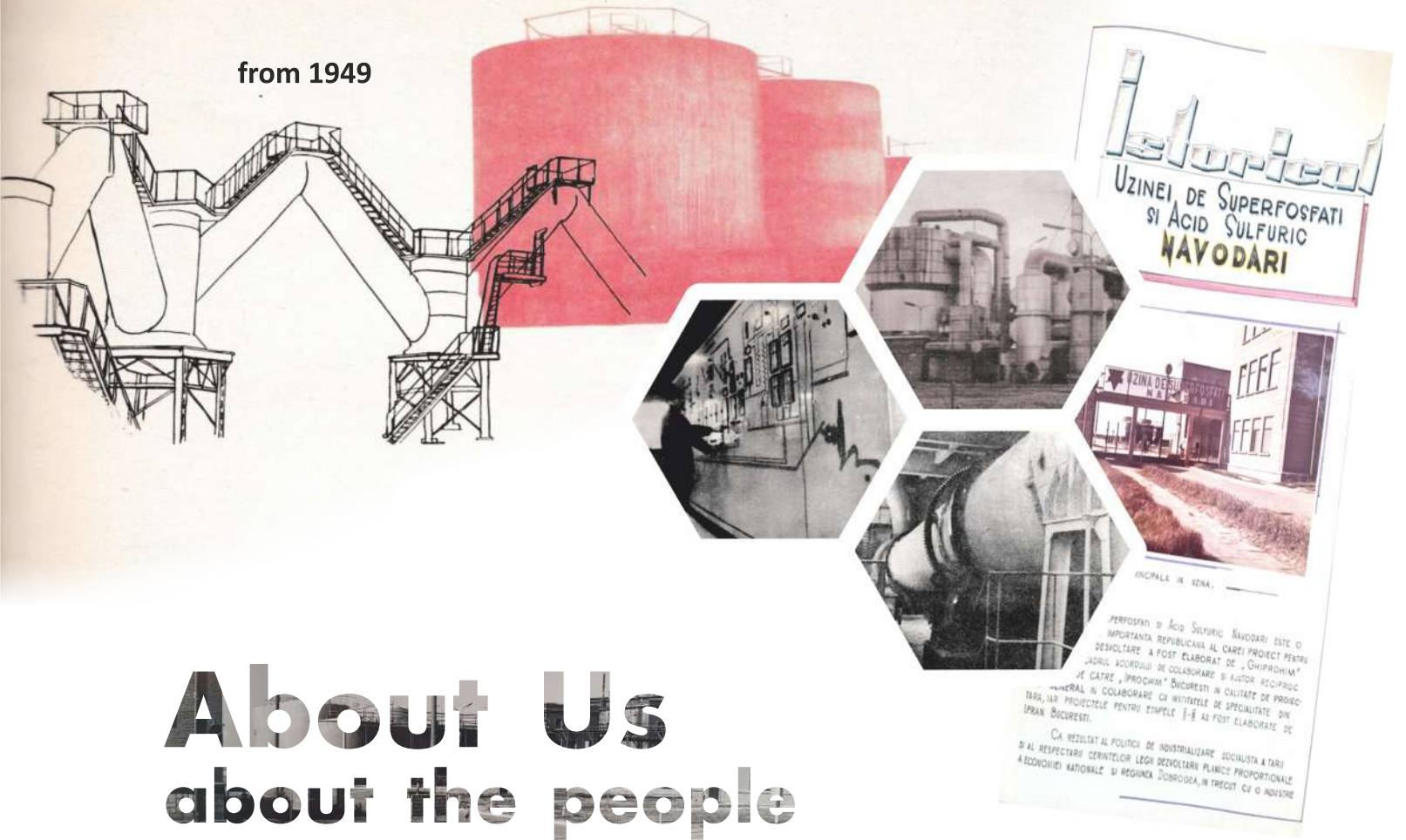


cich.ro

agriculture for the future[®]

from 1949



About Us about the people



"We, the Chemical Fertilizer Plant Năvodari, are in a continuous development of the human factor, so that we can manage and especially solve our customers' problems.

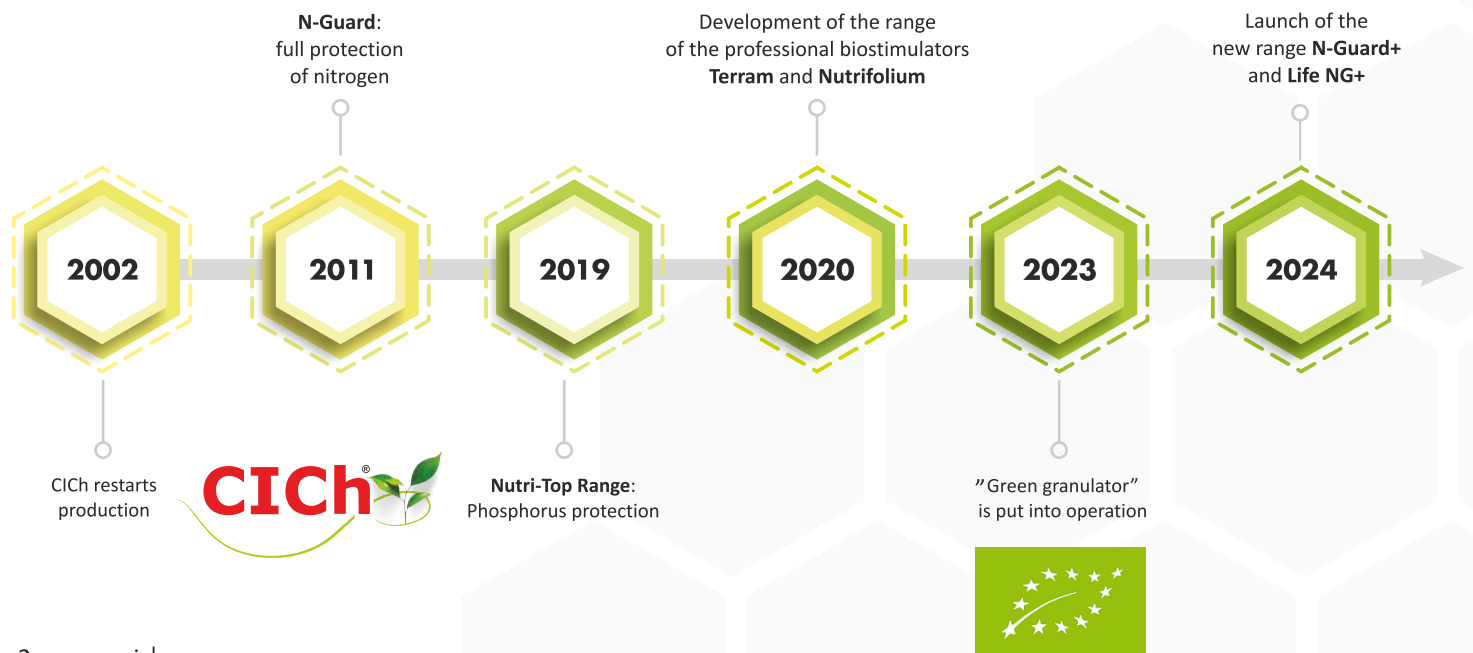
We stand next to our customers and we offer the best solutions for their farms and not only from an environmental but also from an economic point of view.

Together, you the agricultural producers and us the industry, in these 20 years, we have achieved remarkable results, results that are mentioned in the top places of the European rankings.

So, dear Partners, we guarantee that our motto will remain the same:

WE ARE WITH YOU, WE LISTEN TO YOU, WE WILL FIND SOLUTIONS TOGETHER! "

President, **Ernesto Sudati**





CONTENTS

NUTRI-TOP TECHNOLOGY	... 4
WHAT IS NUTRI-TOP TECHNOLOGY?	... 5
NUTRI-TOP 80	... 8
NUTRI-TOP CEREALFOS	... 8
NUTRI-TOP PERFORMANCE	... 9
NUTRI-TOP STARTER	... 9
NUTRI-TOP COMPLEX	... 10
NUTRI-TOP SPECIAL	... 10
DIFFERENCES BETWEEN INHIBITORS	... 12
N-GUARD+ TECHNOLOGY	... 13
LIFE NG+ NEW	... 13
N-GUARD TECHNOLOGY	... 14
UREA NG	... 15
AMOSULF NG	... 15
UTIL SAN NG	... 15
SPECIAL PRODUCTS	... 16
TERRAM RANGE	... 16
TERRAM NUMBER ONE	... 17
TERRAM TOP-CAL	... 18
TERRAM FACTOR	... 19
NUTRIFOLIUM RANGE	... 20
NUTRIFOLIUM MISTER X	... 21
NUTRIFOLIUM UPPER	... 22
NUTRIFOLIUM MEGA-N	... 23
NUTRIFOLIUM SAVE NEW	... 24
ILSAMIN N90	... 25
CICH BIOSTIMULATION TECHNOLOGY OF WINTER CEREALS	... 26
CICH BIOSTIMULATION TECHNOLOGY OF OILSEED RAPE	... 26
CICH BIOSTIMULATION TECHNOLOGY OF SUNFLOWER	... 27
CICH BIOSTIMULATION TECHNOLOGY OF MAIZE	... 27
CICH BIOSTIMULATION TECHNOLOGY OF POTATO	... 28
CICH BIOSTIMULATION TECHNOLOGY OF SUGAR BEET	... 28
DYNAMICS OF NUTRIENT ABSORPTION	... 29
ORGANIC SOLID PRODUCTS	... 30
FERTIL 12,5	... 31
BIOPHOS	... 31
PROGRESS MICRO 6-5-13	... 31
ADJUVANT/ PENETRATING AGENT/ ANTI-FOAMING AGENT/pH WATER CORRECTOR	... 32
TARGETUM NEW	... 33
MAGNET	... 33
P-HIDRO	... 33
14 ESSENTIAL NUTRIENTS	... 34
NUTRIENT DEFICIENCIES	... 35
NG TECHNOLOGY - SOIL MICROBIOLOGY ANALYSIS RESULTS	... 36
ORGANIC M+	... 38
THE ORDER OF ADDING PRODUCTS TO THE TANK	... 39



Nutri-Top

"The Phosphorus Protector"

NUTRI-TOP[®]



The superhero of your crops!

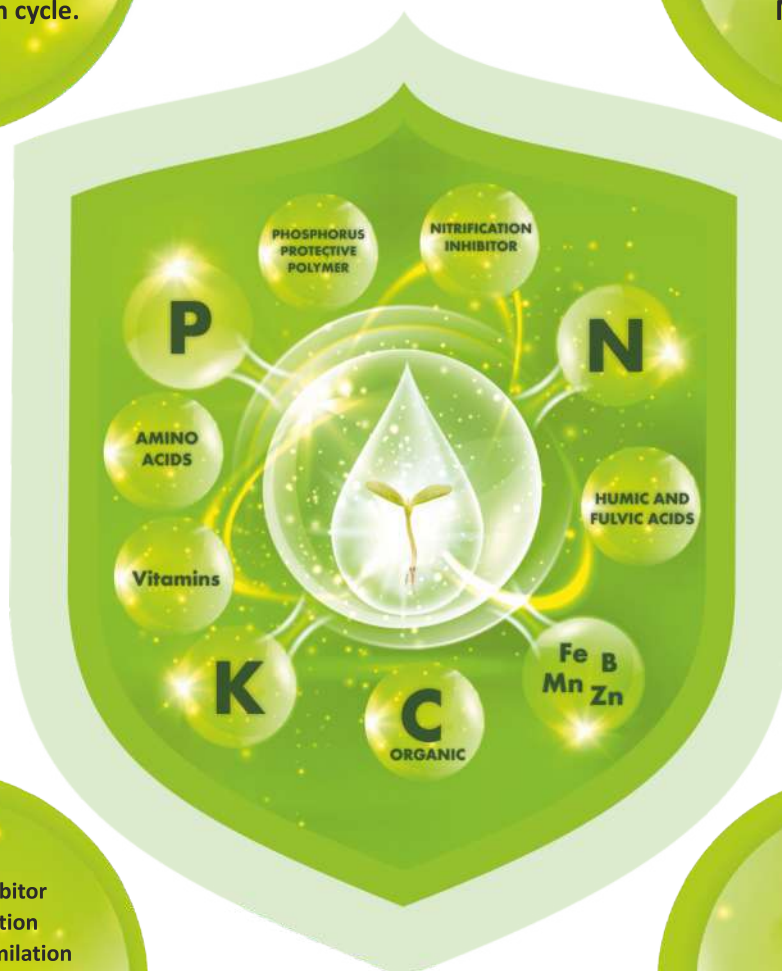
What is NUTRI-TOP Technology?

CiCh's years of research, development and innovation have resulted in the ability to implement **in a single granule the technologies to optimize nutrient efficiency.**

One single grain of NUTRI-TOP contains:

Newest polymer generation that optimizes phosphorus availability and absorption throughout the whole vegetation cycle.

