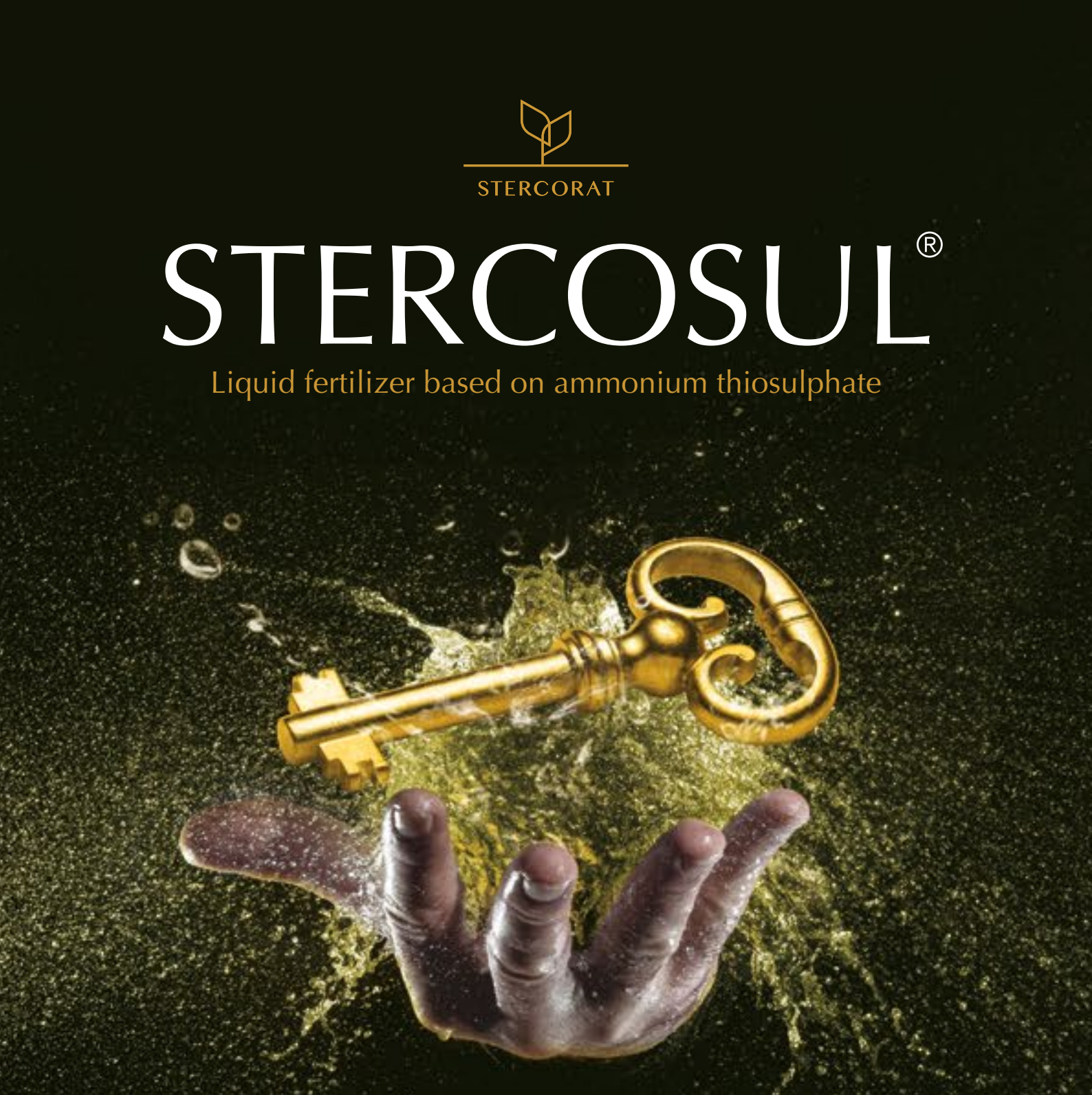
STERCORAT

STERCOSUL®

Liquid fertilizer based on ammonium thiosulphate



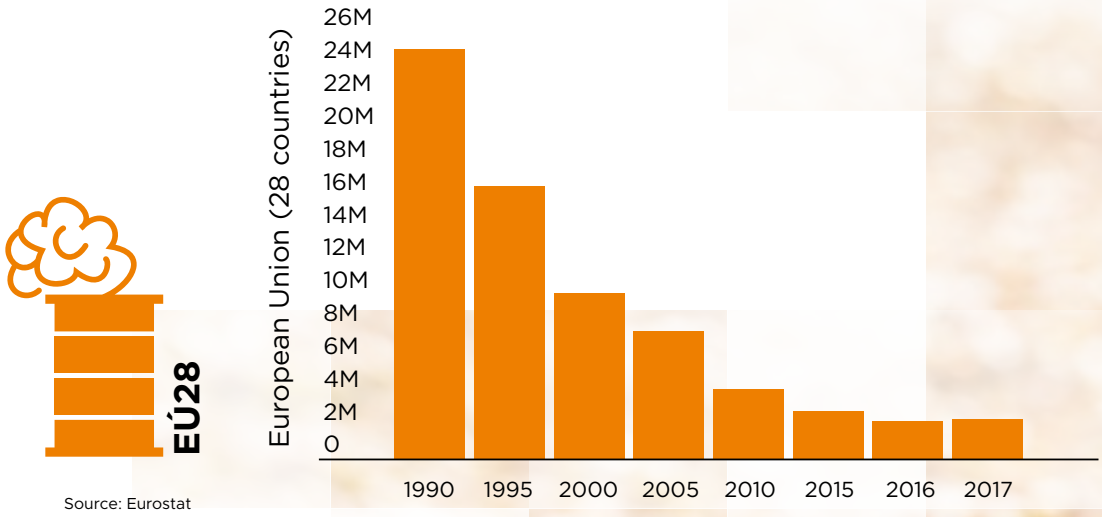
unlock the
path to higher yield
and better quality

WHY SULFUR?

Although the most frequently used fertilization elements are Nitrogen (N), Phosphorus (P) and Potassium (K), the interest in sulfur fertilization has significantly increased over the years due to its deficit in nature. This is mainly due to its significantly reduced presence in emissions in industry and the reduced use of organic fertilizers due to the reduction in the volume of livestock production. **The effect of sulfur on crop production and quality is significant, depending on the type of crop.** Sulfur is present in proteins, participates in the synthesis of some important amino acids (cystine, cysteine, methionine), affects the activity of enzymes and supports the fixation of atmospheric nitrogen by having a positive effect on noodling bacteria. Sulfur is also contained in some secondary metabolites of plants (e.g. glucosinolates).

Sulfur is important for plants not only as an element improving the quality of some crops, but also as one of the main factors influencing the nitrogen uptake by plants. It is necessary to fertilize soil with sulfur due to its high mobility in the soil (leaching and erosion).

Annual emissions of sulfur oxides (in tonnes)



Source: Eurostat

WHY LIQUID SULFUR?

Wide range of application	Application flexibility	More efficient use of fertilizer in adverse conditions	Even supply of nutrients
• incorporation into the soil • application to the leaf during vegetation in mixes with UAN, in a mix with urea solutions • with applicator when hoeing wide row crops (also mixed with UAN, mixed with urea solutions) • in irrigation water	• Before sowing • Foliar - mixed with UAN, or mixed with urea solutions • After harvesting the crops to decompose the post-harvest plant residues	In times of drought it is a better solution than granular fertilizers	The liquid formulation allows more precise coverage of the desired area with nutrient

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BENEFITS OF STERCOSUL

- fertilizer with a high sulfur content (12-0-0-26S)
- excellent miscibility with other liquid fertilizers (UAN, urea)
- reduces nitrogen losses in mixes with UAN and urea
- slows down the nitrification process
- in alkaline soils it may expose some microelements
- contains readily available ammoniacal nitrogen
- two forms of sulfur - with rapid and slow release (for plants)

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BENEFITS OF SULFUR FOR PLANTS

Nitrogen-sulfur interaction

Sulfur and its activity in plants is linked to nitrogen metabolism. The effective use of nitrogen is directly dependent on a sufficient supply of sulfur. Insufficient uptake of sulfur means reduced synthesis of full-value proteins and thus higher content of free nitrogenous substances of non-protein nature, including the accumulation of nitrates.

