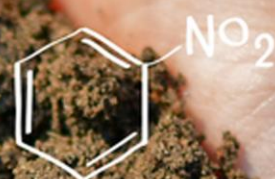
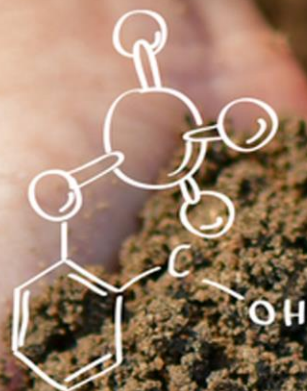
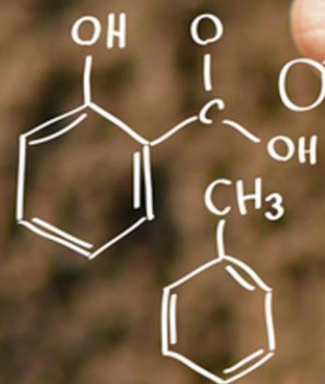
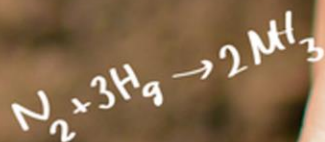
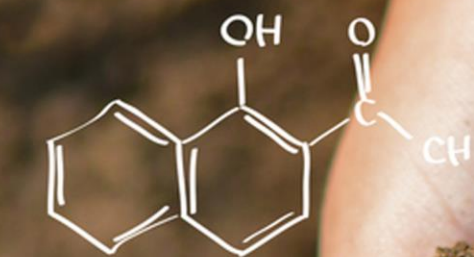


# GoudenKorrel<sup>®</sup>

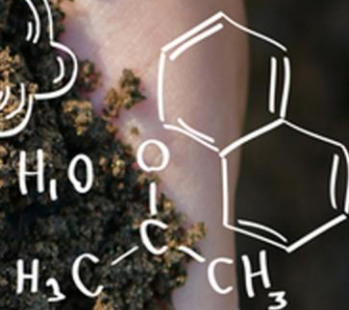
*Compound fertiliser manufacturer*

## PRODUCT HANDBOOK





**pH**





# GoudenKorrel®

a conceptual line of mineral compound fertilizers produced according to the pioneering G2D Technology, based on mineral rock - Polyhalite.

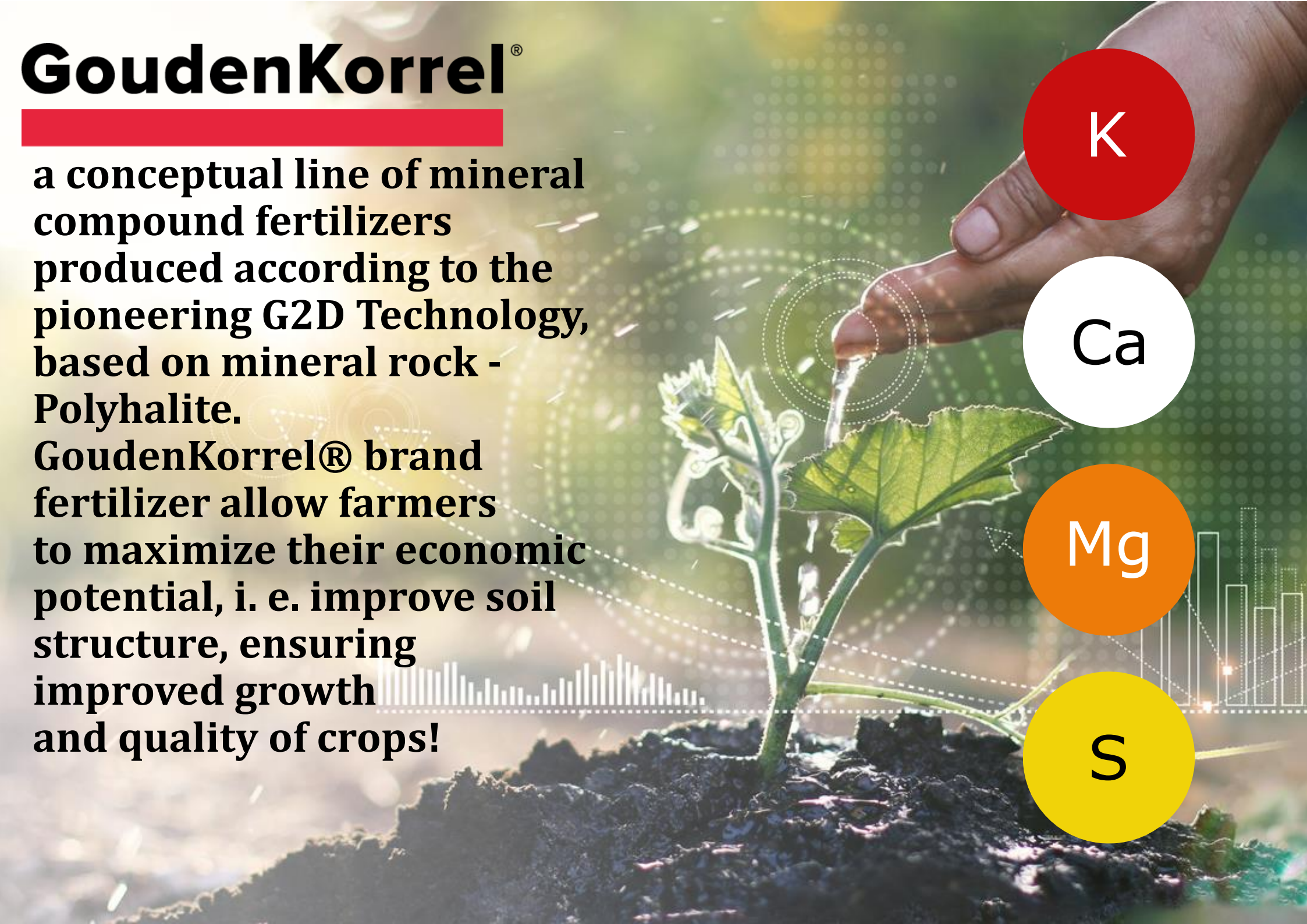
GoudenKorrel® brand fertilizer allow farmers to maximize their economic potential, i. e. improve soil structure, ensuring improved growth and quality of crops!

