather Source

Hourly data and look ahead

The screenshot displays the IQ4 Advanced ET configuration interface. The main window shows a list of weather sources under the heading "WEATHER SOURCES". A dropdown menu is open, highlighting the "Weather" option. The table below lists two weather sources: "170 O'Brein Rd" and "Auckland". The "Auckland" source is selected, indicated by a checkmark in the first column. A configuration modal is open on the right, showing the "Name" field set to "Auckland", "Weather Source Type" set to "Global Weather", and "IQ Global Weather Source Location" set to "Wellington". A red circle highlights the "Add" button (+) in the modal. At the bottom right, a checkbox labeled "1 Dave's Demos" is also circled in red.

Name	Shared	Calendar	Type	Time Zone	Elevation	r(s):
<input type="checkbox"/> 170 O'Brein Rd		View ET Calendar	Global Weather	New Zealand Standard Time	30 m	O'Brien Road
<input checked="" type="checkbox"/> Auckland		View ET Calendar	Global Weather	New Zealand Standard Time	35 m	

IQ4 Advanced ET - Configuration

- Landscape Information

- Soil Type
- Managed Depletion (MAD)

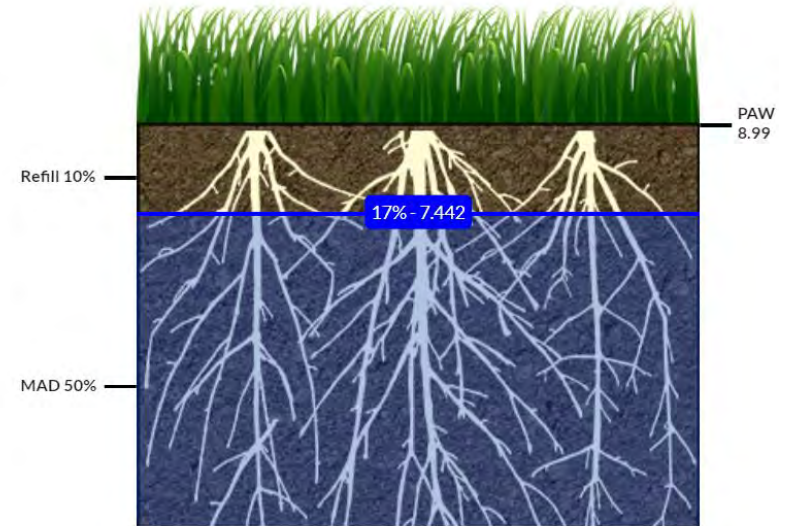
Set to 50% typ

- Refill

Set to 10%-20%

1 Daves Demos - LXME2 - Program 1 - Landscape Information

Plant Material *	Cool Season Turfgrass	
Soil Type *	Sandy Loam	
Root Depth *	74.9	mm
Management Allowed Depletion (MAD) *	50	%
Refill Percentage	10	%
Max Watering ET *	15.0	mm
Landscape Coefficient *	0.7	



IQ4 Advanced ET - Configuration

- Landscape Information

- Plant Material
- Root depth
- Landscape Co-efficient

$$K_L = K_s \times K_d \times K_{mc}$$

species (K_s)

density (K_d)

microclimate (K_{mc})

The screenshot shows the 'Landscape Information' configuration interface. A large blue circle magnifies the input fields. The fields and their values are:

Field	Value
Plant Material *	Cool Season Turfgrass
Soil Type *	Sandy Loam
Root Depth *	74.9
Management Allowed Depletion	50
Refill Percentage *	10
Max Watering ET *	15.0
Landscape Coefficient *	0.7

Additional settings shown in the magnified view:

- Species *: 0.7
- Density *: 1
- Microclimate *: 1
- Use Calculated Landscape Coefficient of: 0.7

