SANBIO
The novel approach of farming.

CATALOG

ENGLISH V2.0

- ADVANCED IMMUNITY ACTIVATORS
- GROWTH STIMULANTS
- SOIL ENHANCERS
- BIO-FERTLIZERS
- MICROBIOLOGICAL DECOMPOSERS

Made in Germany

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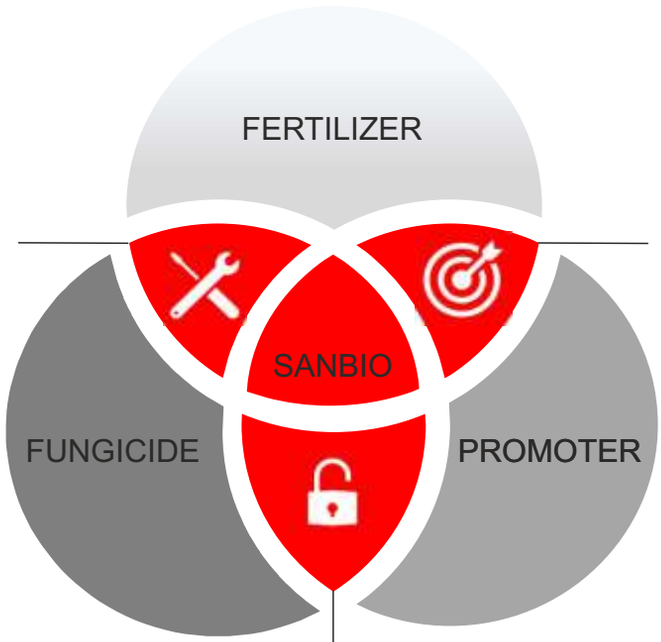
3-in-1. THE NEW APPROACH OF FARMING

SANBIO® is a line of new generation of solid and liquid plant ferti-activators, developed and manufactured by SANBOS GmbH, Made in Germany.

The premium immunity activators and growth stimulants are dedicated for stress control and increase of productivity on all crops. The products combine the core functions into one product: plant nutrition, growth stimulation and natural crop protection.



NUTRITION
Optimal access to nutrients, trace elements and water

STIMULATION
Stimulation of vegetative system to control the vigor and growth

PROTECTION
Activation of immune system to introduce resistance against biotic and abiotic stress factors

Winner of the innovation award „Crop power“

The powerful formulation acts directly in the plant cells and by that it´s triggering the defensive and vegetative processes in the plant. It increases the tolerance and resistance towards environmental and pathological stress by activating the whole plant physiological system. It activates the metabolism that results in enhanced development of root system, shoots, leaves, fruits, improved mobilization and assimilation of nutrients, vegetative growth, early flowering and maturation, improved fruit quality and long storage life.

“ We help you to make **more profit** and to **save money**. “

Jörg MEYER, Founder and CEO

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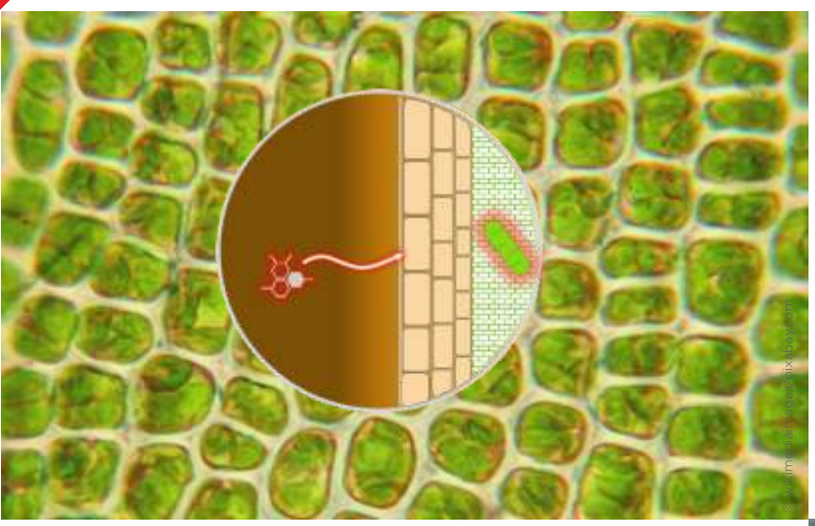

SMART AND UNIQUE TECHNOLOGY

The specific formulated material is activated in an electrical process of supercharging and polarization. Transported into plant cells, the product is acting on cellular level and triggering the defensive and vegetative processes.

The mechanism of electrical stimulation of plant cells makes the difference of SANBIO products versus conventional products acting on chemical mechanisms only.

INTEGRATED STRESS CONTROL SYSTEM

The activation of whole plant physiological system leads to forced secretion of phytohormons, intensified metabolism and accelerated immune response. That increases the tolerance towards environmental stress, resistance towards pathological stress and production performance under extreme conditions.

INTERGRATED CROP PROTECTION

Selective secretion of phenolic compounds and control of peroxidase activity speed up the local response to pathogen attack. That activates the systemic immune system and supports the plants to survive, recover and developing on fast way.

GROWTH CONTROL

The forced secretion of phyto-hormons such as Gibberellins, Cytokinin, Auxin, Ethylene, etc. can control the vegetative growth of roots and leafs, plant vigor, ripening and development of fruits.