N, P and K
+
Secondary
Macroelements
and
Microelements.



Nitrification inhibitor for the stabilization and complete assimilation of ammonium nitrogen in the initial stages of vegetation, from 4 to 6 weeks.

Humic extracts,
Amino acids,
Vitamins,
Organic carbon.

NUTRI-TOP TECHNOLOGY

ENSURES PHOSPHORUS AVAILABILITY THROUGHOUT THE GROWING SEASON

In acidic soils, phosphorus (P) forms insoluble complexes with iron (Fe) and aluminum (Al) hydroxides (Fe and Al phosphates) and in basic, limestone-rich soils, it reacts with calcium (Ca) and transforms (by retrogradation) into dicalcium phosphate or tricalcium phosphate, thus becoming unavailable for crops.

NUTRI-TOP TECHNOLOGY is based on a new generation polymer with a specific molecular structure that results in a high cation exchange capacity. The polymer binds preferentially with metal cations such as aluminum, iron and calcium on acidic and alkaline soils, including neutral reacting soils.

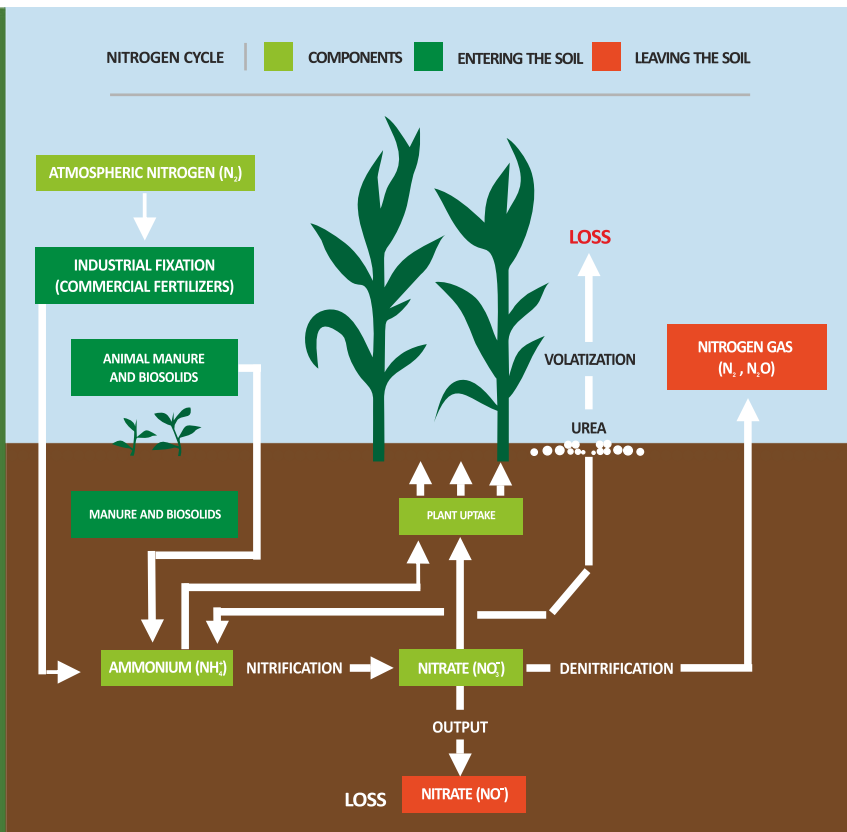
This polymer protects the phosphorus present in CICH fertilizer granules from known retrogradation/blocking phenomena. Phosphorus (P) will therefore be available to the crop even during critical and maximum consumption stages, with a performance that tends to double the availability and soil dynamics of the applied units throughout the growing season.

Research results show that, of the conventional NP/NPK fertilizers applied annually, only a small ratio of 5 to 25% of their phosphorus content is available for plant uptake during the growing season, both on acidic and alkaline soils, with values often below requirements even on neutral soils.

Nutrient efficiency (%) of the conventional fertilizers according to the soil pH values

pH	N %	P %	K %
4.5	21	8	21
5	38	10	30
5.5	50	15	45
6	63	15	55
6.5	70	30	60
7	70	30	60
7.5	60	25	55
8	45	15	45
8.5	40	10	30
9	25	5	20

MAXIMIZES NITROGEN UPTAKE IN INITIAL STAGES OF VEGETATION



NUTRI-TOP TECHNOLOGY

is based on nitrification inhibitor to stabilize and assimilate ammonia nitrogen in the early stages of vegetation, for a period of 4 to 6 weeks (depending on the amount of mineral nitrogen applied and soil temperature), without losses and negative impact on the environment.

HUMIC EXTRACTS: HUMIC AND FULVIC ACIDS, AMINO ACIDS, VITAMINS AND ORGANIC CARBON

NUTRI-TOP TECHNOLOGY is a source of nutrients, amino acids, vitamins and organic carbon for plants and a source of energy for soil organisms (algae, bacteria, fungi, etc.) that support important functions, such as improving the natural fertility and physical-mechanical properties of the soil (structural, color, consistency, drainage and aeration, etc.), balanced growth and development of plants and inducing their resistance against various pathogens. Last but not least, improved soil microbial activity leads to faster and better decomposition/mineralization of plant debris.

NUTRI-TOP TECHNOLOGY is also based on the major impact of humic extracts in increasing water retention capacity, soil structuring and physico-chemical properties such as soil exchange and buffering capacity. When humic extracts, amino acids and vitamins are incorporated into fertilizers, they have a positive effect on nutrient bioavailability, balanced plant growth and development, and thus on maximizing agricultural yields.

Humic acids increase the nutrient and water storage capacity (the ability of humic acids to retain water in the root zone is about seven times greater than that of clay particles) - the insolubility of toxic aluminum (Al) compounds is additionally ensured and they will no longer be absorbed into plant structures, and metal compounds such as Fe, Cu, Zn, Mg, Mn become more accessible to plants and are used as microelements.

Fulvic acids improve membrane permeability and optimize the use of nutrients by "chelating" them into organic forms that are more easily absorbed by the root system - through a synergistic effect, humic and fulvic acids stimulate and support germination, seed viability and uniform crop growth.

The CICH NUTRI-TOP range supports rapid root mass development and sustained root growth, especially in length, optimizing nutrient consumption from fertilizers applied throughout the growing season - loss of nutrients from deep roots through leaching is prevented. Comparing the impact of humic substances on root system growth, it has been concluded in the literature that root systems that have benefited from humic substances or found humic-rich soil were 20-50% more developed.



NUTRI-TOP 80



CHEMICAL COMPOSITION

MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
20% P ₂ O ₅	32% SO ₃ 28% CaO	



TECHNOLOGY



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

NUTRI-TOP 80 is a solid, granular fertilizer containing phosphorus, sulphur and calcium, innovative due to the presence of phosphorus protection polymer and humic extracts.

NUTRI-TOP 80 can be used to correct phosphorus deficiencies in agricultural land and is recommended for all types of soil.

Use: by incorporation into the soil when preparing the seedbed.

NUTRI-TOP CEREALFOS

CHEMICAL COMPOSITION



MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
40% P ₂ O ₅	10% SO ₃ 22% CaO	0,5% MgO 0,3% Fe 0,03% Zn



TECHNOLOGY



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

Nutri-Top Cerealfos is a solid, granulated fertilizer with a high content of phosphorus, calcium, sulphur and microelements, innovative due to the presence of phosphorus protection polymer and humic extracts.

Nutri-Top Cerealfos can be used to correct phosphorus deficiencies in agricultural land and is recommended for all types of soil.

Use: by incorporation into the soil when preparing the seedbed.

NUTRI-TOP PERFORMANCE



CHEMICAL COMPOSITION

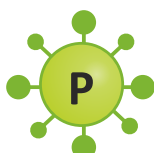
MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
5% N 30% P ₂ O ₅	15% SO ₃ 6% CaO 0,65% MgO	1,65% Fe 0,05% B 0,04% Mn 0,01% Zn



TECHNOLOGY



Nitrification inhibitor



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

Nutri-Top PERFORMANCE is a solid, granular fertilizer, based on nitrogen, phosphorus, macro and micro elements, innovative due to presence of phosphorus protection polymer and humic extracts, in addition, the presence of the nitrification inhibitor allows nitrogen to be used for a period of 4 to 6 weeks. **Nutri-Top PERFORMANCE** is a fertilizer recommended for all soil types.

Use: by incorporation into the soil, when preparing the seedbed or localized with sowing.

NUTRI-TOP STARTER



CHEMICAL COMPOSITION

MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
5% N 25% P ₂ O ₅	10% SO ₃ 30% CaO 1,5% MgO	0,02% B 0,01% Cu 1% Fe 0,02 Mn 0,01% Zn



TECHNOLOGY



Nitrification inhibitor



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

Nutri-Top STARTER is a solid, granular fertilizer based on nitrogen, phosphorus, macro and micro elements, innovative due to the presence of phosphorus protection polymer and humic extracts. In addition, the presence of the nitrification inhibitor allows nitrogen to be used for a period of 4 to 6 weeks.

Nutri-Top STARTER is a fertilizer recommended for all soil types.

Use: by incorporation into the soil when preparing the seedbed.

NUTRI-TOP COMPLEX



CHEMICAL COMPOSITION

MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
4% N, 20% P ₂ O ₅ , 10% K ₂ O	12% SO ₃ , 12% CaO, 1% MgO	0,1% Fe, 0,07% B, 0,07% Mn, 0,05% Zn, 0,02% Cu



TECHNOLOGY



Nitrification inhibitor



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

Nutri-Top COMPLEX is a solid, granulated fertilizer based on nitrogen, phosphorus, potassium, macro and micro elements, innovative due to the presence of phosphorus protection polymer and humic extracts. In addition, the presence of the nitrification inhibitor allows nitrogen to be used for a period of 4 to 6 weeks.

Nutri-Top COMPLEX is a fertilizer recommended for all soil types.

Use: by incorporation into the soil when preparing the seedbed or localized with sowing.

NUTRI-TOP SPECIAL



CHEMICAL COMPOSITION

MAIN MACROELEMENTS	SECONDARY MACROELEMENTS	MICROELEMENTS
4% N, 12% P ₂ O ₅ , 24% K ₂ O	12% SO ₃ , 7,6% CaO, 0,34% MgO	0,5% Fe, 0,01% B, 0,01% Mn, 0,01% Zn



TECHNOLOGY



Nitrification inhibitor



Polymer for phosphorus protection



Humic extracts (amino acids, humic and fulvic acids, organic carbon)

Nutri-Top SPECIAL SPECIAL is a solid, granular fertilizer based on nitrogen, phosphorus, potassium, macro and micro elements, innovative due to the presence of phosphorus protection polymer and humic extracts. In addition, the presence of nitrification inhibitor allows the use of nitrogen for a period of 4 to 6 weeks.

Nutri-Top SPECIAL is a fertilizer recommended for all soil types.

Use: by incorporation into the soil when preparing the seedbed or localized with sowing.



Be the Hero of future generations with

NUTRI-TOP[®]

TYPES OF INHIBITORS

DIFFERENCES AMONG INHIBITORS *	N-GUARD+	N-GUARD	NBPT	NPPT	DMPP	DCD	NITRAPYRIN
RELEASE DATE	2023	2011	1970/1980	2006	2001	1960/1970	1960/1970
FORMULATION	LIQUID	LIQUID	POWDER / LIQUID / SOLID (WHITE)	POWDER (WHITE)	SOLID	SOLID (COLORLESS)	SOLID CRYSTALLINE (COLORLESS)
COMPOUND TYPE	PLANT EXTRACTS AND PREBIOTICS	PLANT EXTRACTS	ORGANO-PHOSPHORUS	ORGANO-PHOSPHORUS	PHOSPHATE SALT	CYANAMIDA/ CYANOQUANIDINE	CHLOROPYRIDINE
FORMULA			$C_4H_{14}N_3PS$	$C_3H_{12}N_3PS$	$C_5H_{11}N_2O_4P$	$C_2H_4N_4$	$C_6H_3Cl_4N$
REQUIRES INCORPORATION IN THE SOIL	✗	✗	✗	✗	✗	✗	✓
Volatilization protection	✓	✓	✓	✓	✗	✗	✗
Nitrification protection	✓	✓	✗	✗	✓	✓	✓
Protection between 0-20 days	✓	✓	✓	✓	✓	✓	✓
Protection between 0-40 days	✓	✓	✗	✗	✓	✓	✓
Protection between 0-110 days	✓	✓	✗	✗	✗	✗	✗
Repellent effect against nematodes	✓	✓	✗	✗	✗	✗	✗
Insect repellent effect (thrips larvae, midges, moths, etc.)	✓	✓	✗	✗	✗	✗	✗
BIOCIDAL PROPERTY	✗	✗	✗	✗	✓	✓	✓
Develops active bacteria in the soil	✓	✓	✗	✗	✗	✗	✗
Develops active fungi in the soil	✓	✓	✗	✗	✗	✗	✗
Use at the same time as sowing, without germination problems	✓	✓	✓	✓	✓	✓	✗
Improved prolonged release of nitrogen by retention in organic form	✓	✗	✗	✗	✗	✗	✗
Improved and accelerated decomposition of plant residues from previous years	✓	✗	✗	✗	✗	✗	✗

