Step 4b: measure application depth and distribution uniformity

The 'bucket test'

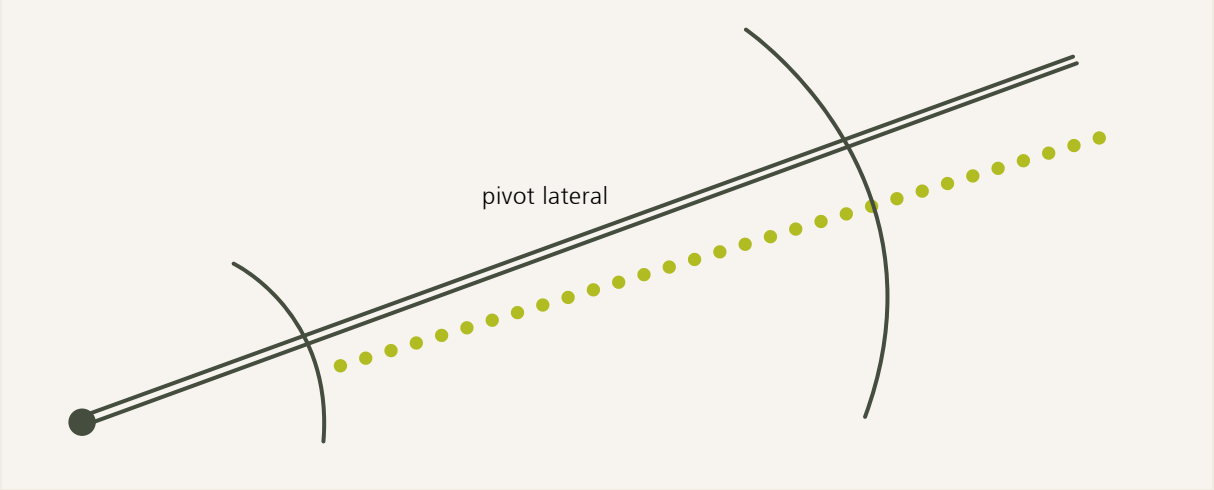
Use a set of buckets to measure how much water is being applied by the irrigator and how uniformly. Carry out these measurements at least once, even if there is a digital readout on the machine, as sometimes they can be wrong.

1. Spread 12 to 48 (a multiple of 4) buckets evenly across the irrigated area putting a stone or weight in each bucket for stability. See the bucket layout suggestions
2. Operate the irrigation on that area as per normal procedure
3. Measure and record how much water is in each bucket using the tables below
4. Calculate the application depth and application uniformity using the steps on the following pages.

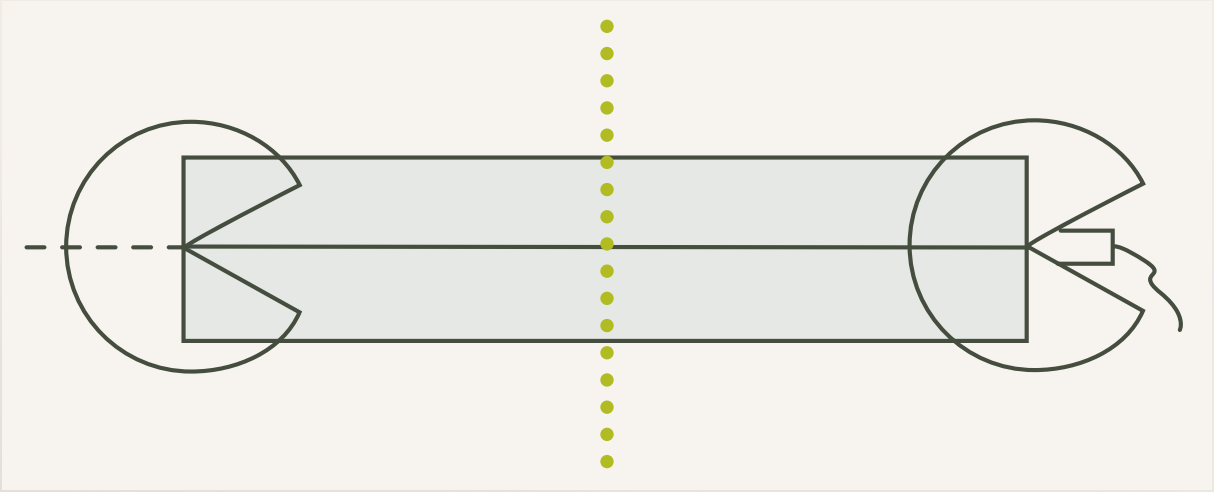
Bucket number	Irrigator 1	Irrigator 2	Irrigator 3
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
Total volume	ml	ml	ml