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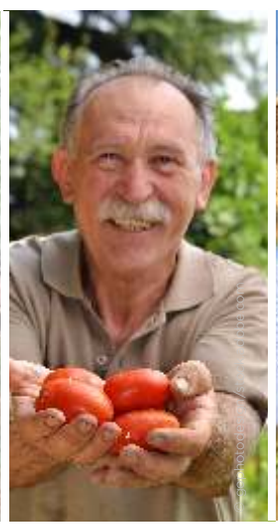
WE HELP YOU

... to tackle your problems for the most profitable and sustainable way to grow a high yielding and top quality crop.

Get technical information and advise on the right product, right application rate, and right timing of application to a farmer´s crop.

WHERE TO BUY SANBIO PRODUCTS?

Please contact us for more information about your nearest local distributor.



SATISFIED CUSTOMERS

"Thank you so much for the that excellent product. It did help me to stopping crop losses caused by plant disease. I did overcome this season and got good harvest. I appreciate so much that I have always received such good service from you." Peter

BECOME A PARTNER

... and participate at our extended program for distributors and profit from unique products and attractive pricing.

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PORTFOLIO



		EPSOMIT	VITAL	PLANTA
Category	Class	Economy	Advance	Premium
	Product integration	3-in-1	3-in-1	4-in-1
	Immunity activator	+	+	+
	Growth stimulant	+	+	+
	Microbiological soil enhancer	-	-	+
	Fertilizer	+	+	+
Purpose	Suitable for	All types of agricultural and horticultural crops		
Results and advantages for farmers	Higher crop yield	+	+	+
	Better quality and storage parameter	+	+	+
	Earlier flowering, ripenening, harvest	+	+	+
	Loss control	+	+	+
	Reduction/saving of artificial fertilizer	+	+	+
	Reduction/saving of pesticides	+	+	+
Control of	Physiological processes	+	+	+
	Defensive processes	+	+	+
	Vegetative process	+	+	+
Function	Active microbiological soil enhancement	-	-	+
	Plant nutrition	+	+	+
	Photosynthesis activation	+	(+)	(+)
	Immunity activation	+	+	+
	Root growth promotion	+	+	+
	Plant growth stimulation	+	+	+
	Environmental stress tolerance	+	+	+
	Pathological stress resistance	+	+	+
	Protection and recovery of roots	-	-	+
	Plant recovery	+	+	+
Properties	Appearance	Crystalline	Liquid	Powder
	Formula	Mineral	Organic-mineral	Organic-mineral
	Minerals	+	+	+
	Macronutrients			
	Micronutrients			
	Amino acids	-	+	-
	Algae extracts	-	+	+
	Yucca extract	-	+	-
	Natural microorganisms	-	-	+
	Advanced treatment (SANBIO techn.)	+	+	+
Instruction for use	Strategy of use	Primary	Special	Complementary
	Foliar	+	-	-
	Fertigation / soil	(+)	+	+
	Seed coating	+	+	-
	Number of applications min/opt	1/2	1/2	1/2
	Standard dosage	1 kg/ha	5-10 L/ha	1.5 kg/ha
	Working solution	500 L/ha	500 L/ha	500 L/ha
	Compatibility with fertilizers	+	+	+
	Compatibility with pesticides	+	(+)	(+)
	Available package size	1/5/25/500 kg	1/10 L	1 kg
	Approved for organic farming	+	-	+

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SANBIO® EPSOMIT

ADVANCED IMMUNITY ACTIVATOR AND GROWTH STIMULANT FOR FOLIAR APPLICATION TO ALL CROP TYPES

HIGHER YIELD
MORE PROFIT

The advantages of **EPSOMIT** are:

- Improving crop yield, quality and storage parameters
- Increasing environmental stress tolerance
- Higher resistance against infections and pests
- Better utilization of nutrients and water
- Better growth under extreme conditions.

DESCRIPTION

EPSOMIT is a premium immunity activator and growth stimulant for stress control and increase of productivity on all crops. EPSOMIT with its powerful formulation acts in the plant cells and by that it triggers the defensive and vegetative processes in the plant. EPSOMIT increases the tolerance and resistance towards environmental and pathological stress by activating the whole plant physiological system. EPSOMIT activates the metabolism that results in enhanced development of root system, shoots, leaves, fruits, improved mobilization and assimilation of nutrients, vegetative growth, early flowering and maturation, improved fruit quality and long storage life.

COMPOSITION

Activated*) Magnesium Sulphate Heptahydrate ($MgSO_4$) ...100 % w/w

*) processed by *SANBIO Biocatalytic Stimulation Technology*

MODE OF ACTION

EPSOMIT combines the core functions in one product: **plant nutrition, growth stimulation, stress control** and **natural crop protection**. The effectiveness of the crystalline ferti-activator EPSOMIT is based on the activation of raw material by the *SANBIO Biocatalytical Stimulation Technology*. The mechanism of **electrical stimulation of plant cells** makes the difference of EPSOMIT versus conventional products acting on chemical mechanisms only.

RAPID ACTION. The powerful formulation leads to an instant adsorption through the leaves and transport into the plant cells. There, EPSOMIT triggers the defensive and vegetative processes.

CROP POWER. EPSOMIT enhances the formation of chlorophyll content which intensifies photosynthesis, accelerates growth and increases biomass.

GROWTH CONTROL. The activation of whole plant physiological system boosting the excretion of phytohormons (Gibberellin, Cytokinin, Auxin, Ethylene). These catalysts intensifying the metabolic processes and enhancing the vegetative growth.