* information sourced from industry literature

N-GUARD®

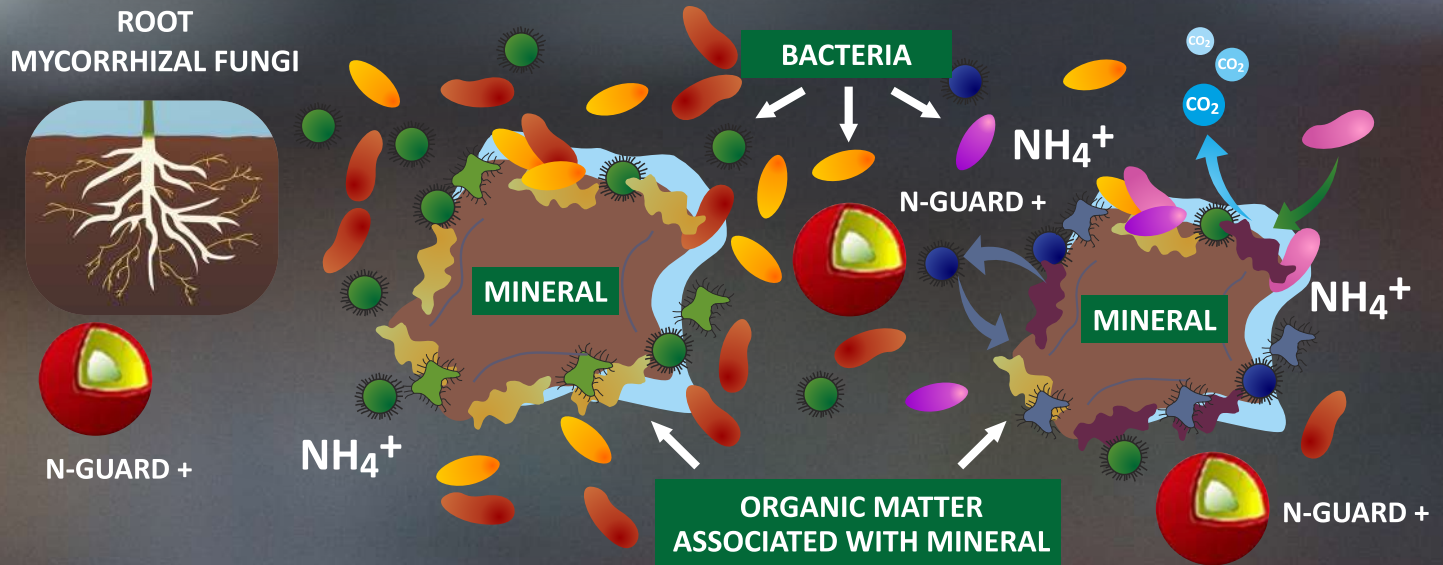
TECHNOLOGY



N-GUARD+[®] TECHNOLOGY

NEW

Prebiotics are natural products which improve the diversity and microbial health of the soil by supporting and stimulating the growth of soil microorganisms already present in the soil-plant system (prebiotics are defined/accepted as beneficial microorganisms which, once applied, are mainly exhibiting soil nutrient mobilization properties).



NG+ main characteristics:

1. natural prebiotic compounds which support the growth of beneficial microorganisms, increasing the natural biological effectiveness of soils by improving the colonization of the rhizosphere with beneficial bacteria and the roots with arbuscular mycorrhizal fungi. The decomposition of plant residues from previous years is thus accelerated and soil conditioning/improving agents are released, restructuring the soils and preventing compaction;
2. natural compounds which support germination, accelerate root cell divisions and help the rapid growth and development of strong root systems and the number of vascular cells in plant stems, improving nutrient transport in plants, tolerance to stress factors and resistance to pathogens;
3. natural chelation system which enables an increase in nitrogen availability for all types of soil, prolonging the effect of fertilization with nitrogen fertilizers (improved retention of ammonium NH₄⁺ in clay and prolonged availability of nitrogen provided by its temporary immobilization in organic form and its subsequent mineralization);
4. natural compounds that increase the repellent effect on nematodes and small insects;
5. non-toxic, no soil pollution effect.



LIFE NG+

40% N + 14% SO₃

CHEMICAL COMPOSITION			pH 6,5 - 7,0
Of which			
Ammoniacal Nitrogen (NH ₄)	Urea Nitrogen (amide)	Sulphur (SO ₃) soluble in water	
5%	35%	14,0%	





N-GUARD® Technology 3 times stronger Nitrogen!

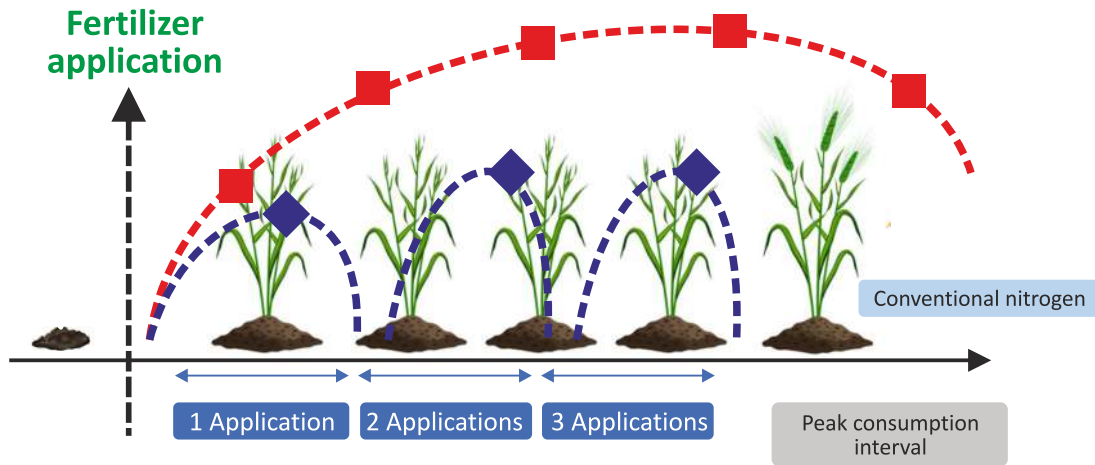
N-Guard Technology contains the only natural vegetable oils-based inhibitor of volatilization and nitrification.

In case of conventional nitrogen-based products, depending on the soil temperatures, the nitrogen (N) is available to plants for a time interval between 4 – 6 weeks!

Soil temperature	Hydrolysis of urea in ammonium NH_4^+	Soil temperature	Nitrification of ammonium NH_4^+ in nitrate NO_3^-
2 degrees C	4 days	5 degrees C	6 weeks
10 degrees C	2 days	10 degrees C	2 weeks
20 degrees C	1 day	20 degrees C	1 week

Only N-GUARD Technology provides protection against volatilization, denitrification and leaching for a period of 90 to 110 days.

N-GUARD: Single application



N-GUARD nitrogen is continuously absorbed by crops during the growth season, based on nutrient absorption curves, with minimal losses and no negative impact on the environment.

N-Guard Benefits:



Nitrogen to the third power!
One application of N-Guard replaces 2-3 applications of conventional products.



Natural nitrification inhibitor, friendly to the environment and soil microorganisms.



Repellent effect on nematodes and some insects.



Nitrogen protection for 90-110 days.



Reduce losses of N due to leaching and denitrification.



Nitrogen available to the plant during critical and consumption periods.



Increasing profitability in one pass!

N-Guard[®] TECHNOLOGY

ONE OF
A KIND IN
EUROPE



UREE NG

46% N

CHEMICAL COMPOSITION

in which

Nitric Nitrogen (NH ₄)	Ureic Nitrogen (amidic)
-	46%

ph
8,5 - 9,0



AMOSULF NG

33% N + 29% SO₃

CHEMICAL COMPOSITION

in which

Nitric Nitrogen (NH ₄)	Ureic Nitrogen (amidic)	Water-soluble sulphur (SO ₃)
10,0%	23%	29,0%

ph
6,8 - 7,0



UTIL SAN NG

21% N + 58% SO₃

CHEMICAL COMPOSITION

in which

Nitric Nitrogen (NH ₄)	Ureic Nitrogen (amidic)	Water-soluble sulphur (SO)
21%	-	58,0%

ph
4,0 - 5,0





SPECIAL PRODUCTS

Benefits:

- STIMULATES INITIAL ROOTING
- ACCELERATED GROWTH OF ROOT SYSTEM
- OPTIMIZED NUTRIENT UPTAKE FROM THE SOIL
- INCREASED STRESS TOLERANCE OF PLANTS
- SUPPORTS THE WINTER STAGES OF CROPS

TERRAM[®]





FOR AN IDEAL START

NUMBER ONE

TERRAM[®] 



Number One is a professional root system biostimulant with high carbon (C) content and organic substances, amino acids and polysaccharides.

HOW IT WORKS

It is based on the Terram Molecular Complex - a patented Cich formula, that is an addition of organic molecules, assimilated by the plant, with a root biostimulation effect, involving:

- Stimulation of rooting (absorbent hairs and lateral roots).
- Stimulation of absorption and mobilization of nutrients.
- Increase plants resistance to overwintering and frost.
- Activation of the plants natural defense system against pathogens.

BENEFITS

➤ Number One is a great recommendation for foliar and/or root applied biostimulant in autumn and early spring (winter cereals and rapeseed). It stimulates the development of the root system in plants and minimizes the negative impact caused by extreme stress conditions (drought, frost, waterlogging, technological accidents, etc.). Due to the high content of organic substances with a very low molecular mass, Number One is more easily absorbed by plants, even in critical periods of stress.

➤ Alginic acids act as a natural adjuvant, so at the time of application a film is formed on the surface of the leaves, increasing the absorption of products with which Number One is combined, such as fungicides, insecticides or other foliar fertilizers.

➤ Applying Number One to rapeseed and winter cereals in the autumn prepares the crop for winter, stimulating the root system and the plants resistance to diseases and stress factors. Spring application supports vegetative restart and helps plants to overcome periods of stress.

Characteristics:

pH (20°C): 6,6
Density (20°C): approx. 1,18 kg/l

Composition	%,w/v
Total nitrogen (N)	1,2
Organic soluble nitrogen (N)	1,2
Organic carbon (C) of biological origin	11,8
Potassium oxide (K ₂ O)	7-8
Organic substance with nominal molecular weight <50 kDa	35,4
Alginic acids	<7
Mannitol	1,2 - 2,4
Betaine	3,54

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Cereals	- From 2-4 leaves, throughout the entire growing season	1.5-3 l/ha (1-2 applications)
Rapeseed	- From 2-4 leaf stage to stem elongation	1.5-3 l/ha (1-2 applications)
Sunflower	- From 2-4 leaf stage to stem elongation	1.5-3 l/ha (1-2 applications)
Maize	- From 2-4 leaves to stem elongation	1.5-3 l/ha (1-2 applications)
Soybeans, peas, beans	- Starting with 2 real leaves	1.5-3 l/ha (1-2 applications)
Orchards	- At the start of vegetation - At flowering - At petal fall	2-4 l/ha
Vineyards	- At the start of vegetation - Shoot 5-7 cm - Shoot 10 cm	2-4 l/ha
Field vegetables, greenhouses and solariums	- After the transplantation	200-400 ml/1000 sqm
Potato	- Until side shoots are formed	1.5-3 l/ha (1-2 applications)
Sugar beet	- When leaves develop	1.5-3 l/ha (1-2 applications)

The carrier of all minerals



TOP-CAL

TOP-CAL has all the characteristics of a biostimulant and complex foliar fertilizer with its balanced content of nitrogen, soluble calcium plus soluble and EDTA-chelated trace elements (B, Cu, Fe, Mn, Mo, Zn), readily available to agricultural and horticultural crops.

HOW IT WORKS

- Top-Cal is a root biostimulant containing **Terram Molecular Complex**, a patented Cich formula, represented by an addition of organic molecules, assimilable by the plant, with root biostimulation effect, which involves: stimulating the development of absorbing root hairs and lateral roots, supporting photosynthesis and improved nutrient uptake, increasing plant stress tolerance and improving soil quality.
- Top-Cal has a high concentration of nitrogen (N) and calcium (Ca), that is applied foliar and to the soil, with a role in plant root development, increasing tolerance for disease and pest attack and other stress factors, increasing the level and quality of agricultural production.

