

FORMUŁA EKSTRA JAKOŚCI

Kompleksowy program odżywiania roślin jagodowych



**Blackcurrant nutrition with
fertilizers containing the
biostimulating substances**

Maciej Sroczyński, Ph.D

Roullier Group in Numbers

- Commercial and industrial branch units in **46** countries
- **6 200** personnel
- **6** research and scientific centres all over the world
- **74** production plants all over the world
- **EUR 3.7 billion** of turnover in 2013





Timac Agro, 55 years know-how

- Supplies for agriculture are **the first and historical operation of the Group**, launched in 1959 in Saint-Malo, France.
- The unique Timac Agro business model is based on **direct relationships with clients and consultations.**

> Supplies for the agricultural sector make **78 %** of the Group sales in 2013.

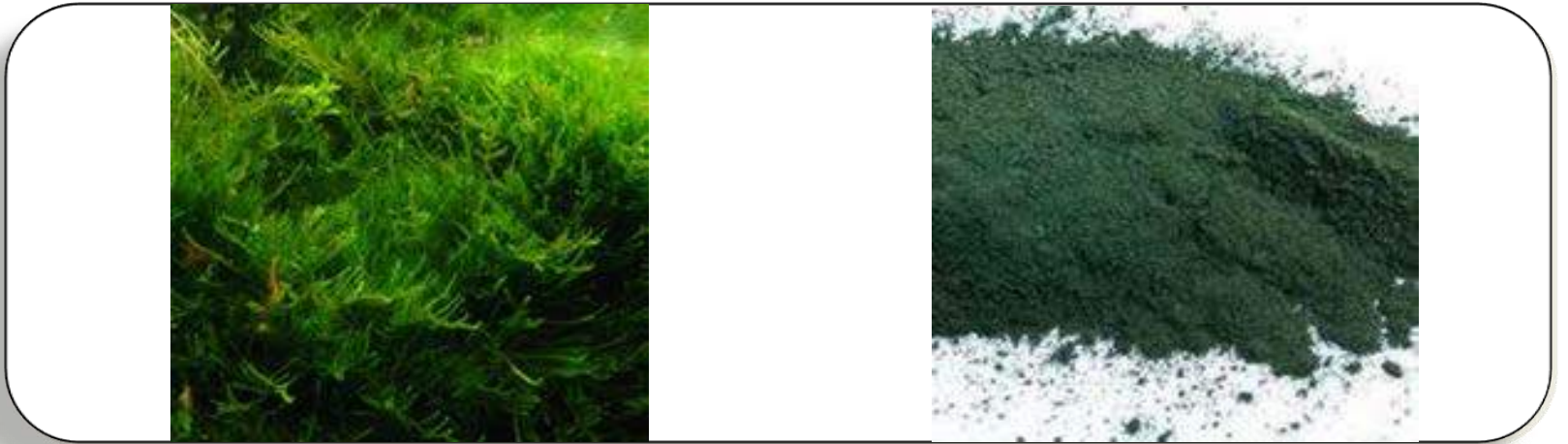
Unique approach to agriculture in Poland

- Our goal is to **raise the efficiency and quality of production.**
- We develop our relations with clients through **advice and partnership.**
- We analyse soil and nutritional needs of plants (fluorometry) to be able to recommend **innovative** solutions which are customised to the client needs.

- > **100 technical and sales consultants**
- > **500 visits to farms paid every day**



Based on algae...



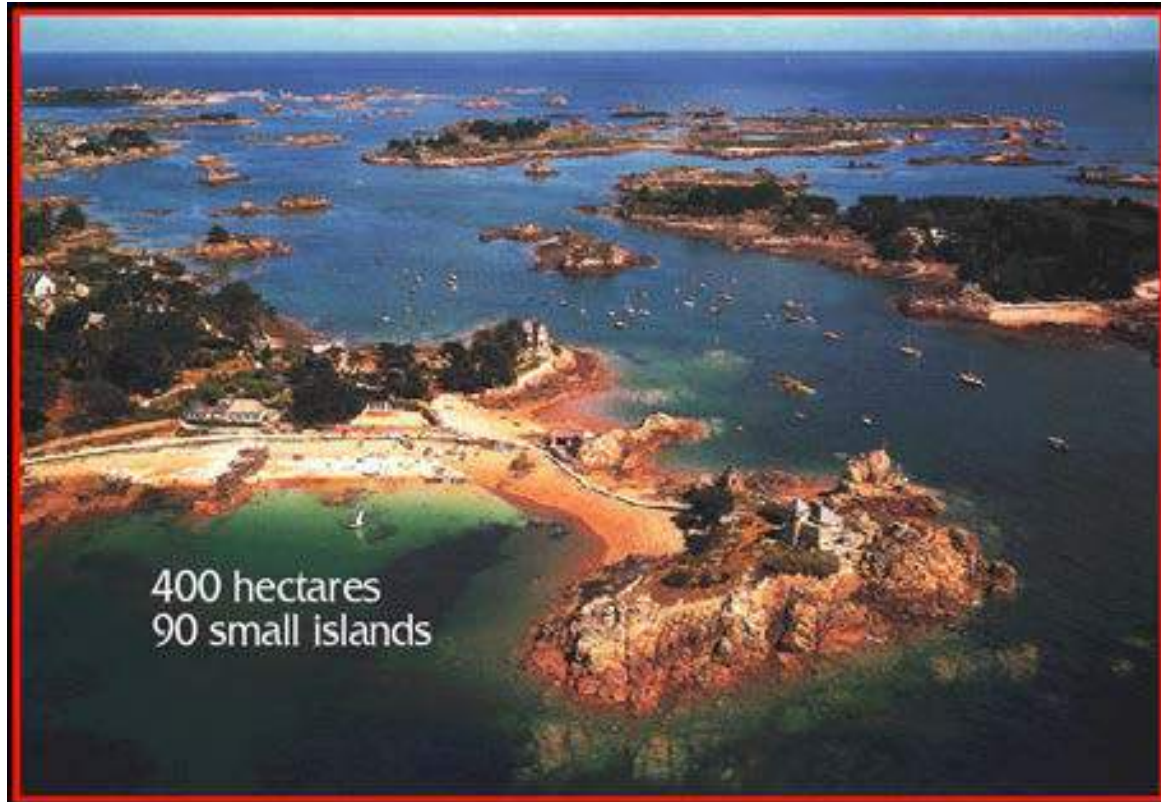
We use algae to produce our fertilizers

Extreme environmental conditions



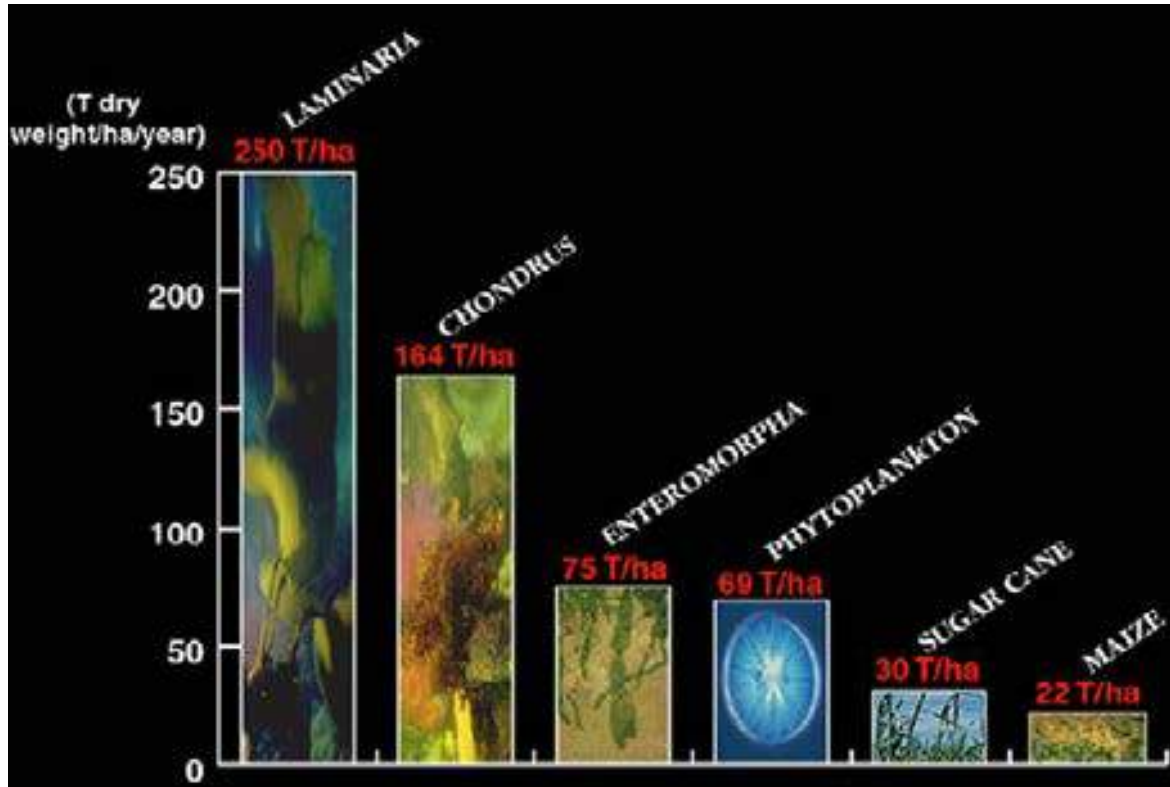
Cyclical differences in aqueous and thermal conditions.

