

Growing sweet strawberries

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Strawberry fruit production will start shortly. Growers wishing to ensure quality fruit with good taste should now ensure their irrigation and fertiliser injection equipment is operating properly. Routine measurement of the electrical conductivity (EC) and pH levels of the feed solution is crucial.

As a fertiliser dissolves in water, it breaks down into positively and negatively charged ions such as potassium (K^+) and nitrate (NO_3^-). As the quantity of these ions increases the ability of water to transmit electricity increases, raising the electrical conductivity (EC) of the water. Thus EC provides a useful measure to track levels of fertiliser present in the water and ensure fertiliser levels are not excessive or too low.

The EC of the feed from fruit set should be 1.6 millisiemens per cm (mS/cm) *, and from fruiting onwards increased to $\sim 1.8 mS/cm$. The EC should then be adjusted to reflect the weather conditions, dropping to $1.6mS/cm$ if weather turns hot and dry and increasing to a maximum of $2.0mS/cm$ if cool and overcast. This $2.0mS/cm$ limit should not be breached as high EC will cause marginal necrosis and encourage leaf and flower tip burn.



Early season strawberry variety, Vibrant grown under HPS (High Pressure Sodium) lights at Horticulture Centre, Greenmount Campus on 4/4/2020

The water pH is important as it dictates the solubility of nutrients in solution – if pH is too high or low, certain nutrients will be ‘locked up’ and not be available to the plant, or else

too soluble leading to nutrient toxicities. The optimum pH for strawberries is pH 5.6 – 6.0 in peat based substrates, but needs to be pH 5.3 – 5.8 in coir based substrates.

Both the EC and pH should be measured 3 times a week as a minimum, at the emitter of the diluted feed and in the drainage water.

Both pH and EC can be measured using dedicated pH or EC 'pens' which cost approximately £80 each, but pens that will measure both pH and EC can be bought for approximately £150 and are available from a range of manufacturers. Regardless of the type of pen you have, it is critical that they are calibrated on a regular basis, preferably weekly, as the readings can 'drift' over time. For most accurate pH readings a 'two point' calibration is recommended, using two pH buffer solutions - one at pH 4.0 and the other pH 7.0. An EC meter is normally calibrated with a single solution of 1.41 mS/cm. To calibrate carefully follow the manufacturer's instructions.



Early season strawberry variety, Vibrant grown under LED (Light emitting diode) lights at Horticulture Centre, Greenmount Campus on 4/4/2020

Most growers should aim for 10% (+/- 5%) irrigation to waste. Anything higher than this will waste water and fertiliser inputs. The EC in the runoff should be ~0.2 mS/cm higher than the input feed. Each plant should generally receive 0.2 – 0.3 litres of water per day, peaking at 0.5 litres per day in high summer. The water should be applied evenly throughout the day in up to ten applications to ensure the compost in the bag stays uniformly moist.

In addition, growers should be looking to achieve maximum nitrogen (N) levels in their feed of between 120 - 140ppm N for June fruit bearers, 160 ppm N for everbearers. High levels of N in feed are linked to an increased incidence in botrytis.

*Most EC pens are in units of mS/cm, but EC can also be expressed in units of dS/M (decisiemens per metre) and $\mu\text{S}/\text{cm}$ (microsiemens per cm). Conversion factors to swap between readings are:

$$1000 \mu\text{S}/\text{cm} = 1 \text{ mS}/\text{cm} = 1 \text{ dS}/\text{m}$$



Under the gutter view of strawberry variety, Vibrant, taken at Horticulture Centre, Greenmount Campus on 22/4/2020



Early season strawberry variety, Vibrant, at Horticulture Centre, Greenmount Campus on 22/4/2020