BENEFITS

- + Calcium increases the uptake of nitrogen, potassium and phosphorus (including from basic fertilization), stimulates photosynthesis and increases the size and quality of fruit. It also makes nitrogen use more efficient.
- + Top-Cal is the ideal supplement to treat and prevent calcium deficiency, including physiological diseases such as apical wilt, fruit and flower drop and abortion, marginal scorch, etc. In the case of fruit and vegetables, it increases shelf life and commercial value.
- + The organic carbon in the Top-Cal composition supports the activity of beneficial soil microorganisms.

TERRAM[®]



Caracteristici:

pH (20°C): 2,5 - 3,0
Density (20°C): approx. 1,42 kg/l

Composition	%w/v
Total nitrogen (N)	11,4
Nitric nitrogen (N-NO ₃)	8,2
Ammoniacal nitrogen(N-NH ₄)	1,7
Water-soluble organic nitrogen (N)	1,4
Calcium oxide (CaO) total	15,6
Water-soluble boron (B)	0,014
Copper (Cu) chelated with EDTA	0,014
Copper (Cu) chelated with EDTA	0,028
Manganese (Mn) chelated with EDTA	0,014
Water-soluble molybdenum (Mo)	0,0014
Zinc (Zn) chelated with EDTA	0,014
Vegetal-origen organic carbon (C)	8,5

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Cereals	- Before and immediately after the shooting - Stem elongation - Appearance of the flag leaf	2-3 l/ha combined with NUMBER-ONE (Example: 1-1.5 l Top-Cal + 1.5 l Number One)
Rapeseed	- From the start of vegetation to the beginning of flowering	2-3 l/ha or together with NUMBER-ONE
Maize	- 4-6 leaves	2-3 l/ha or together with NUMBER-ONE
Sunflower	- From leaf development to to the beginning of flowering	2-3 l/ha or together with NUMBER-ONE
Sugar beet	- From 4 leaves to full cover of vegetation	2-3 l/ha or together with NUMBER-ONE
Potato	- From side shoot formation to flowering	2-3 l/ha or together with NUMBER-ONE
Field vegetables, greenhouses and solariums	- Transplanting - Vegetative growth period - Fruit growth	300ml/1000 sqm
Orchards and vineyards	- From the appearance of the buds to the fruit growth	2-3 l/ha



FACTOR

TERRAM[®]



Factor is a corrector of Boron and Molybdenum deficiencies, and a rooting biostimulant with Terram Molecular Complex.

HOW IT WORKS

Terram Molecular Complex is a patented Cich formula, represented by an addition of organic molecule, assimilable by the plant, with root biostimulation effect, which involves:

- Rapid uptake of the product by the plant.
- Improved nutrient uptake and transport.
- Accelerates root development, especially in autumn rapeseed.
- Increased plant tolerance to stress in the early vegetation period.

BENEFITS

- ✚ Quickly prevents and corrects Boron and Molybdenum deficiency.
- ✚ Ensures uniform flowering and pollen viability for increased yields.
- ✚ Influences nitrogen synthesis and nitrogen fixation activity in soil by Rhizobium bacteria in leguminous plants.
- ✚ Stimulates migration of sugars into root tissues, stimulating soil microbial activity.

Characteristics:

pH (20°C) 7 - 8
Density (20°C) approx. 1,35 kg/l

Composition	%w/v
Boron (Bo) water soluble	14,2
Molybdenum (Mo) water soluble	0,135

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Rapeseed	- 4-8 leaves - Beginning of flowering	1-3 l/ha
Sunflower	- From 4-6 leaves to flower bud appearance	1-3 l/ha
Sugar beet	- From 4 leaves up to full cover of vegetation	1-3 l/ha
Potato	- From side shoot formation to flowering	1-3 l/ha
Lucerne	- Leaf growth	1-3 l/ha
Peas, beans, soybeans	- 5-10 cm - pre-bloom	1-3 l/ha
Orchards	- floral buds - after petals fall - after harvesting	1-3 l/ha

NUTRIFOLIUM[®]



Benefits:

- STIMULATION OF THE VEGETATIVE GROWTH
- IMPROVED ABSORPTION OF NUTRIENTS AND WATER FROM THE SOIL
- STIMULATION OF FLOWERING AND FRUITING
- INCREASED WATER STRESS TOLERANCE

SPECIALIAL PRODUCTS



CICH[®] 
for a good growth

REMEDY AGAINST STRESS



MISTER X

NUTRIFOLIUM[®]



Mister X is a professional foliar biostimulant with a high content of amino acids, nitrogen (N) and organic carbon, microelements and Nutrifolium Molecular Complex. Maximum effects are produced when applied at the start of vegetation in autumn crops and in the early stages of development in spring crops.

HOW IT WORKS

- Nutrifolium Molecular Complex - patented formula developed in Cich laboratories, with biostimulating effect on vegetative and foliar growth by improving nutrient uptake, decreasing the risk of flower abortion and increasing crop tolerance to water stress.
- Nutrifolium molecular complex increases the efficacy of plant protection products when applied together.

BENEFITS

- ✚ Mister X ensures rapid development of the root system and stimulates the development of leaf mass, helping plants to achieve their maximum production potential. By providing amino acids plants save energy that would otherwise be consumed for nitrogen metabolism, thereby improving other processes such as stress resistance, plant growth and yields.
- ✚ The betaine found in the Mister X formulation is an amino acid that increases plant tolerance to environmental stresses such as salinity, extreme temperatures, UV radiation and heavy metals.
- ✚ Mister X rapidly stimulates and regenerates crops when applied even in extreme cases of stress such as hail, excessive surface ponding, phytotoxicity, drought or frost.

Characteristics:

pH (20°C) 8 - 8,5
Density (20°C) approx. 1,15 kg/l

Composition	%, w/v
Organic nitrogen (N)	4,5
Water-soluble organic nitrogen (N)	4,5
Water-soluble boron(B)	0,03
Water-soluble manganese (Mn)	0,1
Water-soluble zinc (Zn)	0,06
Water-soluble molybdenum (Mo)	0,001
Biological-origin carbon (C)	16
Total aminoacids	29
Free aminoacids	3,4
Betaine	4,5

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Cereals	- From the beginning of the stem elongation to the bud stage	1-3 l/ha
Rapeseed	- From side shoot formation to flowering	1-3 l/ha
Maize	- 6-8 leaves to first internode	1-3 l/ha
Sunflower	- From leaf development to stem elongation	1-3 l/ha
Soybeans, peas, beans	- Starting with 4-6 leaves	1-3 l/ha
Potato	- From side shoot formation to tubercle formation	1-3 l/ha
Field vegetables, greenhouses and solariums	- At each intervention	1-3 l/ha
Orchards and vineyards	- At each intervention	1-3 l/ha



NUTRIFOLIUM[®]

UPPER



Upper is a biostimulator specially designed to provide plants with the necessary nitrogen (N), sulphur (S) and microelements during periods of active vegetation, in a formula that is easy to be assimilated by foliar application.

HOW IT WORKS

- Nutrifolium Molecular Complex - patented formula developed in Cich laboratories, with biostimulating effect on vegetative and foliar growth by improving nutrient uptake, decreasing the risk of flower abortion and increasing crop water stress tolerance.
- Nutrifolium molecular complex increases the efficacy of plant protection products when applied together.
- Sulphur plays an important role in plant metabolism. Sulphur is essential for the formation of amino acids and proteins, vitamins and enzymes. Together with nitrogen, sulphur is essential for the formation of amino acids needed for protein synthesis. Upper successfully meets this need by providing balanced supply of nitrogen (N) and sulphur (S).

BENEFITS

- + Helps to improve the tillering of cereal crops.
- + Supplements the sulphur requirements of plants such as rapeseed, wheat or sugar beet.
- + Increases the quality of cereals by providing a high protein and oil content in oilseeds.
- + Ensures balanced vegetative and productive development.

Characteristics:

pH (20°C) 7 - 8
Density (20°C) approx. 1,31 kg/l

Composition	%,w/v
Total nitrogen (N)	20,8
Nitric nitrogen (N-NO ₃)	2,6
Ammoniacal nitrogen (N-NH ₄)	13
Ureic nitrogen (amide N-NH ₂)	5,2
Water-soluble sulfur (SO ₃)	59,2
Water-soluble boron(B)	0,013
Copper (Cu) chelated with EDTA	0,013
Iron (Fe) chelated with EDTA	0,026
Manganese (Mn) chelated with EDTA	0,013
Water-soluble molybdenum (Mo)	0,0013
Zinc (Zn) chelated with EDTA	0,013

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Cereals	- From the beginning of tillering	2-5 l/ha (1-2 applications)
Rapeseed	- From stem elongation to flowering	2-5 l/ha (1-2 applications)
Maize	- From 4-8 leaves to third internode	2-5 l/ha (1-2 applications)
Sugar beet	- From 4-6 leaves to 6-8 leaves	2-5 l/ha (1-2 applications)
Sunflower	- At 4-6 leaves stage	2-5 l/ha (1-2 applications)
Potato	- From leaf development to the beginning of flowering	2-5 l/ha (1-2 applications)

MEGA PRODUCTION



MEGA-N

Mega-N is a biostimulator with high nitrogen content and Nutrifolium molecular complex, with a role in supplying the nitrogen needed by plants during critical stages and in the gluten and protein formation phases.

HOW IT WORKS

- Nutrifolium Molecular Complex - patented formula developed in Cich laboratories, with biostimulating effect on vegetative and foliar growth by improving nutrient uptake, decreasing the risk of flower abortion and increasing crop tolerance to water stress.
- Nutrifolium Molecular Complex increases the efficacy of plant protection products when applied together.

BENEFITS

- ✚ Mega-N contains all forms of nitrogen (urea 16.1%, nitric 7.5% and ammonia 7.5%). Mega-N allows a better foliar penetration, is quickly absorbed in leaves and young tissues with active growth.
- ✚ Zinc content stimulates hormonal activity, through the production of Auxins.
- ✚ The application of Mega-N stimulates the regeneration of crops affected by climatic conditions or technological errors.
- ✚ Mega-N has a "stay green" effect and in the case of winter cereals it prolongs the life of the flag leaf, thus ensuring a high quality yield.

NUTRIFOLIUM[®]



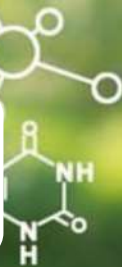
Characteristics:

pH (20°C) 7 - 7,5
Density (20°C) approx. 1,24 kg/l

Composition	%,w/v
Total nitrogen (N)	31
Ammoniacal nitrogen (N-NH ₄)	7,5
Nitric nitrogen (N-NO ₃)	7,5
Ureic nitrogen (amide N-NH ₂)	16,1
Zinc (Zn) chelated with EDTA	0,12

APPLICATION RECOMMENDATIONS TO MAIN CROPS

CROP	RECOMMENDED APPLICATION TIME	DOSE
Cereals	- From the beginning of tillering	3-5 l/ha
Rapeseed	- From stem elongation to flowering	3-5 l/ha
Maize	- From 4-8 leaves to third internode	3-5 l/ha
Sunflower	- From leaf development to the beginning of flowering	3-5 l/ha
Soybeans, peas, beans	- Before and after flowering	3-5 l/ha
Potato	- From tuber formation	3-5 l/ha
Sugar beet	- From 4-6 leaves	3-5 l/ha



NUTRIFOLIUM®

SAVE

SAVE is a professional bio-booster with a high content of potassium, sulphur, silicon and the Nutrifolium molecular complex, which mitigates the negative impact of various types of biotic and abiotic stress, especially drought.

SAVE stimulates the absorption of nutrients, the balanced growth of roots, stems and leaves and maintains the vigour of plants - it reduces water losses and regulates photosynthesis and transpiration of plants, thus increasing their resistance and adaptation to adverse environmental conditions.

SAVE ensures plant resistance to various types of diseases including pathogenic fungi and insect attack.



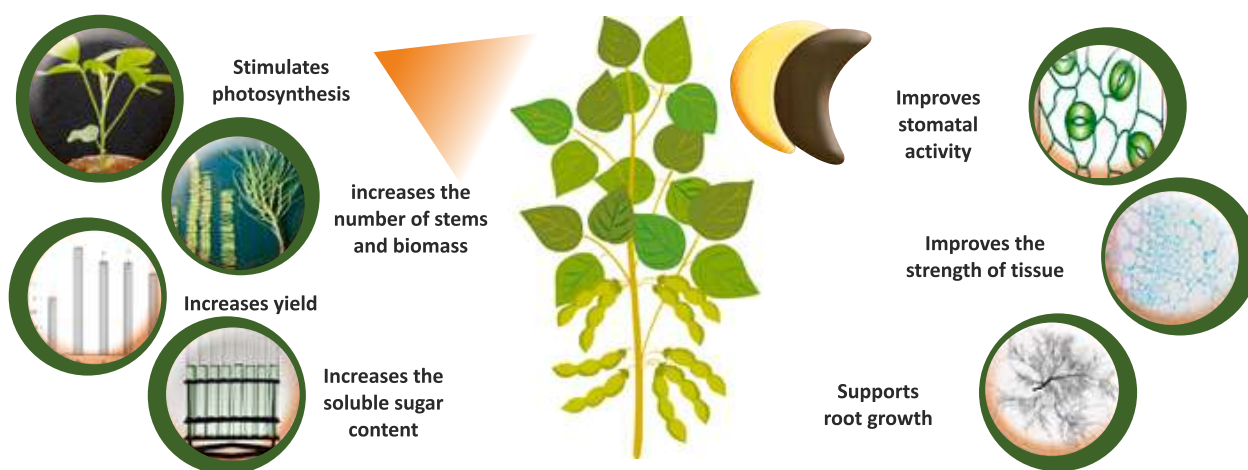
Composition	%,w/v
Potassium Oxide (K ₂ O)	18%
Sulphur (SO ₃) soluble in water	6,5%
Silicon Dioxide (SiO ₂)	2,6%

Characteristics:

pH (20°C) 8,5 -8,9
Density (20°C) about 1,3 kg/l

BENEFITS

- ✦ improves nutrient absorption and nutritional effectiveness ,
- ✦ stimulates photosynthesis and vegetative and productive growth,
- ✦ minimizes the impact of drought on crops and increases yield.