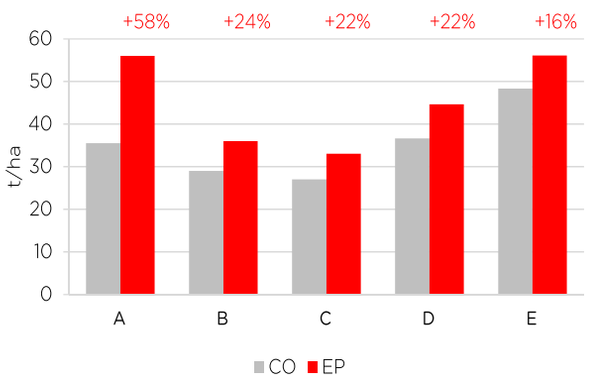
FULL ACCESS. The rapid and significant development of root mass ensures good access, transport and assimilation of essential nutrients, elements and water. Optimal supply can save artificial fertilizers and water.

STRONG AND VITAL. EPSOMIT is equipped with a stress control system. The activation of immune system on cellular level (immune response) enhances the tolerance towards abiotic stress factors and resistance towards biotic stress factors. The plant is able to adapt herselve to disorders (soil toxicity, salinity) and unfavourable conditions (heat, cold, frost, drought, flood). The integrated biological protection system reduces the impact of fungal infections, pathogens and pest attack. As a result, a profitable growth is possible even under extreme conditions, loss can be minimized. EPSOMIT works systemically, preventively and curatively with associated natural mechanisms.

QUICKER. BIGGER. BETTER. EPSOMIT accelarates the plant vigor (early flowering, ripening, harvest), and increases the yield significantly. The fruits show improved quality (appearance, sugar content, taste) and storage parameter (shelf time, stability).

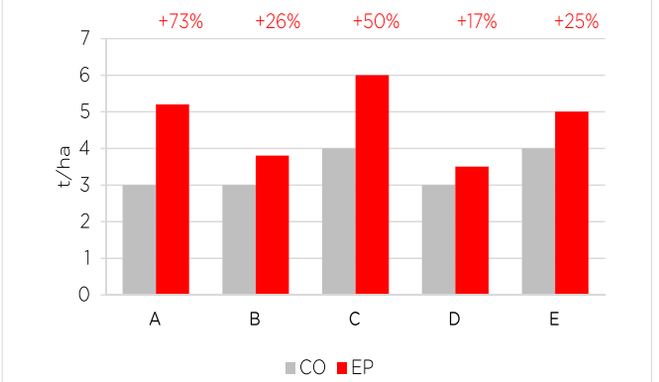
CASESTUDIES

Effects of EPSOMIT on yield of **WHEAT**



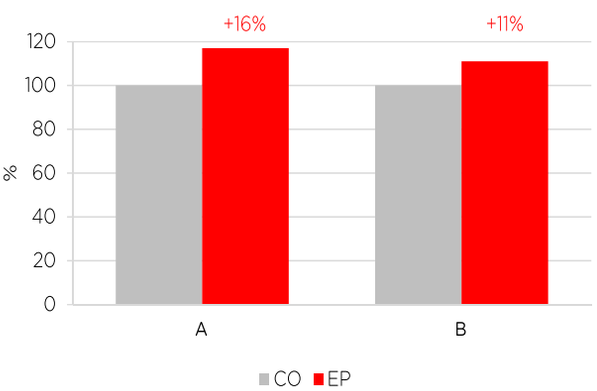
CO=Control (untreated lot)
EP=EPSOMIT (treated lot)
A=Variety „Maali“, Jendouba, Tunisia, 2016, 1kg/ha, dry season
B=Variety „Nasr“, Medjes El Baab, Tunisia, 2016, dry season
C=Variety „Maali“, Qued Zarga, Tunisia, 2017
D=Variety „Maali“, Bizerte, Tunisia, 2018, 2kg/ha
E=Variety „Monastir“, Beja, Tunisia, 2018, 2kg/ha

Effects of EPSOMIT on yield of **VEGETABLES**



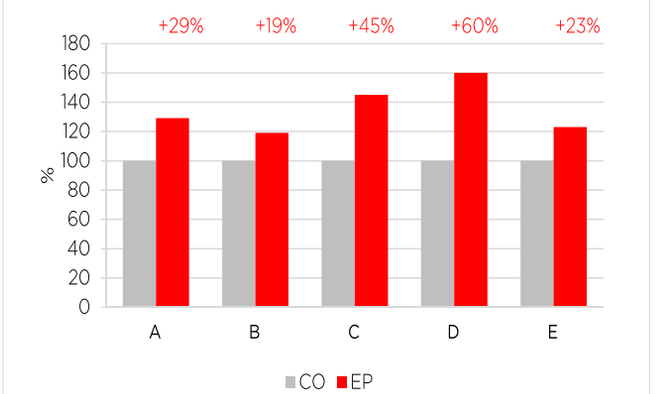
CO=Control (untreated lot)
EP=EPSOMIT (treated lot)
A=Tomato, Bekalta, Tunisia, 2015, 1kg/ha
B=Tomato, Bekalta, Tunisia, 2016, 1kg/ha
C=Pepper, Tunisia, 2016, 1kg/ha
D=Eggplant, Teboulba, Tunisia, 2016, 1kg/ha
E=Zucchini, Teboulba, Tunisia, 2016, 1kg/ha