Bucket number	Irrigator 1	Irrigator 2	Irrigator 3
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
Total volume	ml	ml	ml

Bucket test layout: centre-pivot



Bucket test layout: travelling irrigator



Centre pivot and travelling irrigators

	Value	Irrigator 1	Irrigator 2	Irrigator 3	Units
Number of buckets	**A**				
Total volume of all buckets	**B**				ml
Average volume C = B ÷ A	**C**				ml
Total number of buckets ÷ 4 D = A ÷ 4	**D**				
Total volume of water from the lowest 25% of buckets (refer to page 18)	**E**				ml
Average volume of water from the lowest 25% of buckets (refer to page 18) F = E ÷ D	**F**				ml

Width across the bucket (inside top diameter)	**G**				mm
Bucket radius H = G ÷ 2	**H**				mm
Bucket area (ϖr^2): I = 3.14 x H x H	**I**				mm^2

Average application depth J = 1000 x C ÷ I	**J**				mm

Enter this answer in **4b** on results page

Average distribution uniformity (DU) K = F ÷ C	**K**				%

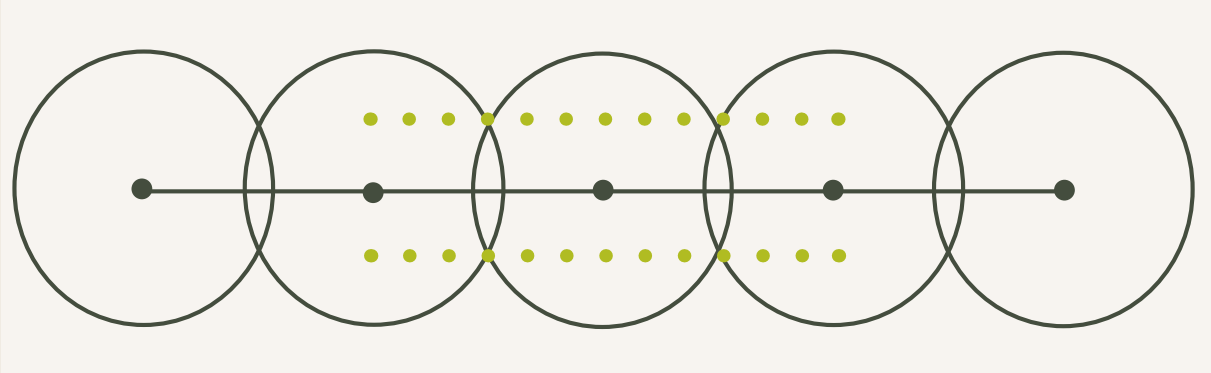
Enter this answer in **4bb** on results page

K-line irrigator

1. Spread 12 to 20 (a multiple of 4) buckets evenly, every 2-3 metres under the K-line, as shown in the diagram, putting a stone or weight in each bucket for stability
2. Operate the irrigation on that area as per normal procedure (allow at least 6 hours to collect enough water to measure)
3. Measure how much water is in the buckets after a known amount of time, and calculate the average application depth and distribution uniformity.

Bucket layout: k-line

The unique watering pattern and low application rate of k-line irrigators require a different bucket test design and slightly different calculations to determine application depth.



To do this:

	Value	Irrigator 1	Irrigator 2	Irrigator 3	Units
Number of buckets	**A**				
Total volume of all buckets	**B**				ml
Average volume C = B ÷ A	**C**				ml
Total number of buckets ÷ 4	**D**				
Total volume of water from the lowest 25% of buckets (refer to page 18)	**E**				ml
Average volume of water from the lowest 25% of buckets (refer to page 18) F = D ÷ E	**F**				ml

Width across the bucket (inside top diameter)	**G**				mm
Bucket radius H = G ÷ 2	**H**				mm
Bucket area (ϖr^2): I = 3.14 x H x H	**I**				mm^2

Time that buckets were under k-lines	**J**				hours
Average application depth (1 hr) K = 1000 x C ÷ I ÷ J	**K**				mm

Or

Enter this answer in **4b** on results page

Average application depth (12 hr) L = K x 12	**L**				mm

Or

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Average application depth (24 hr) M = K x 24	**M**				mm

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Average distribution uniformity (DU) N = F ÷ C	**N**				%

Refer to Irrig8Quick: **pagebloomer.co.nz** for more detail on application uniformity (e.g. DU or CU).

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