RECOMMENDATIONS FOR APPLICATION TO MAIN CROPS:

CROP	RECOMMENDED APPLICATION TIME	DOSE
Straw grains	- From the beginning of straw elongation to spike formation	1-3 l/ha or together with MISTER X {ex 1.5-2 l/ha MISTER X + 1.5 l/ha SAVE}
Rape	- From the formation of lateral shoots to flowering	1-3 l/ha or together with MISTER X
Corn	- 6-8 leaves to the first internode	1-3 l/ha or together with MISTER X
Sun flower	- From leaf development to stem elongation	1-3 l/ha or together with MISTER X
Soya, Peas, Beans	- Starting from 4-6 leaves	1-3 l/ha or together with MISTER X
Potato	- From the formation of lateral shoots to the formation of tubers	1-3 l/ha or together with MISTER X
Vegetables from fields, greenhouses and solariums	- At every intervention	1-3 l/ha or together with MISTER X
Fruit trees and vines	- At every intervention	1-3 l/ha or together with MISTER X



BIO-BOOSTER OF STRESS TOLERANCE, VEGETATIVE STAGES, FLOWERING AND QUALITY OF CROPS

ILSAMIN N90

Ilsamin N90 is a bio-booster and higher-quality fertilizer with high content of organic nitrogen and free amino acids, obtained from gelamine by enzymatic hydrolysis of collagen



HOW IT WORKS

- Stimulates the resumption of biochemical activities of plants under stress, allowing a balanced development of plants, reducing their recovery time in case of damaged plant tissues (temperature changes, hail, water or nutritional imbalances, etc.);
- Improves the process of photosynthesis and stimulates flowering;
- Supports carbohydrate biosynthesis ensuring higher and better quality yields of cereal, industrial, horticultural and fruit crops.

BENEFITS

- ✦ Improves the effectiveness of phytosanitary treatments;
- ✦ Increases the level of nitrogen absorption from applied fertilizers;
- ✦ Stimulates flowering and the number of flowers and the transfer of sugars to fruit;
- ✦ Increasing the protein content of crops;
- ✦ Increases stress tolerance and rapid plant regeneration;
- ✦ Supports plant tolerance to soil salinity;
- ✦ Increases the active resistance of plants to the attack of pathogens.

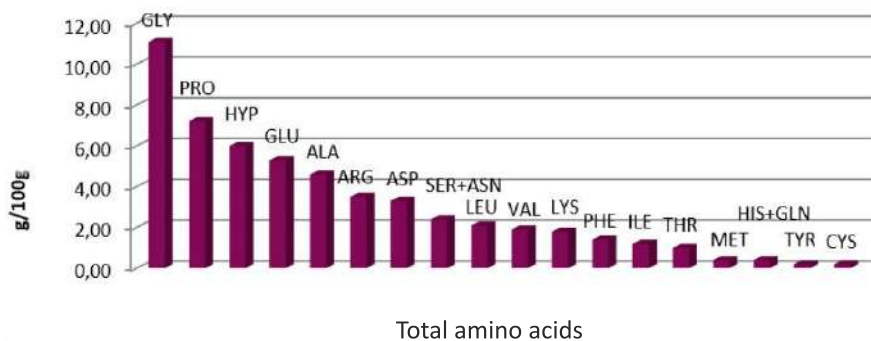
Composition	% w/v
Soluble Organic Nitrogen (N)	8,9%
Organic Carbon (C)	25,0%
Total free and amino acids and levogyrates	> 50%

Characteristics:
pH (20°C) 5,6 ± 0,5
Density (20°C) about 1,22 kg/l

Liquid product with high stability and low salinity

Recommended dose:
1 – 2 l/ha

Aminogram

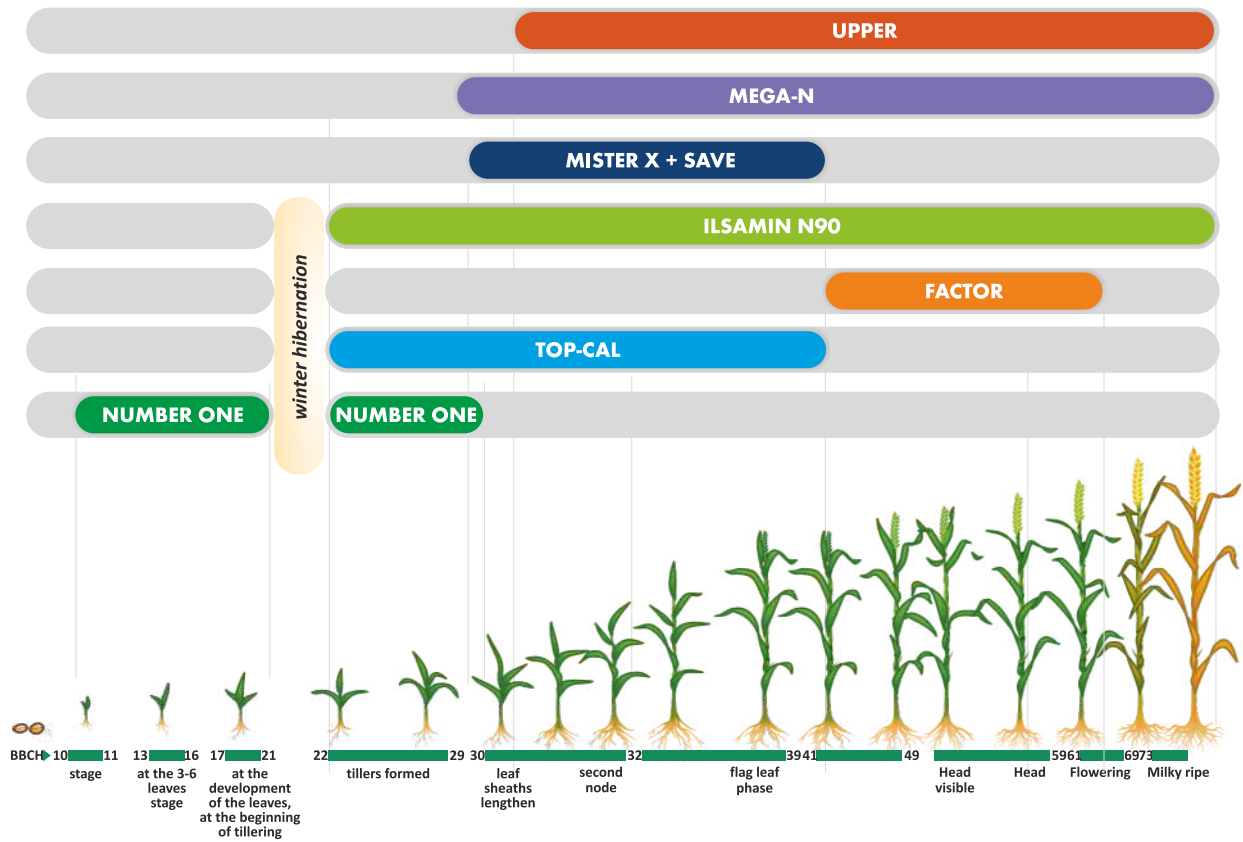


Amino Acid	Total amino acids % w/w	Symbol
Glycine	11,10	GLY
Proline	7,20	PRO
Hydroxyproline	6,00	HYP
Glutamic Acid	5,30	GLU
Alanine ALA	4,60	ALA
Arginine	3,50	ARG
Acid Aspartic	3,30	ASP
Serine + Asparagine	2,40	SER + ASN
Leucine	2,10	LEU
Valine	1,90	VAL
Lysin	1,80	LYS
Phenylalanine	1,40	PHE
Isoleucine	1,20	ILE
Threonine	1,00	THR
Methionine	0,40	MET
Histidine + Glutamine	0,40	HIS - GLN
Tyrosine	0,20	TYR
Cysteine	0,20	CYS
TOTAL	54,00	

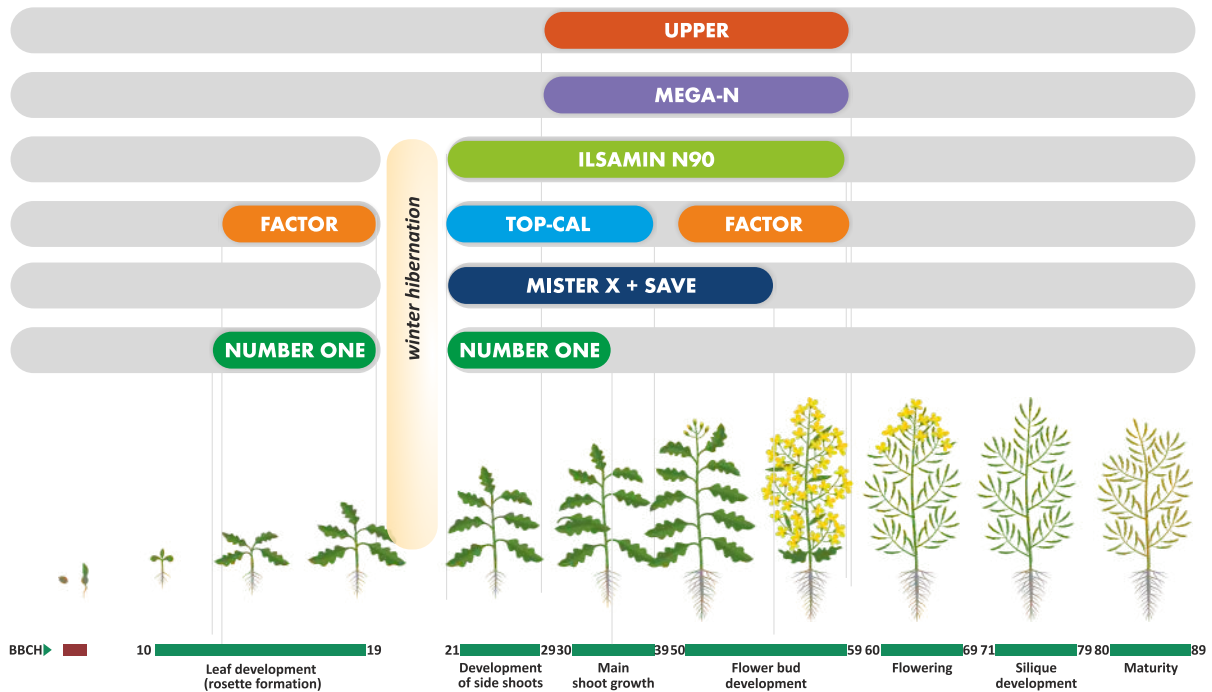
RECOMMENDATIONS FOR APPLICATION TO MAIN CROPS:

CULTURA	MOMENTUL RECOMANDAT APLICĂRII	DOZA
Straw grains	- From the beginning to after flowering	1-2 l/ha
Rape	- From side shoot formation to flowering	1-2 l/ha
Sun flower	- From 2 leaves to flowering	1-2 l/ha
Corn	- From 2-4 leaves	1-2 l/ha
Soya, Peas, Beans	- Starting with 2 real leaves	1-2 l/ha
Vineyards	- When starting up in vegetation - Shoot 5-7 cm - Shoot 10 cm	1-2 l/ha
Vegetables from fields, greenhouses and solariums	- After transplantation	1-2 l/ha