PAW 8.99



IQ4 Advanced ET - Configuration

- System

- Sprinkler Data – by station

Nozzle

Flow

Pressure

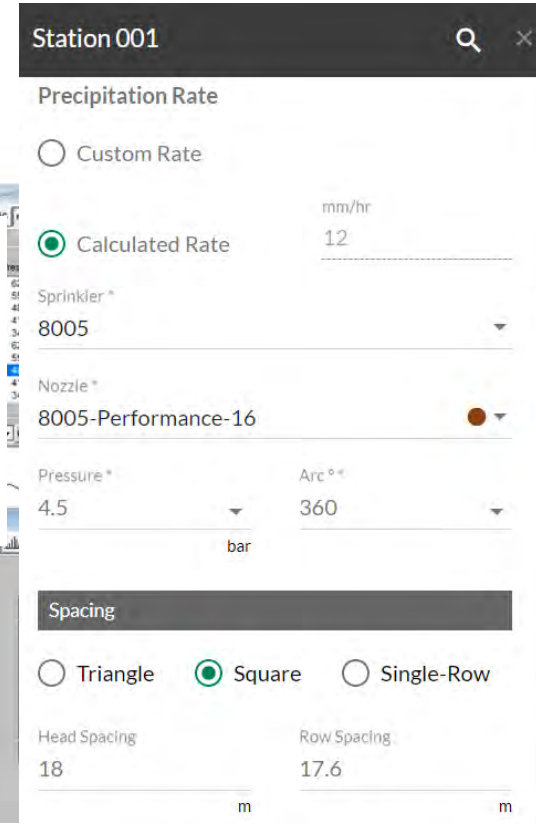
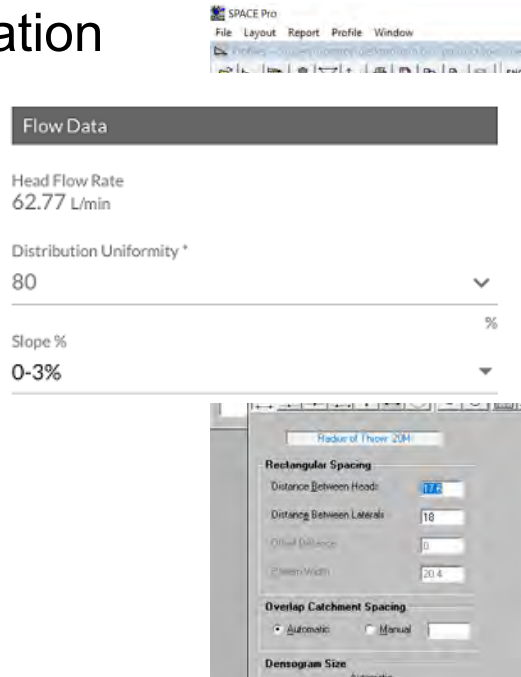
Arc