Effects of EPSOMIT on yield of **POTATOES**



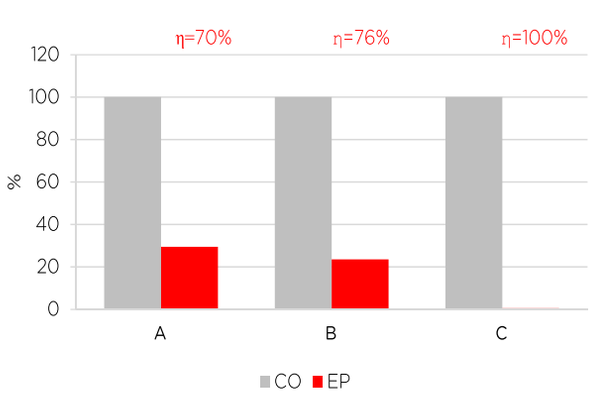
CO=Control (untreated lot)
EP=EPSOMIT (treated lot)
A=Potato „Spunta“, Teboulba, Tunisia, 2017, 2x1.25kg/ha
B=Potato „Spunta“, Teboulba, Tunisia, 2017, 0.65kg PL + 1.3kg EP

Effects of EPSOMIT on yield of **FRUITS**



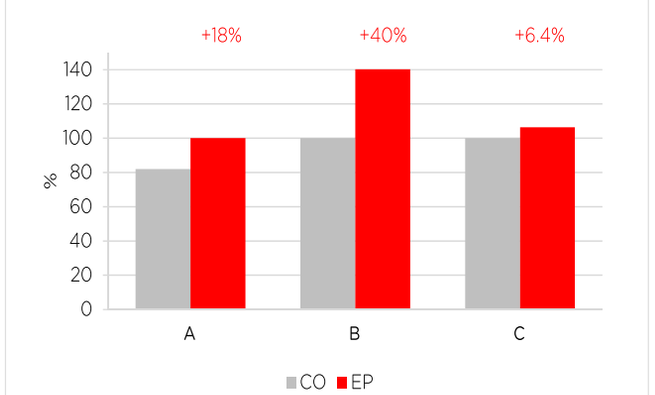
CO=Control (untreated lot) EP=EPSOMIT (treated lot)
A=Citrus „Thomson Navel“, B=Meksi Ansli, C=Washington Navel“, Bou Argoub, Tunisia, 2015, 2.5kg/ha EP + 2.5kg/ha PL
D=Table grapes „Muskat Italia“, Mornag, Tunisia, 2015, 1kg/ha EP + 1kg/ha PL + 2.5L/ha VI
E=Strawberry „Camarosa“, Tazerka, Tunisia, 1kg/ha EP + 1kg/ha PL

Product efficacy of EPSOMIT on major pathogens on **OLIVES**



Product efficacy of EPSOMIT on major pathogens causing root rot and wilt diseases wiltering (*Fusarium solani, F. oxysporum, Pythium sp, Rhizoctonia solani verticillium dahliae*)
CO=Control (untreated lot)
EP=EPSOMIT (treated lot)
A=Disease incidence, treatment one week after inoculation
B=Disease incidence, treatment and inoculation at the same time
C=Disease incidence, treatment one week before inoculation

Product efficacy of EPSOMIT on major pathogens on **MELONS**



Efficacy of EPSOMIT on major pathogen *Fusarium oxy.*
CO=Control (untreated lot)
EP=EPSOMIT (treated lot)
A=Percentage of healthy non-infested melon plants after infestion of plot by *Fusarium oxy.* infestion evaluated two days after treatment
B=Yield of watermelon „Cariston“, 1.5kg PL + 1kg EP
C=Sugar content melon, 1.5kg PL + 1kg EP

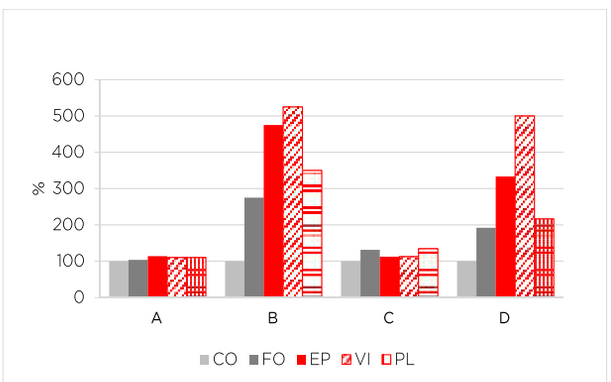
GROWTH & DEFENSE

The effectiveness of EPSOMIT on growth and defense mechanisms on tomato and melon has been recorded seven days after inoculation with soil borne pathogens causing wilting (Fusarium ox.) and air borne pathogens causing gray mold (Botrytis), Laboratory of Genetics and Plant Breeding, INAT, Molecular Plant Microbe Interactions Institut, Tunisia, 2015

CO FO EP VI PL

CO=Control (untreated lot)
FO=Fosetyl-AL, Bayer Crop Science (treated lot)
EP=EPSOMIT (treated lot)
VI=VITAL (treated lot)
PL=PLANTA (treated lot)

Growth performance: A=Leaves, B= Roots
Defense activity: C=Peroxydase D=Release of phenolic compound



Tomato

DIRECTIONS OF USE

EPSOMIT is designed for use in the cultivation of all types of agricultural and horticultural crops.