Improving physiological and metabolic processes

Sulfur is a building block of essential amino acids (cysteine, methionine). It is also part of vitamins, coenzyme A and glucosinolates, which are secondary metabolites. Glucosinolates are directly related to the defense mechanism of plants against diseases and pests. They are also related to the growth hormone metabolism.

The sulfur requirements of crops

Source: Listy olejnin, 2008

CROP	SULFUR NEED PER 1 t OF PRODUCTION (kg)
Winter wheat	4,3
Corn (grain)	1,9
Annual sunflower	12
Winter oilseed rape	17
Soy	15

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BENEFITS OF SULFUR FOR PLANTS

Improving access to P and microelements in soil (Fe, Mn, Zn)

As sulfur reduces the pH of the soil, especially in alkaline or neutral soils, it can positively affect the access of soil to many microelements, including Zn, Fe, Mn and Cu. Even if soil is rich in iron, the rhizosphere may not allow plants to access this valuable element. Therefore, by adding elemental sulfur to the soil, we can improve the availability of iron (Fe) by changing (lowering) the pH. The addition of sulfur to each batch of nitrogen increases the increases of flour extraction rate and the content and absorption of the micronutrients analyzed, i. je. iron, manganese, zinc and copper. The result obtained shows the so-called additive effect of sulfur.

plant resistance support

Sulfur is known for its fungicidal effects against some pathogens (e.g. powdery mildew). It has a positive effect on the health of some plant species (e.g rapeseed, wheat, sunflower). It inhibits the development of some pathogens, especially in foliar application. However, sulfur can also have a positive effect on the development of induced resistance through cystine formation.

Source: Hanna Klikocka, Marek Marks Sulphur and Nitrogen Fertilization as a Potential Means of Agronomic Biofortification to Improve the Content and Uptake of Microelements in Spring Wheat Grain DM

