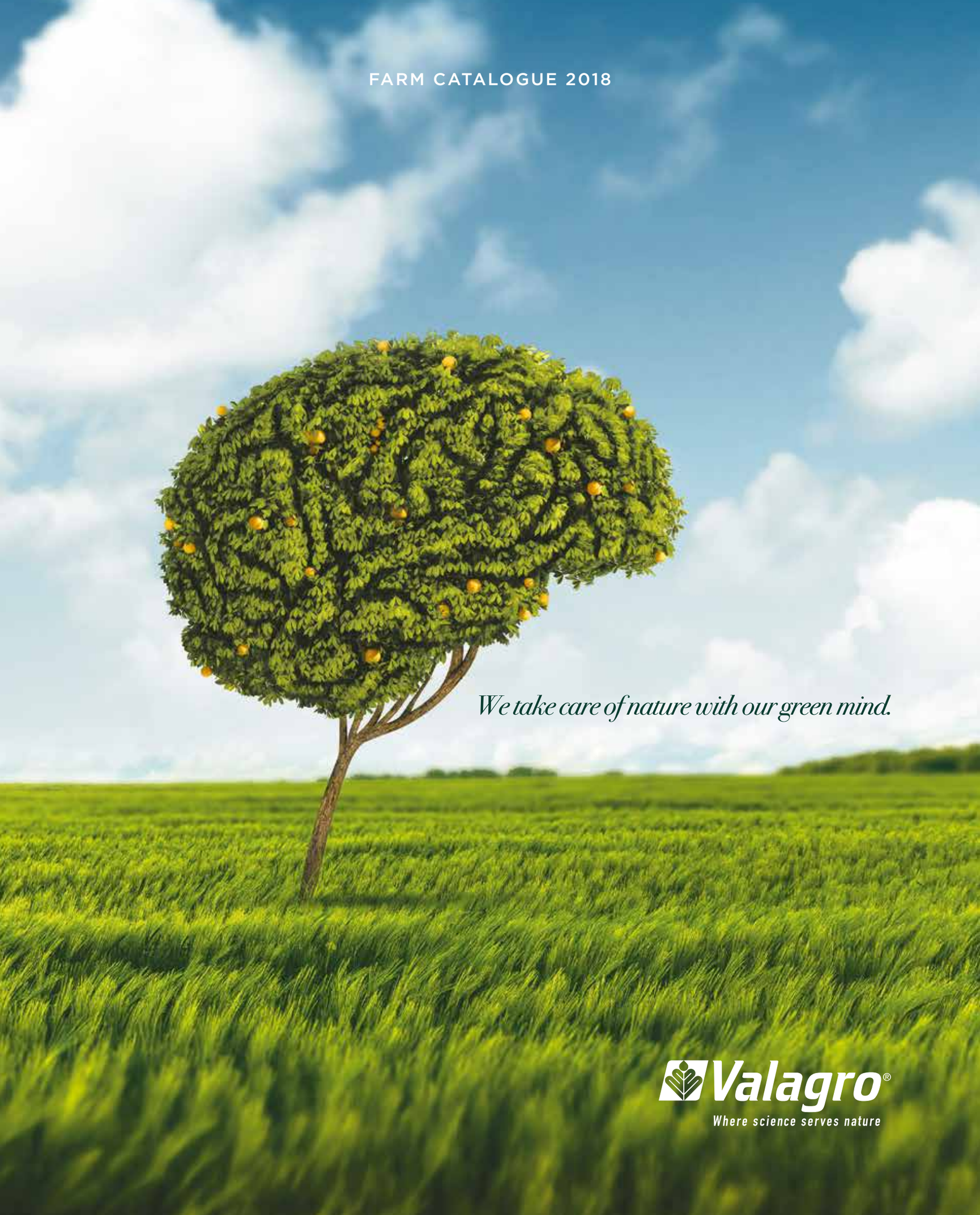
FARM CATALOGUE 2018



We take care of nature with our green mind.

Valagro®

Where science serves nature

FARMCATALOGUE

Valagro®

Where science serves nature

This is a catalogue for those who love agriculture. It is for those who have cultivation in their blood, a family legacy. It is for those who chose it for their career and for those who found it by chance and never left.
It is for farmers, who with their products feed the world, and also for distributors, who with their work offer knowledge and technical support to the former.
It is for the people who work at Valagro, those who every day bring a dream to reality: to give our customers effective and innovative solutions. And it is dedicated to all those who work in the industry every day with dedication and passion.
We believe that agriculture is there for everyone, but especially for those who work within it with commitment and innovation, and have something more to offer about the growing challenge of nutrition.

Ottorino La Rocca
Chairman of Valagro S.p.A

Welcome to the world of Valagro, where science serves nature

Certification regarding GHG
ISO/TS 14064:2013
ISO/TS 14067:2013

Innovation, sustainability, passion for the Customer

Leader in the production and commercialization of biostimulants and specialty nutrients, for more than 30 years Valagro has been committed to offering innovative and effective solutions for plant nutrition and care, able to guarantee better crops both in terms of quality and quantity, increasing efficiency and reducing environmental impact. With 12 subsidiaries throughout the world and a distribution network that covers more than 80 countries, today Valagro can provide a global response to customers' specific requirements.
These new and ever growing needs come within a context of ever scarcer and more precious resources.

For this reason Valagro has set itself a challenge, to be able to bring development and well-being using fewer resources,i.e. producing greater and better quantities for the worldwide food requirement using less land, less water, and fewer technical means.
In order to achieve this, Valagro puts research and scientific innovation at the service of nature, in the knowledge that taking care of the future means working with respect for the environment and protecting the well-being of all.

GLOBALG.A.P. GCSAA DNV·GL DNV·GL DNV·GL DNV·GL DNV·GL Responsible Care® Good Chemistry at Work EMAS IT 001794

The mission, the vision, the values

Science at service of humankind through innovation and respect for Nature

For years Valagro has been developing with passion innovative and effective solutions for plant nutrition and care, while respecting both people and the environment.

The increasing demand from the world's population for food and well-being requires an effective response.

Trusting in a return to nature is not a realistic alternative because it is not sufficient to meet the global needs.

On the other hand, relying excessively on chemistry is not a sustainable choice for the environment in the long term.

Aware of this challenge, Valagro believes it is possible to find a third way: to meet the needs of humankind using fewer resources, thanks to a new Con-science, able to put Science at the service of man through innovation and respect for Nature.

This vision is supported by the following values:

- honesty and integrity;
- passion for the customer, products and our work;
- responsibility to ourselves,
- others and the environment;
- cohesion and multiculturalism;
- confidence in innovation.

GeaPower: from nature, the best innovation and research for sustainable agriculture

GEAPOWER

To meet all the nutritional needs of the various crops throughout the world, with the minimum environmental impact. Following this vision, Valagro has always invested in research and development, generating highly innovative processes and solutions. The best ideas born from Valagro's research become prototypes.
Formulated in the laboratory, they are tested by careful experimentation and are subjected to strict testing in the open field, in different areas and environmental conditions.
Thanks to the agronomic know-how acquired over 30 years of experience, Valagro has created an innovative technological platform, **GeaPower**.

GeaPower technology is the basis for the agricoltural solutions and the industrial applications.

Deep knowledge of active ingredients and raw materials

Our in-depth knowledge of the biological and chemical characteristics of the raw materials - responsibly selected in pristine environments - allows us to identify, characterise and preserve the specific active ingredients that can help you reach targeted physiological responses in plants.

Selection of the extraction methods of active ingredients

For each raw material, and **for each active ingredient**, our researchers select and refine **the most effective extraction process** based on the desired solution. Only in this way it is **possible to preserve the active components** in plants. This is the real strength of our products.

Advanced Screening and investigation technologies

Our laboratories identify the process of **physical**, **chemical and biological classification** of the substances present in the extracts obtained from raw materials. We use genomics, phenomics, proteomics and metabolomics in order to decipher the genetic and molecular triggers and obtain specific physiological responses in plant systems. This helps us understand the way our products work. Thanks to our technology, we can analyse more than dozens of prototypes and hundreds of samples per experiment to map physiological responses in different environmental conditions.

Proven ability to provide effective solutions to the customer's requirements

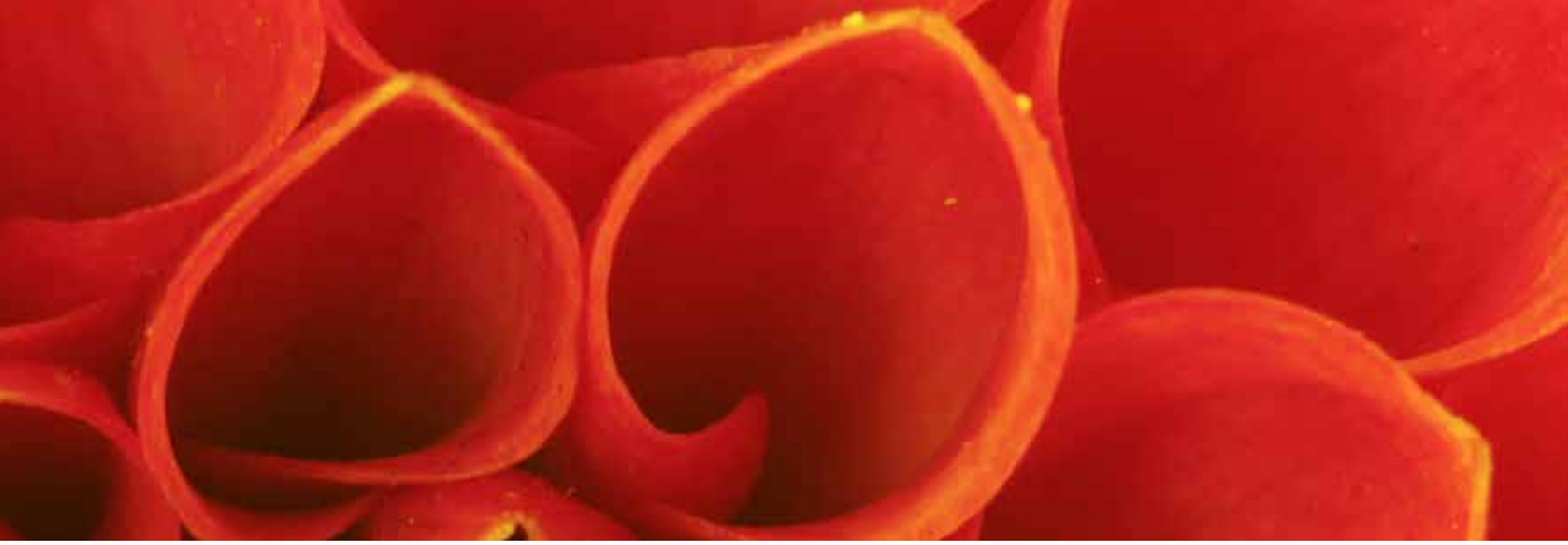
Perfect **knowledge** of functions related to the use of active ingredients extracted and characterised, and the ability to combine them, allows us to offer our customers the **best solution** for their needs. Our Marketing and R&D departments work very closely together because we believe it is essential to identify and offer to the market products with the best development potential.

GeaPower certifies an approach of excellence, based on four fundamental pillars

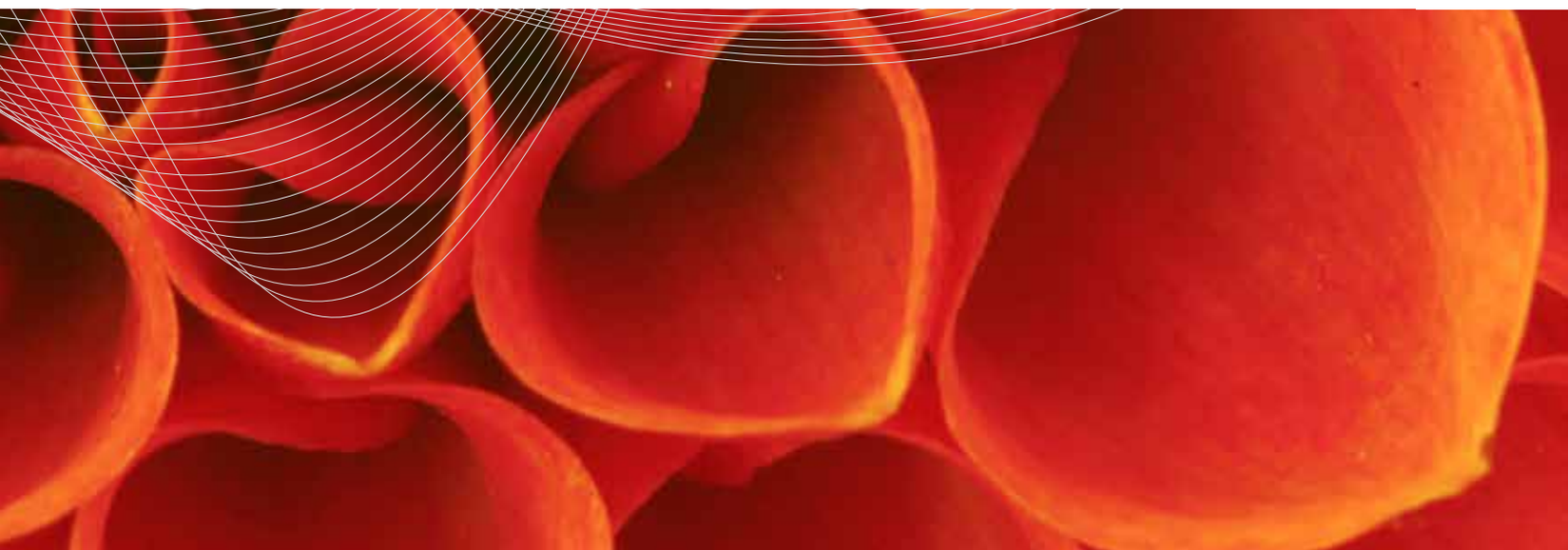
For each of the Valagro specialities, the GEA mark has a numeric code which identifies the specific and distinctive application of GeaPower.

Valagro@yourservice, a world of opportunities for our customers

Valagro®
ACADEMY



Alongside the distinctive offer of solutions constructed around a continual commitment to research and development, Valagro regards **customer focus** as a value to be implemented to the full and decided to expand its offer by including highly innovative and specialised services which can better meet customers' needs. Aware of this, Valagro has created **Valagro Academy**, an innovative programme designed to promote the company's expertise in the field of crop nutrition and biostimulants, and of how Valagro's solutions can improve the performance of crops, benefiting efficiency and sustainability in agriculture. Coordinated by the team of Valagro Marketing Crop Managers, Valagro Academy provides **training sessions** that involve the **sales team at each Group subsidiary**, with different methods (training meetings, one-to-one meetings, digital training), in order to share information and updates on the world of plant nutrition and biostimulants, along with specific sessions on products, local needs and the most appropriate solutions for them. In addition to the sales team of each subsidiary, **Valagro customers** can benefit from this highly specialized knowledge through training sessions based on specific needs and local experiences and can be assisted in choosing the best solutions to be applied in the field. Valagro Academy also includes **Platinum events** which aim to deepen the company technical and scientific expertise with Valagro's best customers, through the support of the Marketing department and sales team, and with the involvement of Valagro Global R&D department, who will be joined by researchers and experts from the academic and research fields. Valagro Academy is an integral part of the exclusive range of services offered to top customers in the **Valagro@yourservice**. This is the service model that the Group adopted to achieve an ever growing customer engagement which is able to promote sharing and partnership more effectively than traditional sales targets and market strategies. Valagro@yourservice offers differentiated services in four categories -Standard, Silver, Gold and Platinum - based on turnover, market potential and level of loyalty, in order to be able to promote a process which interprets this differentiation as a lever to incentivise the customer's potential and loyalty. For the same reason, the service model's categorisation of customers has an annual validity, with the aim of promoting an extremely dynamic process intended to grow and improve year by year. Valagro@yourservice therefore forms an innovation, the like of which it is difficult to find in the broad panorama of this industry. It is aimed at promoting an ever larger involvement of customers for incentivising the sharing and partnership of market objectives and strategies, for continual growth and shared development.



Download me to discover more!

AVAILABLE FROM JUNE

e-Hub
FOR CUSTOMERS

World is changing and digitalisation is one of the key facts of 2018. **Digital technologies** are part of our life and even during work we are using them much more than in the past.
In agriculture, digital technology can be a real support for growers to help them to "produce more with less" but even to increase the growth, predict stress for their plants, be more sustainable and with high quality products. Think about drones, big data, information just in time, easy tool to simplify your work, connection all over the world.
Valagro through **e-Hub**, an easy-to-use app with **high-tech tools**, shares just in time **best practices** and support improved **decisions** quality for farmers, distributors, technicians and customers interested in biostimulants, fertilizers and AG world.

Download it to easily access to complete and accurate info on products and solutions, and to our **social wall** to stay connected with Valagro world. Exclusive contents available **for top customers such as** access to an **exclusive expert club** where technician from distributors and Valagro can discuss about agronomical needs & solutions and to **best practises** from different countries.

Download now e-Hub for mobile
Or enter into the Valagro world
https://ehub.valagro.com

Download on the App Store

GET IT ON Google Play

With 12 subsidiaries throughout the world and a commercial network covering more than 80 countries, information management has always been a key issue and a challenge for Valagro

e-Hub

FARMCATALOGUE

PLANT BIOSTIMULANTS

MICRONUTRIENTS

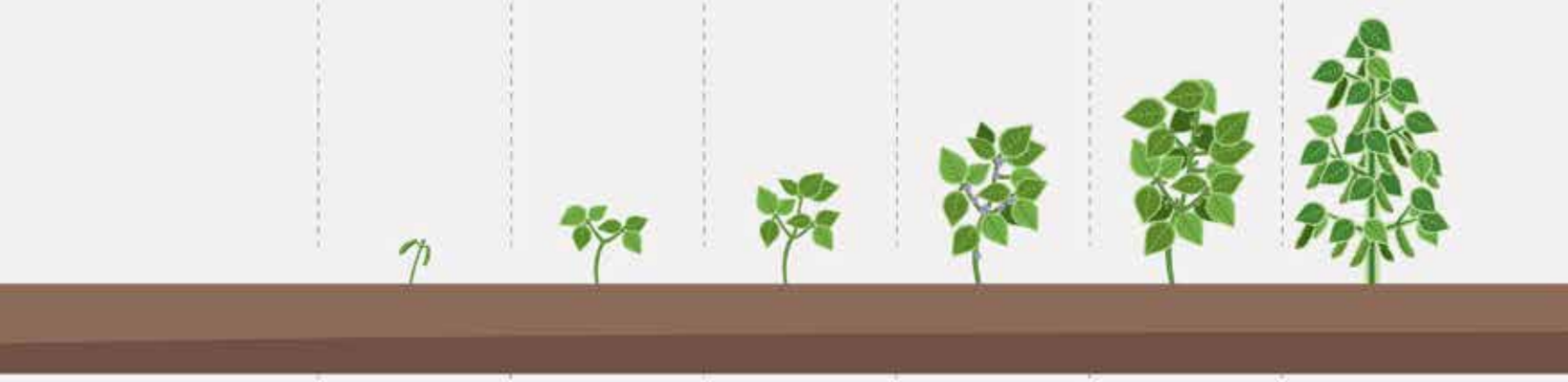
WATER SOLUBLE NUTRITION

WATER SOLUBLE NUTRITION

OTHER

INDUSTRIAL CROPS

PRE-SEEDING	SEEDING	PLANT DEVELOPMENT	PRE-FLOWERING	FLOWERING	FRUIT SET, POST FRUIT SET	RIPENING, HARVEST
		Megafol	Megafol	YieldON	Opifol	Opifol
		Glimo	Opifol	Opifol	Brexil	
		Opifol				