K

Ca

Mg

S





# NEW BEGINNINGS

.....





**POLCALC**  
**2009**

Purchase of a plot on the site of the former airport in Lubień Kujawski



**2012**

Tests of the first granulation line and creation of the first granulate



**2018**

The investment process has been completed. POLCALC ranked among the leaders in the production of granulated calcium fertilizers in Europe



**2011**

Commencement of the construction of a calcium fertilizer factory

**2013**  
**2016**

Start of production and first sale

New warehouse halls are built

**2021**

POLCALC is transferred to the LAFARGE group

**2019**

Start of work on a new line of mineral fertilizers based on polyhalite



**2021**

Launch of a new production line for granulated, multi-component mineral fertilizers



**2023**

BELENUS® - ecological fertilizer wins the "Gold Medal" of the International Agricultural Fair in Kielce, Poland



**2020**

Commencement of the construction of a new Compound Fertilizer Plant in Lubień Kujawski

**2022**

Completion of construction works.  
A new office is built

**GoudenKorrel®**





Boulby Mine  
Great Britain  
Polyhalite



Producer of Compound  
Fertilizers  
Lubień Kujawski Poland  
Belenus® , Vervactor®  
& PoliSulMag®



Boulby Mine is a 200-hectare, site located just south-east of the village of Boulby, on the north-east coast of the North York Moors in Loftus, North England. It is run by Cleveland Potash Limited, which is now a subsidiary of Israel Chemicals Ltd. (ICL). In early 2016 polyhalite mining commenced. In 2019 GoudenKorrel S.A. started cooperation with ICL by signing a contract for the supply of polyhalite to Lubień Kujawski Mine.

This is where our adventure with polyhalite begins.....





# POLYHALITE

$\text{K}_2\text{MgCa}_2(\text{SO}_4)_4 \cdot 2\text{H}_2\text{O}$



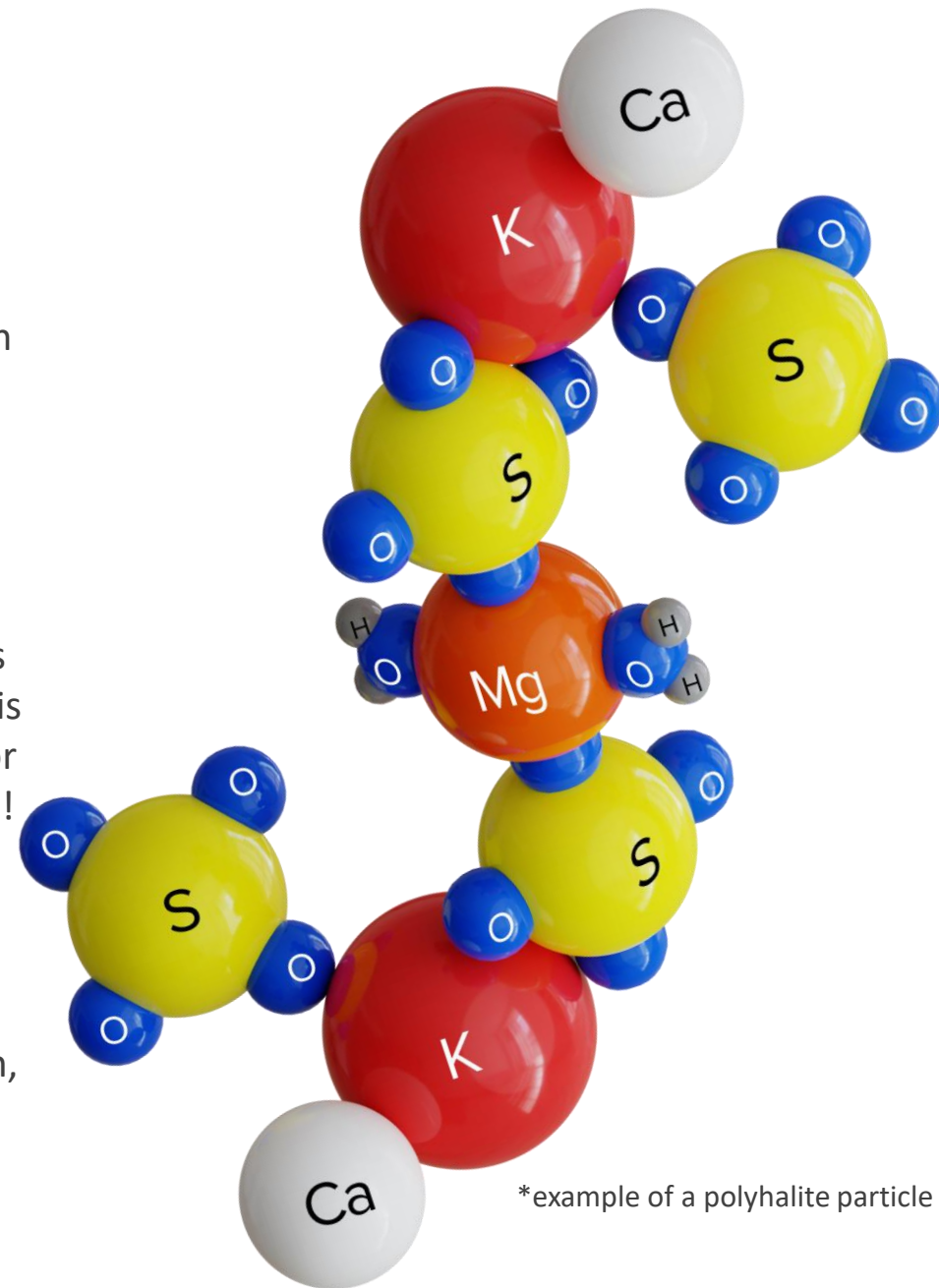
Polyhalite - a naturally occurring mineral, derived from a layer of polyhalite rocks, more than 1000m below the level of the North Sea off the coast of North Yorkshire, UK.