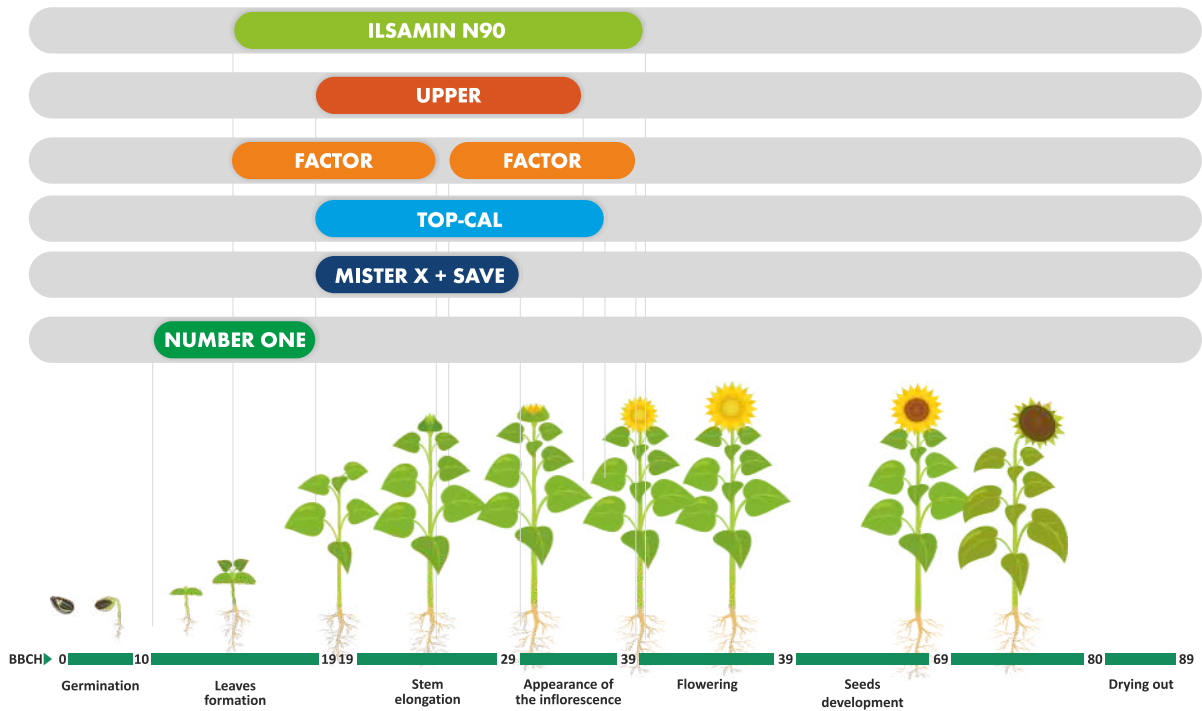
CICH BIOSTIMULATION TECHNOLOGY OF WINTER CEREALS



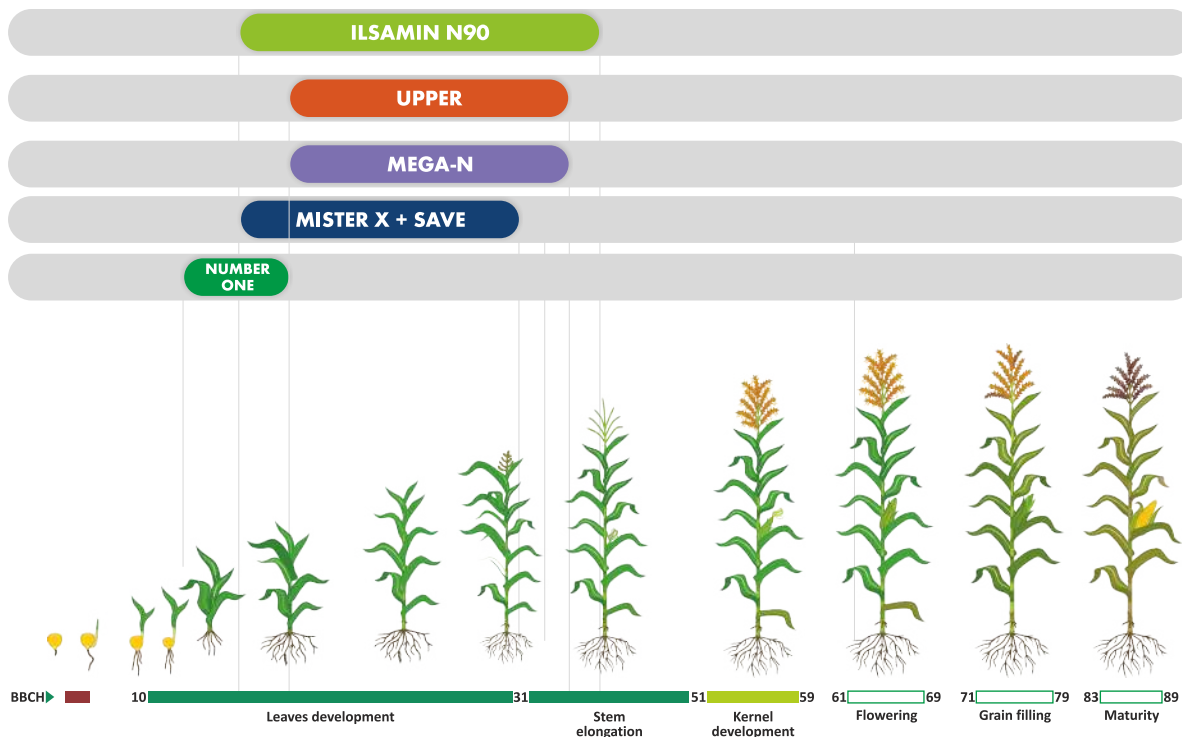
CICH BIOSTIMULATION TECHNOLOGY OF OILSEED RAPE



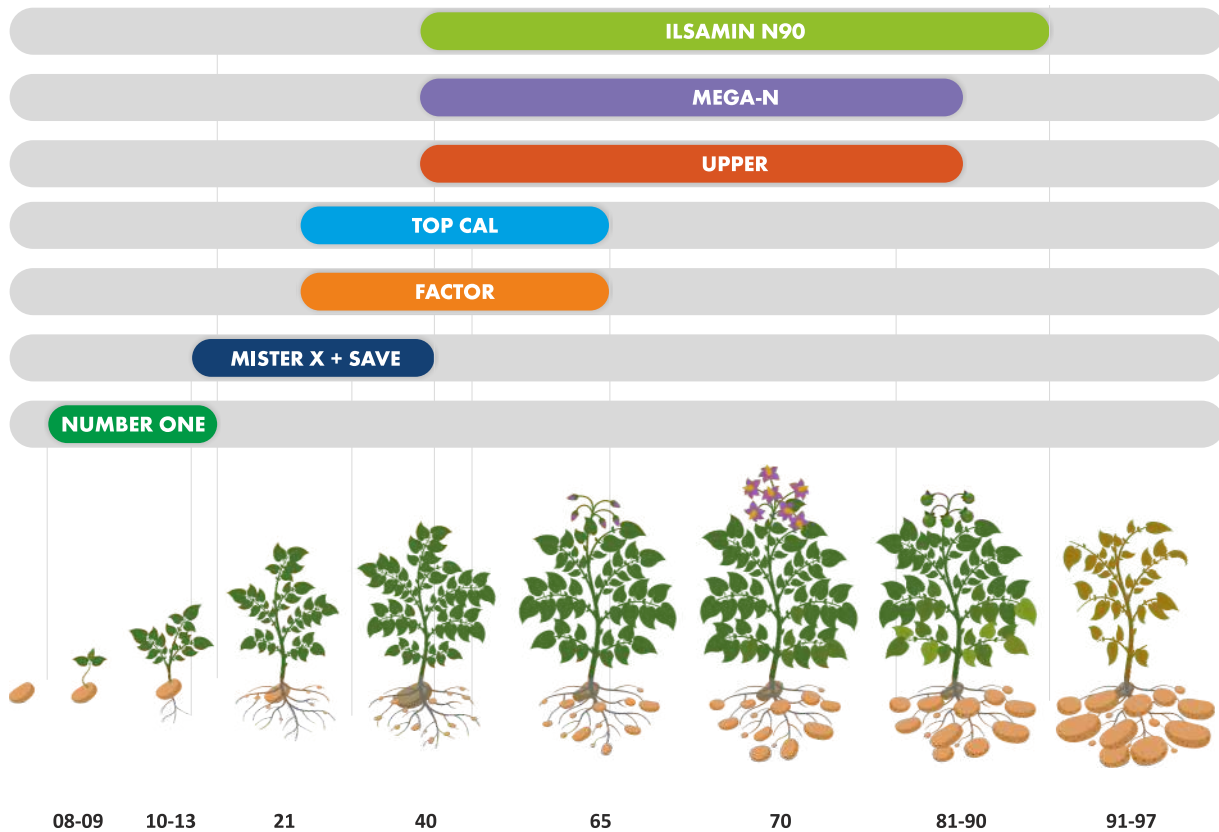
CICH BIOSTIMULATION TECHNOLOGY OF SUNFLOWER



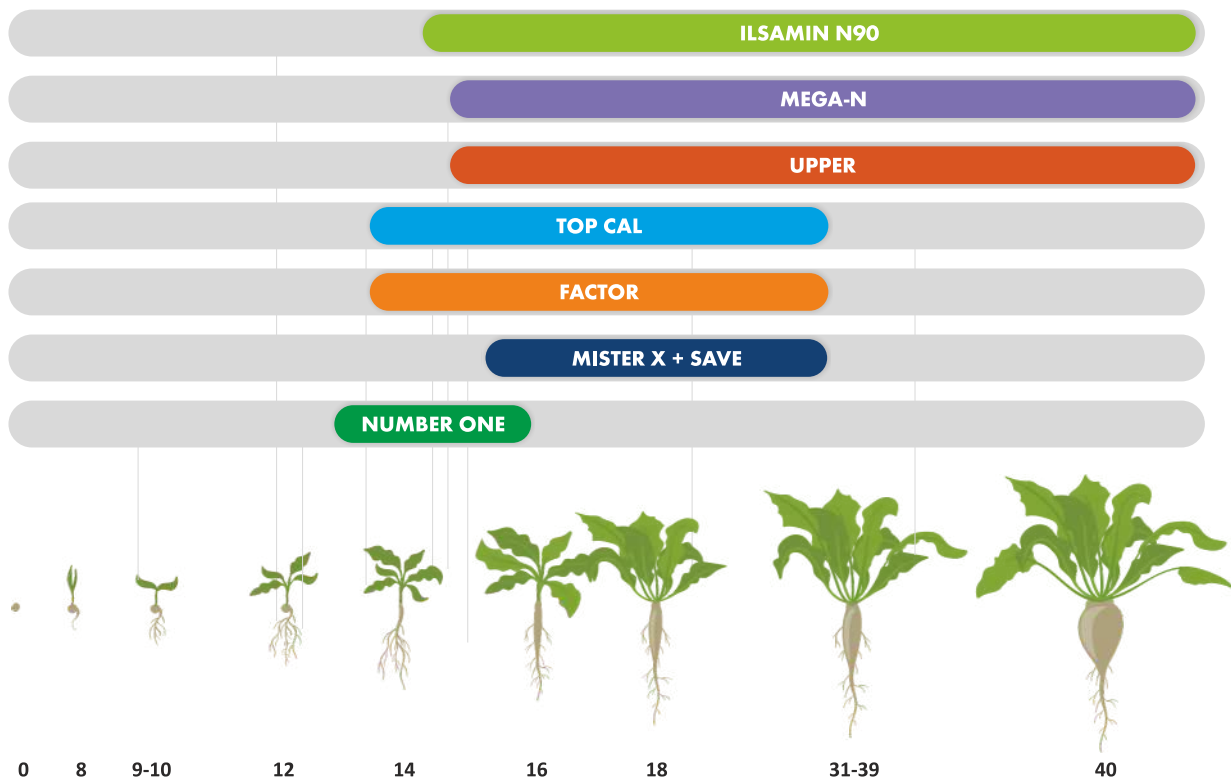
CICH BIOSTIMULATION TECHNOLOGY OF MAIZE



CICH BIOSTIMULATION TECHNOLOGY OF POTATO



CICH BIOSTIMULATION TECHNOLOGY OF SUGAR BEET



NUTRIENT UPTAKE DINAMICS

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Autumn Rapeseed	Seeds (kg/t)	4	35.0	18.0	12.0	10.0	45.0-60.0	3.5
	Vegetal (kg/t)	5	15.0	6.0	30.0	20.0	–	3.0
	Total seeds and vegetal exports			215.0	102.0	198.0	140.0	180.0-240.0

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Wheat	Grains (kg/t)	8	20.0	8.0	5.0	4.5	6.0-10.0	1.9
	Straw (kg/t)	8	9.0	2.5	20.0	6.5	–	0.9
	Total grains and vegetal exports			232.0	84.0	200.0	88.0	48.0-80.0

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Maize	Grains (kg/t)	10	12.0	6.0	5.0	4.0	10.0-12.0	1.3
	Vegetal (kg/t)	8	9.0	2.7	19.5	3.5	–	1.2
	Total seeds and vegetal exports			192.0	81.6	206.0	68.0	100.0-120.0

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Sunflower	Seeds (kg/t)	4	26.0	11.0	10.0	6.5	25.0-30.0	4.5
	Vegetal (kg/t)	3	20.0	4.5	17.0	6.5	–	4.5
	Total seeds and vegetal exports			164.0	56.0	91.0	45.5	100.0-120.0

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Sugar beet	Roots (kg/t)	60	1.8	1.0	3.7	0.7	3.0-4.0	0.35
	Vegetal (kg/t)	40	3.5	2.0	9.5	0.7	–	0.70
	Total seeds and vegetal exports			248.0	140.0	602.0	70.0	180.0-240.0

Crop	Product	Harvest (tons)	Export of nutrients per ton of product					
			N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Potato	Tubers (kg/t)	45	2.8	1.5	6.0	0.6	4.0-6.0	0.30
	Vegetal (kg/t)	15	2.2	0.8	3.5	0.6	0.4	0.35
	Total seeds and vegetal exports			159.0	78.0	322.0	36.0	180.0-270.0

Crop	Product	Export of nutrients per ton of product					
		N	P ₂ O ₅	K ₂ O	SO ₃	CaO	MgO
Vine	Grapes(kg/t)	1.5-2.0	0.3-0.5	3.1-4.0	0.1-0.3	0.5-0.6	0.1-0.3
Vine for wine	Total stems, leaves and grapes (20-30t/ha)	80-120	40-60	150-180	45-60	100-150	30-50
Vine for table	Total stems, leaves and grapes (20-30t/ha)	150-220	60-80	200-280	50-60	150-200	60-80

ORGANIC PRODUCTS



ORGANIC FARMIC



ORGANIC SOLID PRODUCTS

Organic solid fertilizers obtained from AGROGEL with high nitrogen content with modulated natural release, complexed microelements and organic matter.