FOLIAR APPLICATION (recommended):

Crops	Application time	Dosage
Soil-grown agricultural crops Cereals, Pulses, Vegetables and Melons, Fruits, Nuts, Oilseeds, Sugars and Starches, Fibres, Beverages, Narcotics, Spices, Condiments, Rubber Forages, Green and Green leaf manure, Lawns	First application should be done in the early growth period (tillering, 3-5 leaves visible, stem elongation). Subsequent applications can be done optional during the shoot phase until end of flowering phase.	1 kg/ha
Trees	First application should be done in the early growth period at white/colored bud stage. Subsequent applications can be done optional during the shoot phase until end of flowering phase.	1 kg/ha/1m crown-height

Foliar spray is recommended for instant action independently of pH value of soil and for best results. Applications should be made at cold conditions for optimum results. Avoid extreme daytime temperature or strong sunshine during application. Repeat on demand. Wait at least 14 days between two applications.

FERTIGATION (alternative): Use working solution containing ca. 0.1 kg per 1000 L. Apply onto ground close to the plant. For soil-grown plants use every 4. fertigation cycle. For soilless cultures use several time during growth. Wait at least 14 days between two applications.

WATERING (alternative): Water the plants 2-3 times during growth season using solution at concentration of 0.05% (50g of EPSOMIT dilluted in 100 L of water).

SEED COATING: Use working solution of 0.5 – 2 L per 1 ton of seed, containing ca. 0.35 kg per 1 L of water.

OPTIMAL WORKING SOLUTION: Fill tank with 500 Liters of water. Add 1 kg of EPSOMIT. Agitate well. The working solution should be applied promptly. Maintain agitation throughout the fertigation process.

OPTIMAL NUMBER OF TREATMENTS: 1-2.

COMPATIBILITY: Mixing with most fertilizers and plant protection chemicals is possible.

APPROVALS: 100% natural. EPSOMIT is approved for organic farming and meets numerous international standards.

AVAILABLE PACKAGES: 1/5/25/500 kg

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SANBIO® VITAL

ADVANCED IMMUNITY ACTIVATOR AND GROWTH STIMULANT FOR ROOT RECOVERY USED IN FERTIGATION OF ALL CROPS

HIGHER YIELD
MORE PROFIT

The advantages of **VITAL** are:

- Improving crop yield, quality and storage parameters
- Increasing environmental stress tolerance
- Higher resistance against infections and pests
- Biological protection and recovery of roots
- Enhancement of soil fertility
- Better utilization of nutrients and water
- Better growth under extreme conditions.

DESCRIPTION

VITAL is a premium liquid concentrated immunity activator and growth stimulant used in fertigation for root recovery, stress control and increase of productivity of all crops. VITAL with its powerful formulation acts in the plant cells and by that it triggers the defensive and vegetative processes in the plant. VITAL increases the tolerance and resistance towards environmental and pathological stress by activating the whole plant physiological system. VITAL activates the metabolism that results in enhanced development of root system, shoots, leaves, fruits, improved mobilization and assimilation of nutrients, vegetative growth, early flowering and maturation, improved fruit quality and long storage life.

COMPOSITION

Activated*) composition containing: Water, Nitrogen, Magnesium Sulphate Heptahydrate ($MgSO_4 \cdot 7H_2O$), Algae extact (*Ascophyllum nodosum*), Yucca extract (*Yucca Schidigera*)
*) processed by *SANBIO Biocatalytic Stimulation Technology*

MODE OF ACTION

VITAL combines the core functions in one product: **plant nutrition, growth stimulation, stress control** and **natural crop protection**. The effectiveness of the ferti-activator VITAL in liquid form is based on the activation of raw materials by the *SANBIO Biocatalytical Stimulation Technology*. The mechanism of **electrical stimulation of plant cells** makes the difference of VITAL versus conventional products acting on chemical mechanisms only.

RAPID ACTION. The powerful formulation leads to an instant adsorption through the roots and fast transport into the plant cells. There, VITAL triggers the defensive and vegetative processes.

GROWTH CONTROL. The activation of whole plant physiological system boosting the excretion of phytohormons (Gibberellin, Cytokinin, Auxin, Ethylene, Phytoalexin). These catalysts intensifying metabolic processes and enhancing vegetative growth.

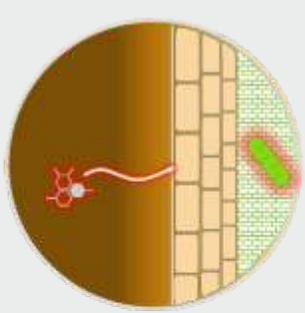
ROOT RECOVERY. The production of Phytoalexin leads to lignin synthesis and generation of Ethylen. As a result biopolymers are created, which forming stronger cell walls and structure of roots. The coverage of damaged root areas creates a new natural physical barrier. By that, the roots are repaired and plant can recover from parasitic damages (e.g. Nematode).

FULL ACCESS. The rapid and significant development of root mass ensures good access, transport and assimilation of essential nutrients, elements and water. Optimal nutrition can save artificial fertilizer and water.

FERTILITY AND NUTRITION. The net positive charge on molecules in VITAL allows it to act as a chelating agent. Nutrients and minerals are hold in the soil thus increasing their availability.

STRONG AND VITAL. VITAL is equipped with a stress control system. The activation of immune system on cellular level (immune response) enhances the tolerance towards abiotic stress factors and resistance towards biotic stress factors. The plant is able to adapt herselve to disorders (soil toxicity, salinity) and unfavourable conditions (heat, cold, frost, drought, flood). The integrated biological protection system reduces the impact of fungal infections, pathogens and pest attack. As a result, a profitable growth is possible even under extreme conditions, loss can be minimized. VITAL works systemically, preventively and curatively with associated natural mechanisms.