Polyhalite mineral contains only sulphate bonds, which is why the fertilizer are safe for plants and the environment!



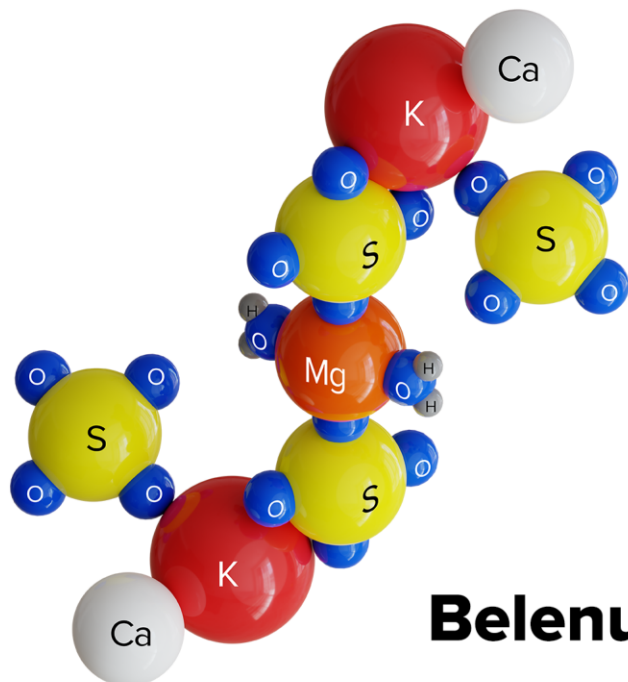
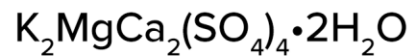
Polyhalite is a natural mineral source of potassium, calcium, magnesium and sulfur with the lowest carbon footprint on the market, with 0,0337 kg of carbon per kg of mined product, as it only requires mechanical processing.




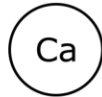


\*example of a polyhalite particle



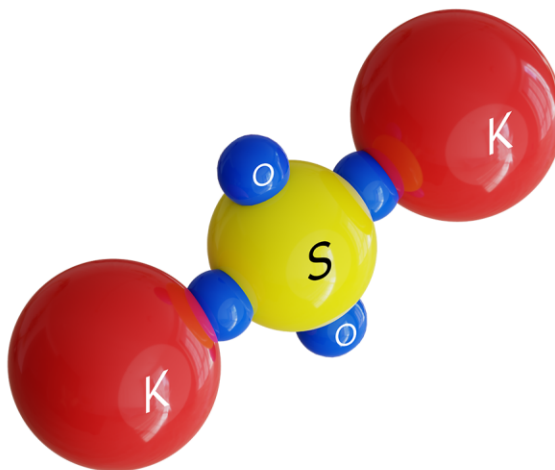
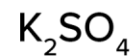
### POLYHALITE (ECO SOP)





**Belenus®**

	<b>K<sub>2</sub>O - 12%</b>
	<b>CaO - 19%</b>
	<b>MgO - 5,5%</b>
	<b>SO<sub>3</sub> - 42%</b>

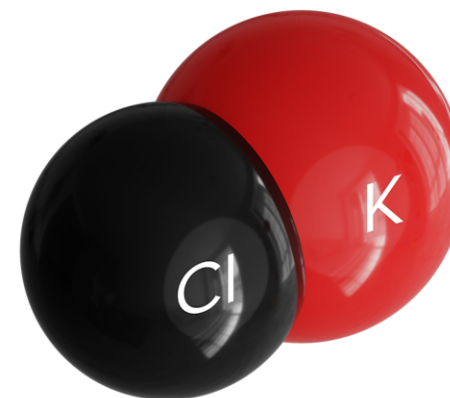
### SULPHATE of POTASH (SOP)