Algae - abundance of nature



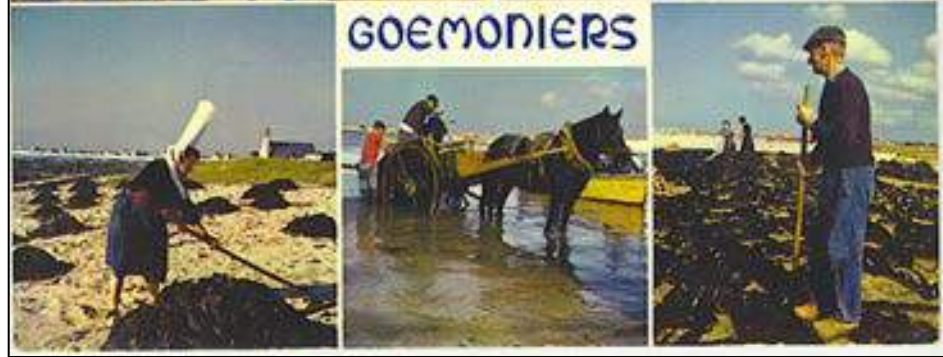
400 hectares
90 small islands

Algae yield potential



The yield potential is 10 times bigger as compared to the field crops.

Algae – the first experience



Algae potential

Mr Daniel Roullier, who was aware of it, decided to find out what is so special about algae...

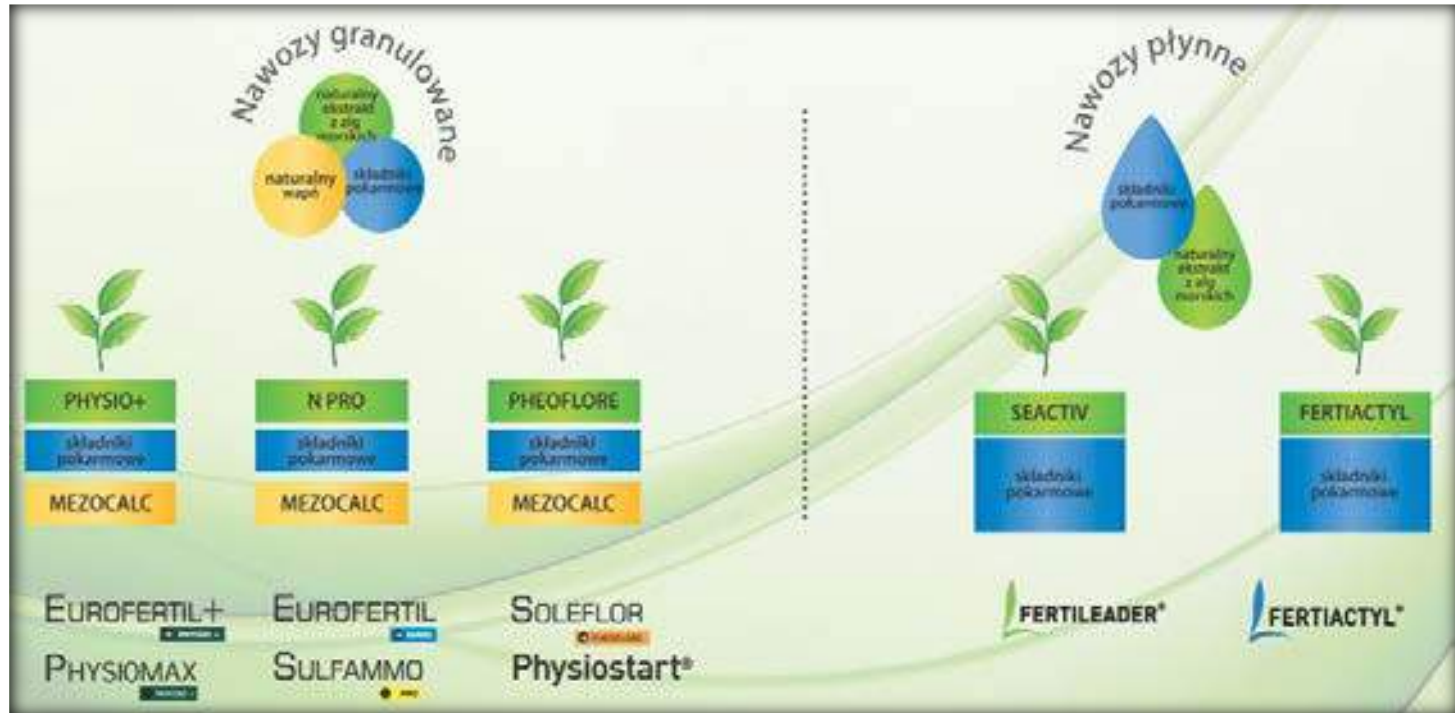


**President of the Group Management Board
Daniel Roullier
Owner of Roullier Group**

Research and Development



Fertilisers enriched with biostimulating substances





Liquid fertilisers with biostimulating substances



FERTIACTYL[®]
Starter

**Liquid fertiliser containing biostimulating substances
with foliar and subsurface action**

FERTIACTYL – innovative start-up fertiliser

1. Humic and fulvic acids



They facilitate accessibility and assimilability of nutrients

2. Glycine Betaine



Anti-stress action
Photosynthesis intensification

3. Zeatin



Radicular system growth
Chlorophyll aging delay

4. Nutrients

- 13% nitrogen
- 5% phosphorus
- 8% potassium



Growth - vigour
Ripening - Quality

Humic and fulvic acids

- Soil structure improvement
- Better uptake of mineral ingredients
- Stimulation of soil life
- Increase of water retention
- Better development of roots



Glycine and Betaine

- Present in all plants
- Produced in stress conditions as defensive reaction
- Reduces unfavourable influence of stress factors
- Increases photosynthesis efficiency



Zeatin

- Stimulates cell division (creating adventitious roots and root hair)
- Increases the uptake of nutrients
- Extends chlorophyll lifetime
- Improves vitality of plants
- Significant amounts of it are present in corn from which the substance derives its name.



Growth optimisation in the initial period



1

Increase of natural immunity

- Increase of resistance against external stress factors e.g. temperature, water



3

Strengthening physiological processes in the plant

- Greater photosynthesis efficiency
- Stimulation of growth of new plant organs

2

Effective uptake

- Increased uptake of nutrients, including phosphorus
- Increased availability of the nutrients in soil

Unique formula!

FERTIACTYL STARTER





 **FERTILEADER[®]**

Strength of nature

Macro-nutrients



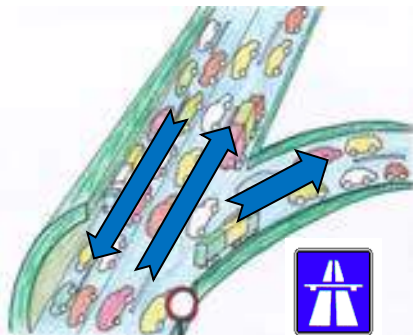
Seactiv



Micro-nutrients

1. IPA

Fast transport of mineral ingredients and assimilative substances



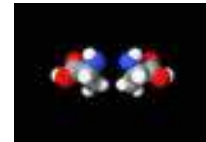
2. Glycine Betaine

Anti-stress action
Photosynthesis



3. Amino acids

- Growth of the vegetative and radicular system
- Production of proteins and sugars
- Immediately available micro-nutrients