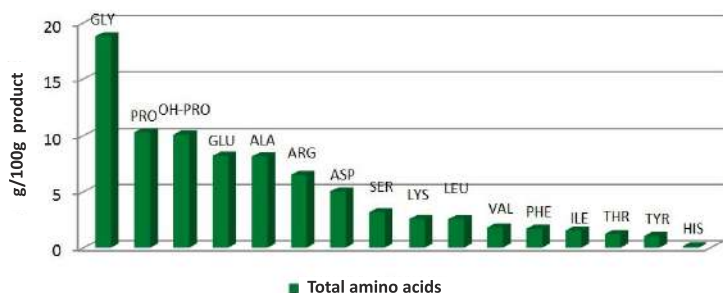
- High quality organic nitrogen fertilizers with slow natural release;
- AGROGEL® ensures maximum safety in terms of composition - the product is homogeneous, standardized and characterized by the controlled release of nitrogen into the soil via micro-organisms;
- High content of fully available organic matter with complex biostimulating action that improves natural soil conditions and allows plants to reach their full production potential;
- All the elements are absorbed by the crops, continuously, during the growing season, without losses, without negative impact on the environment.

FERTIL 12,5

ORGANIC FARMING



Aminogram



Total organic nitrogen (N)	12,5%
- Water soluble organic nitrogen	5,0%
Organic carbon	40,0%
- Extractable organic carbon	95,0%
Organic substance	70%
- Amino acids	80-85%

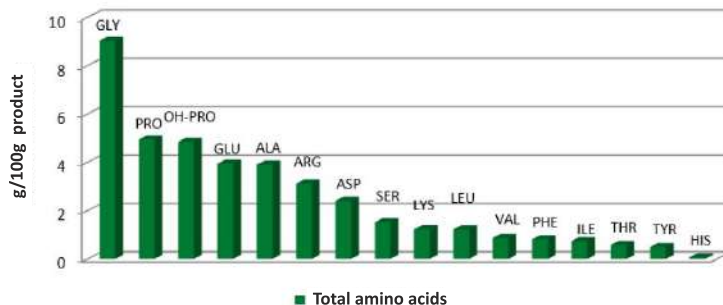


PROGRESS MICRO 6 - 5 - 13

ORGANIC FARMING



Aminogram



Total nitrogen (N)	6,0%
-Nitrogen (N)	6,0%
Total Phosphoric anhydride (P ₂ O ₅)	5,0%
Water soluble potassium oxide K ₂ O	13,0%
Water soluble magnesium oxide MgO	2,0%
Water soluble sulphuric anhydride So ₃	10,0%
Organic carbon (C)	18,0%
Organic substance	43%
Amino acids	30-40%

RECOMMENDED DOSE

/ pellets 4,5 mm:

150 – 300 kg/ha



BIOPHOS

ORGANIC FARMING



Granulated solid fertilizer with high content of phosphorus, calcium and magnesium

- important source of phosphorus, calcium and magnesium;
- helps re-mineralize soils;
- shows colloidal activity - improves the exchange capacity of the soil, allowing the retention of cations - calcium, potassium, microelements until their use by plants, without losses;
- soil conditioner (including sandy soils) through its colloidal activity - colloidal minerals provide benefits for the health of soil microflora, and support root activity;
- easy to dispense - granular product;
- retains ammonia which is subject to volatilization losses when used in composting;
- composting with BIOPHOS promotes the release of nutrients in soluble ionic form.

Total phosphoric anhydride P ₂ O ₅	26,0%
Calcium Oxide CaO	46%
Magnesium oxide MgO	0,35%

RECOMMENDED DOSE

/ granules between 2 and 5 mm, minimum 90%:

150 – 300 kg/ha





**ANTIDRIFT
ADJUVANT
PENETRATING AGENT
ANTI-FOAM
WATER
CONDITIONING**

Magnet

P-Hidro

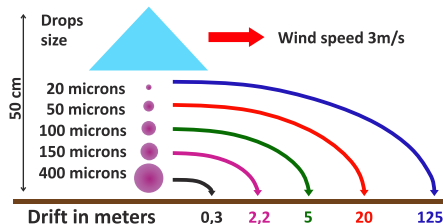
Targetum

TARGETUM

TARGETUM was developed in partnership with CICH Romania and the Faculty of Agronomy of Craiova University within EUREKA Research Project, together with external partners.

ACTION:

TARGETUM can reduce the amount of small particles generated during spraying, resulting in reduced wind drift. The product improves the accuracy of spraying, decreases the risk of phytotoxicity in plants from nearby fields or water pollution. Solutions obtained by mixing TARGETUM with pesticides and fertilizers evenly cover crops and land, reduce pesticide overlaps and losses.



Recommended dose:

Recommended working solution concentration 0.1% - for 100 L of working solution, use 100 ml of TARGETUM. TARGETUM can be used with any registered pesticides and micronutrient fertilizers. It can be applied using any type of equipment, including drones.

MAGNET

**Coadjuvant,
penetrating agent,
anti-foaming**



Glycols	6.5%
Emulsion of dimethylpolysiloxane in a concentration of	10%, 5%

Characteristics:
Density (20°C) 1 kg/l

Recommended dose:

50 -100 ml per 100 liters of water. Apply with all treatments and do not mix with other adjuvants/water conditioners.

- is an adjuvant which, due to the presence of particular substances, favors the homogeneous distribution of fertilizers on the laminar surface of the treated leaves;
- the high penetration power produces an increase in the contact surface between the nutrient solutions and the plant tissue, thus producing a more effective penetration and a consistent assimilation of the nutrients and other inputs;
- has a significant anti-foaming action.



Product for water conditioning and cleaning of treatment equipment

P-HIDRO

Total phosphoric anhydride P ₂ O ₅	25,0%
--	-------

Characteristics:
pH (20°C) 0,61 - 0,73
Density (20°C) approx. 1,24 kg/l

Recommended dose:

The recommended dose to reduce water pH between 8 -9 to pH 5 is 75 -115 ml per 100 liters of water.

For cleaning of installations prepare a 1,5% solution (1,5 liters per 100 liters of water) and treat for 15 minutes.

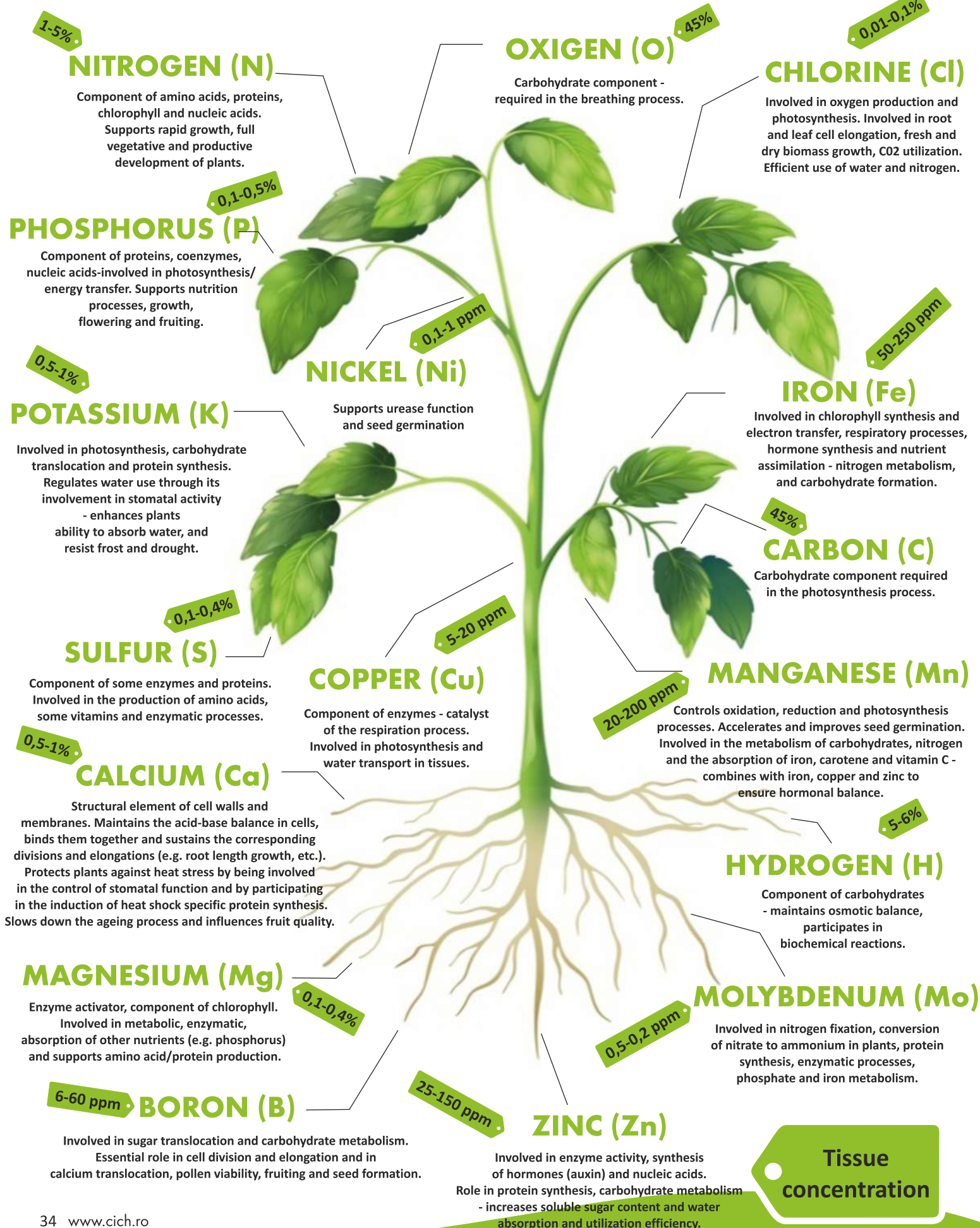
- corrects the alkaline reaction of the water used for treatments -generally the waters in Romania have alkaline pH, not being suitable for the application of foliar products;
- the high pH level of the spraying solution can cause some pesticides to be rapidly degraded by precipitation or hydrolysis;
- P-HIDRO is the solution, in this case, being a product with intense acidifying action:**
- it significantly reduces the pH values of nutrient and protective solutions applied to crops;
- improves the foliar absorption of nutrients and increases the efficiency of phytosanitary treatments;
- can be used to carry out deep cleaning of pipes/installations used for treatments and equipment (tanks, cisterns, containers, etc.) as well as to clean drip irrigation installations from mineral salt deposits and lime deposits.