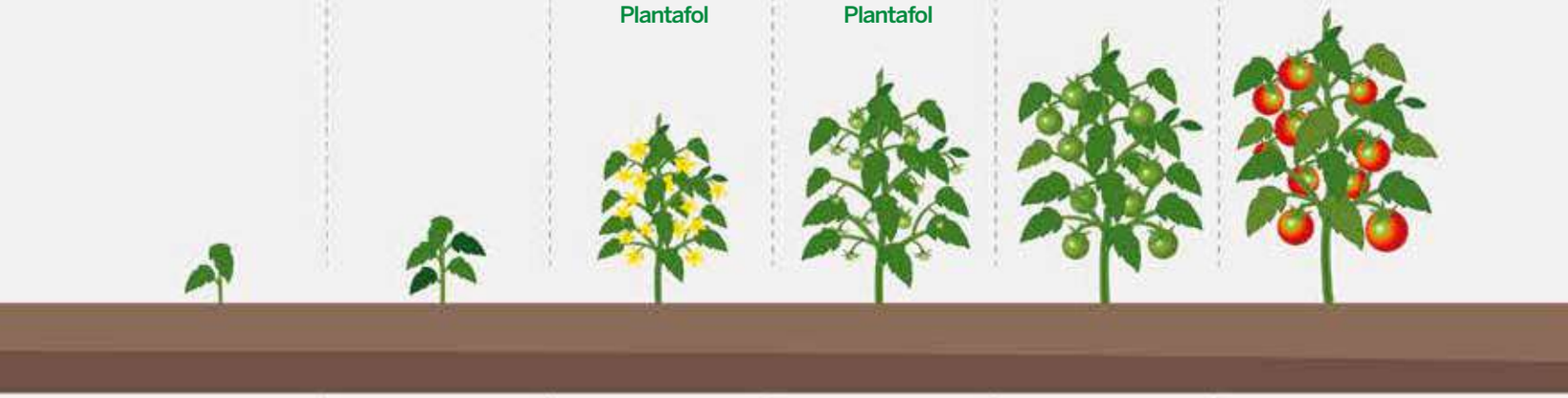


FRUIT CROPS

DORMANCY	VEGETATIVE REGROWTH, PLANT DEVELOPMENT	FLOWERING	FRUIT SET	FRUIT DEVELOPMENT	VERAISON, RIPENING, HARVEST	POST-HARVEST
Erger	Kendal Line	Benefit Pz	Benefit Pz	Actiwave	Actiwave	Brexil
Activ Erger	Mc Extra	Kendal Line	Kendal Line	Kendal Line	Kendal Line	Boroplus
	Megafol	Mc Cream	Mc Cream	Mc Cream	Megafol	Ferrilene
	Retrosal	Mc Set	Megafol	Megafol	Retrosal	Master
	Viva	Megafol	Retrosal	Retrosal	Sweet	Master Supreme
	Brexil	Retrosal	Viva	Brexil	Brexil	
	Ferrilene	Viva	Brexil	Calbit C	Master	
	Master	Boroplus	Boroplus	Ferrilene	Master Supreme	
	Master Supreme	Master	Calbit C	Master	Plantafol	
	Plantafol	Master Supreme	Master	Master Supreme		
		Plantafol	Master Supreme	Plantafol		
			Plantafol			

VEGETABLES

TRANSPLANT	PLANT DEVELOPMENT	PRE-FLOWERING, FLOWERING	FRUIT SET, POST FRUIT SET	FRUIT DEVELOPMENT	VERAISON, RIPENING, HARVEST
Kendal	Kendal Line	Benefit Pz	Benefit Pz	Actiwave	Actiwave
Radifarm	Mc Extra	Kendal Line	Kendal Line	Kendal Line	Kendal Line
	Megafol	Mc Cream	Mc Cream	Mc Cream	Megafol
	Retrosal	Mc Set	Megafol	Megafol	Retrosal
	Viva	Megafol	Retrosal	Brexil	Sweet
	Brexil	Retrosal	Viva	Calbit C	Brexil
	Ferrilene	Viva	Brexil	Ferrilene	Master
	Master	Brexil	Boroplus	Master	Master Supreme
	Master Supreme	Boroplus	Ferrilene	Master Supreme	Plantafol
	Plantafol	Master	Master	Plantafol	
		Master Supreme	Master Supreme		
		Plantafol	Plantafol		



TROPICAL CROPS

TRANSPLANT	VEGETATIVE DEVELOPMENT	FLOWER DIFFERENTIATION	FLOWERING	FRUIT DEVELOPMENT	RIPENING
Kendal	Megafol	Megafol	Benefit Pz	Benefit Pz	Retrosal
Radifarm	Retrosal	Retrosal	Retrosal	Retrosal	Boroplus
	Plantafol	Plantafol	Boroplus	Boroplus	Calbit C
			Calbit C	Calbit C	

Root Application | **PLANT BIOSTIMULANTS**

TECHNOLOGY | **GEA839**

Actiwave®

Increases the absorption of nutrients

Increases the plant's ability to absorb the nutritive elements in the soil. Optimizes mineral fertilization.

ACTIWAVE® is a unique and natural biostimulant that increases the absorption of nutrients in the soil and optimizes their use in the plant, even in difficult growth conditions (pH, heavy soils, drought, heavy rainfall). The exclusive formula, based on Geapower Technology (GEA839), is protected by a European patent application (EPA) which makes the product extraordinarily unique and innovative.

1 lt

10 lt

25 Kg

1000 lt

INGREDIENTS	TARGETS
CAIDRINE + ALGINIC ACID MONOMERS-OLIGOMERS	INCREASES THE ABSORPTION OF AVAILABLE NUTRIENTS
CAIDRINE + BETAINE	PROMOTES THE OVERCOMING ABIOTIC STRESS
CAIDRINE	INCREASES PRODUCTIVITY

DIRECTIONS FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
ACTIWAVE FERTIGATION	ALL CROPS	Applications during the crop cycle in presence of a well-developed root system	15-25 L/ha
ACTIWAVE G TOP DRESSING	FRUIT CROPS	1-2 applications from vegetative growth to fruit development	75-120 kg/ha
	VEGETABLE CROPS	2-3 applications from vegetative growth every 10-15 days	50-100 kg/ha
	ROW CROPS	1-2 applications	75-120 kg/ha

PHYSICAL PROPERTIES

	FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
ACTIWAVE	liquid	6.4	1.29	black	0.25
ACTIWAVE G	granular	7.6	1.0	brown	-

COMPOSITION

	Total nitrogen (N)	Organic nitrogen (N)	Urelc nitrogen (N)	Potassium oxide soluble in water (K2O)	Organic carbon soluble in water (C)	Total iron (Fe)	Fe EDDHA	Total Zinc (Zn)	Zinc EDTA	Total Manganese (Mn)
ACTIWAVE	3.0%	1.0%	2.0%	7.0%	12.0%	0.5%	0.5%	0.08%	0.08%	-
ACTIWAVE G	-	-	-	-	-	-	-	2.0%	-	3.0%

RECOMMENDATIONS

ACTIWAVE: the product performs its action in contact with the root system. When applying directly to the leaves, a significant volume of water must be used in order to wet the root system.

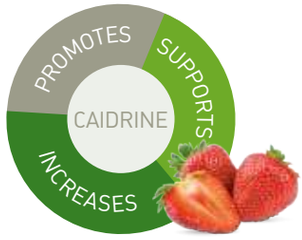
ACTIWAVE G: Plants must have a well-developed root system, in good condition, and physiologically active. The product must be applied in order to ensure contact with the roots (localised applications or at least close to the root system). The prompt action of ACTIWAVE® G is ensured by the next irrigation (or rain) that, on wetting the granules, will elute the product.

MORE INFORMATION

The patent: Caidrine

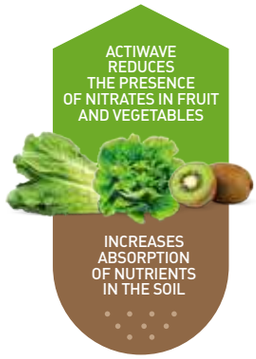
The continuous research and commitment of scientific experts in the R&D department of Valagro led to the identification of a **complex molecule** able to act directly on the mechanisms that regulate the absorption and use of nutrients.
Caidrine has a triple action:

» increases the ability of roots to absorb nutrients;
» increases the availability of nutrients in the soil, making them available for absorption by the plant cells;
» promotes plant use and the inclusion of nutrients in complex molecules (proteins, polysaccharides, etc.).



The problem of nitrates

Actiwave® regulates the absorption and **improves the use of nutrients** within the plant by optimising the absorption of nitrogen and **reducing the quantity of nitrates** in fruits and vegetables. By improving the capacity to absorb nutrients, Actiwave reduces losses through water stress, which also has a positive effect on the environment.
The nitrate problem received a dedicated regulation through a European Community 466/2001 which set the maximum tolerable content of nitrate in some vegetables, including lettuce and spinach. The plants employ nitrogen (N) to synthesize the proteins necessary for their growth, absorbing it from the ground directly in the form of nitrate or associated to other compounds. Through ground water and foods, nitrates can also enter into the human body where they are converted into other substances (nitrites, nitrosamines), compounds extremehly harmful to human health.



Foliar nutrients analysis

QUANTITY OF NUTRIENTS ABSORBED BY THE PLANT

	NUTRIENT	CONTROL	ACTIWAVE	DIFF. %
MACRO AND TRACE ELEMENTS	NITROGEN (N)	3.50	3.74	+ 7%
	PHOSPHORUS (P)	0.29	0.32	+ 13 %
	POTASSIUM (K)	4.58	5.77	+ 26 %
	CALCIUM (CA)	245	293	+ 19 %
	MAGNESIUM (MG)	0.58	0.80	+ 37 %
	IRON (FE)	81.71	98.68	+ 20 %
	MANGANESE (MN)	219.11	419.01	+ 91 %
	COPPER (CU)	3.61	6.13	+ 70 %
	ZINC (ZN)	54.91	112.55	+ 51 %
	BORON (B)	58.10	99.52	+ 71 %

Crop: CAPSICUM
Country: USA
Applications: 3
Dose: 20 lt/ha

Foliar Application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA708**

Benefit PZ®

Increases and standardizes fruit size

1 lt

10 lt

Increases and standardizes fruit size into larger size classes, it does not alter the consistency and shelflife of fruits.

BENEFIT® PZ is a natural product developed for increased weight and greater uniformity of fruits, BENEFIT® PZ, applied from the start of flowering, stimulates cell division and therefore increases the number of cells in each individual fruit.

Following water absorption and during normal metabolic activity of plants, a greater number of cells can therefore grow and expand, to have an increased fruit size, bringing the fruits into more profitable and higher caliber classes.

BENEFIT® PZ is indicated both for fruit crops (stone fruit, kiwifruit, table grapes) and for vegetables (watermelons, melons, courgettes, cucumbers etc), BENEFIT® PZ contains vitamins, proteins and free amino acids.

INGREDIENTS	TARGETS
VITAMINS + AMINO ACIDS AND PROTEINS	INCREASES AND STANDARDIZES FRUIT SIZE

DOSES AND DIRECTIONS FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
FOLIAR APPLICATION	FRUIT CROPS (STONE FRUIT, KIWIFRUIT, TABLE GRAPE)	2-3 treatments every 5-7 days from first flowerings	3-4 L/ha
	VEGETABLES (CUCUMBER, COURGETTE, AUBERGINE, PEPPER, TOMATO)	applications starting from first flowering every 7-10 days, repeat on subsequent flowerings	3-4 L/ha
	WATERMELON AND MELON	weekly treatments starting from first flowerings	3-4 L/ha

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
liquid	6.8	1.20	brown	0.20

COMPOSITION

Total nitrogen (N)	Water-soluble organic nitrogen (N)	Organic carbon (C)
3.0%	3.0%	10.0%

RECOMMENDATIONS Distribute the product with good and uniform wetting of leaf surfaces; for fruit CROP do not use less than 800 L of final solution per hectare.

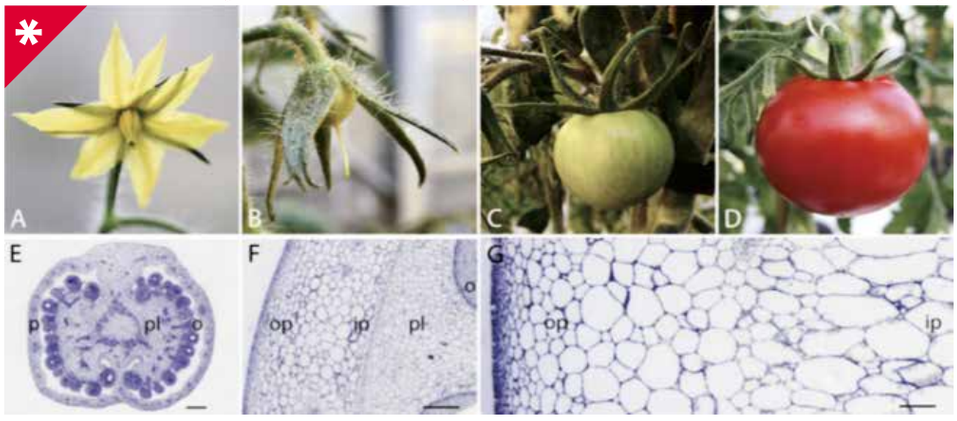
MORE INFORMATION

Benefit PZ + MC Cream Perfect synergy

Synergy is defined as cooperation between two or more elements for achieving a common aim, in our case, greater fruit size. This is what happens when we apply together BENEFIT® PZ and MC CREAM, the first acts on cell division, the second on cell distension.
The active ingredients of the formulation of the two VALAGRO products are complementary and synergic. BENEFIT® PZ contain biomolecules which stimulate the cytokinesis of the fruit (cell division), inducing an increase in the number of cells produced over time.
The higher protein needs of the plant, due to the increased cell division, is supported by the amino acids and vitamins provided by BENEFIT® PZ. At the same time, MC CREAM provides betaine, natural growth factors and amino acids. These active phytoingredients stimulate plant metabolic activity and photosynthesis, promoting moreover cell distension processes.

	INGREDIENTS	BENEFIT PZ **VITAMINS**	BENEFIT PZ **AMINO ACIDS AND PROTEINS**	MC CREAM **GROWTH FACTORS**
FUNCTIONS	**Increases and standardizes fruit size**	✓	✓	
	Stimulates metabolic and photosynthetic activity		✓	✓

Why the first application of Benefit + MC Cream during flowering?



Details of tomato fruit development (Maaike De Jong *et al.*, 2009)

(A, E) Flower and micrograph of an ovary at anthesis, awaiting pollination.
(B, F) Fruit of 0.8 mm in diameter, 10 d after pollination, and a micrograph of its pericarp.
(C, G) Fruit of 3 cm in diameter, 5 weeks after pollination, and a micrograph of its pericarp.
(D) Ripe tomato fruit.
(p) Pericarp
(op) Pericarp exterior
(ip) Pericarp interior
(pl) Placenta
(o) Ovules

CASE STUDY ON TOMATO
The growth of the fruit starts after the flower has been successfully pollinated and fertilised.
Cell division begins after fertilisation, starting from the final phase of flowering, and lasting up to 14 days. This period is followed by 6-7 weeks of cell expansion, during which the fruit's volume increases rapidly. Once the fruit has reached its final size, it begins to mature.

* Application of Benefit® PZ (4 L/ha) + MC Cream (2 L/ha) is particularly recommended starting from the flowering phase in order to provide the plant with all active ingredients essential for increasing cell division, which starts from the end of flowering.

Wood application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA342**

Erger®

Dormancy breaker

20 lt

Advances and synchronizes bud break, achieving early and uniform ripening of fruits.

In areas where the necessary chilling requirements are not satisfied, for example due to a mild winter season, the application of ERGER® allows the plant to start the metabolic processes that lead to the interruption of dormancy.

Using Geapower technology, Valagro developed GEA342, an innovative process that has allowed us to improve the product formulation, enhancing the effectiveness on activation of metabolic processes related to the interruption of plants dormancy.

ERGER® contains selected diterpenes, polysaccharides; it is also enriched with calcium and nitrogen (in the nitric, ammoniacal and ureic forms). Thanks to this formulation, ERGER® is particularly effective in deciduous fruit crops where it advances and synchronises bud break and reduces the number of blind buds. The positive effects can also be noted during the ripening of the fruits: ERGER® anticipates ripening, uniforms fruit size, reduces the number of harvest pickings and increases productivity. ERGER® must be associated with ACTIV ERGER® to support the enhanced plant enzymatic activity.

INGREDIENTS	TARGETS
SELECTED DITERPENES + POLYSACCHARIDES + CALCIUM + NITROGEN	ADVANCES AND SYNCHRONIZES BUD BREAK

DOSES AND DIRECTIONS FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
WOOD APPLICATION	CHERRIES	apply 45 days (± 5) before bud break. Wet the branches uniformly (10-15 hl of solution is recommended per hectare depending on the size of the plants). Note: mix 8 L of ACTIV ERGER with ERGER per hl of final solution. [final solution = 6 L of ERGER + 8 L of ACTIV ERGER + 86 L of WATER].	5-6 L/hl of solution
	TABLE GRAPES	apply 60 days (± 5) before bud break. Consider the anticipation of bud break due to possible covering. Wet the branches uniformly (4-6 hl of solution is recommended per hectare depending on the equipment used). Note: mix 16 L of ACTIV ERGER with ERGER per hl of final solution. [final solution = 6 L of ERGER + 16 L of ACTIV ERGER + 78 L of WATER].	6-7 L/hl of solution

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
liquid	6.0	1.25	brown	0.526

COMPOSITION

Total nitrogen (N)	Ureic nitrogen (N)	Nitric nitrogen (N)	Ammoniacal nitrogen (N)	Calcium oxide (CaO)
15.0%	6.1%	5.8%	3.1%	4.7%

RECOMMENDATIONS | Its use is only recommended in the central-southern areas, in places with fewer than 500 hours of cold (T <7.2° C).

MORE INFORMATION

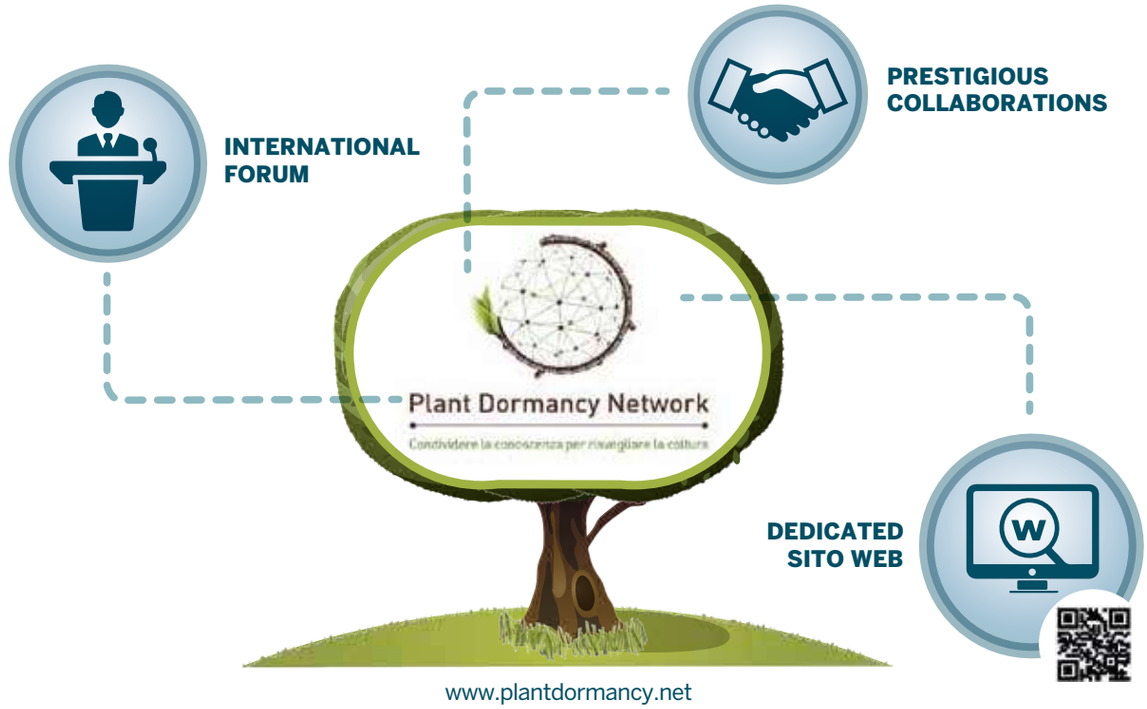
The Plant Dormancy Network

We started a collaboration with "Nsure" **to investigate the molecular aspects behind Erger® in using Next Generation Technology**.
Next Generation Sequencing technology: It is an innovative technology for the detection of all expressed genes, even for crops whose genome has not yet been sequenced.

This revolutionary technology is very important for us:
Discovery of the genes involved in bud break;
Dormancy-related genes modulated by Erger® mode of action, optimize application timing and dosage;
Objective approach, since the effect of Erger may vary, depending on orchard, season and growing conditions;
Correlation with physiological data.

