Water for Profit

CALCULATING DISTRIBUTION UNIFORMITY

WATERFORPROFIT

Distribution Uniformity (DU) is a key indicator of the performance of your irrigation system. DU tests should be done to ensure that your system is applying irrigation water evenly to your crop.

Introduction

Simple catch can trials can be conducted on any type of irrigation system and the data used to calculate the distribution uniformity for the system.

What is distribution uniformity?

DU measures how uniformly an irrigation system applies water to the crop. It is calculated as the ratio of the average irrigation volume applied to the driest quarter of the field (or grid) and the average volume applied across the whole field (or grid):

DU = Average of the lowest 25% of applied depths ÷ average applied depth.

Example data

Assume that a catch can trial, using 25 cans arranged in a grid pattern, was conducted on a sprinkler irrigation system and the following can readings (depths or volumes from same size cans both work) were measured.

Can Readings (mm): 25, 15, 20, 10, 15, 20, 25, 28, 22, 18, 17, 10, 14, 7, 18, 19, 14, 12, 9, 18, 16, 15, 23, 13 and 22.

Example calculation

Step 1. Order these can results from the smallest number to the largest number.

Ordered can readings (mm): 7, 9, 10, 10, 12, 13, 14, 14, 15, 15, 15, 16, 17, 18, 18, 18, 19, 20, 20, 22, 22, 23, 25, 25 and 28.

Step 2. Take the lowest quarter (in this case the lowest six can readings) and find their average. Then find the average of all the can readings.

Lowest ¼ readings are: 7, 9, 10, 10, 12 and 13. The average of these numbers is: (7+9+10+10+12+13) ÷ 6 = 10.2

The average of all the can readings is 17.0.

Step 3. Calculate DU using the equation.

DU = 10.2 ÷ 17.0 = 0.6 or 60 per cent

In this case, the DU is below the minimum target performance standards for horticultural crops. These target levels are 85 per cent for fixed sprinkler and travelling gun systems, 90 per cent for centre pivots, lateral moves and booms, and 95 per cent for micro-sprinkler and drip systems.

Low irrigation uniformity often produces large variations in crop yield and quality. It is also a major factor contributing to low water use efficiency and excessive leaching of nutrients and fertiliser out of the root zone. Improving DU to target levels can also lead to better economic returns.

For more details contact Growcom on 07 3620 3844.

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