**Synthetic potassium  
sulfate**

	<b>K<sub>2</sub>O - 50%</b>
	<b>SO<sub>3</sub> - 44%</b>

### POTASSIUM CHLORIDE (MOP)



**Potassium salt**

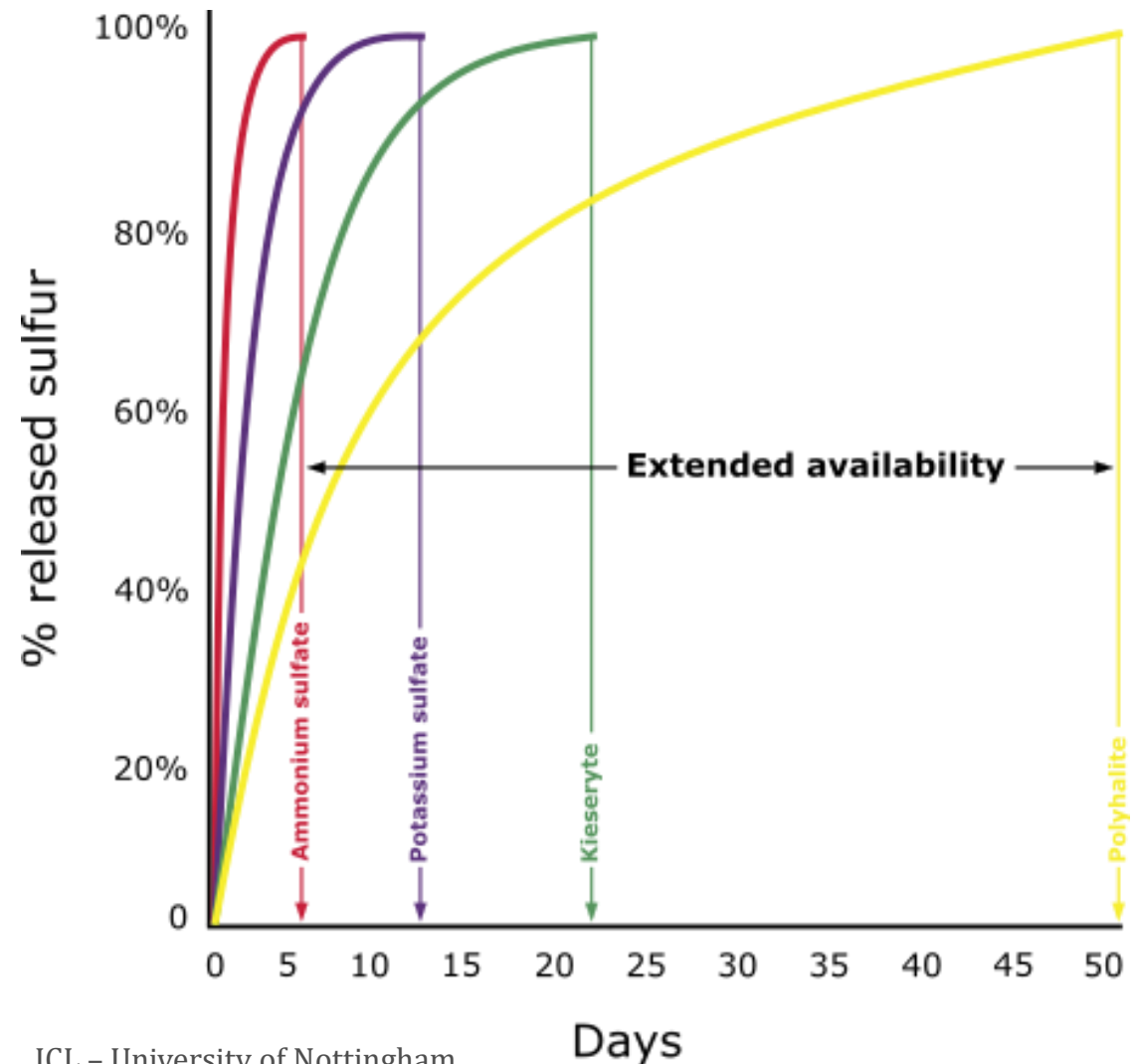
	<b>K - 49,8%</b>
	<b>Cl - 46%</b>



# RELEASE OF SULFUR CONTAINED IN POLYHALITE VERSUS OTHER SOURCES

Sulfur contained in polyhalite fertilizers is available to plants for over 50 days, which means that plants can fully use other elements such as nitrogen, potassium, calcium and magnesium.

Sulfur in the first stage – within 15 days of applying the fertilizer - is available in 50%. As the process progresses over time, this availability increases. Sulfur is released slowly, which extends its action in the soil, the plant is able to absorb it for longer and additionally we avoid its rapid leaching.