CROPS

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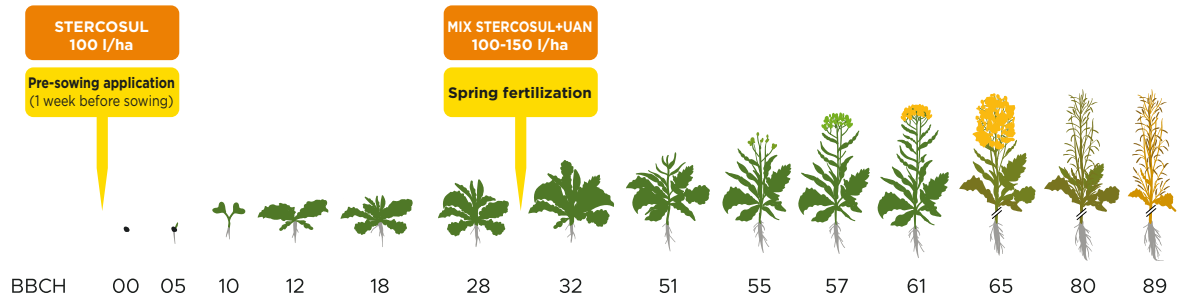
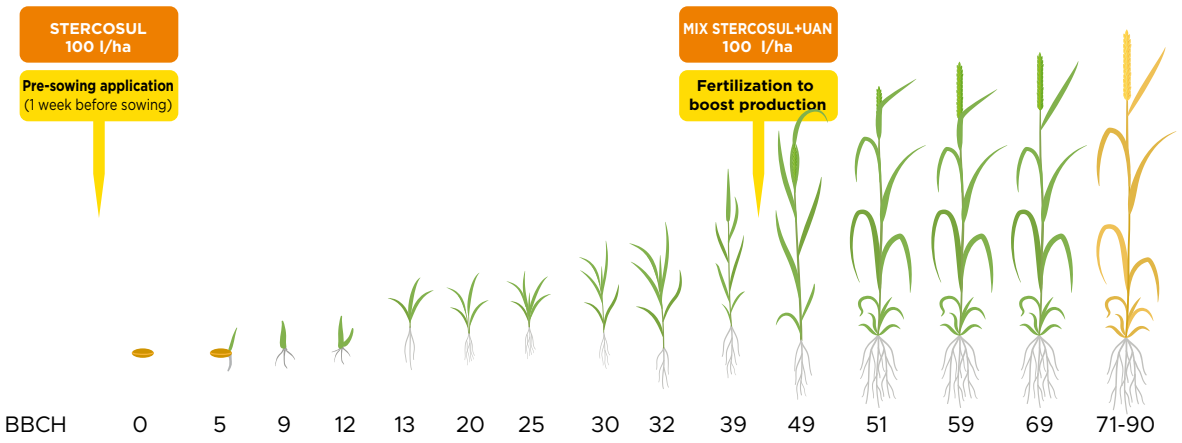
STERCOSUL® + UAN APPLICATION IN WINTER OILSEED RAPE



STERCOSUL® + UAN APPLICATION IN WINTER WHEAT



The combination of STERCOSUL® + UAN or STERCOSUL® + UREA SOLUTION can also be used for spring barley and winter rye fertilization.

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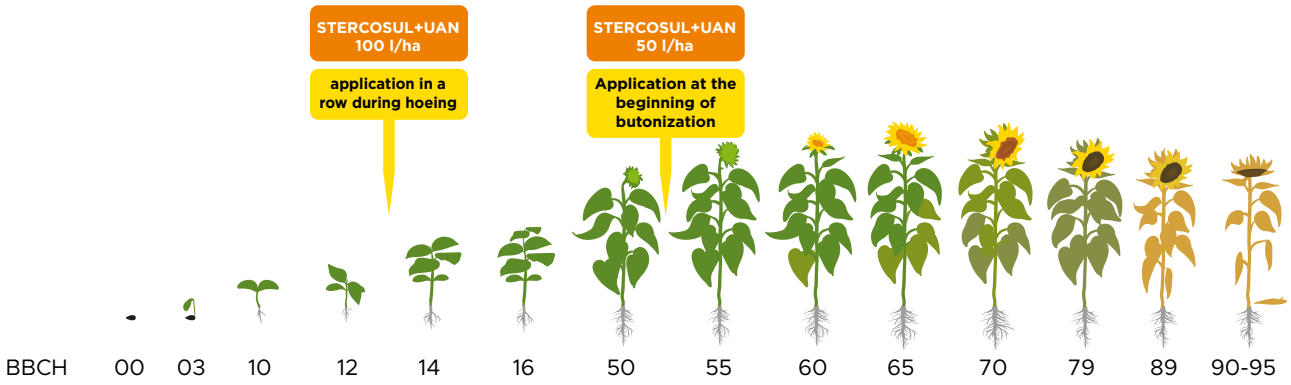
STERCOSUL® + UAN APPLICATION IN SUNFLOWER



STERCOSUL® is a great product for mixing with liquid fertilizers.

