

Agri intelligence



Liqui-Safe

Urease and nitrogen stabiliser for liquid fertiliser
powered by Nutrisphere

Agrii[™]

www.agrii.co.uk





The opportunity to increase yield while benefitting soil biology

How Liqui-Safe Works

The driving force behind LiquiSafe is NutriSphere-NL comprising a long chain organic water soluble compound made up of 2 key organic acids – maleic acid and itaconic acid, both acids are each registered in the EU.

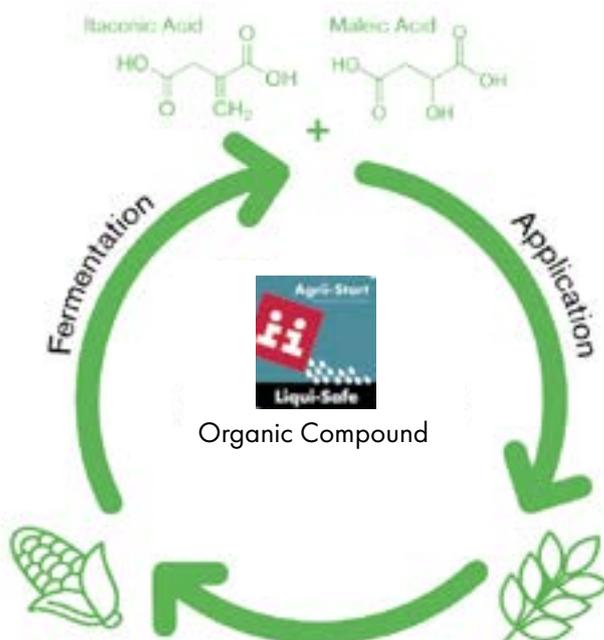
The Itaconic acid is derived from a fermentation process of maize – so a natural organic compound. The maleic acid which is used widely in the food industry is combined to slow down the degradation in the soil.

When the two acids are combined, this creates the 1800 cation exchange capacity (CEC) which denies the bacteria a source of nickel, copper and iron.

The bacteria needs these elements to degrade the applied nitrogen.

Liqui-safe slows down this loss of nitrogen to the air and water by maintaining higher levels of nitrogen in the ammonium form in the soil for the growing crop to use more efficiently.

As an organic compound Liqui-Safe degrades in the soil to leave only carbon, hydrogen and oxygen. This is how the technology achieves the Environmental and Nutrient Use Efficiency (NUE) benefits.





Reducing Environmental Impact on Air Quality

- Compared to standard UAN alone, the UAN + Liqui-Safe treatment reduced ammonia loss to the air by 25% at 20 days after application.
Source - University of Nebraska, USA and published Agronomy Journal, USA 2015
- Over a 266 day field trial, UAN + Liqui-Safe reduced the release of nitrous oxide gas (N₂O) to the air by average 54% compared to standard UAN application.
Source - US Department of Agriculture and California State University, USA 2015
- In a winter wheat field trial to monitor NH₃ concentrations over a 21 day period in the field, compared to standard UAN alone the UAN + Liqui-Safe treatment reduced volatilised ammonia by up to 14%.
Source Arvalis Institute, France 2020.

Reducing Environmental Impact on Water Quality

- UAN + Liqui-Safe applied in a fodder maize crop significantly reduced the movement of soil mineral nitrogen (SMN) through the soil profile over a 5 month period post fertiliser application. Liqui-Safe maintained SMN in the upper soil levels and reduced SMN by 34% at a depth of 90cm in the soil compared to a standard UAN treatment.
Source - Wessex Water, UK 2019
- Liqui-Safe increased the retention of nitrogen in the ammonium form in the soil even under high rainfall conditions. By introducing Liqui-Safe into the fertiliser application it clearly demonstrated x4 increase in level of ammonium in the soil 28 days after application, compared standard treatment, reducing the opportunity for leaching of nitrogen into water courses.
Source - Campden BRI, UK 2018
- Liqui-Safe reduced nitrate losses across the soil profile even under heavy rainfall conditions. Compared to UAN alone the combination of UAN + Liqui-Safe demonstrated a 54% reduction in nitrate levels. This effect was observed 4 days after fertiliser application down to 60 cm in the soil profile, meaning nitrogen was retained in a more usable stable form closer to the root zone.
Source - John Innes Centre, UK 2019
- In a field tile drain trial in grain maize UAN + Liqui-Safe treatment compared to standard UAN application reduced the detectable nitrate levels in the outflow from the field tile drains by 42% two days after application and 21% after 290 days post application.
Source - Guthrie Centre - Iowa, USA 2016
- In a field tile drain trial over a 3 month period in winter wheat in Norfolk, UAN + Liqui-Safe treatment compared to standard UAN application reduced the detectable nitrate levels in the outflow from the field tile drains into a water course consistently by 14% and a reduction up to 24% was recorded.
Source NIABTAG, UK 2020.



Reducing Environmental Impact on Soil Biome

- Compared to the standard application, the addition of Liqui-Safe increased the mycorrhizal colonisation in the soil by 10% over a 64 day period post application. This increase in fungi activity is important as the fungi improve the uptake of certain difficult to absorb nutrients like P for the plant.

Source – University of Athens, Greece 2016

- In a 12-month study on earthworms where the technology was applied at x10 normal dose rate there was no impact on reproduction or mortality of the earthworms.

Source Eurofins, France 2018

Reducing Environmental Impact on Aquatic Organisms

- Operating to international ISO standards experiments were conducted using the technology at x 10 normal dose to assess the effects on sensitive aquatic organisms. There was no mortality when assessing toxicity to fresh water fish, no immobilisation of water fleas and no inhibition of growth for unicellular green algae.

Source – various

Improving Nutrient Use Efficiency and Crop Quality

- In a winter wheat trial in Norfolk, compared to standard UAN alone, the UAN + Liqui-Safe treatment increased harvested grain yield by 7.4% from 13.8 t/ha to 14.9 t/ha.

Source NIABTAG, UK 2019

- In a winter wheat trial in Norfolk, compared to standard UAN alone, the UAN + Liqui-Safe treatment increased total nitrogen uptake in the straw and grain by +9% from 265 kg/ha to 289 kg/ha.

Source NIABTAG, UK 2019

- In a winter wheat trial in Norfolk, compared to standard UAN alone, the UAN + Liqui-Safe treatment increased grain protein nitrogen by +10.7% or 23 kg/ha.

Source NIABTAG, UK 2019

- With 62 trials in UK/Europe with Liqui-Safe over a 3 year period covering a total of 6 different crops the use of the technology produced an average 3.7% yield increase.

Source - Verdesian 2019.





SUMMARY



Liqui-Safe is a highly water-soluble organic compound primarily created from fermentation of maize.



The technology reduces the 3 sources of N loss by using its high cation exchange capacity designed to sequester elements involved in the nitrogen cycle.



Liqui-Safe is proven to provide you with a return on investment. With reduced passes you free up the sprayer during busy periods.



Liqui-Safe keeps the fertiliser where it is needed for longer, increasing nitrogen efficiency, yield and crop quality



Liqui-Safe Lhas demonstrated a beneficial effect on soil biome



Studies have demonstrated significant reductions in Nitrous Oxide and Ammonia losses from field applications of Liqui-Safe