NSURE is a research institutes of Wageningen University, leader in advanced technologies such as Next Generation Sequencing Technology for the detection of gene sequence and expression in plants.

to stimulate and share
KNOWLEDGE ABOUT PLANT DORMANCY



www.plantdormancy.net

Valagro has also promoted the creation of a specific website on dormancy and to ERGER solution:
www.plantdormancy.net

Root Application | Foliar Application | **PLANT BIOSTIMULANTS**

TECHNOLOGY **GEA249**

Kendal®

Nourishes and strengthens the plant naturally

Helps plants to remain vigourous in hostile growth conditions. Allows a better yield in terms of quantity and quality.

KENDAL® was developed to help plants remain vigourous in hostile growth conditions. The exclusive complex of biologically active ingredients, selected and processed with GEA249 technology, allows the entire plant system to be supported in the face of stress factors, promoting antioxidant function within the plant's cells.

1 lt

10 lt

INGREDIENTS	TARGETS
BIOLOGICALLY ACTIVE INGREDIENTS	HELPS PLANTS TO REMAIN VIGOROUS IN HOSTILE GROWTH CONDITIONS

DIRECTION FOR USE		CROP	PERIOD OF APPLICATION DOSE	DOSE
	FOLIAR APPLICATION	FRUIT CROPS	applications every 7-10 days	1.5-3 L/ha
		VEGETABLES	applications every 7-10 days	1.5-3 L/ha
		FLOWERS	applications every 7-10 days	1.5-3 L/ha
	FERTIGATION	FRUITS AND VEGETABLES	applications every 7-10 days	7.5-10 L/ha
	LOCALISED APPLICATION	FRUITS AND VEGETABLES	apply approximately 10 L/plant of nutrient solution	3.5-4 L/ha
		FRUITS AND FLOWERS	apply approximately 100-200 mL/plant of nutrient solution	300-400 ml/hl

COMPOSITION	Total ntrogen (N)	Ureic nitrogen (N)	Organic nitrogen (N)	Ossido di potassio (K2O)	Carbonio (C) organico
	3.5%	3.2%	0.3%	15.5%	3.0%

RECOMMENDATIONS

Copper based formulations can be applied on olives, grapes, potatoes and artichokes. In other crops, perform tests on selected varietals before extending the treatment. The product has an acid reaction. It is therefore recommended not to associate it with compounds with a strong alkaline reaction.

Physical properties: refer to Safety Data Sheet

Foliar Application | **PLANT BIOSTIMULANTS**

TECHNOLOGY | **GEA249**

Kendal® TE

Nourishes and strengthens the plant naturally

Helps plants to remain vigourous in hostile growth conditions. Enriched with Copper, Manganese and Zinc, it enables a greater yield and higher quality.

KENDAL® TE is made up of a pool of molecules extracted from carefully selected vegetable raw materials. This complex, developed with Geapower technology (GEA249), helps plants to mantain their vigour in hostile growth conditions. Furthermore, the presence of Cu, Mn, Zn helps to meet the requirement of micronutrients.

1 lt

INGREDIENTS	TARGETS
BIOLOGICALLY ACTIVE INGREDIENTS	HELPS PLANTS TO STAY VIGOUROUS IN HOSTILE GROWTH CONDITIONS
MICRONUTRIENTS Cu. Mn. Zn	PREVENTION AND CURE OF MICRO DEFICIENCIES

DOSES AND DIRECTION FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
FOLIAR APPLICATION	FRUIT CROPS *	applications every 7-10 days	3-3.5 L/ha
	VEGETABLES **	applications every 7-10 days	2-3 L/ha

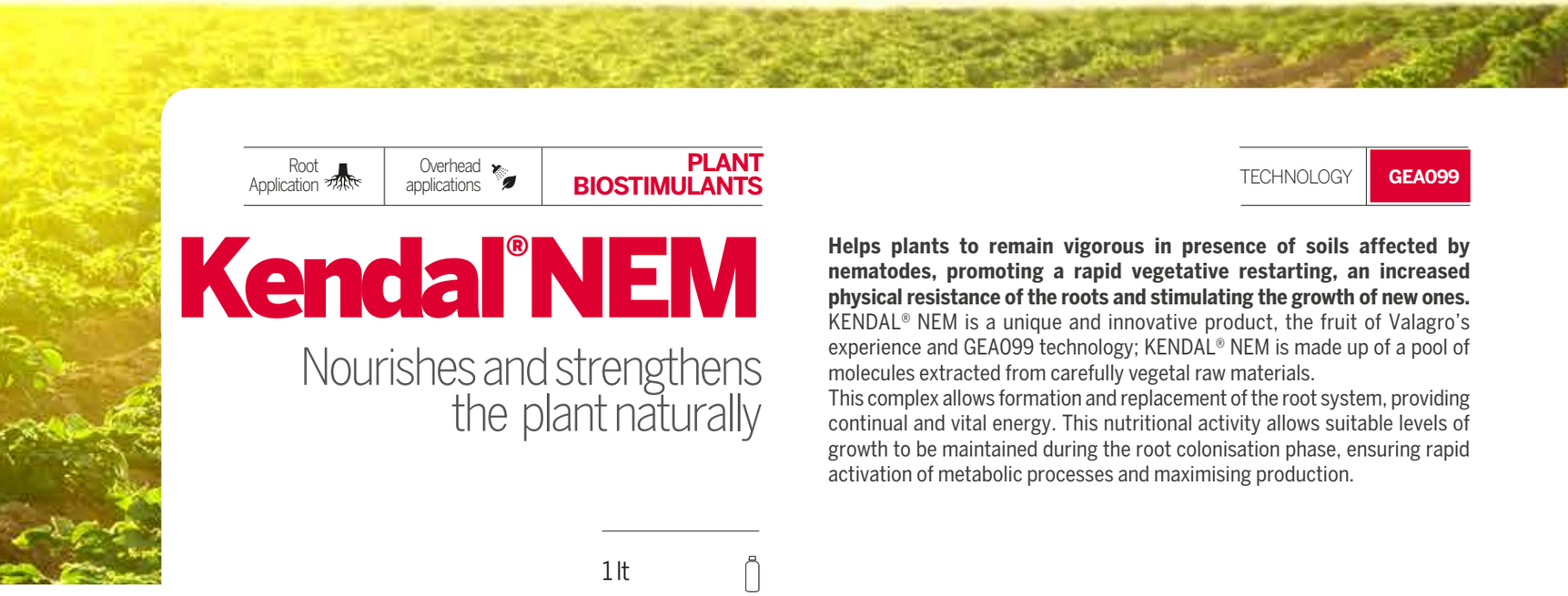
* Do not use KENDAL TE on species/varieties at risk of rust.
** Do not exceed 200 ml/hl in greenhouses. Always perform preliminary phytotoxicity tests.

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
liquid	8.4	1.5	green	0.26

COMPOSITION

	Total Copper (Cu)	Total Manganese (Mn)	Total Zinc (Zn)
KENDAL TE	23.0%	0.5%	0.5%



Root Application | Overhead applications | **PLANT BIOSTIMULANTS**

TECHNOLOGY **GEA099**

Kendal® NEM

Nourishes and strengthens the plant naturally

Helps plants to remain vigorous in presence of soils affected by nematodes, promoting a rapid vegetative restarting, an increased physical resistance of the roots and stimulating the growth of new ones.
KENDAL® NEM is a unique and innovative product, the fruit of Valagro's experience and GEA099 technology; KENDAL® NEM is made up of a pool of molecules extracted from carefully vegetal raw materials.
This complex allows formation and replacement of the root system, providing continual and vital energy. This nutritional activity allows suitable levels of growth to be maintained during the root colonisation phase, ensuring rapid activation of metabolic processes and maximising production.

1 lt

10 lt

INGREDIENTS	TARGETS
BIOLOGICALLY ACTIVE INGREDIENTS	IINCREASES ROOT VIGOUR
BIOLOGICALLY ACTIVE INGREDIENTS	ROOT SYSTEM RECOVERY
MINERAL FRACTION + BIOLOGICALLY ACTIVE INGREDIENTS	NUTRITIONAL ACTIVITY

DOSES AND DIRECTION FOR USE		CROP	PERIOD OF APPLICATION
	FERTIGATION	ALL CROPS	5-20 L/ depending on the severity of root damage and frequency of application*
	OVERHEAD APPLICATION**	HORTICULTURAL CROPS ROW CROPS	5-20 L/ depending on the severity of root damage and frequency of application*

* 5 L/ha for limited root damage or for applications every 7 days; 20 L/ha in case of high root damage or for applications every 20 days.
** Use an adequate volume of water to wash the leaf system so that the product reaches the soil and the roots.

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	suspension	6.1	1.2	brown	0.42

COMPOSITION	Total nitrogen (N)	Ureic nitrogen (N)	Potassium oxide (K2O)
	9.0%	9.0%	9.0%

MORE INFORMATION

Field evidencies

TREATMENTS

		DOSAGE L/HA	N. OF APPLICATIONS	VOLUME (L/HA)
TRIALS	STANDARD*	42	1	15.000
	STANDARD + KENDAL NEM	42 + 5	1 + 4**	15.000

* Chemical nematicide ** Applications every 7 days – first application 7 days after treatment with nematicide.

RESULTS – PRODUCTION

		PRODUCTION (Kg/PLOT)	DIFF. (%)	FRESH ROOT WEIGHT (G)	DIFF. (%)
TRIALS	STANDARD	29.2	-	17.5	-
	STANDARD + KENDAL NEM	45.8	+57%	24	+37%

RESULTS - increase of vegetative developmet after the applications of kendal Nem (5 L/ha)

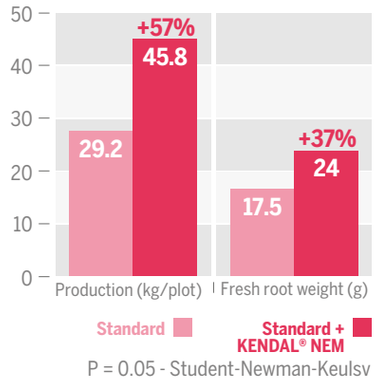
Standard + KENDAL® NEM

Standard

GENERAL INFORMATION

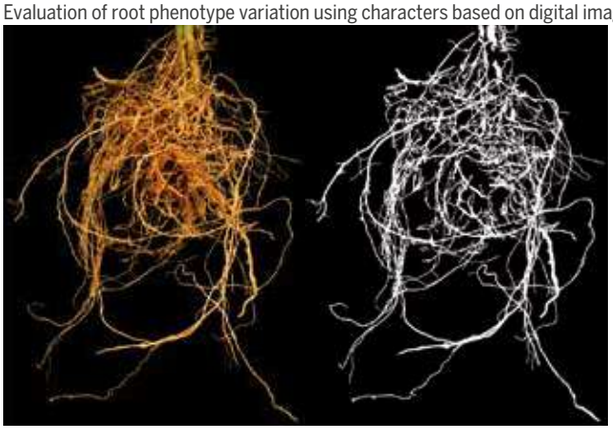
Location Zapponeta (FG)
Crop *Solanum lycopersicum* cv. DRW 7723
Conduction Greenhouse
Trial level II - RCB

RESULTS - CUMULATIVE PRODUCTION AND FRESH ROOT WEIGHT

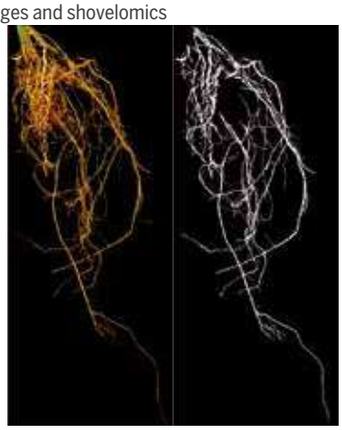


P = 0.05 - Student-Newman-Keulsv

Evaluation of root phenotype variation using characters based on digital images and shovelomics



Standard + KENDAL® NEM



Standard

SHOVELOMICS: high throughput phenotyping of root system architecture.
Trachsel *et al.*, 2011).
The evaluation involves assessing root systems in order to estimate root growth, development and architecture.
They can also be evaluated in the field, rinsed and stored for more in-depth lab analysis.
The technique allows to get a significant amount of data on the sampled and phenotyped roots.

Foliar application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA644**

MC Cream

Increases photosynthetic activity and production levels

MC CREAM is a cream formulation with a high concentration of active phytoingredients extracted from *Ascophyllum nodosum*, combined and processed according to GEA644 technology. This complex made up of betaines, amino acids and natural growth factors, stimulates the plant growth by increasing the metabolic and photosynthetic activity.

1 lt

10 lt

INGREDIENTS	TARGETS
GROWTH FACTORS + AMINO ACIDS + MINERAL FRACTION	GROWTH ACTIVITY INDUCTION
GROWTH FACTORS + BETAINES + AMINO ACIDS + MINERAL FRACTION	INCREASE OF PHOTOSYNTHETIC ACTIVITY

		CROP	PERIOD OF APPLICATION	DOSE
DOSES AND DIRECTION FOR USE	**FOLIAR APPLICATION**	FRUITS: POMACEOUS	1st application: flowering 2nd application: fruit set 2-3 applications every 7-10 days	2-4 L/ha
		FRUITS: DRUPACEOUS	2-3 applications every 5-7 days from dying sepal crown	2-4 L/ha
		WATERMELON AND GRAPES	2-3 applications every 5-7 days from flowering	2-4 L/ha
		POTATOES	1-2 applications every 5-7days from beginning of tuber formation	2-3 L/ha
		VEGETABLES (CUCURBITACEAE AND SOLANACEAE)	applications from first clusters flowering every 7-10, repeat for subsequent flowerings	2-3 L/ha
		STRAWBERRY	2-3 applications every 7-10 days from flowering	2-3 L/ha
		ARTICHOKE	2-3 applications every 7-10 days from differentiation of central flower head	2.5-3 L/ha
		FLORICULTURE	applications every 7-10 days 200 ml/100 L	2 L/ha

	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	liquid	3.9	1.2	green	0.17

	Manganese (Mn)	Zinc (Zn)
COMPOSITION	1.5%	0.5%

Foliar application | **PLANT BIOSTIMULANTS**

TECHNOLOGY | **GEA235**

MC Extra

Increases production and improves vegetative-productive balance

MC EXTRA is a readily and totally soluble concentrate based on active phytoingredients extracted from the algae *Ascophyllum nodosum*, processed according to the exclusive GEA235 technology.
The biologically active ingredients, including betaines, growth factors, mannitol, amino acids and proteins of natural origin, ensure a quantitative increase in production while maintaining optimal, balanced production.

0,5 Kg

1 Kg

20 Kg

INGREDIENTS	TARGETS
GROWTH FACTORS + PROTEINS AND AMINO ACIDS + MANNITOL + MINERAL FRACTION	PRODUCTION INCREASE
GROWTH FACTORS + PROTEINS AND AMINO ACIDS + BETAINES + MANNITOL	IMPROVES VEGETATIVE-PRODUCTIVE BALANCE

DOSES AND DIRECTION FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
FOLIAR APPLICATION	FRUITS: DRUPACEOUS	2-3 applications every 7-10 days starting from fruit set	0.5-1 Kg/ha
	FRUITS: POMACEOUS	2-3 applications every 7-10 days starting from petals falling	0.5-1 Kg/ha
	KIWIFRUIT AND GRAPES	Applications from bud wool stage - soft green tipped bud to pre-flowering	0.5-1 Kg/ha
	VEGETABLES (CUCURBITACEAE AND SOLANACEAE)	applications every 7-10 days from vegetative development to pre-flowering	0.5-1 Kg/ha
	OTHER CROPS	2-3 applications every 10-15 days in the early phases of development	0.5-1 Kg/ha
	STRAWBERRY	2 applications from vegetative restarting	0.5-1 Kg/ha
	FLORICULTURE	applications every 7-10 days from vegetative development to pre-flowering	50-100 g/hl

N.B. Applications on Kiwifruit and Grapevine during bud wool stage at the dose of 1 kg/ha, acting on the buds opening uniformly along the branches.

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
microflakes	9.2	45	black	0.59

COMPOSITION

	Potassium oxide (K2O) water soluble	Organic nitrogen (N)	Betaines	Mannitol	Organic carbon (C)
MC EXTRA	20.0%	1.0%	0.2%	4.0%	20.0%

Foliar application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA524**

MC Set

Stimulates flowering and fruit setting

MC SET is a formulation based on active phytoingredients extracted from the algae *Ascophyllum nodosum* and processed appropriately according to Geapower technology (GEA524). The complex of biomolecules within the product is enriched with a mineral fraction of Boron and Zinc which gives the product a considerable capacity to stimulate the flowering and fruit setting processes.

1 lt

10 lt

1000 lt

INGREDIENTS → **TARGETS**

GROWTH FACTORS + BETAINES + AMINO ACIDS + MINERAL FRACTION → STIMULATES FLOWERING AND FRUIT SETTING

		CROP	PERIOD OF APPLICATION	DOSE
DOSES AND DIRECTION FOR USE	**FOLIAR APPLICATION**	FRUITS: POMACEOUS	flower buds: 2 applications every 7 days	1-2 L/ha (150-200) ml/hl
		FRUITS: DRUPACEOUS	flowering: 2 applications every 5-7 days	
		STRAWBERRY	pre-flowering	
		VEGETABLES	pre-flowering 2 applications every 7-10 days	1-2 L/ha (150-200) ml/hl

	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	liquid	8.5	1.13	black	0.125

	Total Boron (B)	Water soluble Boron (B)	Total Zinc (Zn)	Water soluble Zinc (Zn)	EDTA chelated Zinc
COMPOSITION	0.5%	0.5% (5.65 g/L)	1.5% (17.0 g/L)	1.5% (17.0 g/L)	1.5% (17.0 g/L) stable within pH interval 4-11

MORE INFORMATION

We know *Ascophyllum nodosum* like nobody else!

The MC LINE is range of technical solutions based on active phytoingredients derived from the algae *Ascophyllum nodosum*, a brown algae of the Fucaceae family, the sole species of the *Ascophyllum* genus. It reproduces on the North American, northern European coasts of the Atlantic Ocean and it is also known as the Norwegian algae, as it is very widespread in that area. The specific conditions *Ascophyllum nodosum* grows it ensures that it is out of the water for long periods of time and submerged for other periods. Also, it thrives in areas with extreme variation of day length; many hours of light in summer and darkness in winter. The changes of temperature and humidity are therefore very intense and in order to survive, *Ascophyllum nodosum* developed during its evolution a series of substances with antistress properties.
These substances are extracted, selected and used for the production of Valagro nutritional specialities. In more than 75 years of experience, **Valagro has chemically and physically characterized 95% of *Ascophyllum nodosum.*** The knowledge of t he raw materials, the sustainable harvest methods, advanced production processes and extraction methods as well as the physiological functions of the active ingredients allow us to create products suitable for any need, in order always to get the best, naturally.

Ascophyllum nodosum

1. Deep knowledge of active ingredients and raw materials

• Morphological, cytological, reproductive, biochemical parameters

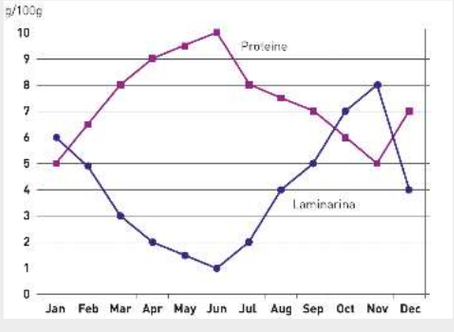
LEGEND
A. apex
B. basal buds
H. basal structure
I. internodes
L. lateral buds
P. primary buds
R. receptacle
S. stem
V. vesicles

•Sustainable harvest

A. nodosum is cut leaving a tallus of about 10 cm from the holdfast to allow it to regrow entirely within 4 years.

• Choice of active ingredients

Variation of the content of laminarin and proteins over the course of the year. The ideal time for harvesting depends on the type of active ingredient wanted.