Recommended combinations of STERCOSUL® fertilizer with liquid nitrogen fertilizers

■ **MIX STERCOSUL® + UAN 390**
(24% N + 8% S)

■ **MIX STERCOSUL® + UREA SOLUTION**
(19% N + 6% S)

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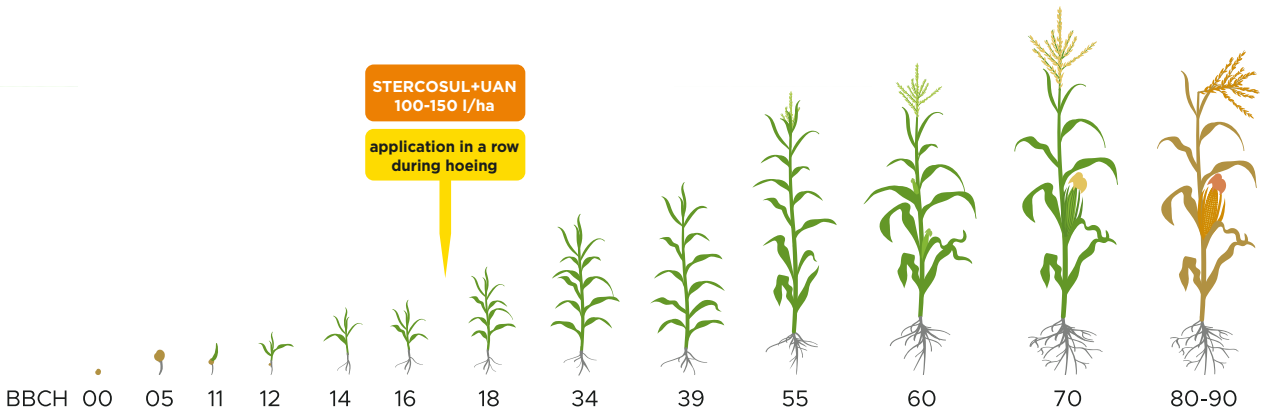
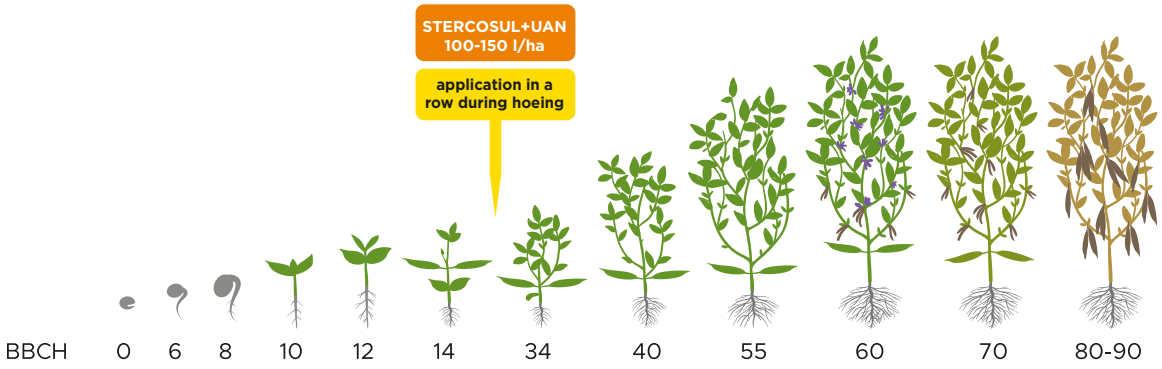
STERCOSUL® + UAN APPLICATION IN CORN