ICL – University of Nottingham,  
UK Report 2016

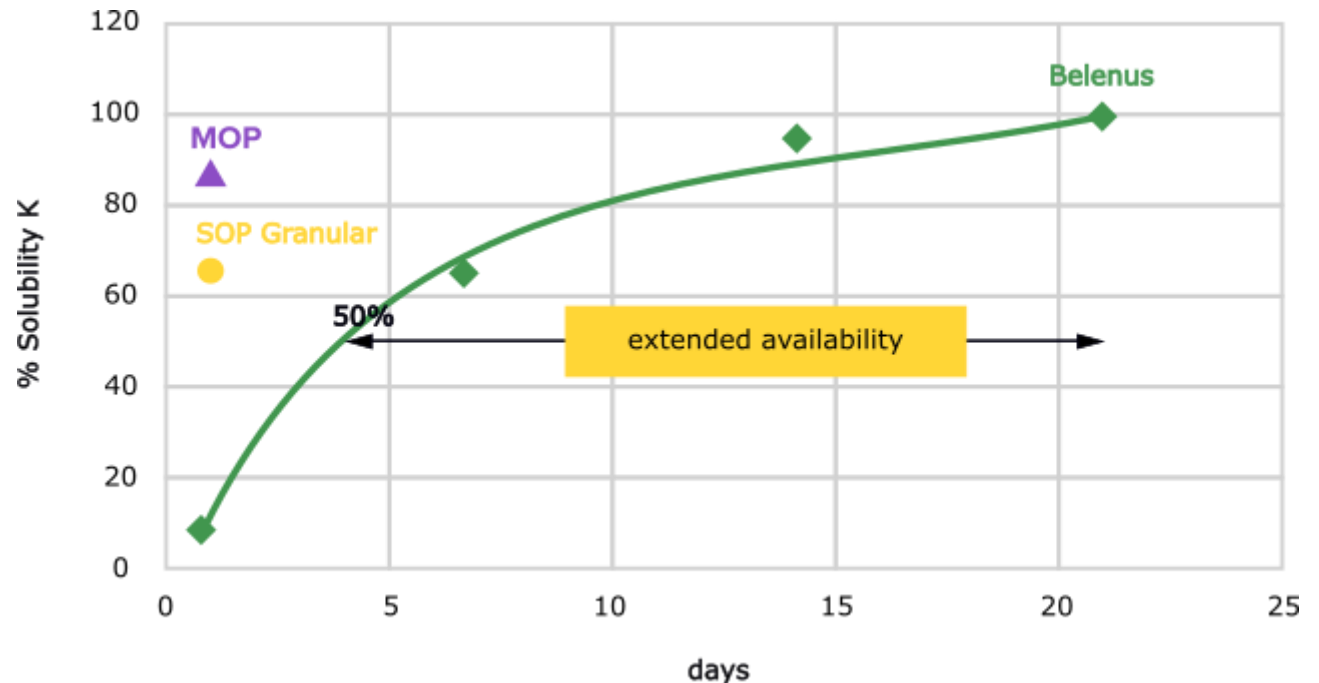


# SOLUBILITY OF K FROM POLYHALITE, MOP AND SOP

Potassium available in polyhalite fertilizer is 100% soluble and the availability process is extended over time.

Potassium in the first stage – within 5 days of applying the fertilizer – is available in 50% then the process of accessibility increases over time. Potassium is released slowly, which extends its action in the soil, the plant is able to absorb it for longer, and additionally we avoid quick leaching.

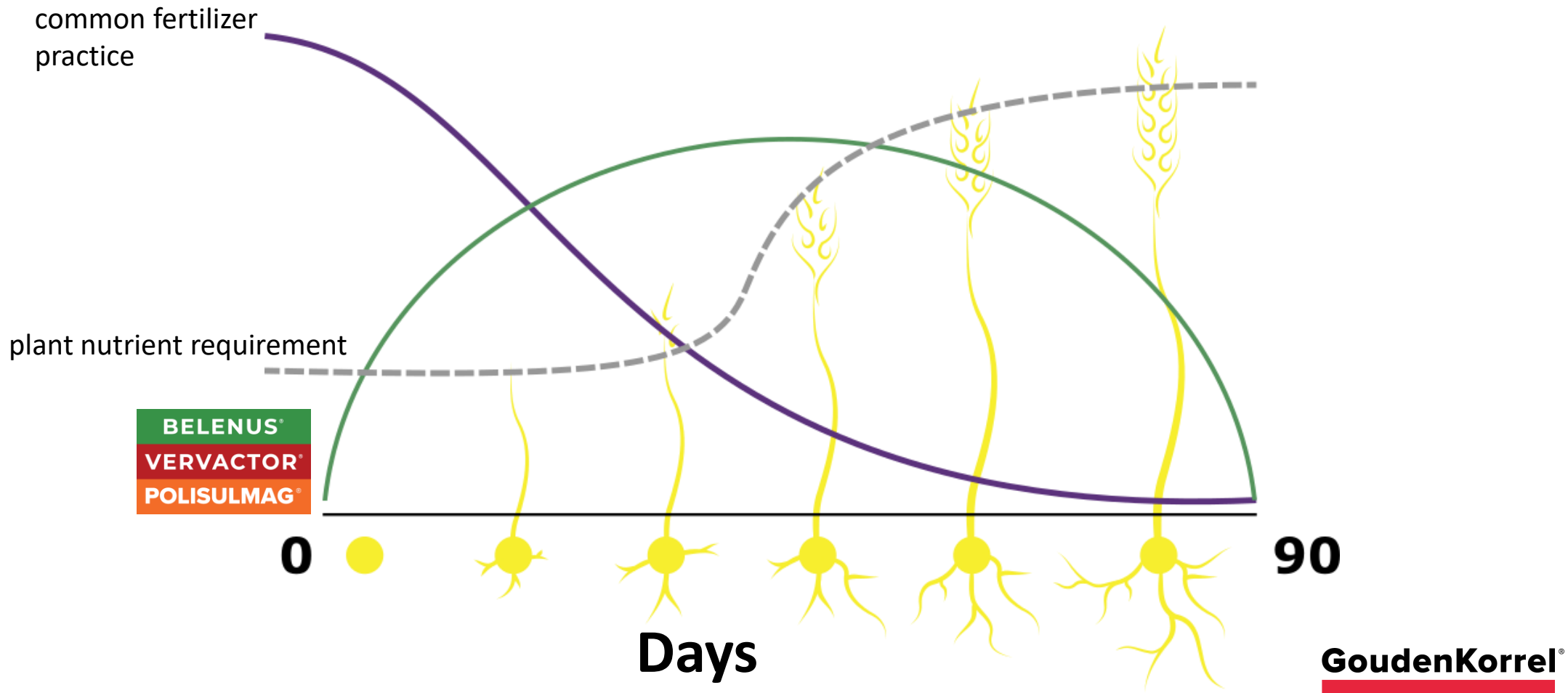
## Solubility K from Belenus, MOP, SOP



ICLSF lab R&D Netherlands, 2016

# SUSTAINED RELEASE FERTILIZER

In GoudenKorrel® brand sustained release fertilizers, nutrients such as sulfur, potassium, calcium, magnesium and sodium, are already 50% available in the first stage, which is 15 days after fertilizer application. As the process progresses over time, this availability increases. The G2D Nodens Technology™ used in the production of GoudenKorrel® mineral fertilizers makes the granules have a sustained activation time, and the decomposition process takes about 3 months. The elements are released slowly, which prolongs their duration of action in the soil and prevents rapid leaching. The rate of nutrient release also depends on temperature and soil moisture.