2. Selection of extraction methods of active ingredients

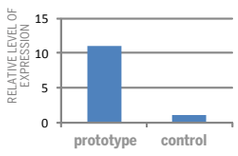
SOLUTION OF ACTIVE PHYTOINGREDIENTS	ACTIVE PHYTO INGREDIENTS IN SOLID FORMULATION	CREAM OF ACTIVE PHYTOINGREDIENTS
1. HARVESTING	1. HARVESTING	1. HARVESTING
2. DRYING	2. DRYING	2. COOLING
3. EXTRACTION OF ACTIVE PHYTOINGREDIENTS	3. EXTRACTION OF ACTIVE PHYTOINGREDIENTS	3. BUFFERING
4. TRANSFORMATION	4. TRANSFORMATION	4. MECHANICAL TRANSFORMATION
5. PACKAGING	5. DRYING	5. REHYDRATION
	6. PACKAGING	6. MECHANICAL OPERATIONS
		7. PACKAGING

3. Cutting edge investigation and analytical skills

Research strategies foresee the use of various instruments and testing, including genomic, phenomic and field trials.

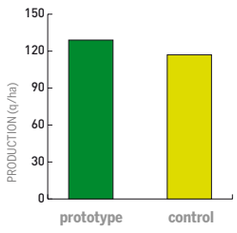
MICRO-ARRAY/GENOMIC GENECHIP®
(es. Arabidopsis)

At1g09240 gene metabolic functions



PHENOMIC
Multi-spectrum image analysis to detect morphological physiological parameters.

GREENHOUSE/OPEN FIELD



4. proven ability to provide effective solutions to the customer requirements

Mc line solution

Foliar Application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA931**

Megafol®

Anti-stress and growth activator

Promotes vegetative growth in normal conditions as well as during environmental stresses. Stimulates plant growth and improves effectiveness of treatments.

MEGAFOL® is a natural biostimulant that contains a complex of selected vegetal extracts, biologically active and it derives from Geapower® (GEA931) technology process. MEGAFOL® promotes balanced vegetative development and productivity. When used at times of stress (frost, flooding , drought and heat conditions, hail), the synergetic action of betaines, aminoacids, vitamins and growth factors allows MEGAFOL® to quickly and brilliantly overcome plant growth stop. MEGAFOL®, applied regularly provides a balanced plant growth development and promoting an improved yield. MEGAFOL® has also a carrier activity, improving foliar uptake of products used in mixture, at the same treatment, applied to the leaves.

- 1 lt
- 10 lt
- 20 lt
- 1000 lt

INGREDIENTS	TARGETS
BETAINES + VITAMINS + GROWTH FACTORS + AMINO ACIDS AND PROTEINS	ANTI-STRESS ACTION
VITAMINS + GROWTH FACTORS + AMINO ACIDS AND PROTEINS	STIMULATES PLANT GROWTH
AMINO ACIDS AND PROTEINS	TRANSPORT ACTIVITY (CARRIER ACTION)

DIRECTION FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	FOLIAR APPLICATION	FRUIT CROPS (GRAPE, APPLE, PEAR, CITRUS, OLIVE, STRAWBERRIES)	pre-flowering, post-setting, fruit development and in all cases of plant growth stop	2-3 L/ha
		VEGETABLES (TOMATOES, PEPPER, AUBERGINE, COURGETTE, CUCUMBER, SALAD)	in open field and greenhouses after transplant every 10-15 days	2-3 L/ha 150 - 250 ml/hl
		EXTENSIVE CROPS (TOBACCO, SUGAR BEET, COTTON)	1-2 applications during growth cycle	2.5-3 L/ha
		ROW CROPS (WHEAT, MAIZE, OIL SEED RAPE, SUNFLOWER, SOYBEAN, RICE, SORGHUM)	1-2 applications during growth cycle	1-3 L/ha

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	6.5	1.22	brown	0.3

COMPOSITION	Total nitrogen (N)	Organic nitrogen (N)	Ureic nitrogen (N)	Water-soluble potassium oxide (K2O)	Organic carbon (C) soluble in water
	3.0%	1.0%	2.0%	8.0%	9.0%

RECOMMENDATIONS

MEGAFOL® cannot be mixed with mineral oils. It can be associated with cupric compounds only on the following crops: olives, grapes, tomatoes, potatoes and artichokes. On plums, perform varietal selectively tests before extending the treatment to all crop.

MORE INFORMATION

Evidence of the phenomic approach about the anti-stress activity of Megafol®

In agriculture, abiotic stress is defined as any environmental pressure, which can reduce the potential productivity of a crop. Environmental stresses are the primary limiting factors for agricultural productivity. When the values of temperature, light intensity, water availability and/or nutrients diverged from the optimum values the crop yield can be seriously damaged or, in extreme cases, destroyed. Because of stresses, many yields are much less than their potential with significant production losses.

Abiotic stresses are classified according to the following table:

ABIOTIC OR ENVIRONMENTAL STRESS

	TEMPERATURE		WATER RELATED		LIGHT RELATED		DAMAGE	WIND
Physical	High	Low	Drought	Flood	Infrared	UV	Hail, pruning	Strong wind
Chemical	Salinity	Herbicide	Insecti-cide	Soil pH	Water pH	-	-	-

MEGAFOL® showed a strong anti-stress activity and the numerous trials realised under genomic and phenomic approaches are further confirmation of the numerous results from field trials of the product against environmental stresses.

STRESS	DEFINITION	PHENOMIC APPROACH	
		TEST	MEGAFOL
Drought	Water stress begins when the water demand of a plant exceeds the availability of water in the soil. The plant's water replacement is therefore limited, causing wilting of the leaves.		
Damage/injury	There is also stress sustained by the plant following pruning caused by cutting; plant grafting; weather events (hail, wind).		
Heat	Damage can occur in the leaves when transpiration is high and water replacement is insufficient or when the stoma are partially or completely closed because of high radiation.		
Low temperature	Low temperatures cause stress due to blocking or reduction of the plant's metabolism.		

The table to the side provides a brief summary of trials carried out, using phenomic approach, on different types of stress.

Tests with MEGAFOL®, under the phenomic approach, were performed at MetapontumAgrobios in Basilicata and were made possible using the Lemnatec Scanalyzer 3D digital measurement station. The phenomic approach involves studying plant development, highly efficiently thanks to the use of digital technology, and measuring the following parameters:

- morphology, architecture, leaf colour (via RGB, or red green blue light images in the visible spectrum);
- morphology and root activity; differences in the water content and other important parameters etc (using NIR – near infrared, images close to the infrared spectrum);
- photosynthetic efficiency (using UV-fluorescent rays).

MEGAFOL® was found to have positive results on the following stresses: drought, heat, low-temperature, physical damage, flood.

Foliar Application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA166**

Megafol® protein

Increase yield value

10 lt

Higher levels of protein on wheat.
Higher levels of protein and better digestibility of alfalfa.

MEGAFOL® PROTEIN is a powerful stimulator of proteins made up of a complex of biologically active organic substances and produced with the exclusive Geapower® technology (GEA166). Starting with selected vegetal matrices and using specific extraction methods, Valagro has developed a purified concentrate of biologically active ingredients that stimulates those metabolic processes which naturally increase biosynthesis and the accumulation of proteins. More specifically, MEGAFOL® PROTEIN increases protein content up to +2.5 percentage points in wheat and up to +5.8 in alfalfa. MEGAFOL® PROTEIN significantly supports plant metabolism, improving biosynthesis and the storage of proteins, via:

- Modulation of hormone signals and enzyme reactions;
- Stimulation of the metabolism of nitrogen, amino acids and sugars;
- Induction of the storage of proteins and protease inhibitors.

The result is a greater concentration of proteins in both wheat and alfalfa, which significantly increases the quality and value of the yield.

INGREDIENTS	TARGETS
BIOLOGICALLY ACTIVE INGREDIENTS	IINCREASE THE QUANTITY OF PROTEINS
BIOLOGICALLY ACTIVE INGREDIENTS	IMPROVE THE DIGESTIBILITY OF ALFALFA

DIRECTION FOR USE		CROP	PERIOD OF APPLICATION DOSE	DOSE
	FOLIAR APPLICATION	WHEAT	flowering	3 L/Ha. 1 application
		ALFALFA	from 7 to 15 days before harvesting	1.5 - 3 L/Ha; 1 or more applications
		SOYBEAN	from full flowering to the beginning of fruit setting	1.5 - 3 L/Ha; 1 application
		BEANS	from full flowering to the beginning of fruit setting	2 - 3 L/Ha; 1 or 2 applications

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20° C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18 °C
	liquid	7.6	1.22	black	0.3

COMPOSITION	Total nitrogen (N)	Organic nitrogen (N)	Ureic nitrogen (N)	Potassium oxide (K2O) soluble in water	Organic carbon (C)	Water-soluble iron (Fe)	EDDHSA Chelated iron (Fe)	Water-soluble manganese (Mn)	EDTA Chelated manganese (Mn)
	2.0%	1.0%	1.0%	4.5%	10.0%	0.022%	0.022%	0.026%	0.026%

MORE INFORMATION

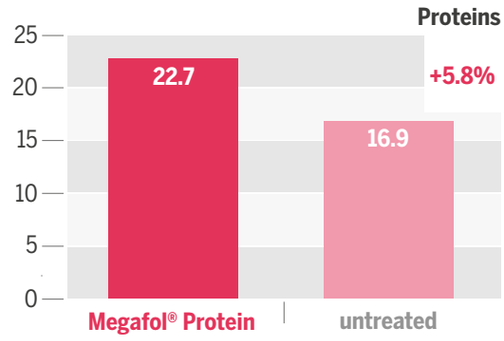
Megafol Protein increases the protein quantity of your crop

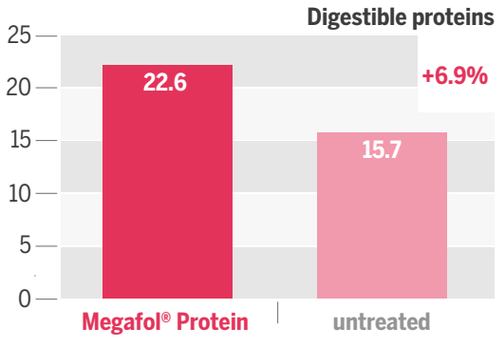
MEGAFOL® PROTEIN **maximises the value of wheat and alfalfa crops,** by naturally promoting an higher concentration of proteins. Its outstanding results are attested by highly accurate genomic analysis and numerous trials throughout the world.

MEGAFOL® PROTEIN is also cost-effective because it can be used with other foliar fertilisers and phytosanitary products (PPP). This is the reason why, a constant use of MEGAFOL® PROTEIN can considerably increase your business.

Higher protein quantity and better digestibility of alfalfa.

Alfalfa is the most cultivated forage legume in the world. It is a good source of protein, calcium, oligoelements and vitamins, which make it a balanced meal for livestock.
MEGAFOL® PROTEIN naturally increases the protein content of alfalfa of up to +34.3. At the same time, it promotes the digestibility of the fibre, as confirmed by its low NDF (Natural Detergent Fiber) index.
The double action of MEGAFOL® PROTEIN guarantees an higher value to alfalfa crops and better feed management in livestock farming.





Overhead Application | Root Application | **PLANT BIOSTIMULANTS**

TECHNOLOGY **GEA932**

Radifarm®

Root promoter
Reduces transplant stress

Ensures full attachment of transplanted or replanted plants. Reduces the time to overcome post transplant stress. Allows homogenous and uniform development of all seedlings.

RADIFARM® was developed for applications during the transplant phase and/or in the early stages of development of various crops. The product, not only nourishes the plant in the early stages but also promotes the formation of rich and advanced root systems by extending the existing roots and issuing new absorbent roots.

RADIFARM®, thanks to the innovative GEA932 technology, ensures optimal attachment of seedlings and rapid recovery from the transplant stress, including in unfavourable temperature and humidity conditions.

1 lt

10 lt

INGREDIENTS	TARGETS
VITAMINS + AMINO ACIDS AND PROTEINS + SAPONINS + MINERAL FRACTION	STIMULATES THE DEVELOPMENT OF THE ROOT SYSTEM
BETAINES + POLYSACCHARIDES	HELPS THE PLANT TO RECOVER FROM POST-TRANSPLANT STRESS

DOSES AND DIRECTION FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
FERTIGATION	HORTICULTURAL CROPS WITH FERTIGATION SYSTEM WITH DRIPPER CLOSE TO TRANSPLANTED PLANT	immediately after transplantation	500 ml/1000 m^2
		7 days after	500 ml/1000 m^2
	HORTICULTURAL CROPS WITHOUT FERTIGATION SYSTEM OR WITH DRIPPER DISTANT FROM THE PLANT (one of the following methods):	fertigation with nutrient solution (around 0.3-0.5 L/plant) immediately after transplant	150-250 ml/hl
		Localised applications with lance connected to atomiser immediately after transplant	150-250 ml/hl
		In case of use of transplant machines	300-400 ml/hl
	FRUITS AND FOREST PLANTS	On planting and on restored vegetative growth with localised fertigation (with nozzle connected to an atomiser or similar)	200-300 ml/hl
	ORNAMENTAL AND POTTED PLANTS	2-3 treatments every 7 days after transpant	1.5-2 L/m^3 of water
	NURSERY	Watering plants in trays	250 ml/hl

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCIVITY E.C. -1‰ (mS/cm) 18°C
liquid	5.0	1.21	brown	0.28

COMPOSITION

Total nitrogen (N)	Organic nitrogen (N)	Ureic nitrogen (N)	Potassium oxide (K2O)	Water-soluble organic carbon (C)	EDTA chelated Zinc (Zn)
3.0%	1.0%	2.0%	8.0%	10.0%	0.1%

MORE INFORMATION

Effect on tomato root physiology using phenomic approach

	TREATMENT	PRODUCT	DOSAGE
ORDINARY CONDITION	0 DPT*	Radifarm	3 ml/L
	7 DPT*	Radifarm	3 ml/L
	-	Control	-

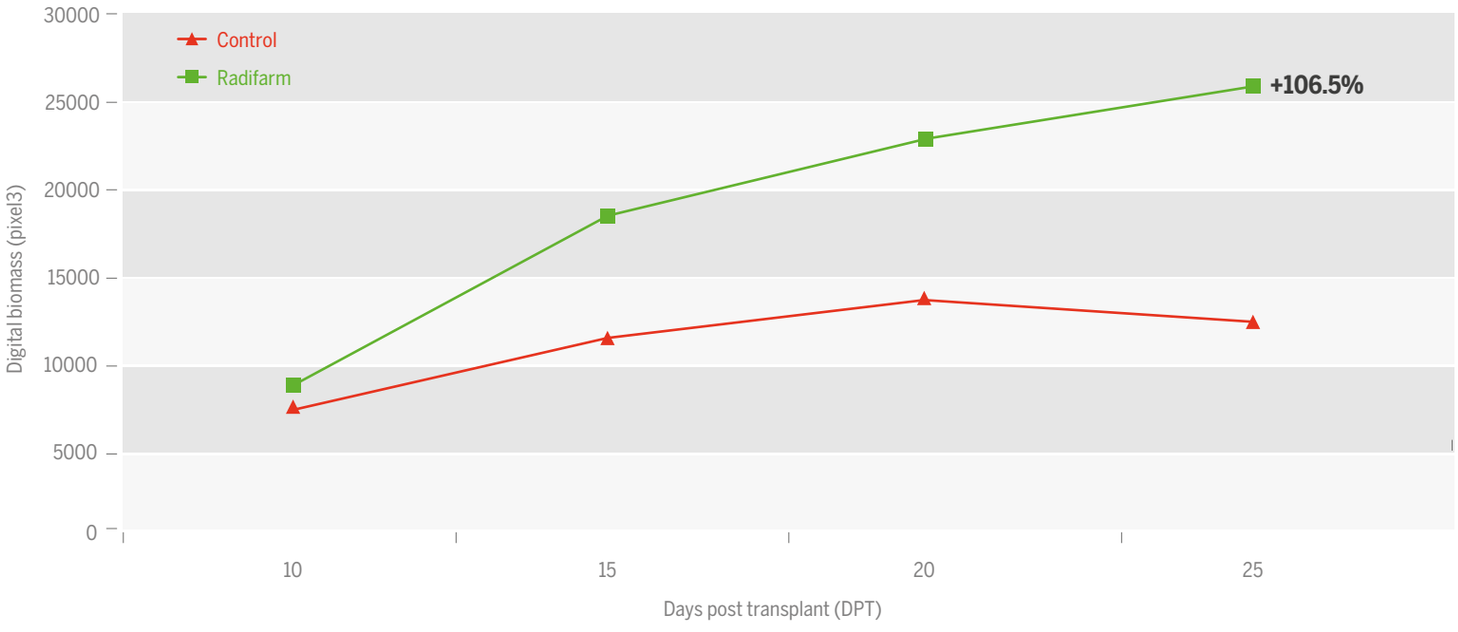
*DPT: days post transplant. Phenological stage at transplant: 4 leaves unfolded

Experiments performed on tomato (cv. "IKRAM")

Treated with Radifarm® +106% **Control**

Root expansion index and total biomass of Radifarm compared with the control

Total biomass



Root Application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA216**

Retrosal®

Keep your plant safe from salinity stress

10 lt

20 lt

Improves nutrient availability under salinity stress.
Retrosal® is an innovative biostimulant that improves plant growth on saline soils. The enriched formulation of retrosal, thanks to the innovative geapower technology (GEA216), is the right solution to keep plants growing vigorously and to ensure high quality and yields under high salinity soil conditions by restoring plant health and improving water retention.
Moreover Retrosal® is enriched with calcium and specific active ingredients that act to counter sodium displacement and improve physical and chemical soil conditions.

DOSES AND DIRECTION FOR USE

	CROP	PERIOD OF APPLICATION	DOSE
FERTIGATION	ALL CROPS	CLAY SOILS	20-25 Lt/ha
	ALL CROPS	SANDY SOILS	10-15 Lt/ha

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCIVITY E.C. -1‰ (mS/cm) 18°C
liquid	2.4	1.3	brown	0.43

COMPOSITION

Total nitrogen (N)	Organic nitrogen (N)	Ureic nitrogen (N)	Potassium oxide (K2O)	Water-soluble organic carbon (C)	EDTA chelated Zinc (Zn)
3.0%	1.0%	2.0%	8.0%	10.0%	0.1%

COMPOSITION

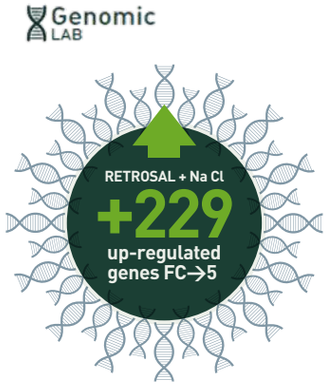
	(N) total	(N) organic	(N) ammon.	(N) ureic	P_2O_2	K_2O	(C) organic	CaO	MgO	Fe	Mn	Zn
RETROSAL N	-	-	-	-	-	-	-	5	-	-	-	0.5%

MORE INFORMATION

Genomic Approach

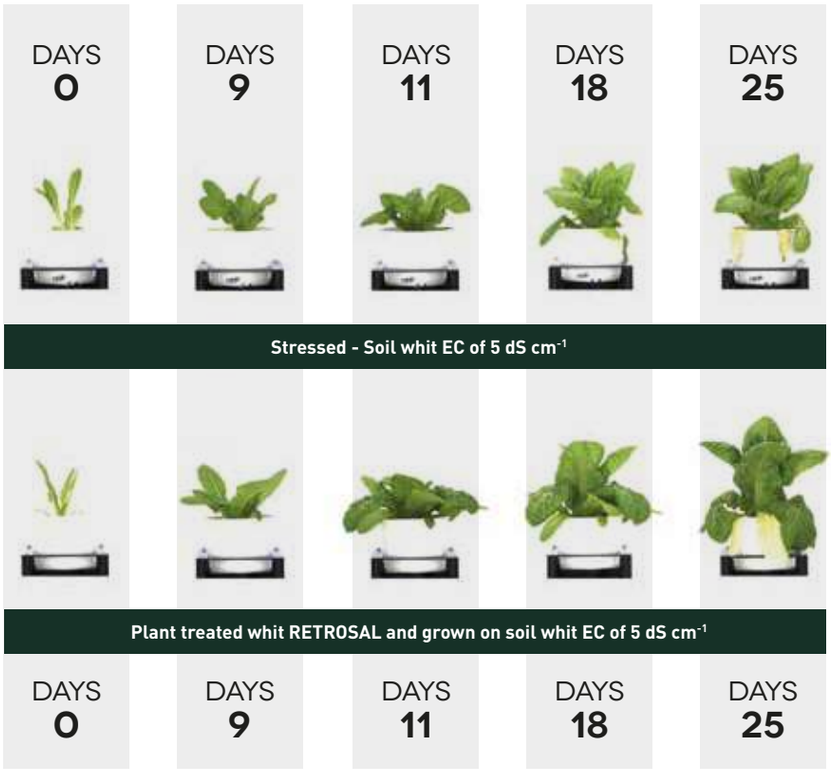
Genomic studies have shown that the application of Retrosal® under salinity stress activates genes/ pathways involved in:

» Osmotic Adjustment: synthesis of compatible osmolytes able to tolerate salinity stress and to confer protective properties;
» Cell Protections: induced biosynthesis of physical protective barriers which reduce the accumulation of toxic compounds;
» Improvement of Plant Metabolism: activation of energy pathways to support plant growth under salinity conditions.