- Spacing and layout

- Precipitation Rate

- DU

SPACE or audit



IQ4 Advanced ET

- operation

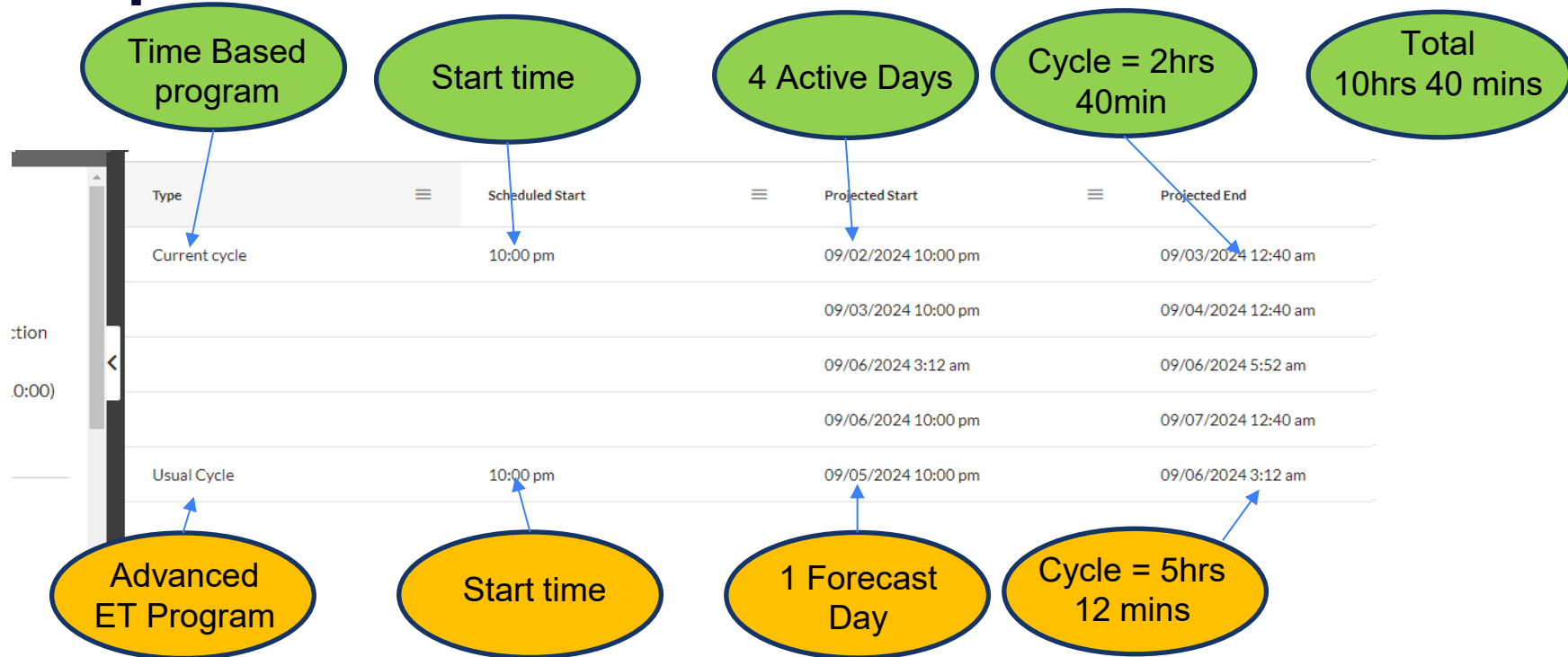
- ET Checkbook
- Site info and forecast used to calculate Program Watering Day and Station run times
- Includes % adjust settings
- Easily adjusted for on-site inputs

The screenshot displays the 'ET Checkbook' interface. At the top, it shows program details: Program: Program 1, Controller: LXME2, and Weather Source: Auckland. A green 'Add Record' button is circled in red. Below this is a table with columns for Date, Program, and Station. The first row shows '01-09-2024', 'Program 1', and 'Station 001'. A dropdown menu is open over the 'Station 001' cell, showing 'Delay Between Stations' and 'Station 002'. Below the table is the 'Add Record' form. It includes fields for 'Name' (Station 001 to Station 006), 'Adjustment Type' (Withdrawal), 'Amount' (2.3), and 'Description' (User entered withdrawal). A dropdown menu for 'Adjustment Type' is open, showing options: Deposit, Deposit, Withdrawal, Set to Field Capacity (0%), Set to Refill (10%), and Set to MAD (50%). The 'Set to Field Capacity (0%)' option is circled in red. At the bottom of the form are 'CLOSE' and 'SUBMIT' buttons.



IQ4 Advanced ET

- Comparison



IQ4 Advanced ET

- Road Blocks

- Time
- Focus – Strategic Importance
 - Resource Allocation for Irrigation Management
- Change
 - Trust

IQ4 Advanced ET

- Industry Assistance for Operations

- Training
- Design and Specification
 - Include ET scheduling and commissioning as an integral part at design and specification level
- Contract Delivery
 - Station Details to be entered as part of contract delivery, reflecting “As-Built”



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IQ4 Advanced ET - Benefits

- Built in – no additional costs
- Proven methodology to promote sustainable irrigation scheduling - confidence
- Straightforward to implement and fine tune
- Improved plant health
- Reduced water use



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IQ4 Advanced ET

Thank You