STERCOSUL® + UAN APPLICATION IN SOYABEAN



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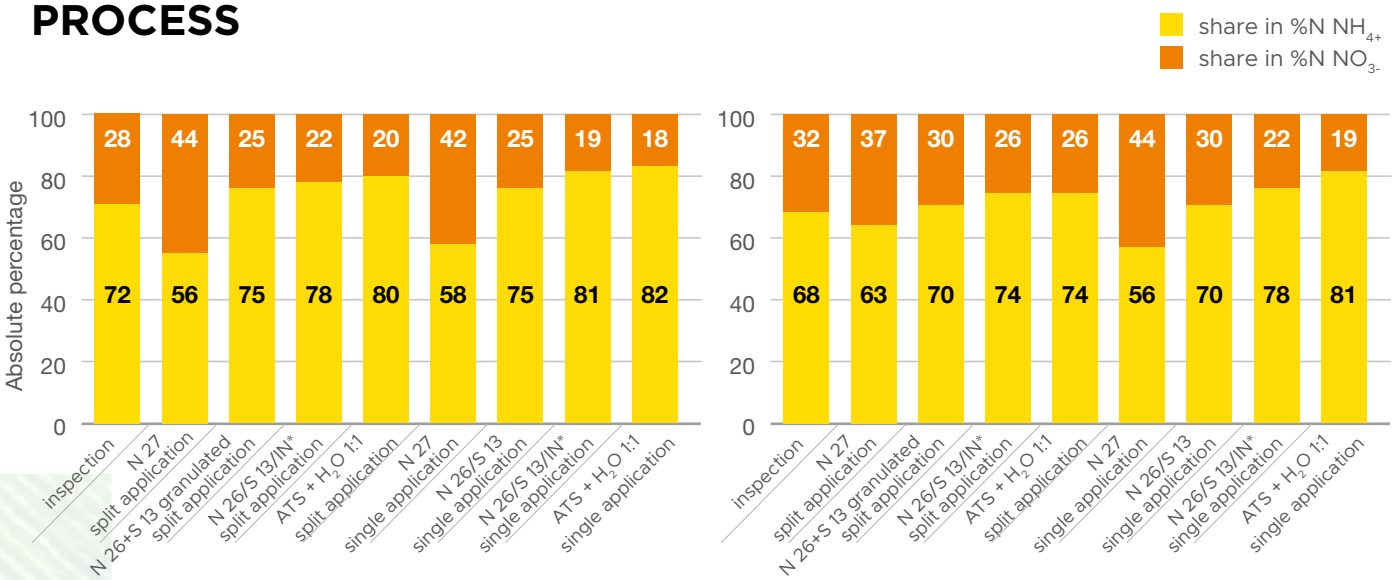
EFFECT OF ATS ON INHIBITION OF THE NITRIFICATION PROCESS



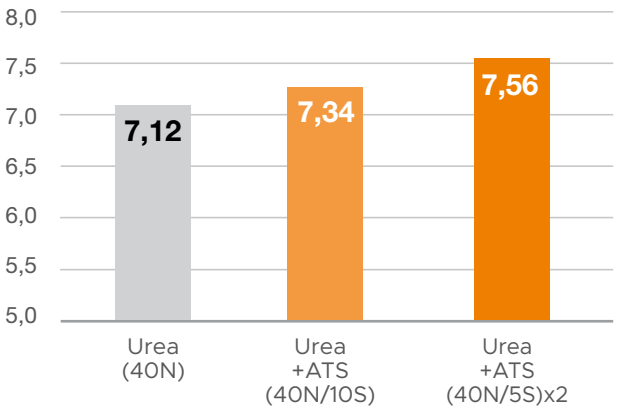
Source: Efficiency of application of nitrogen fertilizers fortified with nitrification inhibitors Ing. Zuzana Palková, dissertation thesis, 2017

Proportion of ammonium and nitrate nitrogen in the content of inorganic nitrogen in the soil in absolute % at a depth of 0.0 - 0.3 m below winter barley (average of 4 repetitions and 4 samples)

Proportion of ammonium and nitrate nitrogen in the content of inorganic nitrogen in the soil in absolute % at a depth of 0.3 - 0.6 m below winter barley (average of 4 repetitions and 4 samples)

TRIAL RESULTS

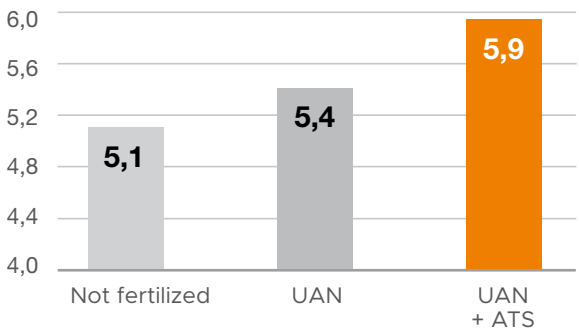
Achieved winter wheat yield for different variants of urea fertilization and combination of urea with ATS*