Phenomic Evidence

Trial carried out on lettuce.
As shown in the figure on the right, when treated with Retrosal®, plants grown on saline soil manifest higher performances compared to stressed plants, especially in terms of digital biomass production. Retrosal® treatment is associated not only with higher biomass, but also with higher green index, a parameter related to chlorophyll content, which indicates a better photosynthetic activity of plants. Moreover, plants treated with Retrosal®, show better water retention capacity than those untreated.



Phenotype characterization of nutritional, hydrological, physiological state of plant growing in salty soil during 25 days.

Foliar application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA395**

Sweet®

Ripening promoter

1 lt

10 lt

Increases sugar concentration.
Improves fruit quality.

SWEET®, is a biostimulant that promotes the sugar production and it accelerates the biochemical processes of ripening, thanks to the content of Calcium, Magnesium, Trace elements and specific polysaccharides. SWEET® is a biostimulant for ripening resulting from the application of GEAPOWER technology (GEA395). SWEET® therefore produces an increase of sugars level, fruit dry matter and reduction of not saleable fruits at harvest time. It is particularly suitable for all cases of high production, in pedoclimatic conditions unfavourable for ripening processes, and for improving production quality (brix, fruit firmness). In flower crops it increases the brilliance, and the shelflife of cut flowers. To improve the effect of SWEET® is recommended to use it mixed with MEGAFOL® to take advantage of synergies between the two products.

INGREDIENTS	TARGETS
TRACE ELEMENTS (B. Zn) + MAGNESIUM + POLYSACCHARIDES	IMPROVEMENT OF SUGAR CONTENT
CALCIUM	IMPROVEMENT OF FRUIT CONSISTENCY AND SHELFLIFE

DIRECTIONS FOR USE

	CROP	TIMING	DOSE
FOLIAR APPLICATION	CITRUS	at the end of fruit enlargment at the beginning of fruit ripening	3-4 L/ha 3-4 L/ha
	APPLE, PEAR, PEACH, APRICOT, CHERRY, PLUM, NECTARIN	pre-veraison; veraison	2.5-3 L/ha 3 L/ha
	WINE GRAPE, TABLE GRAPE	pre-veraison; veraison	2.5-3 L/ha 3 L/ha
	WATERMELON	Fruit development after summer vegetative stasis (2 applications)	3 L/ha 3 L/ha
	TOMATO, PEPPER, AUBERGINE	pre-veraison application every 10-15 days	1.5-2.5 L/ha 2.0-2.5 L/ha
	MELON, WATERMELON	from fruit development every 10-15 days	2-2.5 L/ha
	STRAWBERRY	from whitening of fruits every 8-10 days	2.5-3 L/ha
	CARNATION, LILY, DAISY, ROSE	pre-flowering (1-2 applications)	200-300 ml/hl
	SUGARBEET	2 treatments during root growth	2.5 L/ha

PHYSICAL PROPERTIES

FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
liquid	3.5	1.35	violet	0.54

COMPOSITION

Water soluble calcium oxide (CaO)	Water soluble magnesium oxide (MgO)	Mono-di-tri-Polysaccharides	Boron (B) water soluble	Zinc (Zn) EDTA chelated
10.0%	1.0%	25.0%	0.1%	0.01%

MORE INFORMATION

Genomic Approach: a technique used to improve our products

Our genomic research approach allows Valagro to greatly accelerate the screening process for the substances to be used in the formulation of our nutritional products. The genomic approach also allows us to use the scientific method to confirm the features assigned by Valagro to their nutritional products. This uses a survey technique that allows us to investigate the ability of a substance to enable the functionality of one or more genes, and thus to accelerate one or more metabolic processes. Our genomic approach uses MicroArray technology - commonly known as "Gene Chip" - introduced in the 90s for studying human genetic diseases.
The technology has recently been extended to plant physiology research. This was made possible after the mapping of the genome of Arabidopsis thaliana, published in 2000 in "Science". Through this technology, Valagro can understand the true contribution of each component in the formula of any product ina timely and objective manner.

GENE MARKERS AND PLANT RESPONSE		AT2G43880 METABOLISM OF CARBOHYDRATES	AT2G43880 METABOLISM OF CARBOHYDRATES	AT4G10120 METABOLISM OF SUCROSE
	IMPROVEMENT OF SUGAR CONTENT	3 times more than untreated plants	3 times more than untreated plants	2 times more than untreated plants

The table below illustrates the increased activity of certain genes following the application of SWEET® (fingerprint).

The ability of SWEET® to improve the sugar content is due to the activation of certain genes of the plant involved in the metabolism of carbohydrates and sucrose.

Root Application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA930**

Viva®

Improves the rhizosphere efficiency and the vegetative-productive balance

The formulation of VIVA® has been improved trought the innovative Geapower (GEA930) technology.

The GEA930 process applied to the product has enabled obtaining highly purified humic acids from humin (insoluble and not usable by plants) enriched with vitamins, polysaccharides, amino acids and proteins. This pool of active ingredients revitalizes and improves the structure of the rhizosphere, promoting root growth and the vegetative-productive balance. Recent genomic and phenomic data have shown that application of VIVA® has a balanced action on many physiological plant processes (plant development, hormonal perception/signalling, stress response and metabolic activity). In addition, the treated plants present greater flowering and fruit setting, greater uniformity of ripening and fruit size.

1 lt

20 lt

1000 lt

INGREDIENTS	TARGETS
POLYSACCHARIDES + VITAMINS + PURIFIED HUMIC ACIDS	IMPROVES RHIZOSPHERE EFFICIENCY
POLYSACCHARIDES + AMINO ACIDS AND PROTEINS	BETTER VEGETATIVE-PRODUCTIVE BALANCE
MINERAL FRACTION + AMINO ACIDS AND PROTEINS + PURIFIED HUMIC ACIDS	INCREASED YIELD

DOSES AND DIRECTIONS FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	FERTIGATION	FRUIT CROPS	from vegetative regrowth until post-fruit setting with 2-3 applications	25-30 L/ha
		STRAWBERRY	post-transplant applications, plant regrowth and post-fruit setting	2-4 L/1000 m2
		VEGETABLES (TOMATO, COURGETTE, MELON, AUBERGINE, CAPSICUM, CUCUMBER)	post-transplant applications, vegetative growth and post-fruit setting each 10-15 days	2-4 L/1000 m2
		LEAFY VEGETABLES (ENDIVE, CHICORY, LETTUCE)	1-2 applications	2-4 L/1000 m2
		ARTICHOKE	plant regrowth and formation of central head	15-20 L/ha
		FLOWER CROPS	from post-transplant up to end of crop cycle each 15-20 days	3-5 L/1000 m2
		ROSE	from plant regrowth with applications every 15-20 days	6-7 L/1000 m2
	LOCALIZED APPLICATION	ROW CROPS	localized during sowing	10-20 L/ha

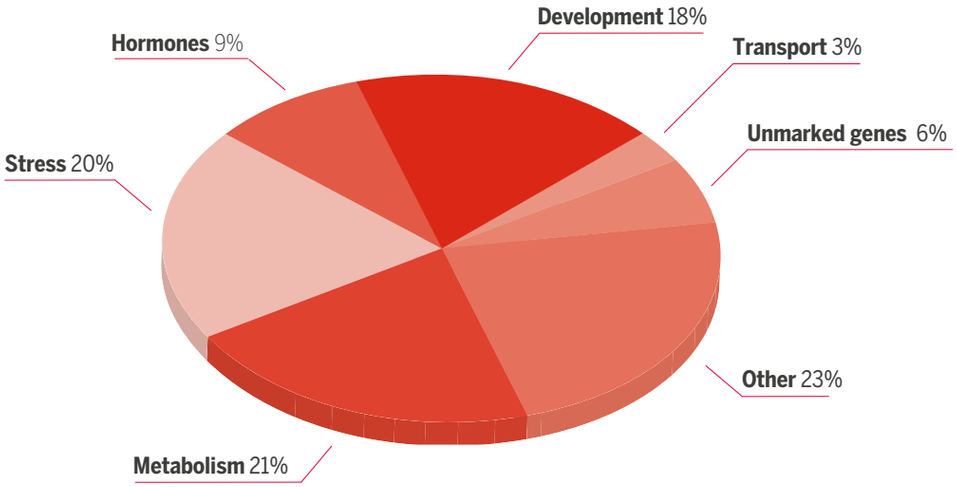
PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	6.2	1.24	black	0.29

COMPOSITION	Total nitrogen (N)	Organic nitrogen (N)	Ureic nitrogen (N)	Potassium oxide (K2O)	Organic carbon (C)	Iron (Fe) EDDHSA
	3.0%	1.0%	2.0%	8.0%	8.0%	0.02 %

MORE INFORMATION

An example of omics technology on product development

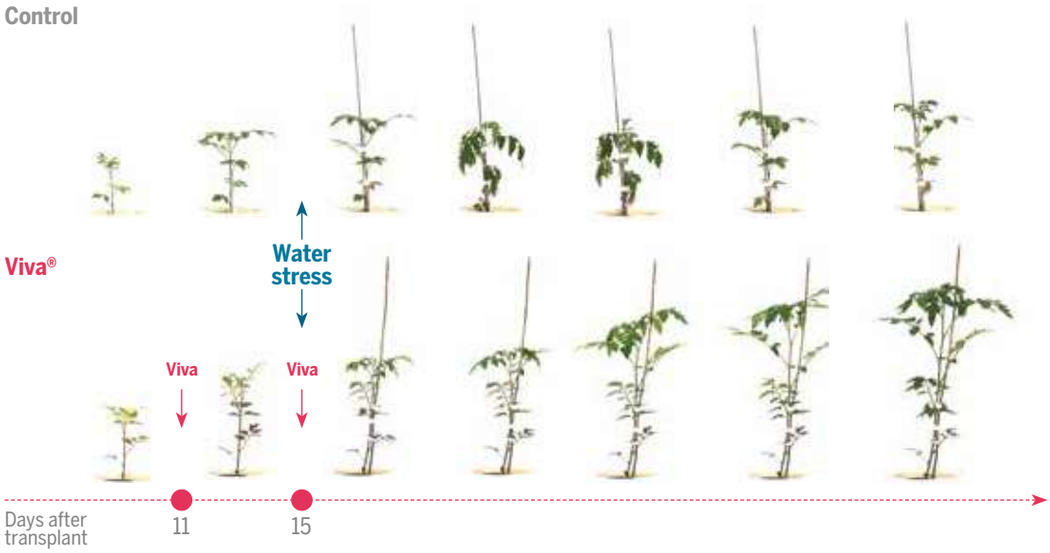
Distribution of functional groups of genes expressed more than three times after treatment with VIVA® compared with untreated control.



GENOMIC APPROACH

Genomic analysis indicates a balanced action of Viva® on many physiological processes of the plant:

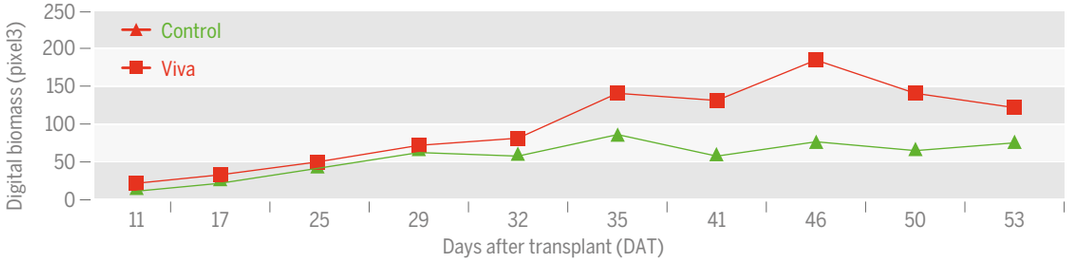
- plant development
- hormonal perception/signalling
- response to stress
- metabolic activity



PHENOMIC APPROACH

Trial with digital Lemnatec Scanalyzer 3D measurements on tomato (cv. Ikram), in stress conditions:

- sandy soil and water stress (-60% irrigation compared to standard conditions starting from 15 days after transplant).
- 2 applications of Viva® (11 and 15 days after transplant, each one at 25 l/ha).



Analysis of digital biomass

Viva® in sandy soil and water stress conditions increased the plant digital biomass by 130% compared to the untreated test.

Foliar application

PLANT BIOSTIMULANTS

TECHNOLOGY **GEA689**

YieldON®

Highest crop productivity, highest return for farmers

YieldON is a biostimulant able to increase row crops productivity modulating cell metabolism, division, expansion, improving also transport of sugars and nutrients, besides lipid biosynthesis and transport. Valagro switches "ON" row crops profitability. The most innovative technologies such as Genomics, Phenomics and Next Generation Sequencing are concentrated in the revolutionary YieldON: the ideal product to increase the productivity of industrial crops, in a natural way and in full respect of plant physiology. The result is an optimal return on investment for the farmer, who can count on a harvest of higher value guaranteed by Valagro.

20 lt

DOSES AND DIRECTIONS FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	FOLIAR	WHEAT	1 application at flag leaf growth stage	2 l/ha
		SOYBEAN	2 applications: the 1st at Vn/R1 growth stage, the 2nd at R3/R5 growth stage	2 l/ha
		CORN	1 application At V4-V6 growth stage	1-2 l/ha
		RICE	2 applications: the 1st at the beginning of booting, the 2nd at heading growth stage	1-2 l/ha
		COTTON	2 applications: the first mixed with pesticide/herbicide treatment, the 2° at the beginning of flowering	1-2 l/ha
		OIL SEED RAPE (CANOLA)	2 applications. The first mixed with pesticide/herbicide treatment, the 2° at the beginning of flowering	1-2 l/ha
		SUNFLOWER	1 application at 4-6 leaf growth stage	2 l/ha

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR
	liquid	6.5	1.2	black

COMPOSITION	Total nitrogen (N)	Soluble Potash (K2O)	Manganese (Mn)	Molybdenum (Mo)	Zinc (Zn)
	3.0%	3.0%	0.5%	0.2%	0.5%

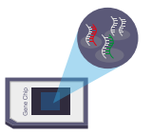
MORE INFORMATION

The innovation way to get YieldON > GEA689* Integrated approches

We carried out an integrated "omics & field-trials" approach to characterize the physiological effect of YieldON using different model plants (*Arabidopsis thaliana*, maize and soybean). In particular, we focused on gene expression and plant phenomic analyses. Thanks to the last "Next Generation Sequencing Technology" we obtained an accurate detection of all expressed genes, even for agronomically relevant crops like corn and soybean. Our results complement at the molecular and morphometric/physiological levels the evidence obtained in field trials.

GENOMICS

Genomic LAB



PHENOMICS

NEXT GENERATION SEQUENCING

EXPERIMENTAL FIELD TRIALS

In collaboration with the most important experimental centers worldwide

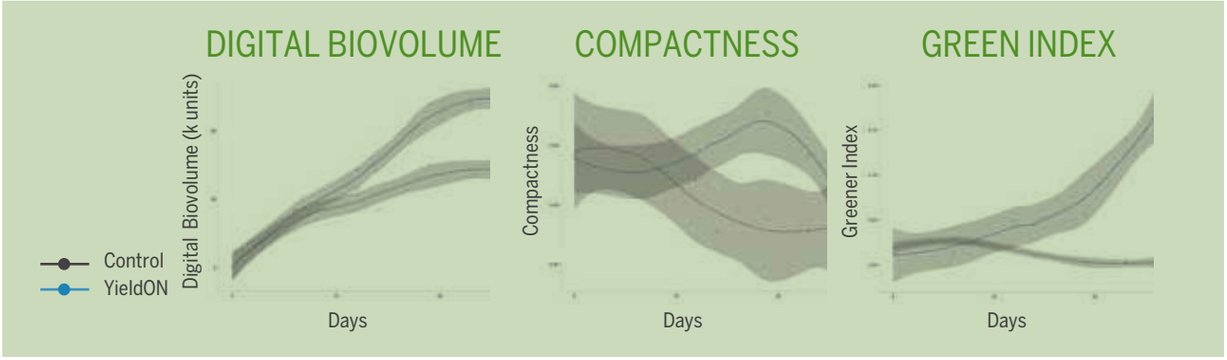
*For YieldON, the GEA code identifies the specific and distinctive application of GeaPower technology.

High efficiency phenotyping analysis as a tool in developingYieldOn 3D Scanalyzer Lemnatec Platform

Plant growth dynamics of soybean plants untreated and treated with YieldON:

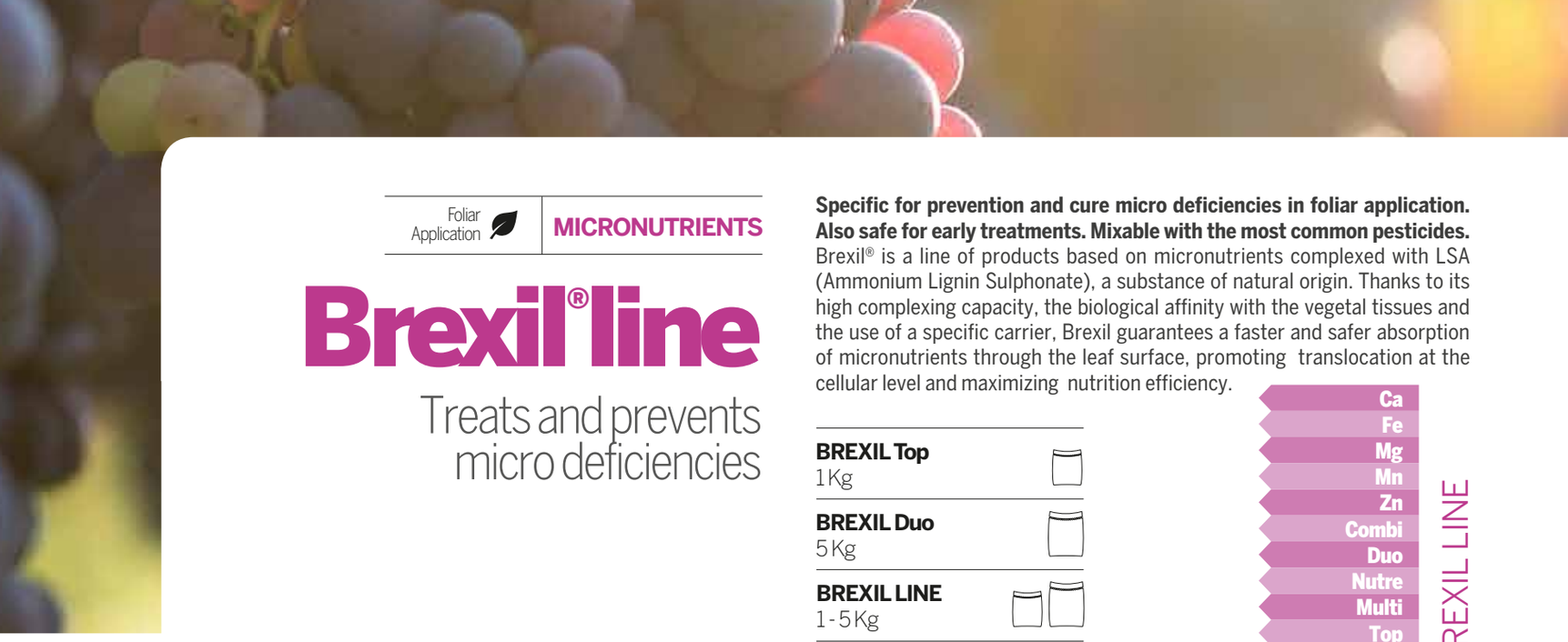
PLANT GROWTH DYNAMICS OF SOYBEAN PLANTS UNTREATED AND TREATED WITH YIELDON :

THESE PARAMETERS ARE STRICTLY CORRELATED TO THE YIELD INCREASE:



Activity presented at

PhenoDays 2016



Foliar Application | **MICRONUTRIENTS**

Brexil® line

Treats and prevents micro deficiencies

Specific for prevention and cure micro deficiencies in foliar application. Also safe for early treatments. Mixable with the most common pesticides.
Brexil® is a line of products based on micronutrients complexed with LSA (Ammonium Lignin Sulphonate), a substance of natural origin. Thanks to its high complexing capacity, the biological affinity with the vegetal tissues and the use of a specific carrier, Brexil guarantees a faster and safer absorption of micronutrients through the leaf surface, promoting translocation at the cellular level and maximizing nutrition efficiency.

