



What is TurfClear?

TurfClear from Amgrow is a soil conditioner containing a revolutionary blend of patented surfactants and biocides that bind to sand and soil particles within the root zone. This optimises free water movement within the root zone, and polymerisation of the surfactant compounds creates a web of chain-like structures that assist in water retention and soil stability, particularly in sandy soils.



Features of TurfClear

- ✓ Revolutionary new surfactant blend developed by Arcis Biosciences, a leading biotech group in the UK.
- ✓ Unique surfactant compounds polymerise in the root zone to stabilise sandy soils.
- ✓ Dual action molecule binds to sand particles and enhances free movement of capillary water.
- ✓ Acutely toxic to soil-borne nematodes. The future of nematode control.
- ✓ Safe for humans and the environment – entirely biodegradable.
- ✓ Excellent safety on all common turf species found in Australia when used at label rates.
- ✓ Highly tank mix flexible.
- ✓ Quality product manufactured in the UK.

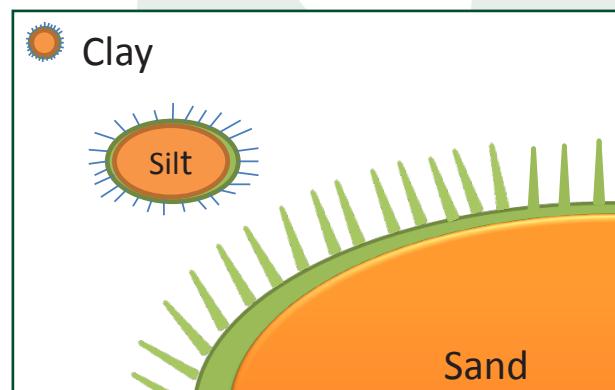
TurfClear at a glance

Active Ingredient	80% Proprietary Surfactants
Pack Size	2L
Rate	4L/ha
Poison Schedule	Unscheduled
Activity	Multi-faceted soil activity

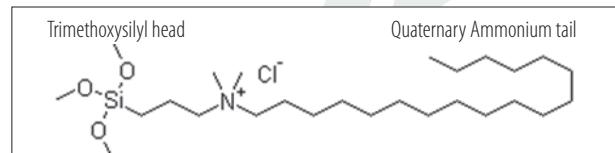
› Novel Blend of Materials

TurfClear contains a blend of unique surfactant molecules that work in synergy to enhance the efficiency of water movement within the soil profile and polymerise within the root zone to stabilise the structure of sandy soils. The SiQuat portion of the surfactant blend features two distinct parts:

- › **Trimethoxysilyl head** that binds to the soil particle and possesses an unusually strong covalent bond that binds to sand particles for up to 14 days.
- › **Quaternary ammonium tail** that enhances the surface area of the soil particle to retain more moisture within the rhizosphere (root / soil interface). The tail section of the SiQuat molecule is also acutely antagonistic to the cell membrane of soil borne nematodes.

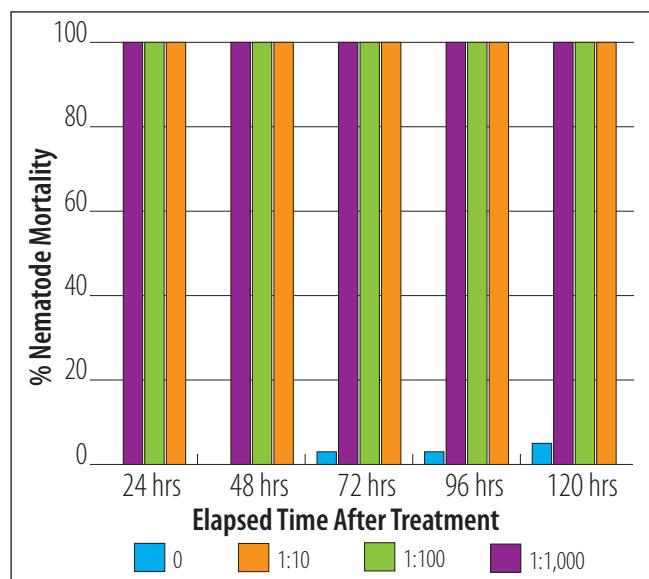


SiQuat molecule binds to sand and soil particles greatly enhancing their surface area to optimise water movement within the root zone.