QUICKER. BIGGER. BETTER. VITAL recovers damaged roots, accelarates the plant vigor (early flowering, ripening, harvest), and increases the yield significantly. The fruits show improved quality (appearance, sugar content, taste) and storage parameter (shelf time, stability).



1. Stimulation of plant cells

2. Generation of biopolymer

3. Recovery of roots

4. Formation of new barrier

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CASESTUDIES

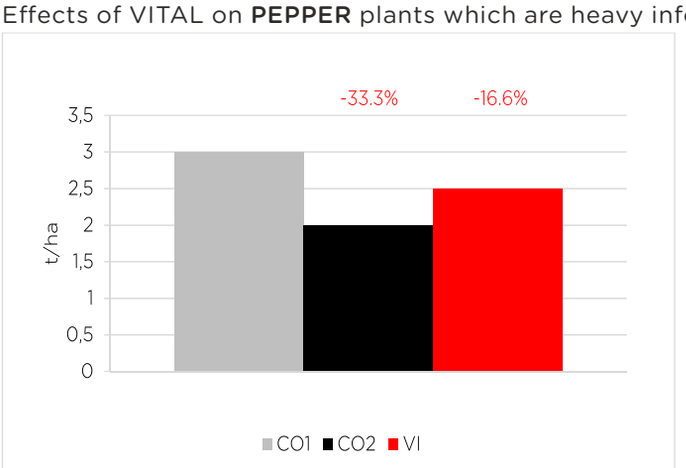
Recovery of heavy root-knot nematodes (*Meloidogyne incognita*) infected **CUCUMBER**

Before treatment: weakened plants due to heavy infection by root-knot nematodes, Jordan, 2018

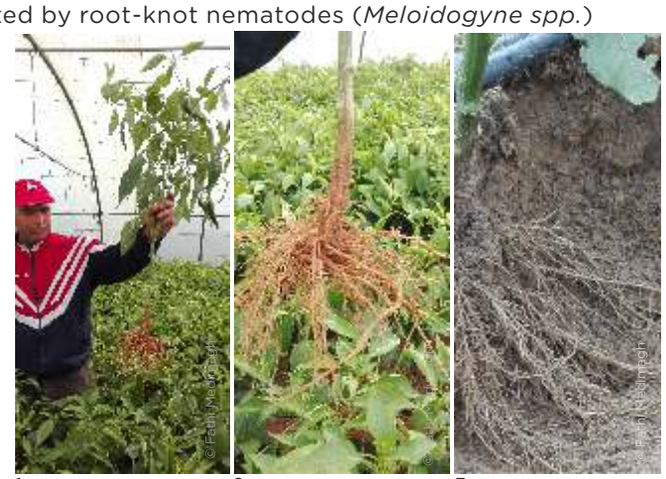
2 weeks after first treatment: development of new roots is starting (1 treatment weekly)

8 weeks after first treatment: total recovery of large root mass

Effects of VITAL on **PEPPER** plants which are heavy infected by root-knot nematodes (*Meloidogyne spp.*)

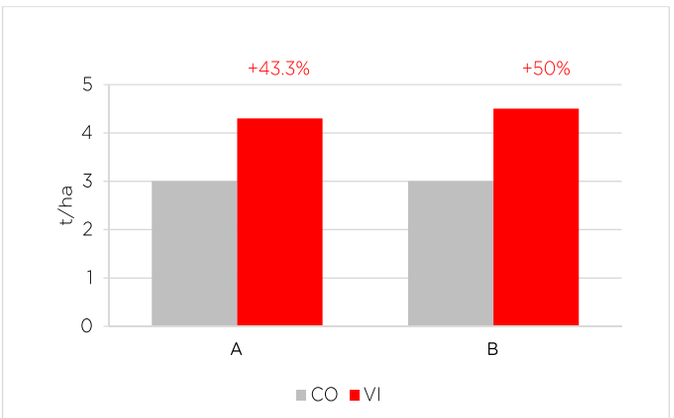


C1= Non-infected greenhouse, untreated (control 1)
C2= Infected greenhouse, untreated (control 2)
VI=Infected greenhouse, treated with VITAL
Bekalta, Tunisia, 2015



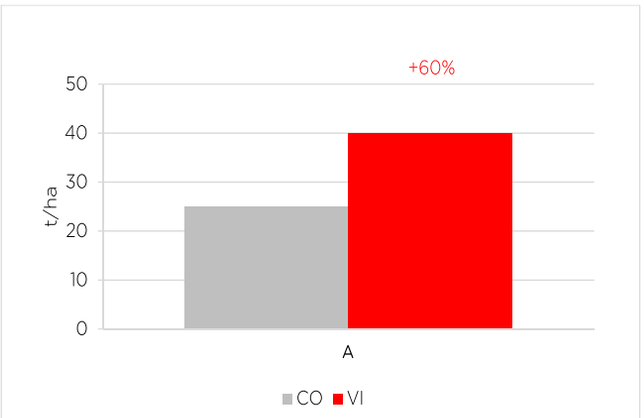
1 2 3
1/2= infected roots before treatment
3= root recovery 21 days after treatment