BREXIL Top
1 Kg

BREXIL Duo
5 Kg

BREXIL LINE
1 - 5 Kg

BREXIL LINE
- Ca
- Fe
- Mg
- Mn
- Zn
- Combi
- Duo
- Nutre
- Multi
- Top
- Mix

		FORMULATION	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)
PHYSICAL PROPERTIES	BREXIL Ca	microgranules	6.5	brown	25
	BREXIL Fe	microgranules	3.3	brown	40
	BREXIL Mg	microgranules	3.4	brown	30
	BREXIL Mn	microgranules	3.3	brown	40
	BREXIL Zn	microgranules	3.5	brown	30
	BREXIL Combi	microgranules	3.9	brown	35
	BREXIL Duo	microgranules	5.8	brown	30
	BREXIL Nutre	microgranules	3.1	brown	30
	BREXIL Mix	microgranules	4.6	brown	30
	BREXIL Multi	microgranules	3.2	brown	30
	BREXIL Top	microgranules	7	brown	30

			FRUITS	VEGETABLES	FLORICULTURE	ROW CROPS
DOSES AND DIRECTION FOR USE	FOLAIR APPLICATION	BREXIL Ca	2.5-3.0 Kg/ha	2.5-3.0 Kg/ha	250-300 g/hl	2.5-3.0 Kg/ha
		BREXIL Fe	2.0-2.5 Kg/ha	2.5-3 Kg/ha	150-200 g/hl	2.5-3.0 Kg/ha
		BREXIL Mg	4-6 Kg/ha	2-5-3 Kg/ha	250-300 g/hl	3-5 Kg/ha
		BREXIL Mn	1.5-2.5 Kg/ha	1.5-2 Kg/ha	150-200 g/hl	2.5-3.0 Kg/ha
		BREXIL Zn	1.0-2.5 Kg/ha	1.0-1.5 Kg/ha	100-150 g/hl	100-200 g/hl
		BREXIL Combi	200-300 g/hl	150-200 g/hl	150-200 g/hl	1.5-2.5 Kg/ha
		BREXIL Duo	2-4 Kg/ha	2-4 Kg/ha	-	-
		BREXIL Nutre	2-2.5 Kg/ha	1-1.5 Kg/ha	100-150 g/hl	2.5-3 Kg/ha
		BREXIL Mix	200-300 g/hl	150-200 g/hl	150-200 g/hl	1,5-2,5 Kg/ha
		BREXIL Multi	2,5-3 Kg/ha	1,5-2 Kg/ha	150-200 g/hl	2,5-3 Kg/ha
		BREXIL Top	150-200 g/hl	100-200 g/hl	100-200 g/hl	1-2 Kg/ha

		CaO	MgO	B	Cu	Fe	Mn	Mo	Zn
COMPOSITION	BREXIL Ca	20.0%	-	0.5%	-	-	-	-	-
	BREXIL Fe	-	-	-	-	10.0%	-	-	-
	BREXIL Mg	-	8.0%	-	-	-	-	-	-
	BREXIL Mn	-	-	-	-	-	10.0%	-	-
	BREXIL Zn	-	-	-	-	-	-	-	10.0%
	BREXIL Combi	-	-	0.9%	0.3%	6.8%	2.6%	0.2%	1.1%
	BREXIL Duo	18%	4.0%	0.5%	0.5%	-	2%	-	2%
	BREXIL Nutre	-	-	-	-	2.0%	6.0%	-	6.0%
	BREXIL Mix	-	6.0%	1.2%	0.8%	0.6%	0.7%	1.0%	5.0%
	BREXIL Multi	-	8.5%	0.5%		4.0%	4.0%	-	1.5%
	BREXIL Top	-	-	2.0%	-	-	5.0%	0.5%	6.0%

* For BREXIL DUO, BREXIL NUTRE, BREXIL MIX, BREXIL TOP, BREXIL MULTI, follow the recommendations on the labels.

MORE INFORMATION

LSA: the benefits of the Brexil® Line

The use of micronutrients based products made up of salts or chelates with synthetic agents can cause problems of limited penetration, leaching and reduced selectivity. The fast and complete water solubility of Brexil's microgranular formulation and the complexing action of LSA on metals, guarantee a faster and safer absorption of micronutrients thorugh the leaf surface without leaving residues compared with product based on salts or chelates.

BENCHMARK MICRONUTRIENTS BASED PRODUCTS

SALTS ($ZnSO_4$. $CaCl_2$)	Medium leaf penetration	Easily leached	Risk of phytotoxicity
SALT + EDTA PHYSICAL EDTA MIXTURE	It is not a true chelate	High risk of phytotoxicity	Difficulty mixing with pesticides
SALT+ EDTA EDTA CHEMICAL REACTION	It is a true chelate	Medium leaf penetration efficiency	Risk of phytotoxicity
SALT + AMINO ACIDS PHYSICAL MIXTURE	It is only a mixture. it is not a chelated based products		
SALT + LSA CONTROLLED CHEMICAL REACTION	STABLE BREXIL® COMPLEX	Excellent penetration	Fast absorption	No risk of phytotoxicity	Mixable with the most common pesticides

FOCUS ON LSA

LSA (Ammonium Lignin Sulphonate) is a complexing agent derived from various sources of lignin, differing according to the species it is extracted from. Lignin is formed from the polymerisation of three hydroxycinnamyl alcohols, also called **monolignols.**
They are **p-coumaryl, coniferyl and sinapinic** alcohols. The ratio between the three monolignols in the lignin molecule is important in influencing the complexing capacity and the release of micronutrients within the tissues. Valagro's technology allows the most appropriate plant species to be chosen and the most innovative extraction methods to be used in order to obtain a lignin with an optimised ratio of the three monolignols. This translates into a **high complexing capacity** of micronutrients and the **natural selectivity and facility of penetration** within the plant tissues which are a feature of the products in the Brexil® line. The following is a schematic illustration of the leaf absorption process and the release of nutrients performed by the complexing agent LSA.

fig.1

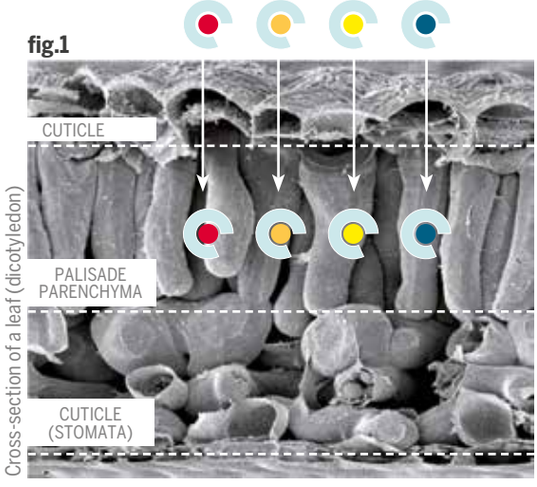
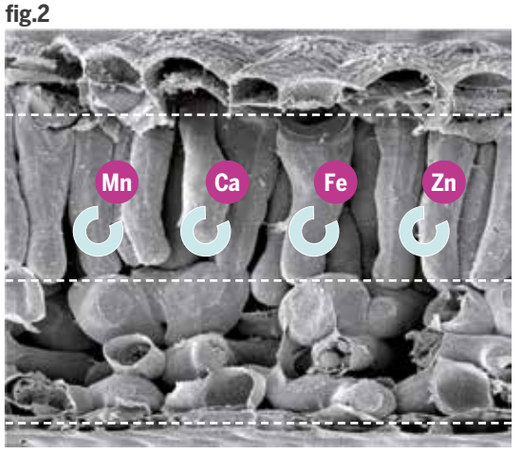
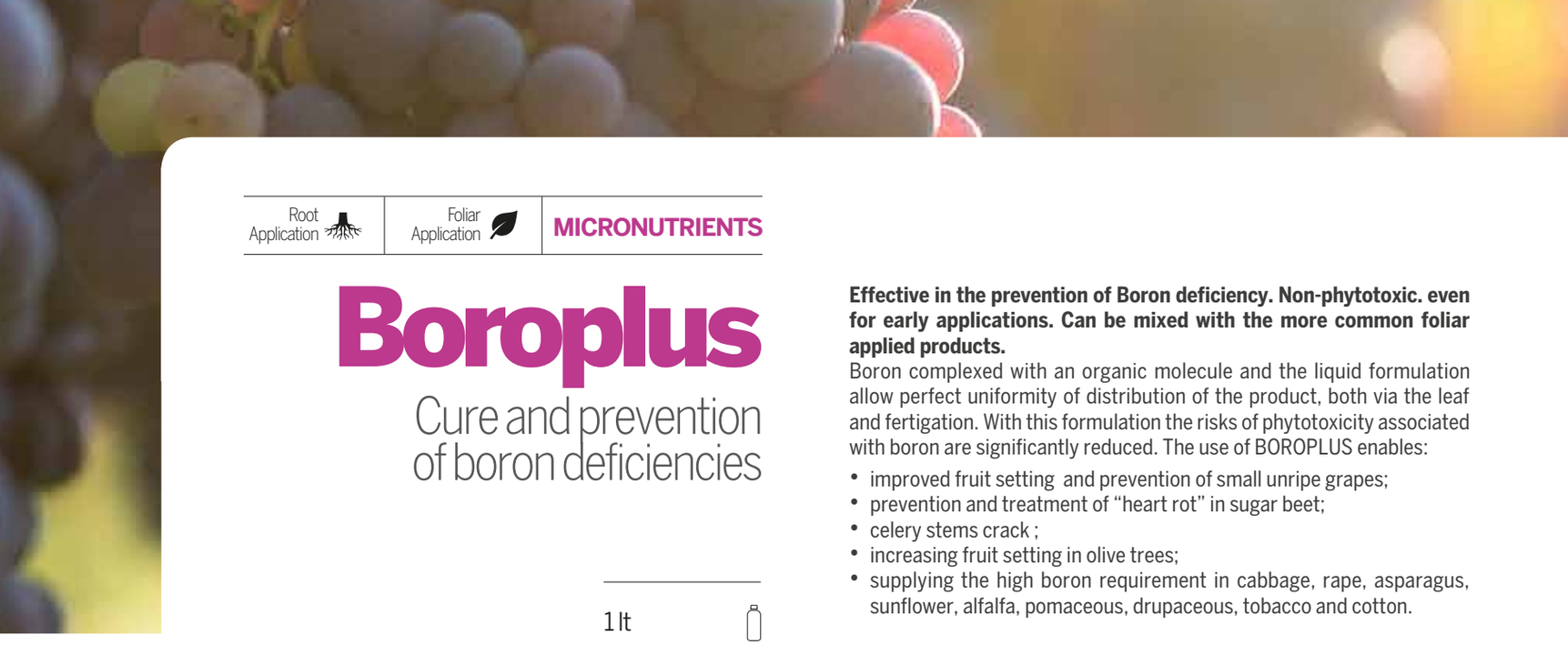


fig.2



1. The Brexil® solution is rapidly absorbed and leaves no residues on the leaf surface.
After penetration, the LSA performs its protective action of the nutrients, increasing their bioavailability.

2.The plant recognises LSA as a source of energy or food; therefore, the microelements that bind to the LSA are released in the plant, preventing and curing microelement deficiencies.



Root Application | Foliar Application | **MICRONUTRIENTS**

Boroplus

Cure and prevention of boron deficiencies

1 lt

10 lt

Effective in the prevention of Boron deficiency. Non-phytotoxic. even for early applications. Can be mixed with the more common foliar applied products.

Boron complexed with an organic molecule and the liquid formulation allow perfect uniformity of distribution of the product, both via the leaf and fertigation. With this formulation the risks of phytotoxicity associated with boron are significantly reduced. The use of BOROPLUS enables:

- improved fruit setting and prevention of small unripe grapes;
- prevention and treatment of "heart rot" in sugar beet;
- celery stems crack ;
- increasing fruit setting in olive trees;
- supplying the high boron requirement in cabbage, rape, asparagus, sunflower, alfalfa, pomaceous, drupaceous, tobacco and cotton.

		CROP	Period of application	DOSE
DIRECTION FOR USE	**FOLIAR APPLICATION**	CITRUS, DRUPACEOUS, GRAPE	3 applications starting from beginning of flowering	100-200 ml/hl
		POMACEOUS	3 applications starting from beginning of flowering	100-200 ml/ha
		OLIVE	pre-flowering	2L/ha
			post-setting	2L/ha
		VEGETABLES	from beginning of flowering	100-200 ml/hl
		ROW CROPS	early plant growth stages	1-2L/ha
		FLOWER CROPS	pre-bud formation	100-150 ml/hl
	FERTIGATION	ROW CROPS	distribute before sowing of before pre emergence crop stages alone or mixed with herbicides	3-5 L/ha
		FRUIT CROPS	at starting vegetative growth	4-6 L/ha
		FLOWERS AND ORNAMENTAL CROPS	distribute before transplanting or during fastest vegetative growth development	3-5 L/ha

	FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	liquid	7.7	1.37	yellow	0.20

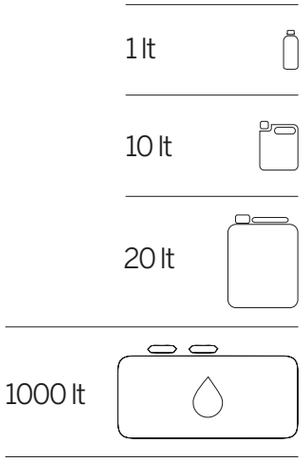
		Water-soluble boron (B)
COMPOSITION	**BOROPLUS**	11.0%

RECOMMENDATIONS | We do not recommend to mix BOROPLUS with mineral oils, activated oils or with other prodcts by alkaline reaction.

Root Application | Foliar Application | MICRONUTRIENTS

Calbit C

Treats and prevents calcium deficiencies



Promotes rapid translocation of calcium in fruits and flowers. No-phytotoxic for early treatments. Mixable with the more common pesticides

CALBIT C is a calcium-based nutritional supplement complexed with LSA, specific for the prevention and treatment of:

- bitter pit in apples;
- apical rot of tomato;
- rot (bruising) of pepper;
- drying of melon leaves;
- tip burn of lettuce, endive, chicory;
- cracking of cherries, peaches, nectarines, plums.

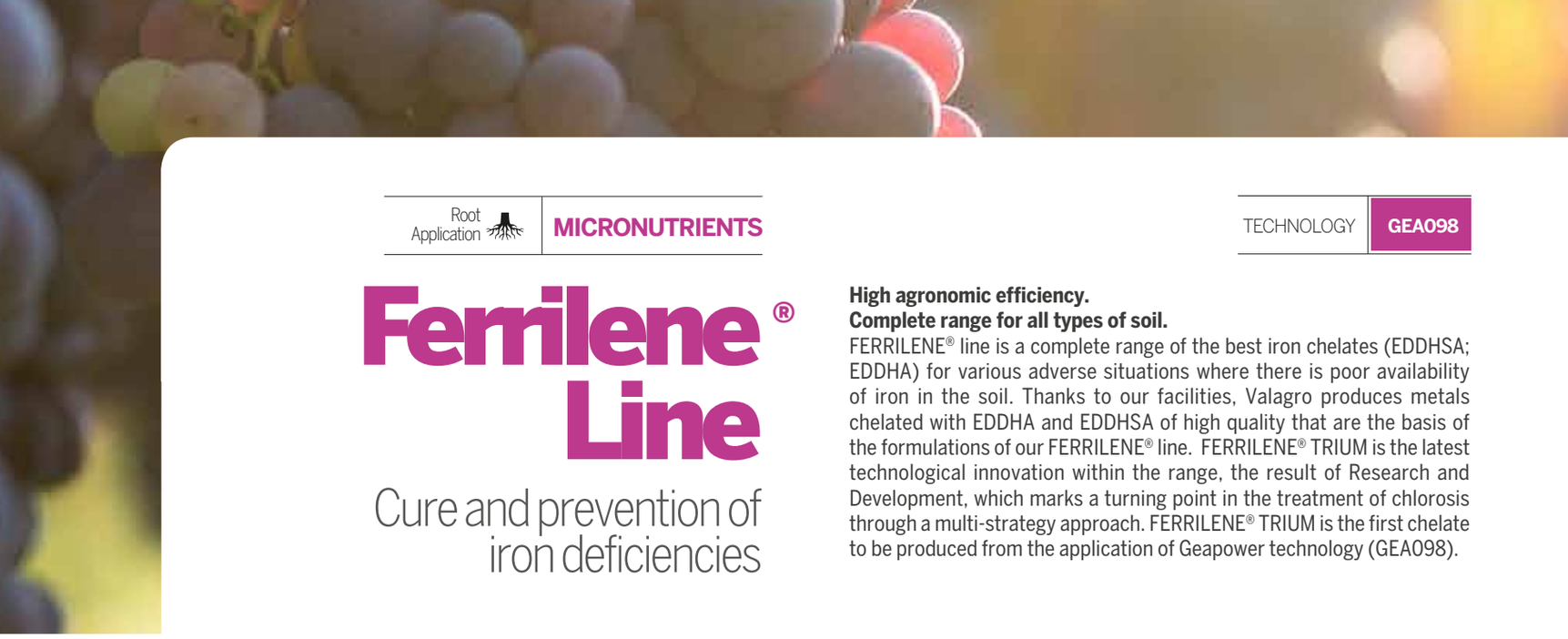
Treatments with CALBIT C lead to increase fruit firmness and, consequently, longer shelf life. CALBIT C is the ideal solution for applying calcium via fertigation thanks to the presence of the LSA complex which protects the same from insolublisation reactions (the LSA-calcium complex is stable with a pH between 3 and 6.5).
If applied to the leaves, CALBIT C is not phytotoxic and does not cause russeting on the fruits sensitive to such physiological problems (e.g. pome fruits).

DOSES AND DIRECTION FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	FOLIAR APPLICATION	FRUITS	applications every 10-15 days starting from fruit setting	2-3 L/ha
		VEGETABLES	applications every 8-10 days starting from fruit setting	2-3 L/ha
		LEAF VEGETABLES	weekly applications from 8-10 days after transplant	250-350 ml/hl
		FLOWERS AND ORNAMENTALS	applications every 8-10 days during the crop cycle	250-350 ml/hl
	FERTIGATION	FRUITS	applications post fruit setting	10-30 L/ha
		VEGETABLES	applications after fruit setting and during fruit enlargment	10-30 L/ha
		ROW CROPS	-	10-30 L/ha

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	8.0	1.45	brown	0.65

COMPOSITION	Calcium oxide (CaO)
	15.0%

RECOMMENDATIONS | Perform miscibility test before mixing with products containing phosphorus and/or sulphur.



Root Application | **MICRONUTRIENTS**

TECHNOLOGY | **GEA098**

Ferrilene® Line

Cure and prevention of iron deficiencies

High agronomic efficiency.
Complete range for all types of soil.

FERRILENE® line is a complete range of the best iron chelates (EDDHSA; EDDHA) for various adverse situations where there is poor availability of iron in the soil. Thanks to our facilities, Valagro produces metals chelated with EDDHA and EDDHSA of high quality that are the basis of the formulations of our FERRILENE® line. FERRILENE® TRIUM is the latest technological innovation within the range, the result of Research and Development, which marks a turning point in the treatment of chlorosis through a multi-strategy approach. FERRILENE® TRIUM is the first chelate to be produced from the application of Geapower technology (GEA098).