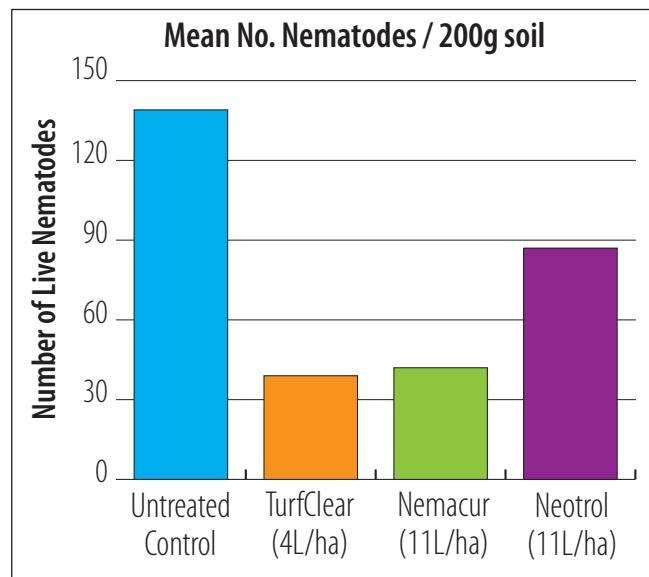


► Biocidal Properties

Soil borne nematodes are acutely sensitive to the compounds contained within TurfClear. The SiQuat molecule within the formulation possesses a unique chemical fingerprint that when in contact with the nematode epidermis will rupture the cells causing immediate nematode death. Local and international lab studies, field trials and pot trials have clearly demonstrated TurfClear's impact on soil-borne nematodes, as demonstrated in the below tables.



Trial undertaken by Arcis Biosciences, UK. Percent of nematode mortality following exposure to varying concentrations of TurfClear diluted with water.



Trial undertaken by SGS Analytical, QLD (2013). Mean count of *Paratrichodorus* spp. (stubby root nematodes) in replicated greenhouse pot trial.

What makes TurfClear unique in its activity on soil borne nematodes is the combination effect of the compounds contained within the formulation, each performing a specific function in a multi-combination process.

► Component 1: Trimethoxysilyl Head

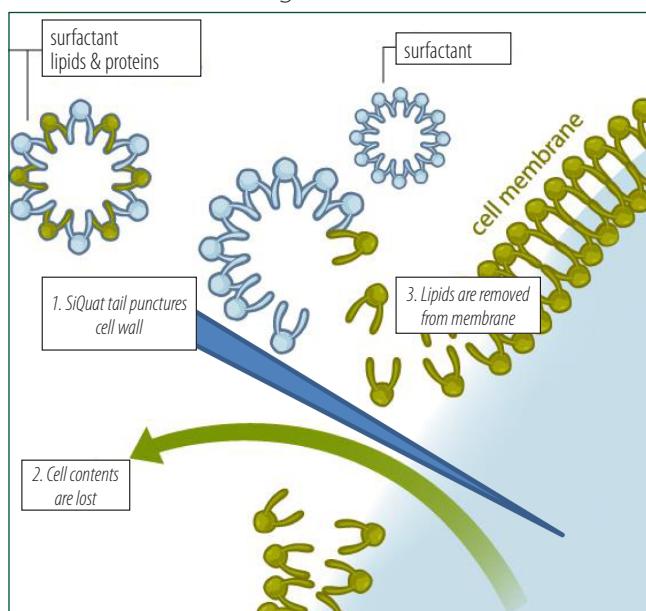
The SiQuat molecule bonds to the soil or sand particle through strong covalent bonding in the trimethoxysilyl head. This bond is strengthened with patented technology allowing the binding side to remain intact in solution. The result is a stable bond that keeps the SiQuat molecule secure on its binding site, particularly in sandy soils.

► Component 2: Quaternary Ammonium Tail

With the molecule secure within the root zone the quaternary ammonium tail remains suspended in solution around the soil particle. As nematodes travel through the film of water surrounding the soil, the hydrophobic chains within the tail act as a spike to puncture the outer membrane of the cellular structure.

► Component 3: Surfactant Micelles

Micelles of surfactant molecules held within the structure of the quaternary ammonium tail bind to the exposed phospholipids in the punctured cell wall, further degrading the cellular structure. As a result the cell wall collapses spilling cellular contents and causing immediate loss of function.



Multi-step process involved in soil-borne nematode death.