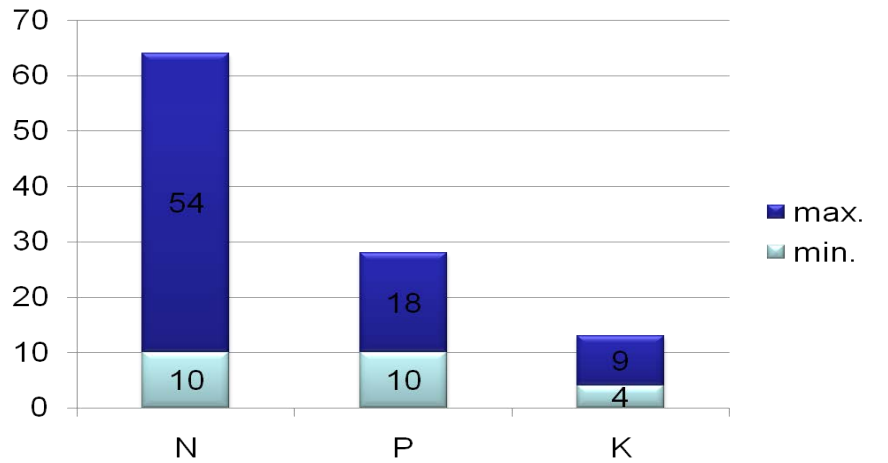
Glycine and Betaine

- Present in all plants
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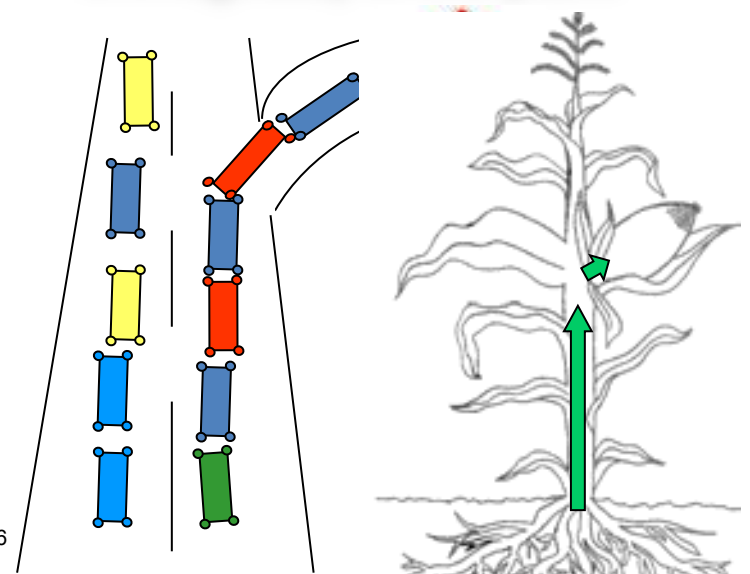
Systemic transport

Comparison of nutrient uptake by plants with IPA and in the control conditions (% more)



Source : agroressources, wheat, 1996

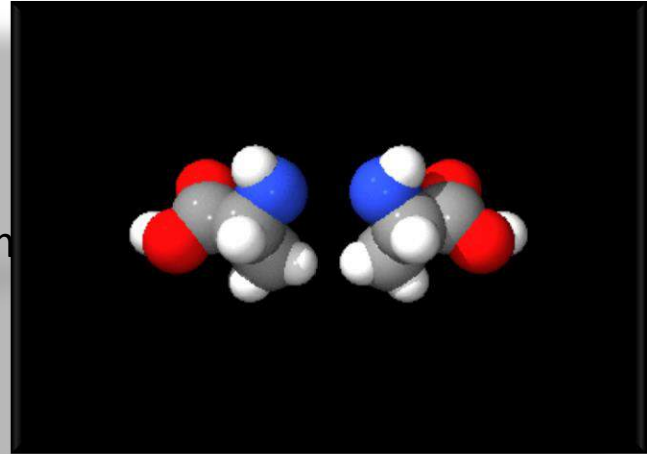
IPA highway in the plant

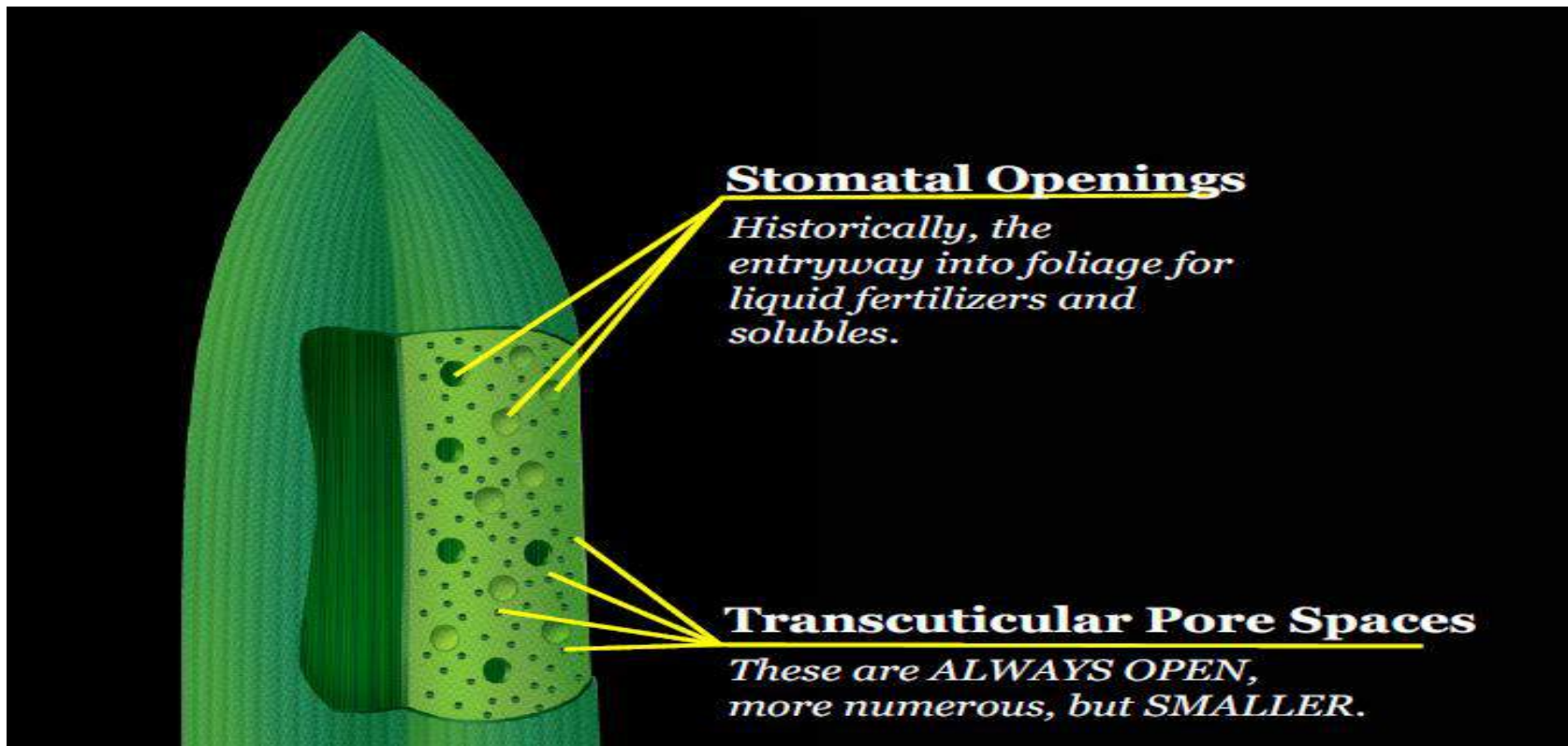


IPA is a cytokinin which stimulates uptake and transport of nutrients

Amino acids - carriers without defects

- The fastest possible penetration into the plant
- Amino acid is a component of proteins
- The substance is entirely neutral to the environment
- "Perpetum mobile" - nothing is wasted.





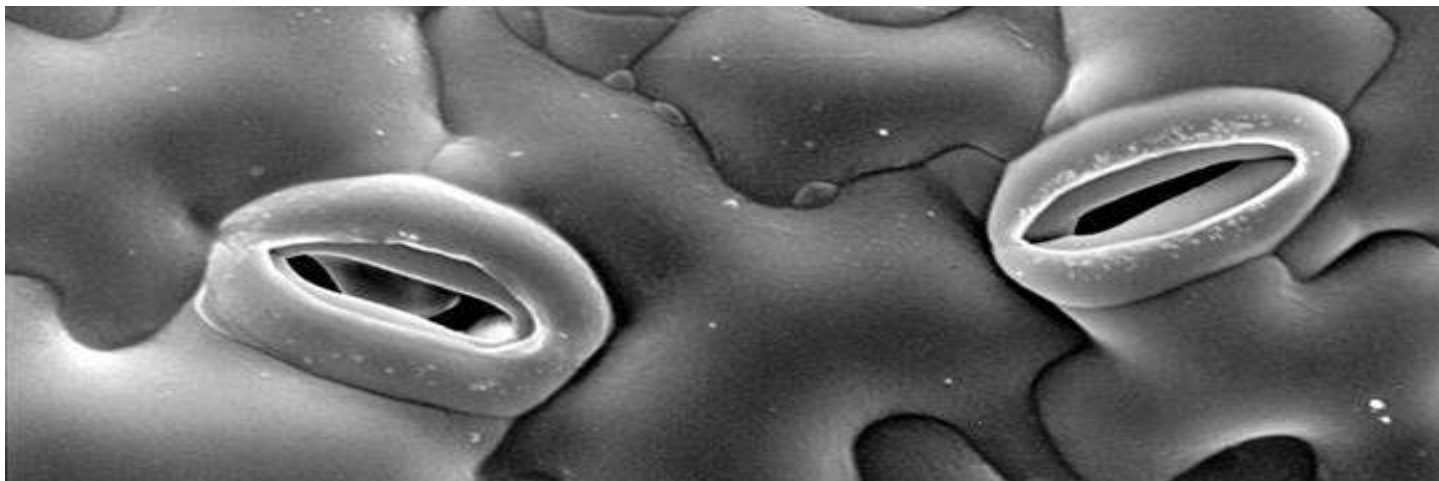
Stomatal Openings

Historically, the entryway into foliage for liquid fertilizers and solubles.

