

Calibrating irrigation scheduling tools using crop growth measurements

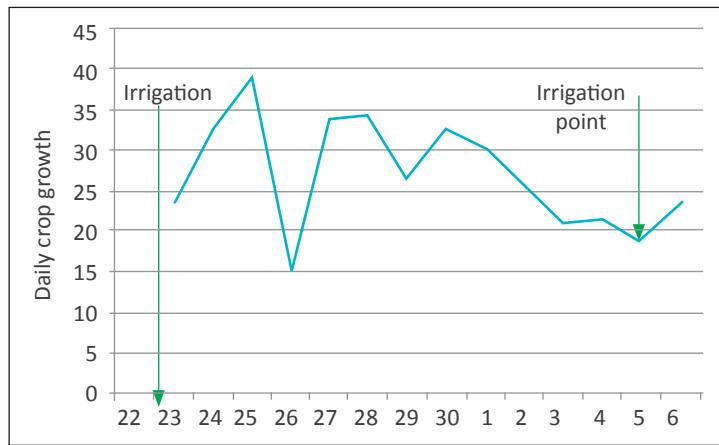
All irrigation scheduling tools should be calibrated so they can be used the most effectively. Crop growth measurements are the simplest calibration method and can be done as soon as the crop starts to develop cane. Crop growth measurements will help determine the irrigation trigger point. At that point the reading on the scheduling tool is taken (for example, mini pan evaporation, tensiometer suction, etc). The tool has now been calibrated for that crop.

Equipment

- Tape measure or measuring stick (a piece of marked conduit works well).
- Bottle lids – for example, milk or juice bottle lids.
- Flagging tape.
- Recording sheet.

Site selection

- The crop should be near full canopy and actively growing.
- The monitoring site should be at least 5-8 rows from the edge and 2-3 m into the paddock.
- Select 25 main stalks, 12 stalks on one side and 13 on the other side. Mark each stalk with flagging tape and place the bottle lids at the base of the stalk (this provides a fixed base for measuring). Number each stalk so that there is a reference for recording.



Taking measurements

- Measure each day, making sure it is at the same time. Take the stalk and measure it from the ground to top visible dewlap (see photo). If the tape measure is hard to use, attach it to a piece of conduit or something similar.
- Record the stalk measurements (see example overleaf). Add these readings together and divide by 25 to give the average growth for the day.

Irrigation trigger points

For a fully irrigated crop, the irrigation trigger point is when the average growth reduces to below 50% of the maximum recorded for two or more days. In the example, this would be about December 4.

For a supplementary irrigated crop, the trigger point will depend on the amount of water available and the region.

Crop growth can stall for a number of reasons, not just irrigation management. Weather conditions such as overcast days can have a major impact. Ideally stalk measurements should be done over more than one irrigation cycle.



Above: Taking measurements.

Left: Graph of daily crop growth.

Example growth measurement recording sheet

	Block	1-4		Variety	Q208		Class	1st ratoon							
Date	21.11	22.11	23.11	24.11	25.11	26.11	27.11	28.11	29.11	30.11	01.12	02.12	03.12	04.12	05.12
Stalk #	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	1490	1510	1510	1530	1580	1600	1630	1640	1660	1700	1710	1730	1760	1790	
2	1510	1510	1550	1560	1570	1590	1630	1640	1660	1680	1700	1720	1760	1760	1760
3	1550	1580	1600	1680	1700	1720	1740	1740	1780	1790	1820	1840	1850	1850	1870
4	1610	1630	1660	1710	1710	1760	1780	1800	1830	1870	1880	1920	1940	1960	1980
5	1510	1560	1580	1600	1630	1650	1740	1800	1870	1920	1950	1970	2010	2010	2060
6	1590	1610	1630	1730	1780	1800	1830	1860	1890	1920	1940	1970	1980	1980	1990
7	1520	1550	1670	1690	1730	1760	1780	1810	1840	1860	1880	1900	1920	1940	1950
8	1570	1580	1610	1630	1650	1670	1700	1720	1750	1790	1820	1850	1860	1890	1920
9	1390	1430	1440	1470	1490	1530	1560	1590	1620	1660	1680	1700	1720	1740	1780
10	1440	1450	1460	1490	1500	1540	1590	1610	1630	1650	1680	1700	1720	1730	1770
11	1490	1510	1510	1530	1580	1600	1630	1640	1660	1700	1710	1730	1760	1790	
12	1510	1510	1550	1560	1570	1590	1630	1640	1660	1680	1700	1720	1760	1760	
13	1550	1580	1600	1680	1700	1720	1740	1740	1780	1790	1820	1840	1850	1850	1870
14	1610	1630	1660	1710	1710	1760	1780	1800	1830	1870	1880	1920	1940	1960	1980
15	1510	1560	1580	1600	1630	1650	1740	1800	1870	1920	1950	1970	2010	2020	2060
16	1590	1610	1630	1730	1780	1800	1830	1860	1890	1920	1940	1970	1980	1990	
17	1520	1550	1670	1690	1730	1760	1780	1810	1840	1860	1880	1900	1920	1940	1950
18	1570	1580	1610	1630	1650	1670	1700	1720	1750	1790	1820	1850	1860	1890	1920
19	1390	1430	1440	1470	1490	1530	1560	1590	1620	1660	1680	1700	1720	1740	1780
20	1440	1450	1460	1490	1500	1540	1590	1610	1630	1650	1680	1700	1880	1920	1960
21	1610	1630	1660	1710	1710	1760	1780	1800	1830	1870	1880	1920	1940	1960	1980
22	1510	1560	1580	1600	1630	1650	1740	1800	1870	1920	1950	1970	2010	2020	2060
23	1590	1610	1630	1730	1780	1800	1830	1860	1890	1920	1940	1970	1980	1990	
24	1520	1550	1670	1690	1730	1760	1780	1810	1840	1860	1880	1900	1920	1940	1950
25	1570	1580	1610	1630	1650	1670	1700	1720	1750	1790	1820	1850	1860	1890	1920
Average	1526.4	1550.0	1582.8	1621.6	1637.2	1671.2	1705.6	1732.0	1764.4	1794.8	1820.4	1841.6	1863.2	1882.0	1905.6
Difference	23.6	32.8	38.8	15.6	34.0	34.4	26.4	32.4	30.4	25.6	21.2	21.6	18.8	23.6	