FERRILENE 4.8
FERRILENE TRIUM
1 - 5 Kg

FERRILENE
5 Kg

FERRILENE LINE

4.8
TRIUM
FERRILENE

			POMACEUS Kg/ha	DRUPACEUS Kg/ha	STRAWBERRY Kg/ha	CITRUS Kg/ha	TABLE GRAPE Kg/ha	KIWI FRUIT Kg/ha	VEGETABLES AND ROW CROPS Kg/ha	FLOWER CROPS Kg/ha	POTTED PLANTS g/pianta
DIRECTION FOR USE	**FERTIGATION**	**FERRILENE 4.8**	10-30	10-30	5-15	10-30	10-30	10-30	5-15	5-15	0.5-2
		FERRILENE TRIUM	10-30	10-30	5-15	10-30	10-30	10-30	5-15	5-15	0.5-2
		FERRILENE	10-30	10-30	5-15	10-30	10-30	10-30	5-15	5-15	0.5-2

N.B. The dosage intervals are based on the plant mass and the severity of the chlorosis.

		FORMULATION	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	**FERRILENE 4.8**	soluble microgranules	7.4	black	4	0.48
	FERRILENE TRIUM	soluble microgranules	7.6	black	8	0.59
	FERRILENE	soluble microgranules	7.5	dark red	35	0.68

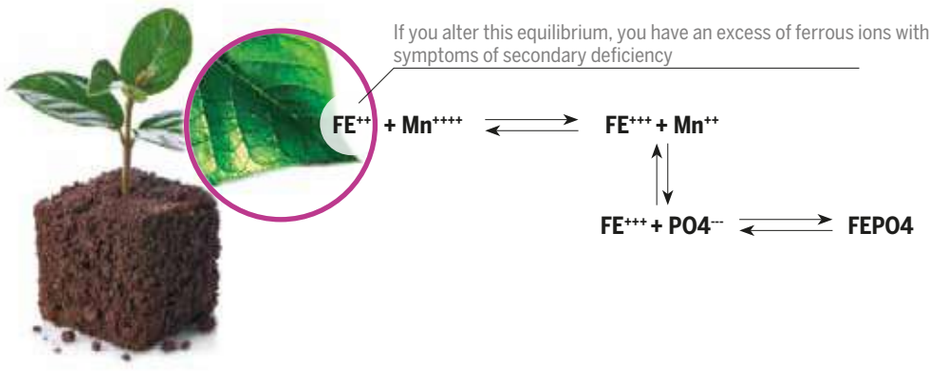
		Chelating agent	Water-soluble Fe	Chelated fraction	Percentage of iron (orto-orto)	Water-soluble EDTA Mn	Potassium oxide K_2O
COMPOSITION	**FERRILENE 4.8**	EDDHA	6.0%	100%	4.8%	-	-
	FERRILENE TRIUM	EDDHSA/ EDDHA	6.0%	100%	1.0% EDDHA 3.0% EDDHSA	1.0%	6.0%
	FERRILENE	EDDHSA	6.0%	100%	3.8%	-	-

N.B.The EDDHA and EDDHSA Fe chelates are stable within the pH interval of 4-10.

MORE INFORMATION

Ferrilene Trium, the first chelate resulting from Geapower (GEA098) technology

Essential nutrients can interact with the iron within the plant, causing deficiency symptoms. Among the most important of these interactions there is the ionic Fe/Mn ratio. Generally, the antagonism between the two trace elements, especially when the iron is supplied in the form of EDDHA/SA, restricts the availability of Mn as they are interdependent. An excess of one of the two, in plant tissues, conditions the content of the other proportionally. In the leaf, the reactivity of the iron depends on its oxidisation status. Manganese has greater oxidisation potential than iron, and oxidises the excess and transforms it into inactive iron, which is immobilised by the phosphates which form an iron phosphate complex (phosphoprotein, called phytoferritin which forms an iron reserve within the plant). The equilibrium of this mechanism is fundamental as any excess of iron is temporarily stored in the leaf and reused if needed.



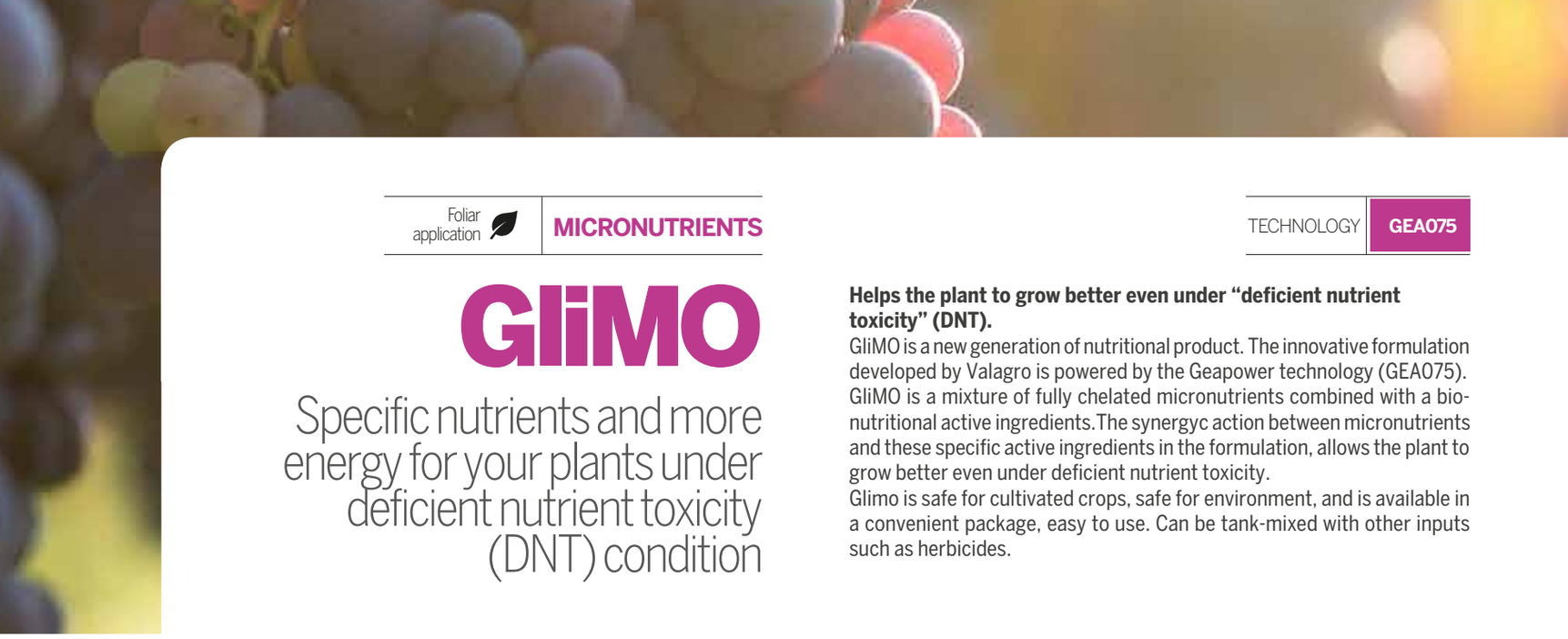
Where there is an imbalance between iron and manganese, the following conditions can occur:

- in a solution with excess iron, the dynamic equilibrium between the two elements is lost and secondary symptoms appear due to the excess of ferrous ions, with symptoms similar to those due to manganese deficiency;
- when there is an excess of manganese, the new leaves of the plant appear chlorotic, with symptoms similar to those due to iron deficiency. The excess of manganese causes excessive oxidisation from Fe2+ to Fe3+, making it insoluble and therefore not usable by the cells.

In open field cultivation, iron chlorosis becomes a secondary problem, hiding the chlorosis caused by manganese deficiency. Correcting the first often ensures that the second appears and aggravates. This phenomenon has occurred on various situations and has been verified by numerous researchers. Therefore, the Fe/Mn ratio in nutritional solutions is more important than the individual concentrations of Fe and Mn. Various field trials and tests conducted using the phenomic approach have shown that the problem of chlorosis does not depend only by the iron and can be efficiently solved with a multi-strategy approach

Evidence from the phenomic approach

A trial on kiwifruit was performed at the AGROBIOS research centre in Metaponto. The efficacy of FERRILENE TRIUM was tested comparing the product with an iron chelate 4.8 (o-o) and an untreated control. Chlorosis was induced in kiwi plants using an appropriate substrate. The trial plants were analysed with a Lemnatec 3-D Scanalyzer and the following parameters were measured: digital biomass; dark green colour classes; photosynthetic activity, greening speed; persistence of action. The figure illustrates the images of the digital biomass and dark green colour classes. The photos show how the plants treated with Ferrilene Trium indicate an efficient chlorosis solution and an improvement over chelate 4.8 o-o.



Foliar application | **MICRONUTRIENTS**

TECHNOLOGY | **GEA075**

GliMO

Specific nutrients and more energy for your plants under deficient nutrient toxicity (DNT) condition

Helps the plant to grow better even under "deficient nutrient toxicity" (DNT).
GliMO is a new generation of nutritional product. The innovative formulation developed by Valagro is powered by the Geapower technology (GEA075). GliMO is a mixture of fully chelated micronutrients combined with a bio-nutritional active ingredients.The synergyc action between micronutrients and these specific active ingredients in the formulation, allows the plant to grow better even under deficient nutrient toxicity.
Glimo is safe for cultivated crops, safe for environment, and is available in a convenient package, easy to use. Can be tank-mixed with other inputs such as herbicides.

5 Kg

INGREDIENTS	TARGETS
Zn EDTA + Mn EDTA	MANGANESE AND ZINC INTEGRATION
BIO-NUTRITIONAL INGREDIENTS + Zn EDTA + Mn EDTA	ENERGETIC PROCESSES ACTIVATION

		CROP	TIMING OF APPLICATION	DOSE
DOSE AND MODE OF APPLICATION	**FOLIAR APPLICATION**	SOYBEAN	Post-emergence (2 to 6 trifoliate leaves) Glyphosate application	0,5-1 kg/ha (½ to 1 lb/acre) repeated as necessary
		CORN	Post-emergence - Glyphosate application (V2 to v6)	0,5-1 kg/ha (½ to 1 lb/acre) repeated as necessary
		COTTON	Pin head square to early bloom	0,5-1 kg/ha (½ to 1 lb/acre) repeated as necessary
		OTHER CROPS	In the case of DNT condition	0,5-1 kg/ha (½ to 1 lb/acre) repeated as necessary

	FORMULATION	pH (1% solution)	COLOUR	SOLUBILITY (g/100 ml)
PHYSICAL PROPERTIES	microgranules	6.8	brown	30

	Manganese EDTA	Zinc EDTA
COMPOSITION	10%	1.0%

RECOMMENDATIONS | GliMO is compatible with a wide range of fertilizers and pesticides, including glyphosate. A compatibility jar test, however, should be performed before mixing.

MORE INFORMATION

Focus on Deficient Nutrient Toxicity (DNT)

Defined as a loss of plant growth due to a pesticides toxicity. This problem occurs in both annual (row crops) and perennial (orchards) crops. The degree of toxicity depends on the type of crop, rotation, use of pesticides (amount and frequency).
DNT is not caused by lack of available nutrients but to an inability of the plant to absorb and utilize various nutrients due to a "toxic" zone in the root rhizosphere.
When the pesticide moves through the plant and it is exudated from the roots into the rhizosphere, it impacts negatively on root hairs, bacteria (including the nitrogen fixing ones), and other beneficial microbial functions that are necessary for nutrient utilization. Furthermore inside the plant the pesticide interferes with the nutrients (mainly Mn), blocking and making them unavailable for the plant, thus chlorosis appear. Furthermore the plant spends more metabolic energy to overcome this problem, reducing its growth.

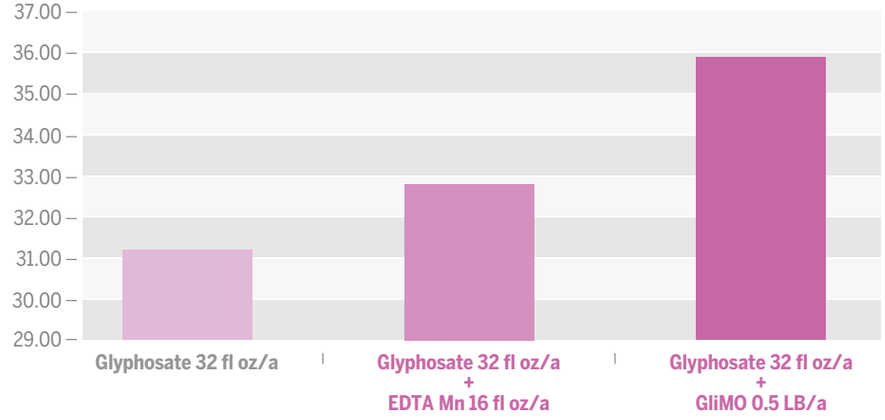
CASE STUDY: Mn deficiency on glyphosate-tollerant CROPS

Generally glyphosate application or soil carryover in glyphosate-tolerant (GT) crops induces positive-ion nutrient deficiencies. In the case of manganese (Mn), the most prevalent nutrient deficiency, is sometimes evidenced by yellow "flashing" symptoms due to a complex formed between Mn and glyphosate, which reduces Mn translocation in the plant.

Yellow "flashing" symptoms on GT soybean.

EXPERIMENTAL TRIAL MADE IN COLLABORATION WITH MISSOURI UNIVERSITY

Crop Soybean (Asgrow 3803)
Timing of application Post-emergence with glyphosate



- Thanks to a stable Mn form in the GliMO there is not any interference beetwen Mn and glyphosate, avoiding manganese deficiency.
- Bio-active ingredients in GliMO stimulate metabolic processes such as glycolysis and mitochondrial respiration, in order to produce more energy for the plant under deficient nutrient toxicy condition.

Root Application | Foliar Application | **MICRONUTRIENTS**

Hidromix S

Cure and prevention of trace element deficiencies

5 Kg

Chelated trace elements. Suitable for soilless crops .
HIDROMIX S is a mixture of chelated trace elements expressly designed for use in hydroponics and soilless CROPS.
The trace elements are present according to specific ratios which take account of the consumption of the main vegetables CROPS.

DIRECTIONS FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	FOLIAR APPLICATION	GRAPES, KIWIFRUIT, CITRUS, POME FRUIT	applications every 15-20 days starting from the first appearance of deficiency symptoms	80-100 g/hl
		STONE FRUIT, VEGETABLES (tomato, capsicum, melon and watermelon)	applications every 15-20 days starting from the first appearance of deficiency symptoms	50-80 g/hl
	FERTIGATION	ALL CROPS	preventive treatments	3-6 Kg/ha
		ALL CROPS	curative treatments	10-30 Kg/ha
	HYDROPONICS/SOILLESS CROP	VEGETABLE AND FLOWER CROPS	during all crop cycle	20-50 g/m3 of water

PHYSICAL PROPERTIES	FORMULATION	pH (1% in soluzione)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	soluble microgranules	5.5	brown	10	0.28

COMPOSITION		Copper (Cu) EDTA	Total iron (Fe)	Iron (Fe) EDTA	Iron (Fe) EDDHA	Manganese (Mn) EDTA	Molybdenum (Mo)	Zinc (Zn) EDTA	Boron (B)
	HIDROMIX S	0.27%	7.0%	6.3%	0.7%	3.3%	0.2%	0.6%	0.65%

RECOMMENDATIONS | In greenhouses do not exceed the concentration of 50 g/hl.

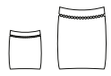
Root Application | Foliar Application | **MICRONUTRIENTS**

Valagro® EDTA

Treat and prevent micronutrient deficiencies

Complete range of single or blend trace elements chelated WITH EDTA for the treatment and prevention of trace element deficiencies.
The presence of trace elements in chelated form and formulation in soluble microgranules make VALAGRO® EDTA specific products for the prevention and treatment of microdeficiencies.

1 - 5 Kg



VALAGRO EDTA

- MIX 5
- Cu
- Fe
- Mn
- Zn

		CROP	PERIOD OF APPLICATION	DOSE
DOSES AND DIRECTIONS FOR USE	FOLIAR APPLICATION	GRAPES, KIWIFRUIT, CITRUS, POME FRUIT	applications every 10-15 days starting from the first appearance of micro deficiencies	80-100 g/hl
		STONE FRUIT, VEGETABLES (tomato, capiscum, melon and watermelon)	applications every 10-15 days starting from the first appearance of micro deficiencies	50-80 g/hl
	FERTIGATION	ALL CROPS	preventive applications	3-6 Kg/ha
		ALL CROPS	curative applications	10-30 Kg/ha

		FORMULATION	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	VALAGRO EDTA MIX 5	soluble microgranules	4.5	green	10	0.55
	VALAGRO EDTA Cu	soluble microgranules	6.5	blue	120	0.30
	VALAGRO EDTA Fe	powder	4.5	yellow	9	0.17
	VALAGRO EDTA Mn	soluble microgranules	6.5	beige	80	0.40
	VALAGRO EDTA Zn	soluble microgranules	6.5	white	100	0.39
	VALAGRO EDTA Ca	soluble microgranules	6.0	white	80	0.28
	VALAGRO EDTA Mg	soluble microgranules	7.6	white	90	0.38

		MgO	Fe	B	Mo	Mn	Zn	Cu
COMPOSITION	VALAGRO EDTA MIX 5	5.0%	4.0%	0.5%	0.1%	4.0%	1.5%	1.5%
	VALAGRO EDTA Cu	-	-	-	-	-	-	15.0%
	VALAGRO EDTA Fe	-	13.0%	-	-	-	-	-
	VALAGRO EDTA Mn	-	-	-	-	13.0%	-	-
	VALAGRO EDTA Zn	-	-	-	-	-	15.0%	-
	VALAGRO EDTA Ca	14.0%	-	-	-	-	-	-
	VALAGRO EDTA Mg	-	10.0%	-	-	-	-	-

RECOMMENDATIONS | In greenhouse, do not exceed the concentration of 50 g/hl.

Root Application | Foliar Application | **MICRONUTRIENTS**

Molibion

Cure and prevention of molybdenum deficiencies

1 lt

Supply molybdenum, improving the use of nitrogen or its fixation in legumes.

Molybdenum accelerates the transformation of nitrogen in plants into organic products (amino acids and proteins) and promotes symbiotic fixation of nitrogen in legumes.

The use of molybdenum is indicated:

- for reducing the content of nitrates in all short cycle and winter vegetables (mainly salads, spinach, chard);
- to facilitate symbiotic fixation of nitrogen in legumes;
- for preventing and treating molybdenum deficiencies on the particularly sensitive CROP (e.g. melon).

DIRECTIONS FOR USE		CROP	DOSE
	FOLIAR APPLICATION	FRUIT CROPS	50-70 ml/100L
		VEGETABLE CROPS	80-120 ml/100L
		ORNAMENTAL CROPS	50-70 ml/100L
		EXTENSIVE CROPS	1-1.5 l/ha
	FERTIGATION	ALL CROPS	1-2 l/ha

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	COLOUR	DENSITY (g/cm^3) 20°C	CCONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	5.7	green	1.15	019

COMPOSITION		Water-soluble molybdenum (Mo)
	MOLIBION	8.0%

Root Application

WATER SOLUBLE NUTRITION

P54

Nourishes and supports the plant growth

10 lt

P54 is a product for promoting the root development of plants and for obtaining abundant flowering. The formulation is based on phosphoric acid indicated to supply phosphorus, acidifying at the same time the nutrient solutions.

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	1.78	1.65	green	1.84

DOSES AND DIRECTIONS FOR USE		CROP	DOSE
	FERTIGATION	FRUIT CROPS	40-60 L/ha
		INDUSTRIAL CROPS	20-30 L/ha
		VEGETABLE AND FLOWER CROPS	20-30 L/ha

COMPOSITION	Phosphorus pentoxide (P2O5)
	54.0%

Root Application

WATER SOLUBLE NUTRITION

Master® line

Nourishes and supports the plant growth

Sodium and Chlorine free. Complete with chelated trace elements (EDTA).

The MASTER® line is a complete range of water-soluble microcrystalline fertigators that are totally and immediately soluble, specific for fertigation systems. The different formulations have been designed to meet the nutritional needs of all crops, in each crop phase and for each type of soil, ensuring improved yields and quality.