Source: Operational trials by EXATA, 2020

ATS* = STERCOSUL®

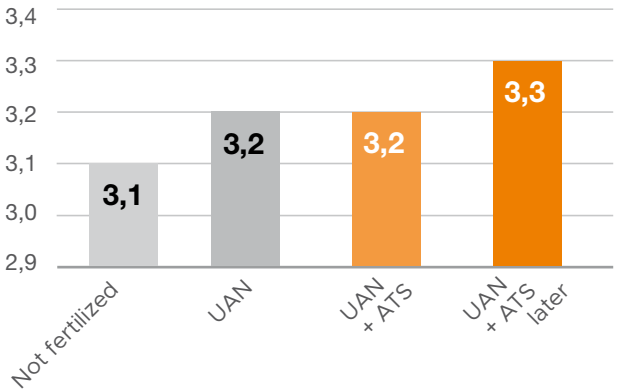
Achieved winter wheat yield for different variants of UAN fertilization and combination of UAN with ATS*



Source: Small-plot trials, Vatín, 2018

ATS* = STERCOSUL®

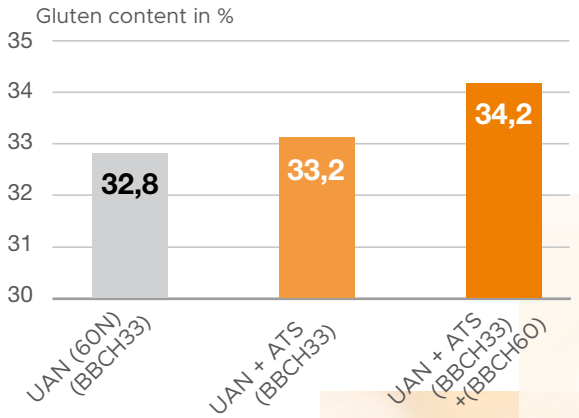
Comparison of oilseed rape yield with different variants of UAN fertilization and combination of UAN with ATS* and different application dates



Source: Small-plot trials, Vatín, 2018, Mendeleev University, Brno

ATS* = STERCOSUL®

Comparison of gluten content in different variants of winter wheat fertilization using UAN and UAN + ATS



