

Rain Gauge Accuracy

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Calibrated rain gauges are typically better than 5% accuracy from the factory. Rain gauge accuracy can be checked with a Field Calibrator which drips a known volume of water into the gauge at a known rate – typically equivalent to 50mm/hr or 100mm/hr of rain. You cannot check a rain gauge by pouring a known volume of water into the gauge as that is going to be hundreds of times faster than actual rain so some water splashes out of the bucket each time it tips

- Rain gauges even a few metres apart can differ by 10 percent or more as the capture area of a rain gauge is not large enough to cope with the statistical variation of rainfall. To try and overcome this variation very accurate scientific rain gauges have been made that have a capture diameter of one metre which is impractical for normal use.
- While calibrated rain gauges a few metres apart can read quite differently for a single short rain event, over time the total rainfall measured by both gauges will be very close. This is due to the random nature of individual raindrops that averages out over time. For agriculture, the total rain over time is far more important than a single short rain event.
- Wind has a major effect on the readings from rain gauges as the wind tends to form vortices at the funnel that whips some of the rain out and results in lower than actual readings.
- An experiment was done in the UK over 100 years ago where they put rain capture buckets at various heights up the side of a church steeple. The buckets at the top of the steeple recorded almost no rain due to the higher winds at that height. This is why the World Meteorological Organisation recommends that rainfall is measured with the rain gauge sitting on the ground on mown grass (to avoid any drops bouncing off a hard surface like concrete and getting into the bucket). That is not usually practical in an agricultural setting so placing the gauge at head height is an acceptable compromise.
- In situations where we compare two different types of rain gauge here at Harvest, we will ensure that the two gauges are mounted in virtually the same position eg: We will actually put gauges side by side almost touching each other with the top of the capture buckets at exactly the same height. Even with this arrangement it can take multiple rain events to get an accurate comparison of readings.
- The World Meteorological Society recommends that weather stations are placed at a distance away from any nearby obstacles that is at least six times the height of the obstacles as the most optimal way to ensure accurate readings, this can prove impossible on a lot of orchards and farms due to space requirements.
- If a rain gauge is near a shelter belt, when the rain is blocked by the shelter the rain gauge will always read lower than actual open space rainfall. In an orchard the best compromise is often to place the rain gauge in the centre of a block as far from shelter as possible. The rainfall downwind from shelter will be much less than in the centre of the block.

- By placing soil moisture probes in the centre of a block and also on the downwind side of shelter it becomes obvious that natural rainfall will not have an even distribution. Ideally irrigation should take this into account for optimum growth.