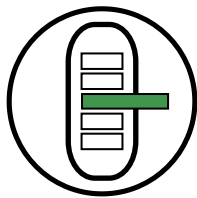




# CONTENT OF CHLORIDES IN FERTILIZERS



Ideal for  
chloride –  
sensitive crops



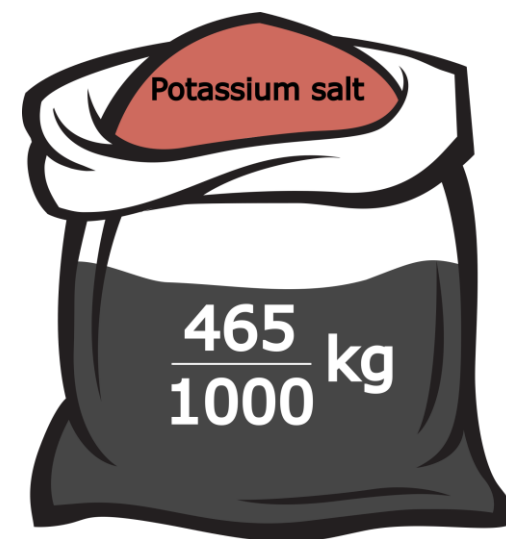
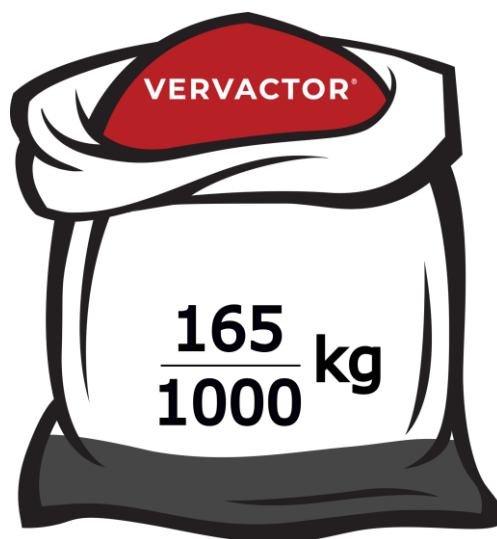
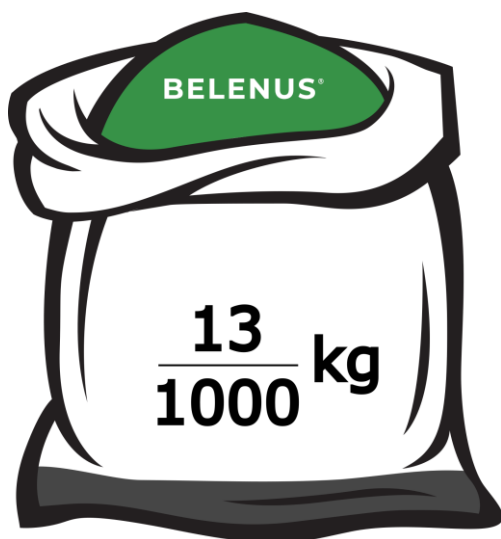
Low salinity index  
and neutral pH

The high content of chlorine in the fertilizer can disinfect the soil, destroy the bacterial flora, affect the plant's ability to absorb water, limit the growth and development of plants, cause diseases and damage plant tissues!

Belenus® & Vervactor® fertilizers are safe for the environment and plants.

Substance pH: 7,7

## CHLORIDE CONTENT PER 1 TON OF FERTILIZER





TECHNOLOGY

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# G2D Nodens Technology™

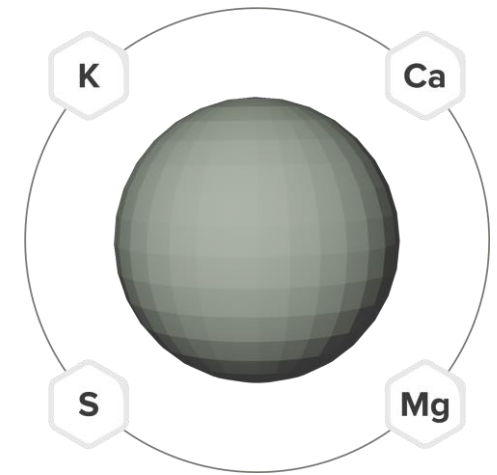
Grind to Dust Nodens Technology™ is a unique, multi-stage technology that atomise materials down to tens of microns. The first stage of treatment involves breaking down the crystal structure of the polyhalite and releasing the sulphates 'trapped' in the rock. Only the raw material processed in this way undergoes further processing, i.e., the separation of active particles, their mixing and aggregation. Each fully reactive granule obtained is equipped with a smart decomposition activation system, so that the product has the highest performance – complete solubility and gradual release of nutrients.



Our technology allows us to produce a product that is perfect in this form, which works almost double! We will not tell you that we are the only ones who recognise the power contained in polyhalite, but we are the ones who start where others end.

# G2D Nodens Technology™

**GoudenKorrel®** granulate polyhalite using a patented G2D Technology™ to produce **Belenus®, Vervactor® & Polisulmag®**



98% of the products is in the form of granules measuring 2-5 mm



ICL, POLYHALITE –  
crushed rock



Technology G2D™



GoudenKorrel®  
products



# OUR PRODUCTS

.....



