

# ENVIRONMENTAL SUSTAINABILITY

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**Decreased carbon footprint.** TwinN is a simple way to slash the carbon footprint of your production system via reduced rates of nitrogen fertiliser. Nitrogenous fertilisers contribute to a very significant proportion of the carbon footprint of cropping/grazing systems. This is partly due to the high energy and natural gas raw material required for manufacturing products like urea. In addition, volatilization of nitrogenous fertilisers releases nitrous oxide ( $N_2O$ ), a potent 'greenhouse' gas.

Carbon budgets and greenhouse emissions have become an important issue for primary producers and reductions of nitrogen fertiliser via TwinN, even partially, results in a large decrease in the carbon footprint of the crop production system. This helps producers of crops where carbon footprint budgets are becoming regulated (such as bio-fuel feedstock producers), as well as producers who just prefer to produce yields sustainably.

TwinN has been 'carbon audited' and carbon offsets have been purchased to allow TwinN to be accounted as 'carbon neutral'. Mapleton Agri Biotec can work with producers to calculate the reductions in  $CO_2$  eq. that can be achieved by use of TwinN to reduce nitrogen fertiliser needs (see Carbon Footprint tab).

**Increase soil carbon.** TwinN drives increased soil carbon by three mechanisms.

1. TwinN increases root growth and a large biomass of roots, particularly in annual crops, is a very effective way to increase soil carbon.
2. TwinN assists development of a vigorous soil microflora in the root zone and this contributes substantially to soil carbon accumulation.
3. High rates of nitrogen application cause loss of soil carbon and TwinN reduces the need for such high rates of N fertiliser application.

**Decreased runoff and leaching problems.** Nitrogen fertilisers are usually poorly bound to soils and leaching of nitrogenous compounds into aquifers, waterways, lakes and oceans is a serious problem. In many countries, including Australia, Europe, UK, USA and others, legislation has been introduced to enforce reduced nitrogen fertiliser use in sensitive zones. This is usually directly associated with a loss of yield and profitability to the affected farmers. TwinN is perfectly placed to allow these nitrogen reductions with minimal or no loss of productivity.

**Improved soil quality.** Reducing nitrogen fertiliser rates by using TwinN helps in developing an enriched soil microbe population and better nutrient availability. Excessive use of nitrogen fertilisers affects pH and structure of soils and reductions in nitrogen fertiliser rates reduces these effects. High or excessive rates of nitrogen fertilizer application have been shown to reduce residual soil organic carbon levels over time. Soils are part of our environment as well as a key part of farm production systems. Good farmers are always looking at ways to look after their soil to help productivity and to fill their role as custodians of their land.

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