Transcuticular Pore Spaces

These are ALWAYS OPEN, more numerous, but SMALLER.

Aparaty szparkowe a przestrzenie kutikularne



- Transcuticular Pores
– 10,000,000 per square centimeter

Amino acids – carriers of micro-nutrients

Uptaking doses of various preparations of iron in the form of foliar fertilisers after 8 hours.

Measurement	Fe z Amino acid	Fe-EDTA *	FeSO4
Leaves	43.09 %	26.23 %	29.24 %
Stems	0.49 %	0.14 %	0.32 %
Entire plant	43.58 %	26.37 %	29.56 %

Purpose of applying liquid fertilisers



1

Stimulating physiological performance

Better uptake of nutrients



3

Greater resistance to stress

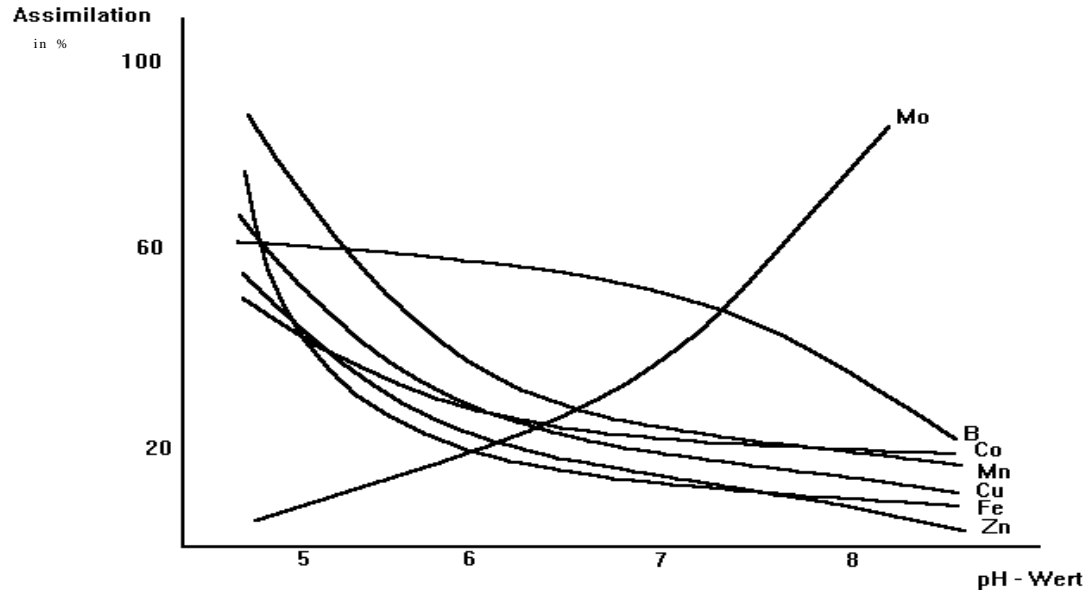
Plants are more resistant to stress conditions.

2

Improvement of transport system

More effective uptake of nutrients

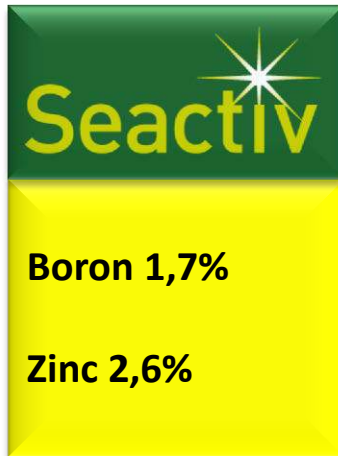
Micro-nutrients vs Soil Reaction



Quelle: PROTEX

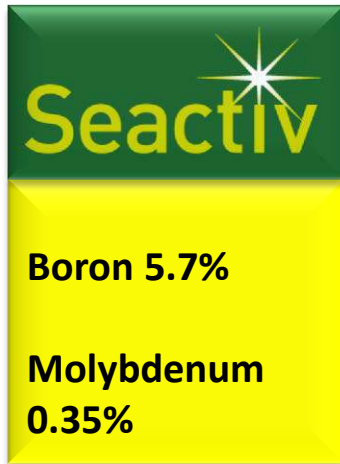
- The soil pH is adjusted for the uptake of macro-nutrients.
- The availability of micro-nutrients in such soil is low.

FERTILEADER LEOS



- This ensures greater resistance in the initial phase of growing minimizing the effects of stress (weather conditions)
Have a better uptake and transport of nutrients and increases energy production
Provides fully digestible micronutrients: boron (production and pollen viability, cell division), zinc (synthesis of enzymes, creating auxin)
- Dose: 4 l/ha

FERTILEADER GOLD BMo



- Increase of flowering and pollination
- Production and transport of sugars
- Uptake and transformation of nitrogen
- Production of proteins
- Dose: 5 l/ha or 2x3 l/ha

FERTILEADER AXIS



Seactiv

Nitrogen 3 %

Phosphorus

18%

Manganese

2.5%

Zinc 5.7%



- Energy support for fruit buds
- Intensification of cell division
- Improvement of plant condition
- Dose: 3 l/ha

FERTILEADER VITAL 954



Seactiv

Nitrogen 9%
Phosphorus 5%
Potassium 4%
Boron 0.05%
Copper 0.02%
Manganese 0.1%
Molybdenum 0.01%
Zinc 0.05%



- It stimulates the growth of the vegetative and radicular system.
- It intensifies the production of proteins and sugars.
- Micro-nutrients are immediately available.
- Terms of application: heads setting
- Dose: 5l/ha

FERTILEADER ELITE



Seactiv

Nitrogen 9 %

Potassium 6%

Calcium 12%

Boron 0.2%

The image shows a vertical rectangular label for Seactiv. The top part is green with the brand name 'Seactiv' in yellow. Below this is a yellow section containing the nutrient composition: Nitrogen 9%, Potassium 6%, Calcium 12%, and Boron 0.2%.

- It has anti-stress performance.
- It influences the growth and the dry matter content.
- It strengthens the epidermis (skin) and improves the resistance of fruits.
- It ensures maximum quality parameters.
- Terms of application: growth and ripening.
- Dose: 2x3 l/ha

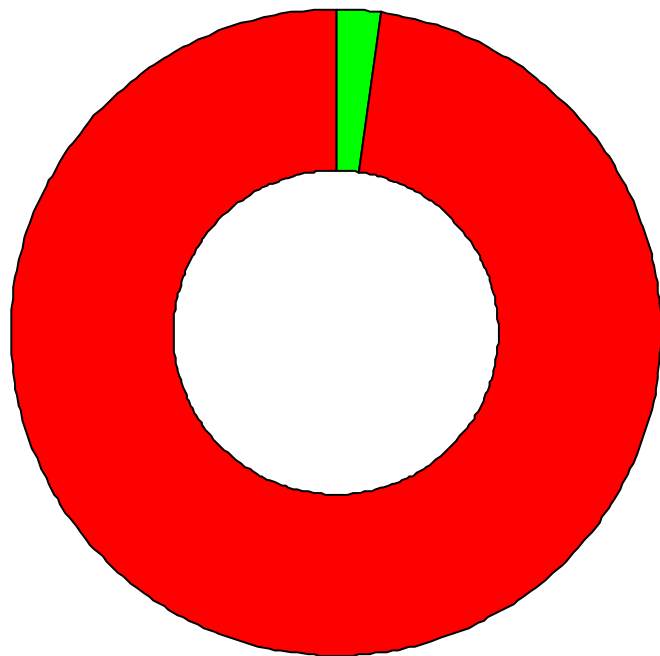
The added value which we offer along with our liquid products are:

- Individual consultancy (100 consultants all over Poland)
- Fluorimetric surveys



Plant Nutritional Status

2.34% measurements prove that plants have been correctly nourished.