# Our common goal is to maximise the beneficial power of **polyhalite**!

MINERAL FERTILIZER (PFC1(C)(I)(a)(i))  
K(Ca, Mg, Na, S) SIMPLE SOLID  
INORGANIC MACRONUTRIENT  
FERTILIZER  
12(+19+5,5+6,5+42)



MINERAL FERTILIZER (PFC1(C)(I)(a)(i))  
K(Ca, Mg, Na, S) SIMPLE SOLID  
INORGANIC MACRONUTRIENT  
FERTILIZER  
30(+15+3+5,5+22)



MINERAL FERTILIZER (PFC1(C)(I)(a)(i))  
K(Ca, Mg, Na, S) SIMPLE SOLID  
INORGANIC MACRONUTRIENT  
FERTILIZER  
5,5(+15+21+1,8+22)





# BELENUS® ECOLOGICAL MINERAL FERTILIZER



## BELENUS®



K<sub>2</sub>O 12%

CaO 19%

MgO 5,5%

Na<sub>2</sub>O 6,5%

SO<sub>3</sub> 42%

# 6 reasons to choose

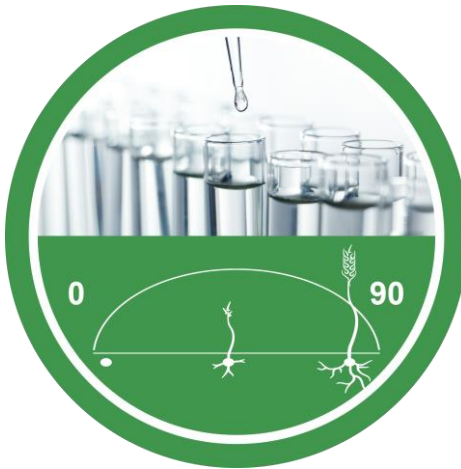
## BELENUS®



1. Eco SOP = granulated fertilizer based on milled chloride-free polyhalite



2. A safe source of natural sulfur, potassium, magnesium and calcium for ecological farming



3. High solubility and extended plant availability



4. No effect of acidification, salinity and elimination of soil bacterial flora substance  
pH: 7,7



5. For use before sowing and top dressing, also for ecological farming & gardening



6. Patented formulation



# ECO CERTIFICATE



Puławy, 2022.08.18

Your letter from 01 August 2022

Our sign: NŻN.501.387.2022.JT

## Certificate of the qualification of the product for use in organic farming

issued for: GoudenKorrel S.A.

At the request of the producer: GoudenKorrel S.A., in accordance with Regulation (EU) 2018/848 and Regulation (EU) 2021/1165, EC fertilizer BELENUS - straight solid inorganic macronutrient fertilizer PFC 1(C)(I)(a)(i), was qualified by IUNG-PIB in Puławy for use in organic farming.

The product is included in the list of products qualified for use in organic farming under number NE/647/2022.

The certificate is not a guarantee of utility value and quality of the product. The party responsible for it, is GoudenKorrel S.A.

The certificate expires when the production technology (raw material composition or source of raw materials, etc.) changes and significantly affects properties of the product. The manufacturer is obliged to immediately inform IUNG-PIB in Puławy of any such modifications.

The certificate shall be withdrawn if facts about the adverse effects of the product on the environment, human or animal health, or non-compliance with the applicable regulations on organic farming, unknown at the date of issue, are discovered.

Issued to: GoudenKorrel S.A.

*Tamara Jadczyńska*  
dr inż. Tamara Jadczyńska

*Anna Podkościelna*  
Kierownik Zakładu  
prof. dr hab. Anna Podkościelna



OF&G  
Approved Inputs  
Scheme



## Certificate of Evaluation for Compliance

This is to certify that the products or services listed below comply with the OF&G Standards (incorporating EC Regulation 834/2007) and are approved for use in Organic Systems:

**GoudenKorrel S.A.**

ul. Sienkiewicza 82/84, 90-318 Łódź, Poland  
Tel: +48 887 098 800

### Product Approved for Restricted Use - Approval Required

Fertilisers

Belenus®

Institute of Soil Science and Plant Cultivation – State Research Institute  
Department of Plant Nutrition and Fertilization  
Contact person: Tamara Jadczyńska  
Phone: +814786832, +48 516 203 554  
e-mail: tj@iung.pulawy.pl

ul. Czarzyskich 8, 24-100 Puławy  
tel.: +48 81 47 86 700, +48 81 47 86 800  
www.iung.pl, e-mail: iung@iung.pulawy.pl  
NIP: 716-000-42-81

Registration Number: UKE1864

Renewal Month: 06 (June)

Date Issued: 19 June 2023

Certificate Expiry Date: 30 June 2024

Signed by: *J. Gadsbey*

Julie Gadsbey - Certification Officer

This Certificate remains at all times the property of OF&G  
Old Estate Yard, Shrewsbury Road, Albrighton, Shrewsbury, Shropshire, SY4 3AG  
Tel: 01939 291800 Email: info@ofgorganic.org