Effects of VITAL on **VEGETABLE** infested by root-knot nematodes



CO=Control (untreated lot)
VI=VITAL (treated lot)
A=Tomato „Sahel“, 2 applications VI
B=Sweet pepper, 2 applications VI
Bekalta, Tunisia, 2016

Effects of VITAL as biostimulator on **TABLE GRAPES**



CO=Control (untreated lot)
VI=VITAL (treated lot)
Table grapes „Muskat Italia“, 2kg/ha PL + 2.5L/ha VI
Mornag, Tunisia, 2015

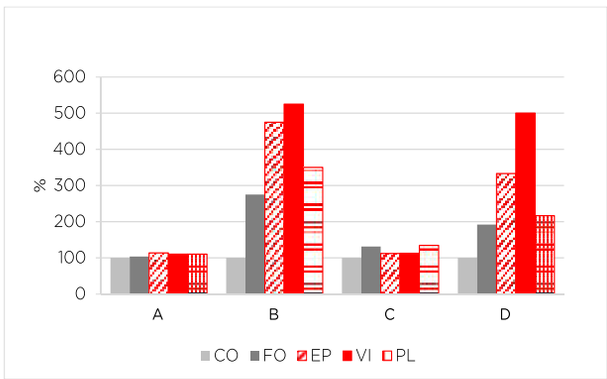
GROWTH & DEFENSE

The effectiveness of VITAL on growth and defense mechanisms on tomato and melon has been recorded seven days after inoculation with soil borne pathogens causing wilting (*Fusarium oxy.*) and air borne pathogen causing gray mold (*Botrytis*), Laboratory of Genetics and Plant Breeding, INAT, Molecular Plant Microbe Interactions Institut, Tunisia, 2015

CO FO EP VI PL

CO=Control (untreated lot)
FO=Fosetyl-AL, Bayer Crop Science (treated lot)
EP=EPSOMIT (treated lot)
VI=VITAL (treated lot)
PL=PLANTA (treated lot)

Growth performance: A=Leaves, B= Roots
Defense activity: C=Peroxydase D=Release of phenolic compound



Tomato

DIRECTIONS OF USE

VITAL is designed for use in the cultivation of all types of agricultural and horticultural crops.

FERTIGATION APPLICATION

Crops	Application time	Dosage
Soil-grown agricultural crops Cereals, Pulses, Vegetables and Melons, Fruits, Nuts, Oilseeds, Sugars and Starches, Fibres, Beverages, Narcotics, Spices, Condiments, Rubber Forages, Green and Green leaf manure, Lawns	First application should be done in the early growth period (tillering, 3-5 leaves visible, stem elongation). Subsequent applications can be done optional during the shoot phase until end of flowering phase.	5 - 10 L/ha
Substrate	Prior sowing	2 L/m3

Administer by fertigation. Apply onto ground close to the plant. Repeat on demand. Wait at least 14 days between two applications.

SEED COATING: Use working solution of 0.5 – 2 L per 1 ton of seed, containing ca. 0.5 L VITAL per 1 L of water.

OPTIMAL WORKING SOLUTION: Fill tank with 500 Liters of water. Add 5-10 L of VITAL. Agitate well. The working solution should be applied promptly. Maintain agitation throughout the fertigation process.

OPTIMAL NUMBER OF TREATMENTS: 1-2.

COMPATIBILITY: Mixing with most fertilizers and plant protection chemicals is possible. Do NOT mix with alkaline agrochemicals (pH value >7).

AVAILABLE PACKAGES: 1 L / 10 L

SANBIO® PLANTA

ADVANCED IMMUNITY ACTIVATOR AND GROWTH STIMULANT FOR FERTIGATION ON ALL CROP TYPES

HIGHER YIELD
MORE PROFIT

The advantages of **PLANTA** are:

- Improving crop yield, quality and storage parameters
- Increasing environmental stress tolerance
- Higher resistance against infections and pests
- Microbiological enhancement of soil fertility
- Better utilization of nutrients and water
- Better growth under extreme conditions.

DESCRIPTION

PLANTA is a premium immunity activator and growth stimulant used in fertigation, stress control and increase of productivity on all crops. PLANTA with its powerful formulation acts in the plant cells and by that it triggers the defensive and vegetative processes in the plant. PLANTA increases the tolerance and resistance towards environmental and pathological stress by activating the whole plant physiological system. PLANTA activates the metabolism that results in enhanced development of root system, shoots, leaves, fruits, improved mobilization and assimilation of nutrients, vegetative growth, early flowering and maturation, improved fruit quality and long storage life.

COMPOSITION

Activated*) biopreparation containing: Magnesium Sulphate Heptahydrate ($MgSO_4 \cdot 7H_2O$), Algae extact (*Ascophyllum nodosum*), mixture of high concentrated living microorganisms **): concentration 2.3 Billion CFU/g, species: Mycorrhiza (*M. spp, M. Glomus intraradices*), Bacillus (*B. subtilis, B. lichenformis, B.megaterium, B. amyloliquefaciens*), Pseudomonas (*P. trivialis*), Trichoderma (*T. harzianum T58*);

*) processed by *SANBIO Biocatalytic Stimulation Technology* **) see legal statement

MODE OF ACTION

PLANTA combines the core functions in one product: **plant nutrition, growth stimulation, stress control** and **natural crop protection**. The effectiveness of the ferti-activator PLANTA in powder form is based on the activation of the raw materials by the *SANBIO Biocatalytical Stimulation Technology* supported by the innovative biopreparation of natural microorganisms. The mechanism of **electrical stimulation of plant cells** makes the difference of PLANTA versus conventional products acting on chemical mechanisms only.