97.66%

measurements show
insufficiencies in the
nutrition of plants.

N 48.38%

B 4.16%

Mg 31.34%

Mn 7.06%

S 0.36%

K 1.98%

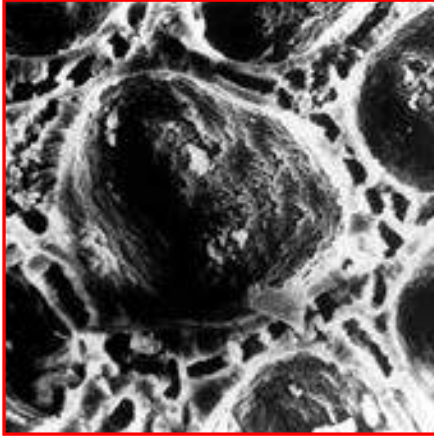
Fe 5.06%

Ca 1.62%



Granulated fertilisers with biostimulation – the only product of this type available on the market!

MAERL

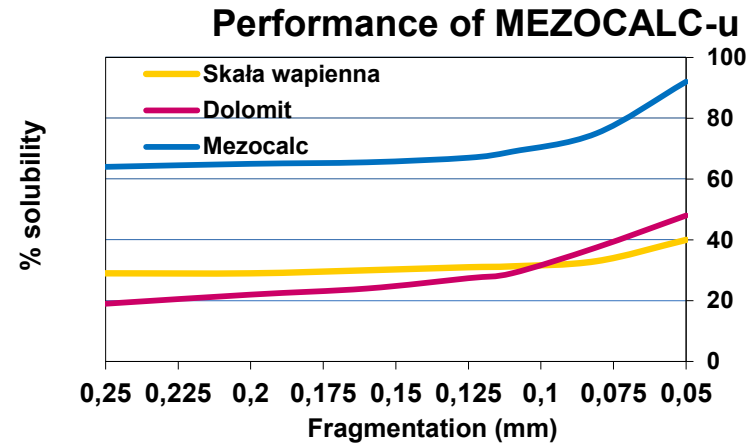
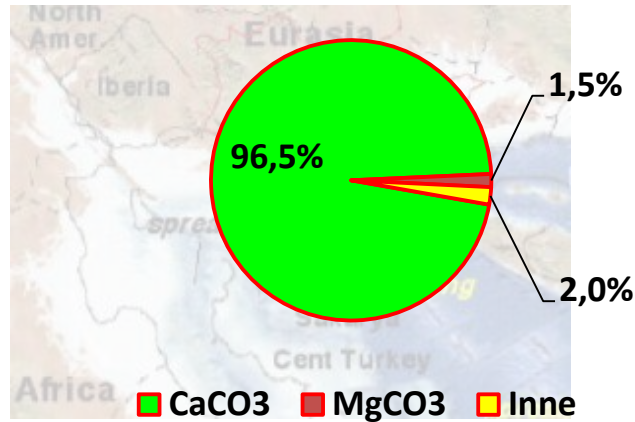


**IMAGE FROM
MICROSCOPE**

Bringing up the MAERL



MEZOCALC – highly reactive calcium carbonate



The application of MEZOCALC means:

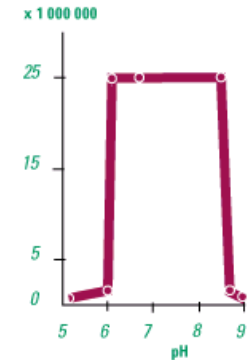
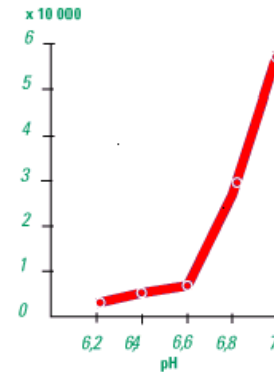
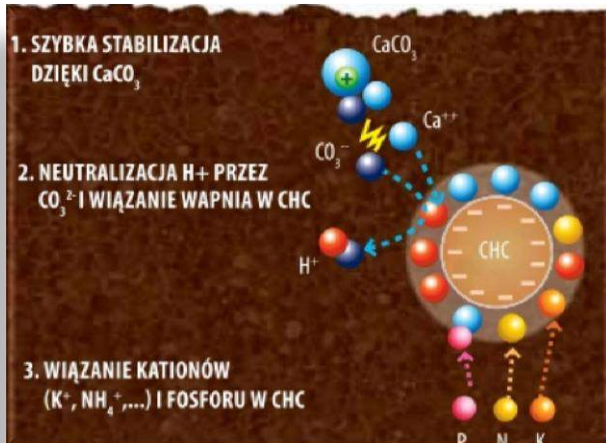
- Fast and long-lasting action
- Soil structure improvement
- Stimulus for soil micro-organisms
- More effective uptake of nutrients
- Supply of Ca as a plant nutrition component

Fertile soil with good structure

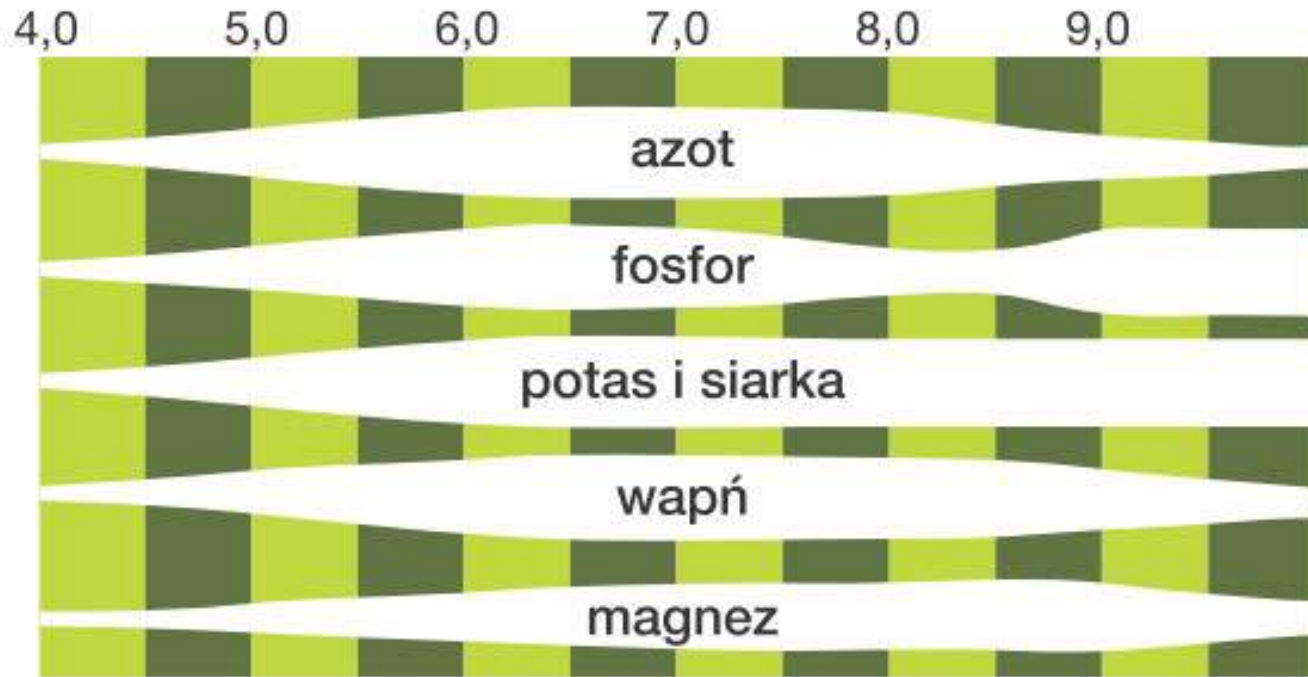
Micro pH optimisation



Increased ability to store nutrients on soil sorption complex

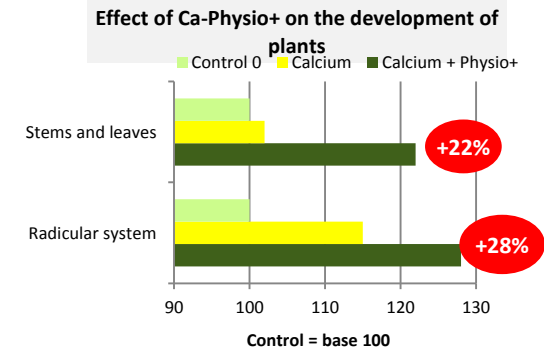
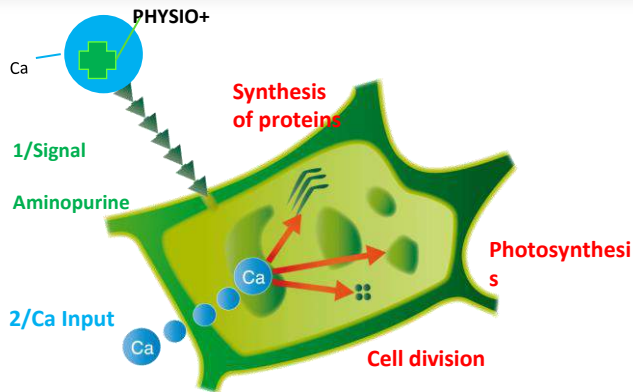