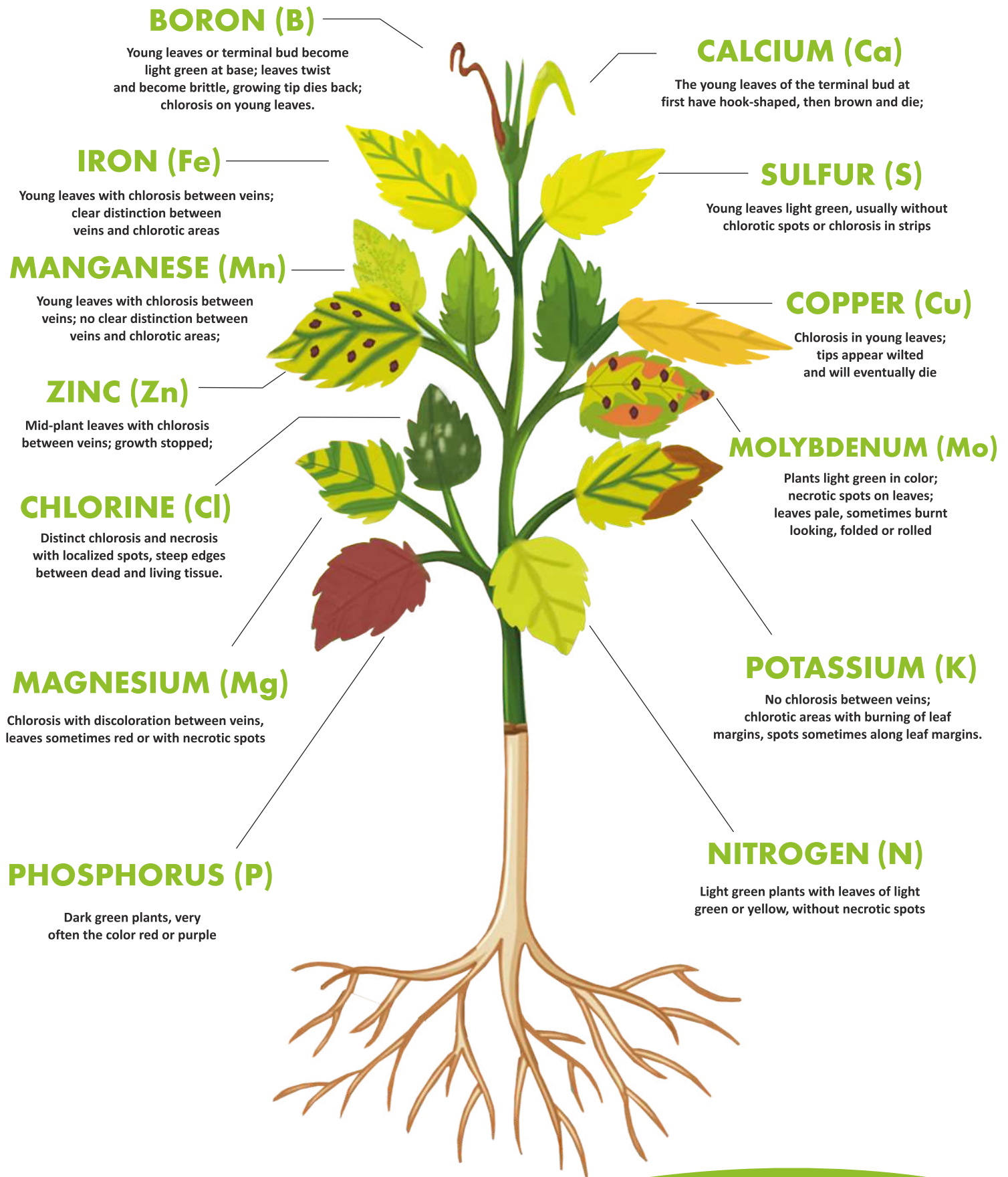
14 ESSENTIAL NUTRIENTS



FOR IMPROVING AND PROTECTING PLANT HEALTH



NUTRIENT DEFICIENCIES



NG TECHNOLOGY

SOIL MICROBIOLOGY ANALYSIS RESULTS

In order to ensure their growth and development, plants rely on the support of soil microorganisms during vegetation, which play an essential role in the decomposition of organic matter and mineralization of nutrients. Being actively involved in the research and development of fertilizers with latest generation technologies that maintain and improve the quality of soils, CICH ROMANIA demonstrates through the analyses carried out on the microbiological activity the positive impact of using N-GUARD technology:

The results of the research carried out within the technical department of CICH ROMANIA on the impact of the use of the professional N-GUARD technology on soil microbiology have highlighted the following:

GV1D- FERTILIZED WITH NG UREA IN AUTUMN AND SPRING

Total Bacteria (µg/g)	998
Total Fungus (µg/g)	225
Bacterii Active (µg/g)	20.1
Active Fungus (µg/g)	17.6
Hifal Diameter (µm)	2.89
Active Fungus/ Active Bacteria	0.88

GV2D FERTILIZED WITH NG UREA IN SPRING, ONE DOSE

Total Bacteria (µg/g)	531
Total Fungus (µg/g)	183
Active Bacteria (µg/g)	22.9
Active Fungus (µg/g)	26.0
Hifal Diameter (µm)	2.87
Active Fungus/ Active Bacteria	1.14

GVMD UNFERTILIZED CONTROL

Total Bacteria (µg/g)	651
Total Fungus (µg/g)	217
Active Bacteria (µg/g)	16.9
Active Fungus (µg/g)	12.6
Hifal Diameter (µm)	2.92
Active Fungus/ Active Bacteria	0.74

- **the total biomass of bacteria and fungi** is high in all tested variants, recording values well above the optimal values. However, it should be noted that the application of **UREEA NG** in fractionated doses in the vegetation, that is one third at the beginning of winter and two thirds at the beginning of March, records after harvesting the crop values of the biomass of microorganisms more than 50% higher than the non-fertilized variant.
- **the values of active bacteria and active fungi** are low **on unfertilized land** compared to land where **N-GUARD** technology was used, indicating that anaerobic microorganism activity is predominant in unfertilized land. It is preferable that the activity of aerobic micro-organisms is given priority so as to maximize the mineralization of plant residues and thus the decomposition of simple carbon compounds, thus ensuring the retention and continuous supply of nutrients to the crops. Not to be neglected is the positive impact of aerobic microorganism activity in soil restructuring.
- the recorded values **of the ratio of active fungi to active bacteria** indicate that, when using N-GUARD technology, the balanced growth of both bacteria and aerobic fungi is stimulated - values close to 1 are preferable.



NG TECHNOLOGY vs CONVENTIONAL FOR THE MAIZE CROP



Determination / Specification	Reference LIMIT	CICH1		Control		CICH2	
		Available elements	TOTAL (mg/kg)	Available elements	TOTAL (mg/kg)	Available elements	TOTAL (mg/kg)
pH	6,5	6,1		6,4		6,5	
N (mg/kg)	-	-	2098	-	2357	-	1891
Phosphorus (ppm)	16	12	488	12	534	7	472
Potassium (ppm)	121	283	6572	284	6777	198	6221
Organic matter (%)	3,00	3,9	-	4,2	-	3,1	-
Potential mineralizable nitrogen (kg/N/ha)	-	58	-	43	-	55	-
Microbial biomass (mg/kg)	-	2076	-	1482	-	1834	-
Report C:N	10-12	10,8	-	10,2	-	9,5	-
Total Nitrogen (%)	-	0,210	-	0,240	-	0,190	-
CO - C (µg/kg)	>70	93	-	66	-	82	-
Organic Carbon (%)	-	2,3	-	2,4	-	1,8	-

Research on the use of professional N-GUARD technology on maize compared to control areas fertilized with conventional nitrogen fertilizers has shown that the use of N-GUARD technology positively influences soil microbiology, resulting in significant increases in microbial biomass after application, ranging from 20-40% (soil analysis method based on the measurement of CO₂ content, mainly from the respiration of microorganisms).

NG TECHNOLOGY FOR THE OILSEED RAPE CROP

Determination / Specification	Available LIMIT	RVA (before application)		RVA (after application)	
		Available elements	TOTAL (mg/kg)	Available elements	TOTAL (mg/kg)
pH	6,5	6,0		5,9	
N (Kg/ha)		21		38	
N ₄ - NH (ppm)	-	1,6	130	4,0	1170
N ₃ - NO (ppm)		5,4		8,6	
Phosphorus(ppm)	16	26	510	24	506
Potassium (ppm)	-	266	6031	239	5528
Potential mineralizable nitrogen (kg/N/ha)	-	46	-	81	-
Microbial biomass (mg/kg)	-	1768	-	3528	-
Report C:N	10-12	11,6	-	13,1	-
Total Nitrogen (%)	-	0,130	-	0,120	-
CO - C (µg/kg)	>70	79	-	159	-
Organic Carbon (%)	-	1,5	-	1,6	-

Soil analysis carried out to the oilseed rape crop prior to the application of N-GUARD technology, in a single dose, in spring and immediately after harvest, show a significant increase (almost double) in the amount of potential mineralizable nitrogen and soil microorganism activity, as well as an improved retention of organic carbon in the soil.

It is also interesting to note that NUTRI-TOP and N-GUARD technologies ensure particularly high utilization coefficients of the content of active ingredients in fertilizers - the production results obtained in this case were achieved practically without significant changes in the content of available and total phosphorus in the soil.

In order to ensure profitability and sustainability (while providing important environmental benefits), farmers can adopt and implement on their farms innovative fertilization technologies specific to both intensive and organic farming systems along with farmland management practices that are appropriate to their specific environment.

In this regard, CICH ROMANIA is currently working on the development of a new range of granulated organo-mineral fertilizers for agricultural and horticultural crops, fertilizers that contain, along with mineral elements, carbon and nutrients of exclusively biological origin.

Organo-mineral fertilizers are the optimal result of organic and mineral substances, depending on the nutritional needs of plants, which will lead to products that release nutrients (nitrogen, phosphorus, potassium, magnesium and other microelements) that, in addition to providing nutrients deficient plants, also have qualities to improve soil attributes (Blaga, Gh. et al., 2008).

These products, together with the appropriate fertilization method, constitute and represent modern technologies with significant quantitative and qualitative effects on yields and with positive economic and environmental impact.

0 Emissions

Environmentally friendly
No harmful pollutants
dispersed in the atmosphere

The only ECO certified granulator in Eastern Europe

ECO certification process, totally new granulation
line, 100% environmentally friendly

In the future, it is expected that the surfaces
of organic crops will steadily increase

Maximum Efficiency

INNOVATIVE production process
High quality raw materials,
ECO certified
Products that meet the needs
of plants

In this context, to maximize the effectiveness of the use of applied organo-mineral fertilizers, farmers soils must have good physical characteristics to allow plant roots to access water and nutrients - the soil surface must be protected from crusting and erosion to maximize water infiltration and the soil itself should be free of compacted layers (which constitute a barrier to root growth and water movement) and allow adequate habitat for a diversity of beneficial organisms.

Regarding the impact of using organo-mineral fertilizers on farmland and their environmental benefits, the literature mentions the following:

- They integrate more easily into the soil by absorbing the water available at the surface of the granules (they have a beneficial effect on soil structure and water availability in the immediate vicinity of the granules)
- Improve availability, usage and assimilation of mineral elements in the composition
- Enhance microbial activity - increase the activity of microorganisms by up to 75% which results in a greater variety of root biostimulants (substances that behave like plant hormones)
- Promote and support root activity / increase plant assimilation capacity
- Improve mineralization of organic matter
- Reduce nitrate runoff by improving nutrient recycling
- Improve humic substances/humic acids content
- Ensure healthy and fertile soil



ORDER OF ADDING PRODUCTS TO THE TANK-MIX

Fill half the clean tank with water, start stirring and add one at a time:

- 1 Products formulated as water soluble bags. (WSB)
- 2 **Dry formulated products** - water soluble granules (WSG/SG), wettable powders (WP), water dispersible granules (WDG/WG)
- 3 Compatibility agents and/or half the amount of anti-foaming agent - wait 2-3 minutes before adding other products, maintaining agitation.
- 4 Suspension concentrates (SC), suspension emulsions (SE), emulsions in water (EW), micro capsules (CS)
- 5 Liquid anti-drift agents, before the addition of concentrated emulsion formulations (EC)
- 6 Liquid formulated products such as emulsion concentrates (EC) based on oils or solvents, micro-emulsion formulations (MEC) and/or oil dispersion (OD) formulations - agitate liquid formulated products prior to blending
- 7 Water soluble concentrates (WSC), water soluble solutions (AS/SN) and soluble liquids (SL)
- 8 Concentrated oil-based additives (COC), surfactants, stickers, etc.
- 9 Liquid fertilizers, biostimulants and remaining water until the tank is full
- 10 Products for correcting the pH to the desired final value and the remaining half of the amount of anti-foaming agent

To increase the effectiveness of the spraying solution do not forget to use
TARGETUM | **P-HIDRO** | **MAGNET**
water conditioning products.



cich.ro



**COMBINATUL DE
ÎNGRĂȘĂMINTE
CHIMICE S.R.L.**

Head office

România, Constanța, Năvodari
Strada Principală, nr. 1,
pavilion administrativ, et. II
Tel. +40 241 255 175
Fax. +40 241 618 640

Sales Office

România, Bucharest
Șos. Gheorghe Sisești, nr. 75B, sector 1
E-mail: comercial@cich.ro

www.cich.ro



for over **20** years with you



The photos of products in this catalogue are for presentation, advertisements and informative purposes and may be changed due to raw materials and other factors.

NĂVODARI CHEMICAL FERTILIZER FACTORY