NutriSphere-NL®

PRODUCT GUIDE

NUTRISPHERE-NL FOR LIQUID NITROGEN FERTILISER

VERDESIAN

THE NUTRIENT USE EFFICIENCY PEOPLE®

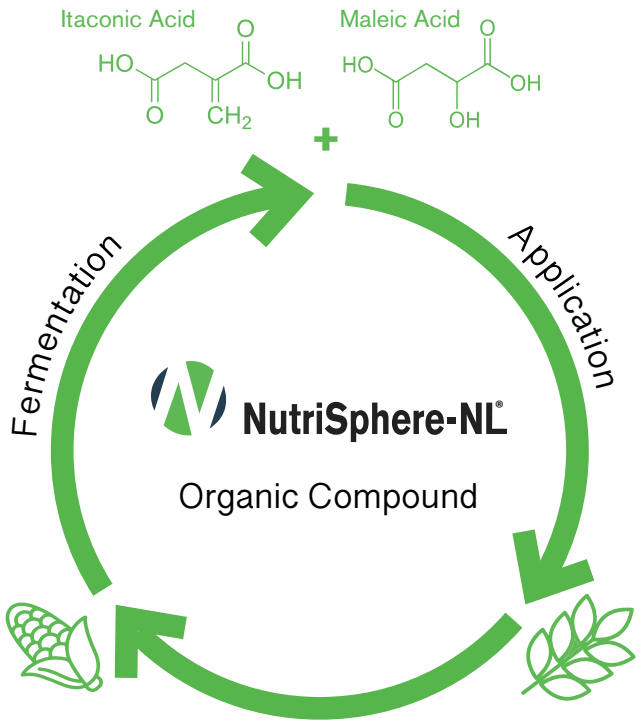
VERDESIAN LIFE SCIENCES EUROPE LTD.

How NutriSphere-NL works

The opportunity to increase yield with a lighter environmental touch

The driving force behind NutriSphere-NL is a long chain organic water soluble compound made up of 2 key organic acids – maleic acid and itaconic acid, both acids are Reach 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. NutriSphere-NL 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 NutriSphere-NL 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 + NutriSphere-NL 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 + NutriSphere-NL reduced the release of nitrous oxide gas (N20) 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 21day period in the field, compared to standard UAN alone the UAN + NutriSphere-NL treatment reduced volatilised ammonia by up to 14%. Source Arvalis Institute, France 2020.

Reducing Environmental Impact on Water Quality

UAN + NutriSphere-NL 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. NutriSphere-NL 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

NutriSphere increased the retention of nitrogen in the ammonium form in the soil even under high rainfall conditions. By introducing NutriSphere 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 – Verdesain sponsred trial by Campden BRI, UK

NutriSphere-NL reduced nitrate losses across the soil profile even under heavy rainfall conditions. Compared to UAN alone the combination of UAN + NutriSphere-NL 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.