More effective uptake of nutrients in alkaline pH



PHYSIO+ performance principle

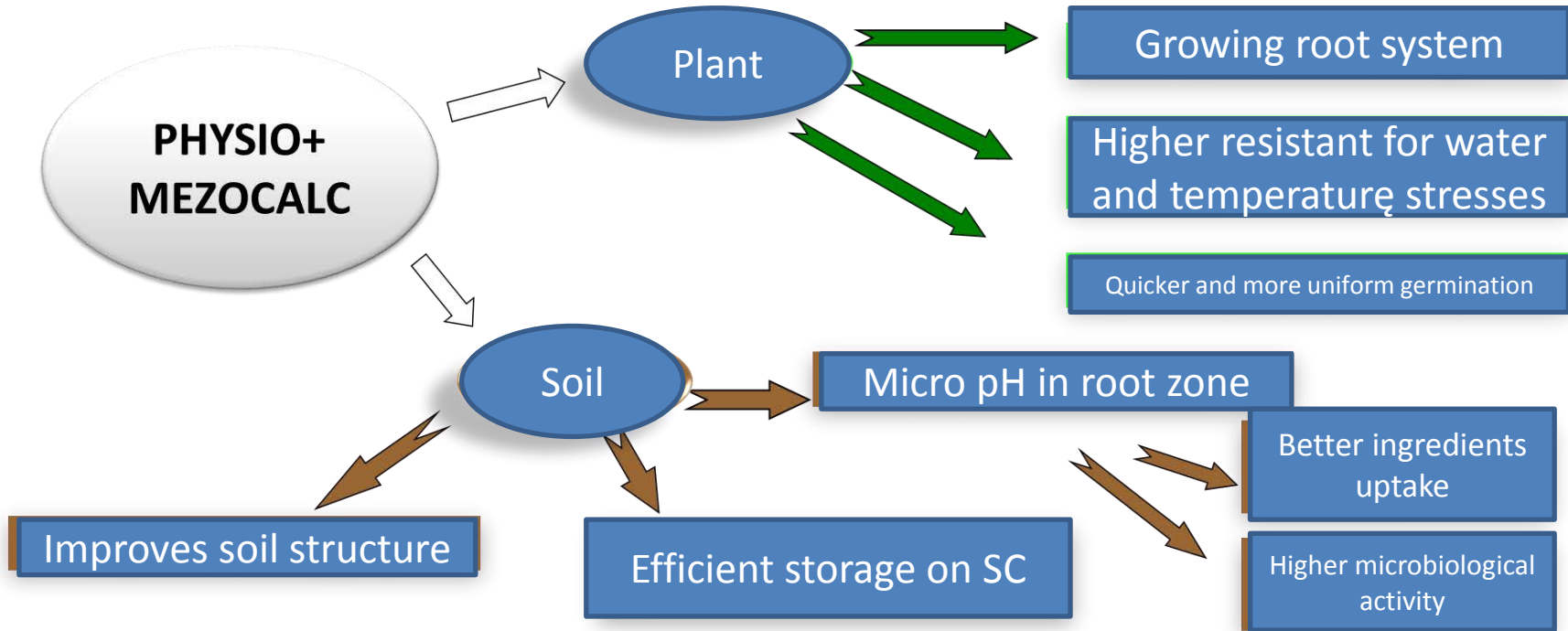
Aminopurine is a natural substance which is present in every plant. By getting connected with the cellular receptors, it works as a signal for the plant to intensify the uptake of calcium. While increasing the uptake of Ca, it intensified cellular divisions, improves the growth and development of the main root and the root hair, germination, flowering and ripening.



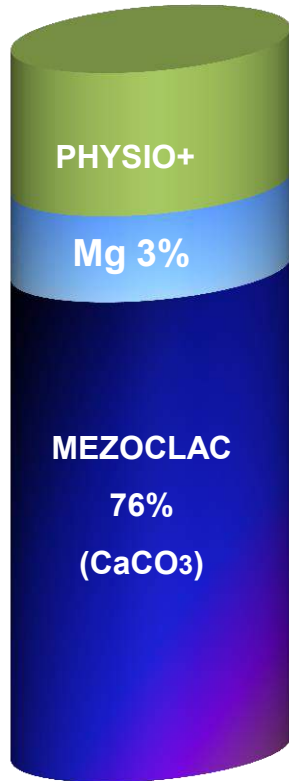
Source: Villais, universit  de Rennes

Joint action of MEZOCALC – PHYSIO+

Współdziałanie MEZOCALC – PHYSIO+



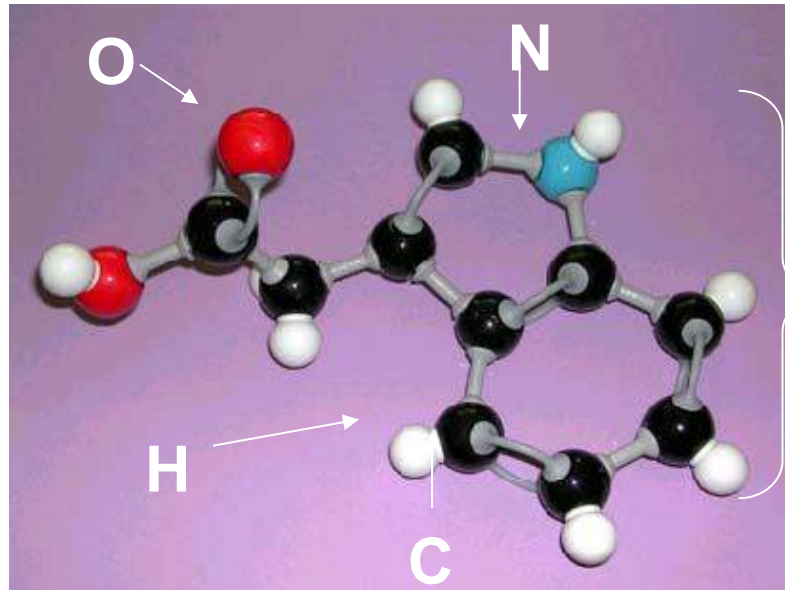
PHYSIOMAX – fertiliser content



PHYSIOMAX 975:

- Improves the reaction and structure of soil
- Ensures better growth of the radicular system of plants
- Increases the efficiency of the organic and mineral fertilisation
- Increases the plant resistance to thermal and aqueous stress
- Intensifies calcium nutrition
- The fertiliser is approved for use in the organic agriculture
- dose: 300-600 kg/ha