Source: Small-plot trials, SPU Nitra, Želiezovce 2019/2020

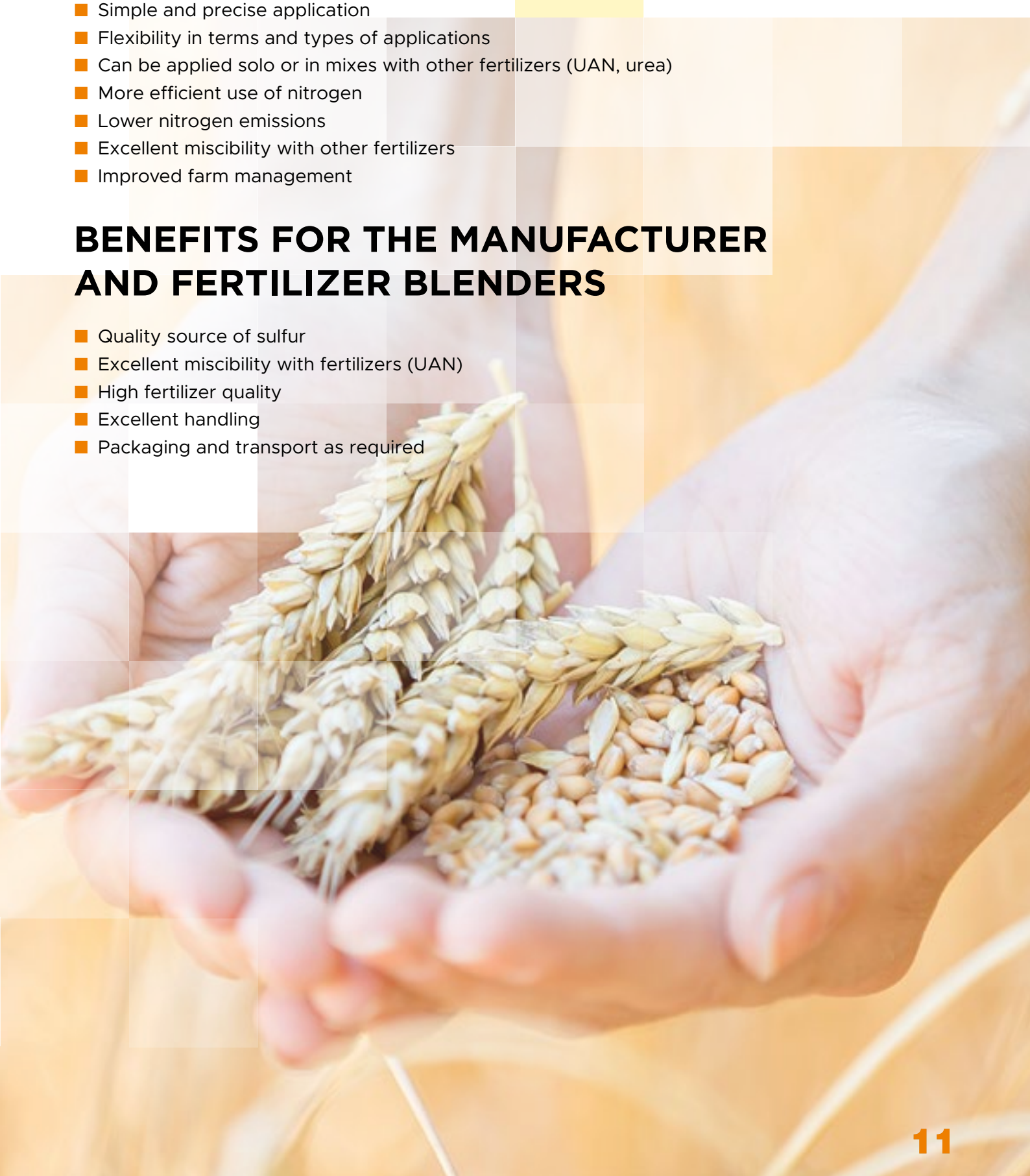
ATS* = STERCOSUL®

BENEFITS FOR THE FARMER

- Simple and precise application
- Flexibility in terms and types of applications
- Can be applied solo or in mixes with other fertilizers (UAN, urea)
- More efficient use of nitrogen
- Lower nitrogen emissions
- Excellent miscibility with other fertilizers
- Improved farm management

BENEFITS FOR THE MANUFACTURER AND FERTILIZER BLENDERS

- Quality source of sulfur
- Excellent miscibility with fertilizers (UAN)
- High fertilizer quality
- Excellent handling
- Packaging and transport as required



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STERCOSUL® - MACRO-NUTRIENT COMPOSITION

Total nitrogen (N):	12,0 wt. %
Ammonia nitrogen (N-NH_4^+)	12,0 wt. %
Total sulfur (as S)	26,0 wt. %
Total sulfur (as SO_3^{2-})	64,9 wt. %

STERCOSUL® - MATERIAL COMPOSITION

Ammonium thiosulphate $(NH_4)^2S_2O_3$	50 - 57,5 wt. %
Sulfite (SO_3^{2-})	1,5 - 5,0 wt. %
Sulphates (SO_4^{2-})	0,0-7,0 wt. %
Chlorides (Cl^-)	does not contain
Heavy metals	less than the permitted limit

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