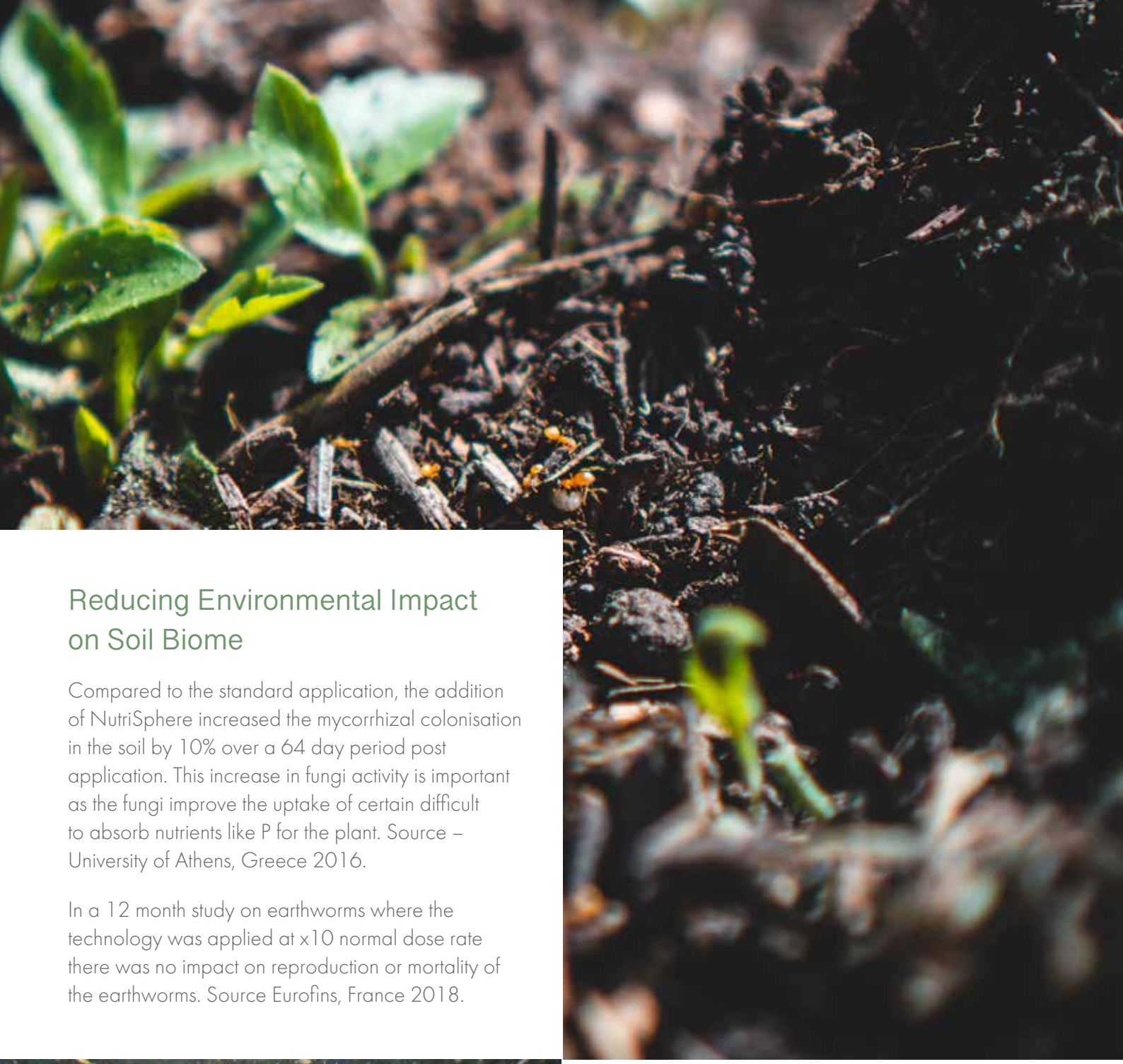
Source – Verdesian sponsored trial by John Innes Centre , UK

In a field tile drain trial in grain maize UAN + NutriSphere-NL 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 + NutriSphere-NL 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 Verdesian sponsored trial by NIABTAG, UK



Reducing Environmental Impact on Soil Biome

Compared to the standard application, the addition of NutriSphere 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 where 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 + NutriSphere-NL 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 + NutriSphere-NL treatment increased total nitrogen uptake in the straw and grain by +9% from 265 kg/ha to 289 kh/ha. Source NIABTAG, UK 2019*.

In a winter wheat trial in Norfolk, compared to standard UAN alone, the UAN + NutriSphere-NL treatment increased grain protein nitrogen by +10.7% or 23 kg/ha. Source NIABTAG, UK 2019*.

With 62 trials in UK/Europe with NutriSphere-NL 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.

*Verdesian sponsored trial by NIABTAG, UK

Summary

NutriSphere-NL 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 to deny certain bacteria key elements (Ni, Cu, Fe).

NutriSphere-NL is proven to provide farmers with a return on investment.

The technology keeps the fertiliser where it is needed for longer, increasing nitrogen efficiency, yield and crop quality.

The technology has demonstrated a beneficial effect on soil biome.

The technology helps reduce the environmental impact on air and water quality.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