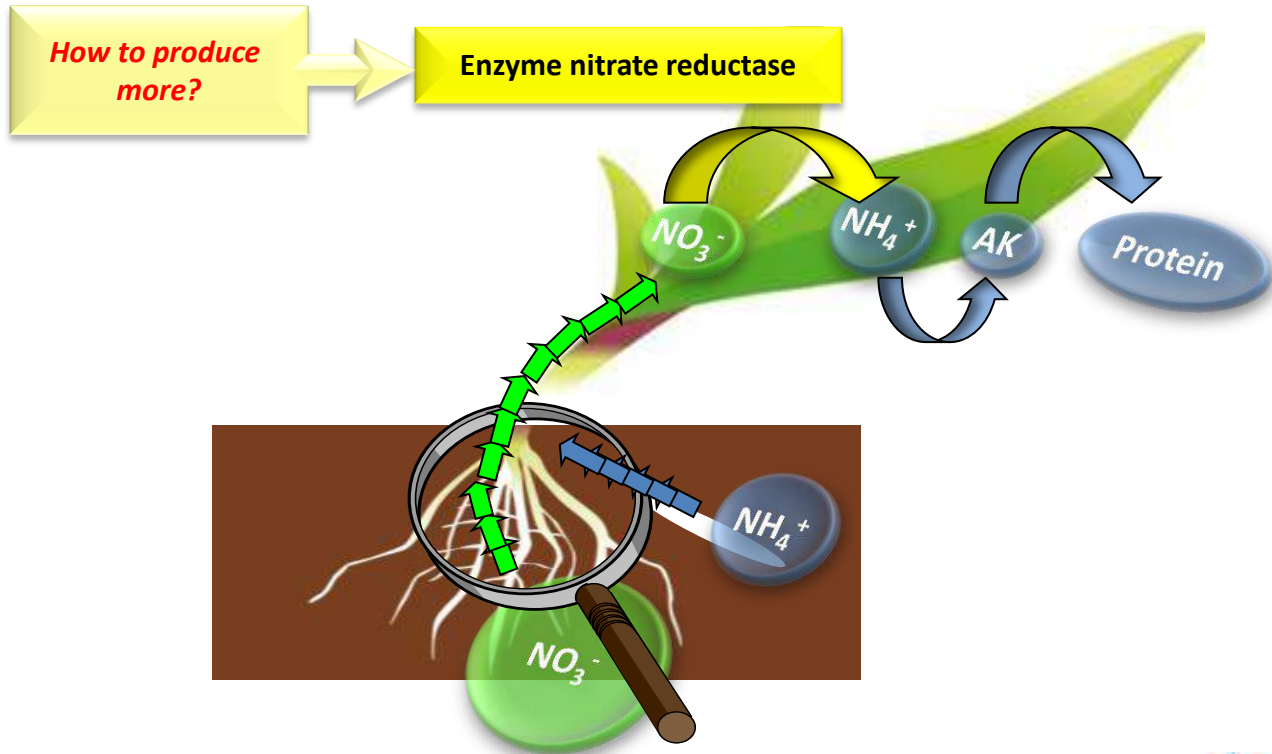
N PRO



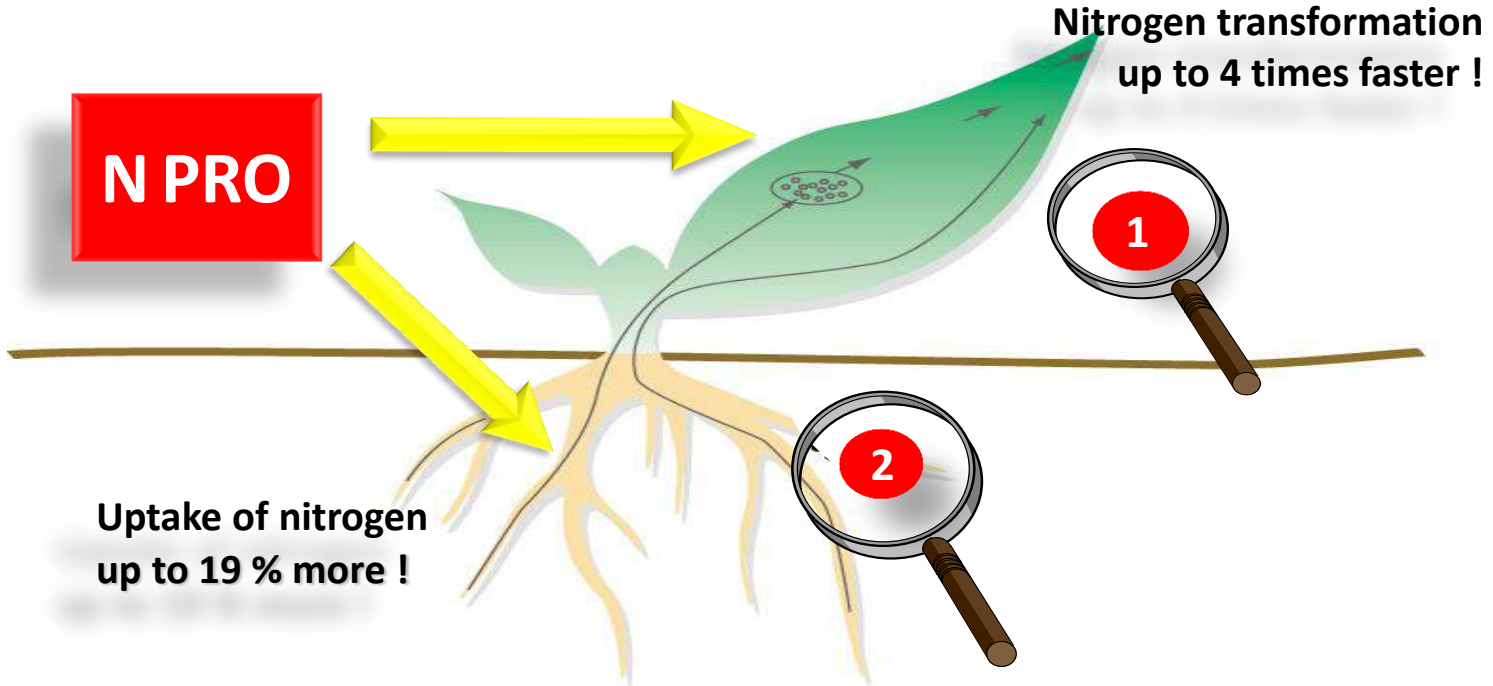
Indole kernel

The N PRO complex is a set of selected indole derivatives which determine the assimilation and transformation of nitrogen.

Process of nitrogen uptake by the plant

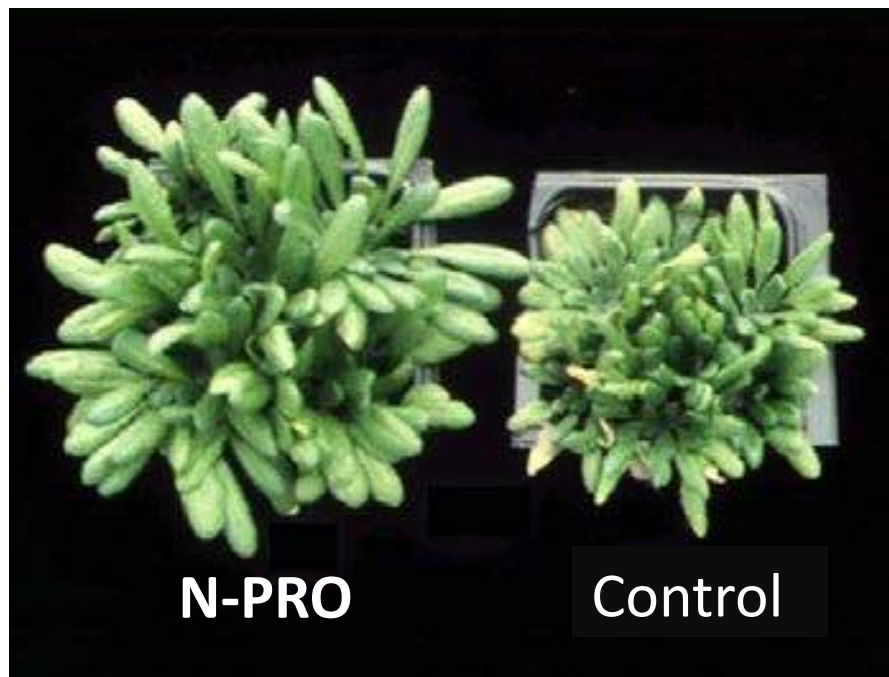


N PRO performance



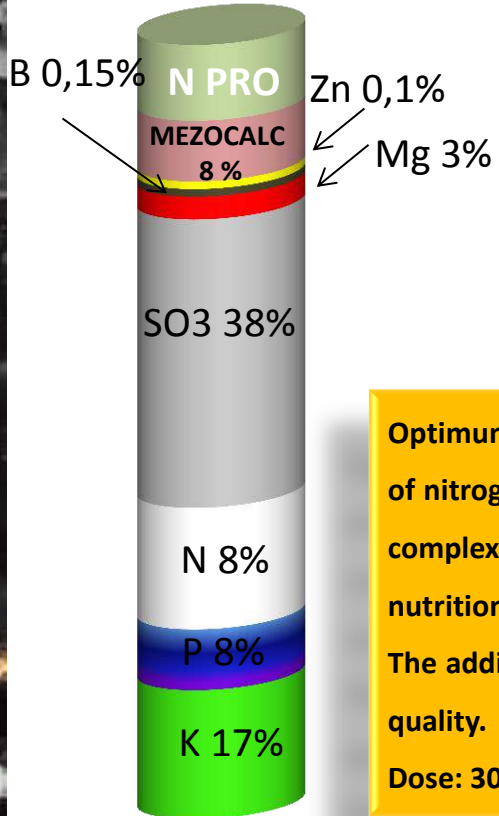
The N PRO complex not only increases the output of crops but also improves their quality, reducing the amounts of harmful nitrates!

Influence on the plant - 16 days after application



10 mM of nitrate

EUROFERTIL 33 N PRO (w/o chloride)

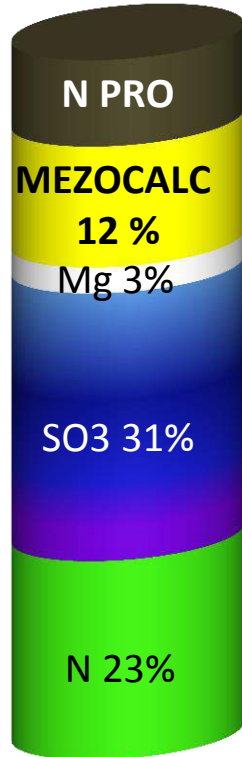


Optimum form of potassium for plants sensitive to chlorine. Ammonium form of nitrogen, content of calcium, magnesium and sulphur as well as the N PRO complex - all these factors increase the efficiency of the plant nitrogen nutrition.