# VERVACTOR® MINERAL POTASSIUM FERTILIZER



## VERVACTOR®

K <sub>2</sub> O	30%
CaO	15%
MgO	3%
Na <sub>2</sub> O	5,5%
SO <sub>3</sub>	22%



# 6 reasons to choose

## VERVACTOR®



1. High proportion of potassium in combination with sulfur, calcium and magnesium



2. Reduced content of toxic chlorides - only 16.5% (potassium salt 46%)



3. For use before sowing and top dressing, on agricultural and vegetable crops



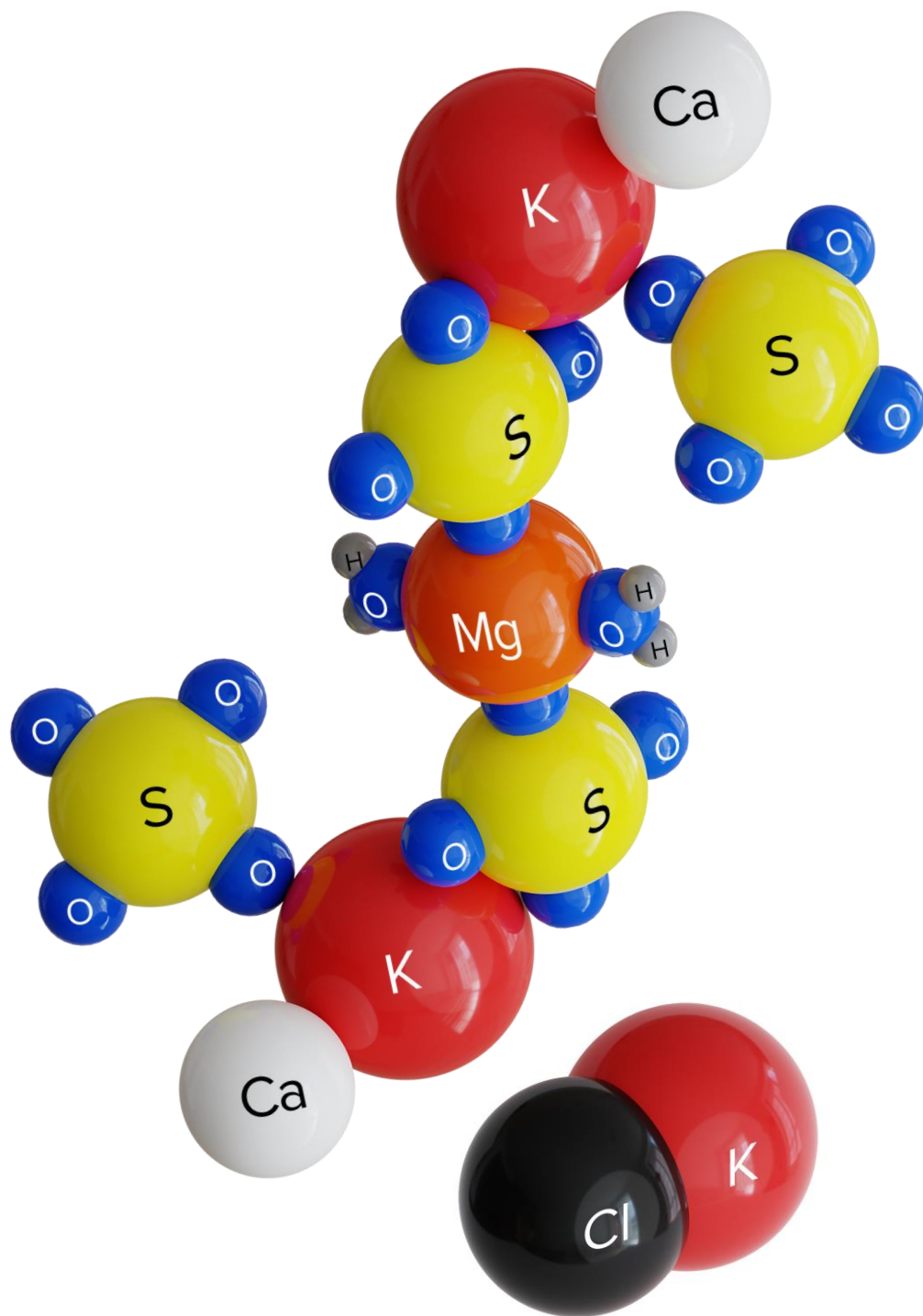
4. High solubility and extended availability to plants



5. No effect of salinity and acidification of the soil



6. Patented formulation



VERVACTOR<sup>®</sup> fertilizer is made of natural rock, which is polyhalite with the addition of potassium salt. Therefore, in its composition there are links between sulphate - chloride elements, which means that the degree of salinity is lower than in similar fertilizers of this type.

Low chloride content – 16,5%



# POLISULMAG® MAGNESIUM SULPHATE MINERAL FERTILIZER



## POLISULMAG®

$K_2O$	5,5%
$CaO$	15%
$MgO$	21%
$Na_2O$	1,8%
$SO_3$	22%

# 6 reasons to choose

## POLISULMAG®



1. High magnesium and sulfur ratio with added potassium and calcium



2. Minimum content of toxic chlorides



3. High solubility and extended plant availability



4. No effect of soil salinity and acidification

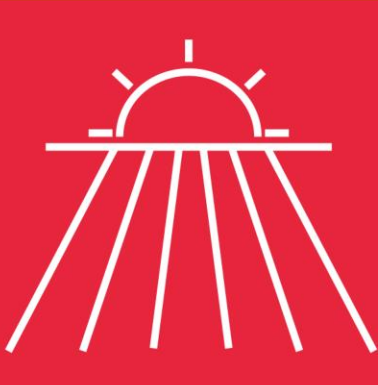


5. To be used before seeding and top dressing, in agricultural, vegetable and horticultural crops



6. Patented formulation





GoudenKorrel<sup>®</sup>  
fertilizers are  
dedicated to all  
types of crops  
and soils!



# Notes



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**Misael Machado**

Export Sales Director

[machado@goudenkorrel.com](mailto:machado@goudenkorrel.com)

+48 663 606 040



**[facebook.com/GoudenKorrel.eu](https://facebook.com/GoudenKorrel.eu)**



**[www.goudenkorrel.eu](http://www.goudenkorrel.eu)**

Compound Fertilizers  
Production Plant  
Kaliska, Fabryczna  
Street, 5  
87-840 Lubień  
Kujawski, Poland