MASTER 20.20.20
MASTER 15.5.30+2
10 Kg

MASTER LINE

25 Kg

MASTER LINE
- 20.20.20
- 18.18.18+3
- 13.40.13
- 15.5.30+2
- 17.6.18
- 19.6.6
- 3.37.37
- 20.5.10+2
- 3.11.38+4
- 6.6.43

		FORMULATION	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18 °C
PHYSICAL PROPERTIES	MASTER 20.20.20	soluble microcrystals	5.1	blue	55	0.914
	MASTER 18.18.18+3	soluble microcrystals	4.3	white	20	0.744
	MASTER 13.40.13	soluble microcrystals	4.7	orange	42	1.053
	MASTER 15.5.30+2	soluble microcrystals	5.6	red	35	1.063
	MASTER 17.6.18	soluble microcrystals	5.2	green	45	1.500
	MASTER 19.6.6	soluble microcrystals	5.1	violet	58	1.836
	MASTER 3.37.37	soluble microcrystals	4.0	red	25	1.765
	MASTER 20.5.10+2	soluble microcrystals	4.0	white	10	1.667
	MASTER 3.11.38+4	soluble microcrystals	3.4	white	10	1.280
	MASTER 6.6.43	soluble microcrystals	3.7	yellow	20	1.290

N.B.: Cu, Mn and Zn chelated with EDTA are stable at a pH of 4-11, Fe chelated with EDTA is stable at pH 3-7.

		DOSE
DOSES AND METHODS FOR USE	FERTIGATION	0.5-1.5 Kg/1000 m² a day

N.B.: For non-daily fertigation the dose must be increased in proportion to the number of days between one application and the next (e.g. 5-15 kg/1000 m² every 10 days).

		(N) total	(N) nitric	(N) ammon.	(N) ureic	P_2O_5	K_2O	MgO	SO_3	B	Mn	Zn	Cu	Fe
COMPOSITION	MASTER 20.20.20	20.0	5.6	4.0	10.4	20.0	20.0	-	-	0.02	0.03	0.01	0.005	0.07
	MASTER 18.18.18+3	18.0	5.1	3.5	9.4	18.0	18.0	3.0	6.0	0.02	0.03	0.01	0.005	0.07
	MASTER 13.40.13	13.0	3.7	9.3	-	40.0	13.0	-	-	0.02	0.03	0.01	0.005	0.07
	MASTER 15.5.30+2	15.0	8.4	3.6	3.0	5.0	30.0	2.0	-	0.02	0.03	0.01	0.005	0.07
	MASTER 17.6.18	17.0	5.0	12.0	-	6.0	18.0	-	-	0.02	0.03	0.01	0.005	0.07
	MASTER 19.6.6	19.0	1.7	17.3	-	6.0	6.0	-	-	0.02	0.03	0.01	0.005	0.07
	MASTER 3.37.37	3.0	3.0	-	-	37.0	37.0	-	-	0.02	0.03	0.01	0.005	0.07
	MASTER 20.5.10+2	20.0	7.5	12.5	-	5.0	10.0	2.0	-	0.02	0.03	0.01	0.005	0.07
	MASTER 3.11.38+4	3.0	3.0	-	-	11.0	38.0	4.0	25.0	0.02	003	0.01	0.005	0.07
	MASTER 6.6.43	6	6	-	-	6	43	-	-	0.02	0.03	0.01	0.005	0.07

N.B.: Cu, Mn and Zn chelated with EDTA.

MORE INFORMATION

The exclusive and high quality of the raw materials

Quality and efficacy of products start from the selection of raw materials and this is the fundamental characteristic that differentiates Master® from all the other fertilizers on the market.
All products of MASTER® line have been developed based on new and high standards of quality, ensured by innovative production processes and careful selection of the raw materials which garantee a rapid and unique solubility of the formulations.

ANALYSIS AND COMPARISON OF THE MAIN RAW MATERIALS USED IN COMMON NPK FERTILIZERS AND THOSE USED IN THE MASTER® PRODUCTS.

Ammonium Sulphate (Technical Product vs Non-Technical)

Ammonium sulphate
Industrial production waste

Ammonium sulphate
Competitor

Ammonium sulphate
VALAGRO
technical product

Ammonium sulphate
Industrial production waste

Ammonium sulphate
Competitor

Ammonium sulphate
VALAGRO
technical product

UREA micro-prilled VALAGRO

VALAGRO UREA
micro-prilled

Competitor
UREA prilled

VALAGRO UREA
micro-prilled

Competitor
UREA prilled

Potassium sulfate vs. Potassium nitrate (Complete or Partial solubility)

Potassium sulphate
(partially soluble)
9 g/100 ml

VALAGRO potassium nitrate
(completely soluble)
36 g/100 ml

Root Application

WATER SOLUBLE NUTRITION

Master Supreme line

The high quality WSN enriched with biologically active ingredients

High quality water-soluble fertilizers to nourish the plant and increase productivity.

Master Supreme is the new line of high quality water-soluble fertilizers, enriched with biologically active components which guarantee both nutritional and biostimulant effects. The innovative formulations, based on Geapower Technology (GEA582), are naturally involved in the biological and physiological processes of the plant, stimulating metabolism and ensuring a greater increase of quantity and quality of production. The line offers five different solutions in order to provide the correct amount of nutrients in each phenological stage of plant growth.

10 Kg

MASTER SUPREME LINE

- MASTER SUPREME STARTER
- MASTER SUPREME DEVELOPMENT
- MASTER SUPREME FLOWERING
- MASTER SUPREME RIPENING
- MASTER SUPREME BALANCED

		FORMULATION	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18 °C
PHYSICAL PROPERTIES	MASTER SUPREME STARTER	soluble microcrystals	5.9	red	10	0.910
	MASTER SUPREME DEVELOPMENT	soluble microcrystals	5.6	red	10	0.600
	MASTER SUPREME FLOWERING	soluble microcrystals	5.9	red	10	1.130
	MASTER SUPREME RIPENING	soluble microcrystals	6.1	red	10	1.190
	MASTER SUPREME BALANCED	soluble microcrystals	6.5	red	10	0.100

		DOSE
DOSES AND METHODS FOR USE	FERTIGATION	2.5-5 Kg/1000 m^2

N.B.: CROPS: All crops. Period of application: During the crop cycle

		(N) total	(N) nitric	(N) ammon.	(N) ureic	P_2O_5	K_2O	B	Mn	Zn	Cu	Fe
COMPOSITION	MASTER SUPREME STARTER	11.0	2.6	8.4	-	42.0	11.0	0.02	0.03	0.01	0.005	0.07
	MASTER SUPREME DEVELOPMENT	20.0	5.0	1.0	14.0	5.0	15.0	0.02	0.03	0.01	0.005	0.07
	MASTER SUPREME FLOWERING	8.0	0.5	4.7	2.8	24.0	24.0	0.02	0.03	0.01	0.005	0.07
	MASTER SUPREME RIPENING	5.0	3.9	0.8	0.3	10.0	40.0	0.02	0.03	0.01	0.005	0.07
	MASTER SUPREME BALANCED	18.0	5.1	5.4	7.5	18.0	18.0	0.02	0.03	0.01	0.005	0.07

N.B. Cu, Mn and Zn are chelated with EDTA

MORE INFORMATION

Double action:
nutritional and biostimulant effect

The exclusive formulations, based on **Geapower technology (GEA582)** , guarantee the correct amount of macro and micronutrients requested by each phenological stage, optimize plant nutrition while offering a biostimulant effect to all plants.

- Regulates metabolism and the natural plant growth
- Stimulates plant's development and production
- Optimizes plant nutrition
- Enriched with biologically active components
- Increases the quantity and quality of yield

ONE SOLUTION FOR EACH PHENOLOGICAL STAGE

Master Supreme offers 5 different solutions in order to provide the correct amount of nutrients and biologically active substances for each vegetative stage of development and production:

1. MASTER SUPREME **STARTER:**
The nutritional solution to improve crop-growing start-up and increase root growth

2. MASTER SUPREME **DEVELOPMENT:**
The formulation suitable to feed the plant and increase the vegetative growth

3. MASTER SUPREME **FLOWERING:**
The formulation designed to feed the plant during flowering able to stimulate the metabolic activity

4. MASTER SUPREME **RIPENING:**
The presence of biological active components helps to improve the fruit quality parameters

5. MASTER SUPREME **BALANCED:**
The balanced formula for any phenological stage of plant growth

Foliar Application

WATER SOLUBLE NUTRITION

Opifol®

A new landmark for row crops nutrition

25 Kg

Support vegetative and productive stages of row crops. Promotes an higher crop yield and a better grain quality.

Opifol® is the new highly soluble foliar fertilizer line specific for row crops with rapid uptake into plant leaves. Opifol® line contains a combination of macro and micronutrients to maximize crop yield and quality. Opifol® is a part of a complete solution, together with Yieldon, created by Valagro in order to provide the best solution for row crops.

- Balanced foliar nutrition
- Higher crop yield and better grain quality
- Compatible with most fungicides, insecticides and herbicides
- Excellent crop/Plant safety

		FORMULAZIONE	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	**OPIFOL VEGETATIVE**	soluble crystals	4.7	Violet	20	0.45
	OPIFOL REPRODUCTIVE	soluble crystals	3.7	Violet	20	1.4
	OPIFOL MATURATION*	soluble crystals	4.7	Violet	10	1.3
	OPIFOL EQUILIBRIUM	soluble crystals	4.6	Violet	20	1.2

		PRODUCT	CROP	PERIOD OF APPLICATION	DOSE
DIRECTIONS FOR USE	**FOLIAR APPLICATION**	OPIFOL VEGETATIVE	All Industrial crops	Vegetative stage	2.5/3.5 Kg/ha
		OPIFOL REPRODUCTIVE	All Industrial crops	Reproductive stage	2.5/3.5 Kg/ha
		OPIFOL MATURATION*	All Industrial crops	Reproductive stage	2.5/3.5 Kg/ha
		OPIFOL EQUILIBRIUM	All Industrial crops	During all crop cycle	2.5/3.5 Kg/ha

It is recommended to use Opifol products with YieldON (2 l/ha)

		(N) total	(N) nitric	(N) ammon.	(N) ureic	P_2O_5	K_2O	B	Cu	Fe	MgO	Mn	Mo	Zn
COMPOSITION	**OPIFOL VEGETATIVE**	30.0	25.7	4.3	-	15.0	5.0	-	0.2	-	-	-	-	0.2
	OPIFOL REPRODUCTIVE	3.0	1.0	2.0	-	10.0	40.0	-	-	-	1.0	0.5	0.1	-
	OPIFOL MATURATION*	6.0	-	3.6	2.4	12.0	36.0	-	-	-	-	-	-	1.0
	OPIFOL EQUILIBRIUM	15.0	-	10.5	4.5	15.0	15.0	-	0.05	0.1	-	0.05	-	0.05

*Only for Indian and Chinese markets

Foliar Application

WATER SOLUBLE NUTRITION

Plantafol line®

Promotes balanced and efficient plant nutrition

Elevated purity and solubility. Enriched with trace elements chelated with EDTA. Suitable for any nutritional requirement.

The PLANTAFOL® line consists of foliar fertilizers based on high solubility and rapid and complete absorption within the leaves. All products contain trace elements chelated with EDTA and can be mixed with the most common pesticides. The PLANTAFOL® line offers several solutions based on different levels of nitrogen, phosphorus and potassium content, able to:

- support the vegetative and productive stages of crops;
- ensure high quality and quantity of production.

PLANTAFOL 10.54.10

5 Kg

PLANTAFOL 30.10.10

1 - 5 Kg

PLANTAFOL 5.15.45
PLANTAFOL 20.20.20

1 - 5 - 25 Kg

PLANTAFOL LINE

- 30.10.10
- 10.54.10
- 5.15.45
- 20.20.20
- 0.25.50

		FORMULAZIONE	pH (1% in solution)	COLOUR	SOLUBILITY (g/100 ml)	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
PHYSICAL PROPERTIES	PLANTAFOL 30.10.10	soluble crystals	4.8	white	40	0.62
	PLANTAFOL 10.54.10	soluble crystals	4.5	white	30	0.80
	PLANTAFOL 5.15.45	soluble crystals	6.26	white	10	1.25
	PLANTAFOL 20.20.20	soluble crystals	4.5	white	30	0.68
	PLANTAFOL 0.25.50	soluble crystals	7.5	white	10	1.25

		CROP	PERIOD OF APPLICATION	DOSE
DIRECTIONS FOR USE	**FOLIAR APPLICATION**	FRUIT CROPS	during the crop cycle	2.5-4.0 Kg/ha
		VEGETABLE CROPS	during the crop cycle	2.5-3.5 Kg/ha
		ROW CROPS	during the crop cycle	3.0-3.5 Kg/ha
		FLOWERS	during the crop cycle	150-250 g/hl

		(N) total	(N) nitric	(N) ammon.	(N) ureic	P_2O_5	K_2O	B	Cu	Fe	Mn	Zn
COMPOSITION	PLANTAFOL 30.10.10	30.0	3.0	3.0	24.0	10.0	10.0	0.02	0.05	0.1	0.05	0.05
	PLANTAFOL 10.54.10	10.0	-	8.0	2.0	54.0	10.0	0.02	0.05	0.1	0.05	0.05
	PLANTAFOL 5.15.45	5.0	5.0	-	-	15.0	45.0	0.02	0.05	0.1	0.05	0.05
	PLANTAFOL 20.20.20	20.0	4.0	2.0	14.0	20.0	20.0	0.02	0.05	0.1	0.05	0.05
	PLANTAFOL 0.25.50	-	-	-	-	25.0	50.0	0.02	0.05	0.1	0.05	0.05

N.B.: Cu, Fe, Mn and Zn are chelated with EDTA.

Wood application | OTHER PRODUCTS

Activ Erger®

Mineral activator of ERGER

Nitrogen fertiliser with high calcium content to be used in association with ERGER® for breaking dormancy. The use of ACTIV ERGER® is necessary to support the significant metabolic stimulus of ERGER® with calcium and nitrogen.

20 lt

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	5.9	1.28	colourless	0.76

DOSES AND DIRECTIONS FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	WOOD APPLICATION	CHERRIES	associated with ERGER	8L/100L of solution
		TABLE GRAPES	associated with ERGER	16L/100L of solution

COMPOSITION	Total nitrogen (N)	Nitric nitrogen (N)	ammoniacal nitrogen (N)	Calcium oxide (CaO))
	15.0%	9.0%	6.0%	6.5%

Foliar Application | OTHER PRODUCTS

Liokil

Surface-active action

LIOKIL is a foliar fertilizer for surface-active action, which increases the efficacy of treatments thanks to its acid pH. LIOKIL can be used both in the open field and in greenhouses. LIOKIL nourishes plant by supplying nitrogen and phosphorus and also cleans the plants from organic exudates on the leaves and fruits. It should be applied in the early hours of the day with large volumes of water.

10 lt

PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm³) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	5.2	1.15	green	0.15

DOSES AND DIRECTIONS FOR USE		PERIOD OF APPLICATION	DOSE
	FOLIAR APPLICATION	For washing organic exudates using high volumes of water (15-20 hl). The washing effect is proportional to the dose used and shows greater efficacy at high dosages indicated	500-1000 ml/hl
		In association with other treatments with the volumes normally used for applications	350-450 ml/hl

COMPOSITION	Total nitrogen (N)	Ureic nitrogen (N)	ammoniacal nitrogen (N)	Water-soluble phosphorus pentoxide (P_2O_5)
	10.0%	8.5%	1.5%	8.0%

Foliar Application | OTHER PRODUCTS

Control DMP

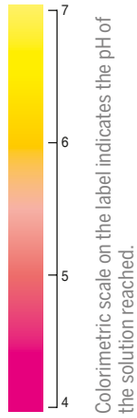
Foliar uptake improver

Acidifies irrigation water and indicates the pH reached. Facilitates penetration of solutions into the leaves. Provides nitrogen and phosphorus, rapidly usable by plants.

Control DMP is an acidifying fertiliser. The pH value achieved can easily be determined by comparing the colour of the solution with that of the colorimetric scale indicated on the label. Control DMP reduces the surface tension facilitating penetration of the solution into the plants.Control DMP acts as a dispersant and helps make compatible mixtures of more products.

1 lt

20 lt



PHYSICAL PROPERTIES	FORMULATION	pH (1% in solution)	DENSITY (g/cm^3) 20°C	COLOUR	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	liquid	2.15	1.16	red	0.79

DOSES AND DIRECTIONS FOR USE		CROP	DOSE
	FOLIAR APPLICATION	ALL CROPS	50-80 ml/hl
		TO ACIDIFY SOLUTIONS*	50-80 ml/hl to reach pH values of 6-6.5
		TO FACILITATE PENETRATION OF SOLUTIONS	20-30 ml/hl

* Pour CONTROL DMP directly into the atomiser before adding other products. The dosage varies with the pH and the initial hardness of the water.

COMPOSITION	Total nitrogen (N)	Ureic nitrogen (N)	Water soluble phosphorus pentoxide (P_2O_5)
	3.0%	3.0%	17.0%

Soil application

OTHER PRODUCTS

Micro NP

NP Fertilizers for localized application at sowing

10 - 25 Kg

Ideal for sowing/transplanting. Promotes initial growth of seedlings, even in unfavourable environmental conditions. Enables simplified cultivation operations.

MICRO NP is specially designed to provide a "STARTER" effect to crops, giving them a strong and vigorous start and improving industrial cycles of fullfield crops, namely:

- wheat
- corn
- processing tomato
- sugar beet
- sunflower, etc.

PHYSICAL PROPERTIES		FORMULATION	pH (1%in solution)	COLOUR	SPECIFIC WEIGHT	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	MICRO NP	microgranules	4.0	brown	970 g/L	0.80

DOSES AND DIRECTION FOR USE		CROP	DOSE
	MICRO NP	ROW CROPS (localised applications) maize, tomato and other vegetables, wheat, sunflower, sorghum, rice, oil seed rape, potato, carrot, onion	25-40 Kg/ha
		VEGETABLES AND FLORICULTURE (localised applications)	25-40 kg/ha
		FRUITS (localised applications)	30-40 kg/ha

COMPOSITION		Total Nitrogen (N)	Ammoniac Nitrogen (N)	Phosphorous pentoxide (P_2O_5) soluble in Ammonium citrate and neutral and water	Phosphorus pentoxide (P_2O_5)	EDTA Chelated zinc (Zn)	Water-soluble zinc (Zn)	Potassium oxide (K_2O)
	MICRO NP	4.0%	4.0%	30.0% of which Phosphorous pentoxide (P_2O_5) soluble in water 27.0%	-	0.8%	0.2%	-

Soil application

OTHER PRODUCTS

Slowenne®

NPK fertiliser with slow transfer nitrogen

Ensures constant availability of nitrogen for the entire crop cycle.
Allows the reduction of the number of applications.
Does not alter the ground's level of salinity.
SLOWENNE® contains nitrogen in the ammoniacal, ureic form and in the synthesised organic form (UREAFORM), featuring gradual and differentiated solubility. It ensures to crops prolonged and high availability of nitrogen also during the fruit setting and fruit growth and avoids the expensive fractionated fertilization.

25 Kg

PHYSICAL PROPERTIES	FORMULATION	pH (1%in solution)	COLOUR	SPECIFIC WEIGHT	CONDUCTIVITY E.C. -1‰ (mS/cm) 18°C
	granules	-	red	-	-

DOSES AND METHODS FOR USE		CROP	PERIOD OF APPLICATION	DOSE
	BASELINE FERTILISATION	FRUIT CROPS	in the January-April period	600-800 Kg/ha
		OLIVE	in the January-April period, depending on development	2-3 Kg per plant
		VEGETABLES	during soil preparation	400-600 Kg/ha
		INDUSTRIAL CROPS	during soil preparation	200-300 Kg/ha
			during sowing	200-400 Kg/ha
			during plant growth	200-300 Kg/ha
		FLOWER CROPS	1-2 distributions depending on crop requirements	80-100 Kg/1000 m2

COMPOSITION	Total nitrogen (N)	Ammoniac nitrogen (N)	Nitrogen (N) ureic	Nitrogen (N) from UREAFORM	Water-soluble phosphorus pentoxide (P_2O_5)	Anidride Fosforica (P_2O_5) solubile in acqua e Citrato ammonico	Water-soluble potassium oxide (K_2O) with low titre of Chlorine	Water soluble magnesium oxide (MgO)	Water-soluble sulphur trioxide (SO_3)
	14.0%	3.4%	7.1%	3.5%	5.7%	7.0%	14.0%	5.0%	19.0%

Note

dispenserstudio.it

Valagro®

Where science serves nature

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