The additive of micro-nutrients ensures high output of crops and their better quality.

Dose: 300-800 kg/ha

SULFAMMO 23 N PRO



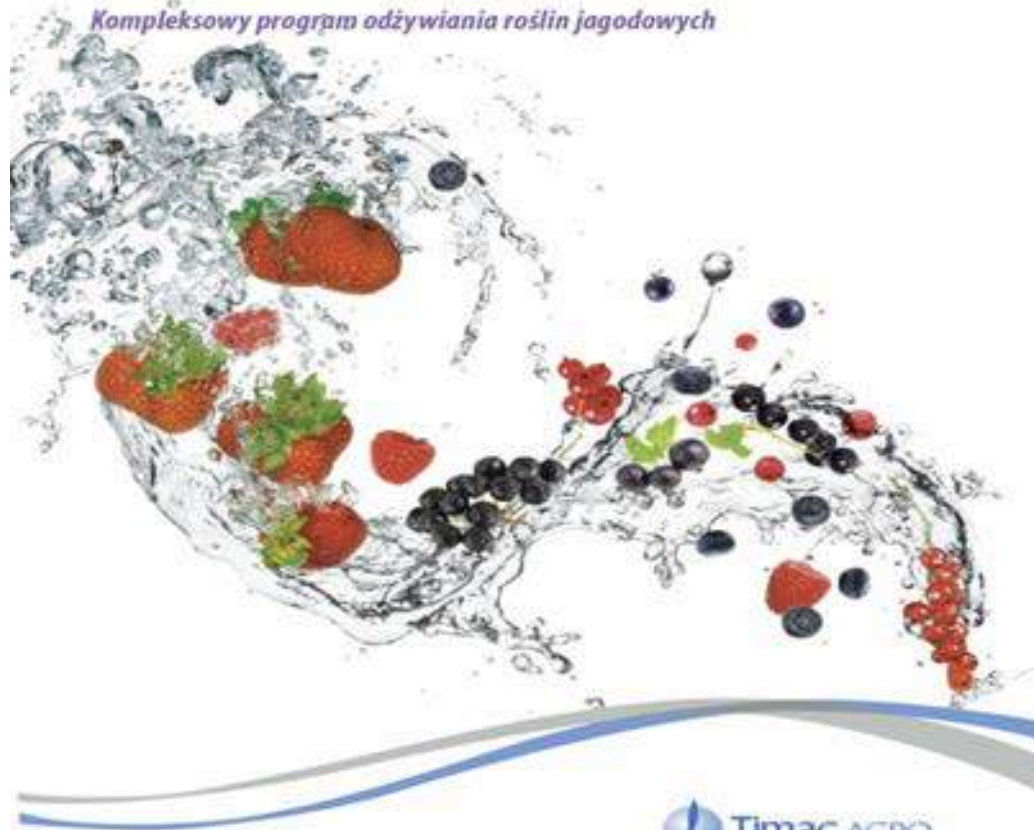
The complex fertiliser with a high content of nitrogen and sulphur, containing magnesium and calcium. Nitrogen is present in two forms: the fast acting ammonium one and the slow acting amide one.

The fertiliser contains the active N PRO complex which present in the fertiliser accelerates the uptake and processing of nitrogen.

Dose: 200-300 kg/ha

FORMUŁA EKSTRA JAKOŚCI

Kompleksowy program odżywiania roślin jagodowych



PROGRAM ODŻYWIANIA PORZECZKI



PHYSIOMAX 975*
300-600 kg/ha



EUPROFERTAL 33
N PRO**
300-600 kg/ha



FERTIACYL
STARTER
5 l/ha



FERTILEADER
LEOS
4 l/ha



FERTILEADER GOLD
800
5 l/ha lub 2 x 3 l/ha



wczesna wiosna



Po zbiorze owoców -
jesienią



początek wegetacji



wzrost i dojrzewanie
owoców



rozwój liści



wzrost zawieszek
owoców



przed w trakcie
kwitnienia



koniec kwitnienia



FERTILEADER
LEOS
5 l/ha



PHYSIOMAX 975*
300-600 kg/ha



FERTILEADER
SUITE
2 x 3 l/ha



FERTILEADER
VITAL
5 l/ha



FERTILEADER AXIS
5 l/ha



SULFAMWO 23
N PRO**
200-300 kg/ha



UWAGA NA PRZYMROZKI:

Na 24 h przed spodziewanym przymrozkiem należy zastosować FERTILEADER LEOS w dawce 5 l/ha, a dzień po przymrozkach FERTILEADER VITAL w dawce 5 l/ha

* dydaktycznie w zależności od zawartości gliny w dostępnym wapiu
** dydaktycznie w zależności od zawartości gliny w dostępnym azocie

Dodatkowo:
FERTILEADER MAGNUM 5 l/ha
w przypadku niedoboru magnezu





KONTROLA (standardowe nawożenie)



TIMAC AGRO



KONTROLA (standardowe nawożenie)



TIMAC AGRO

After applying fertilizers of Timac Agro on blackcurrant plantation , in 2014 were observed as follows:

- increased flowering shrubs (among longer with more flowers)
- a greater percentage of knotted berries among

PROGRAM ZASTOSOWANY NA PORZĘCZCE (DRUGI ROK OWOCOWANIA)

Lp.	Preparat	Termin zabiegu (miejscowość)	Dawkę (l/ha)
1	Fertiacyl STARTER	Początek wegetacji	5
2	Fertileader LEOS	28.03 i 04.04	2,5
3	Fertileader GOLD	11.04 (pierwszy kwiat na gronie)	5
4	Fertileader AXIS	18.04 (koniec kwitnienia)	3
5	Fertileader VITAL	25.04 (wzrost zawiązków)	5
5	Fertileader MAGNUM	09.05	3

Ground frost damages

Inspection



TIMAC AGRO



The use of fertilizers containing complex Seactiv (glycine betaine, IPA, amino acids) increases the ability of the plant to overcome stress (set with the occurrence of low temperatures)?

Trial

Inspection



Despite the adverse weather conditions in the spring of 2014 the formation of the fruit on the bushes fed with fertilizers containing complex fertiactyl and seactiv is greater than the bushes control (standard fertilization) - as at 18.05

TIMAC AGRO



WYNIKI BADAŃ Z TECHNOLOGIĄ TIMAC AGRO

PORZECZKA

PORÓWNANIE PŁONOWANIA Z LAT 2012-2013



		kontrola (standardowe nawożenie) [t/ha]	TIMAC [t/ha]	przyrost [%]
2012	Odmiana 1	8.5	9.2	10.8
	Odmiana 2	6.5	7.3	12.3
2013	Odmiana 1	9.2	10.5	14.1
	Odmiana 2	7.3	8.5	16.4

Conclusions

- comprehensive nutrition program blackcurrant bushes fertilizer company Timac Agro improves plant growth (increased vigor), which contributes to the "construction of the production potential" for next year
 - improves flowering and fruit set
 - increases the resistance of plants to stress
 - increases the yield

Timac Agro technology – our partners



URSZULA I WŁODZIMIERZ BEREZIŃSCY HORTICULTURAL FARM: AGROPLANT SPJ. BEREZINSKI AND PARTNERS NATURALIS - NATURAL PRODUCTS

I have been using liquid and granulated fertilisers from Timac Agro for 3 years. These include the EUROFERTIL 33 N PRO chloride-free fertiliser and PHYSIOMAX 975. The liquid fertilisers are LEOS, GOLD, AXIS, ELITE and others. The most important advantage which I have found after applying the Timac AGRO fertilisers is a better appearance of leaves throughout the entire vegetative period. They are healthier and less infested. The uniform ripening of fruits made the harvests easier. The above actions have significantly improved the quality and increased the yield. The Timac products are widely applicable to my cultivations: most of all the currant, the production of aronia berry (grown for the production of cosmetics and other purposes), in the orchard and in the horticultural farm - tree and decorative bush nurseries. Here, thanks to the Timac fertilisers, we see better rooting of plants, better health and correct development.

Timac Agro technology – our partners



WIESŁAW BŁOCKI, SIEMIATYCZE

In my farm, I use Timac Agro granulated and liquid fertilisers. The important factor is that they have biostimulating properties. I use the Timac products in the cultivation of currant, cherry and blackcurrant nurseries. I especially recommend FERTILEADER LEOS to protect the plantation during the flowering and fruit setting periods.