RAPID ACTION. The powerful formulation leads to an instant adsorption through the roots and fast transport into the plant cells. There, PLANTA triggers the defensive and vegetative processes.

CROP POWER. PLANTA enhances the formation of chlorophyll content which intensifies photosynthesis, accelerates growth and increases biomass.

GROWTH CONTROL. The activation of whole plant physiological system boosts the excretion of phytohormons (Gibberellin, Cytokinin, Auxin, Ethylene). These catalysts intensifying metabolic processes and enhancing vegetative growth.

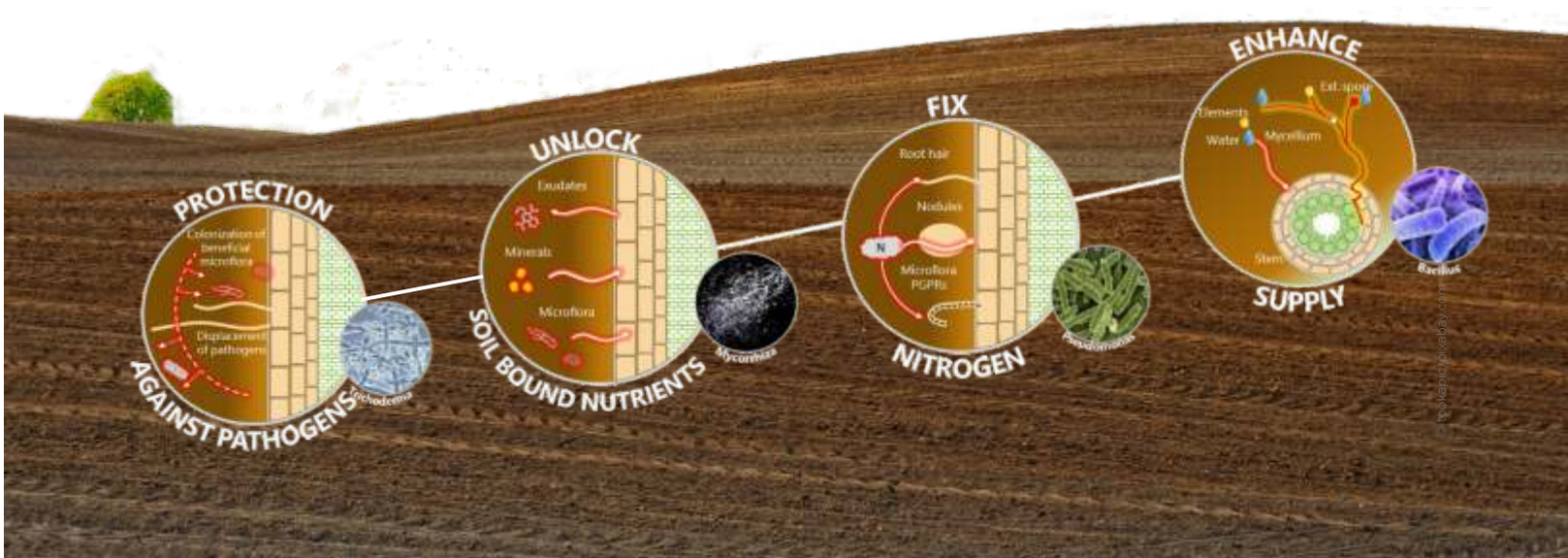
FULL ACCESS. The rapid and significant development of root mass ensures good access, transport and assimilation of essential nutrients, elements and water. Optimal nutrition can save artificial fertilizers and water.

ENHANCED MICROBIOM. PLANTA contains an innovative high concentrated biopreparation of natural microorganisms. The selected strains (Bacillus, Pseudomonas, Trichoderma, Mycorrhiza) are isolated from natural environment. The augmentation of microbial acitivity – intensified by SANBIO processing – leads to intensive symbiotic interaction between microorgansisms and roots. Furthermore, it enriches the soil life for higher fertility, especially soil structure, moisture, habitate and pH value.

PERFECT NUTRITION. The enhanced metabolism of the microorganisms unlocks and solubilises soil bounded phosphorous, fixes nitrogen and provides the nutrients in plant available form by ion exchange process. Furthermore, the microrganisms increase the content of humus by decomposition of cellulose and other crop residues.

STRONG AND VITAL. PLANTA is equipped with a two stage natural stress control system: 1. Displacement of antagonists and pathogens by root colonialization of the useful microorganisms. 2. Introduction of resistance: electrical stimulation of plant cells leads to selective excretion of phenolic compounds, control of peroxidase activity and acceleration of immune response to pathogen attack. The activation of immune system on cellular level (immune response) enhances the tolerance towards abiotic stress factors and resistance towards biotic stress factors. The plant is able to adapt herselve to disorders (soil toxicity, salinity) and unfavourable conditions (heat, cold, frost, drought, flood). The integrated biological protection system reduces the impact of fungal infections, pathogens and pest attack. As a result, a profitable growth is possible even under extreme conditions, loss can be minimized. PLANTA works systemically, preventively and curatively with associated natural mechanisms.

QUICKER. BIGGER. BETTER. PLANTA accelarates the plant vigor (early flowering, ripening, harvest), and increases the yield significantly. The fruits show improved quality (appearance, sugar content, taste) and storage parameter (shelf time, stability).



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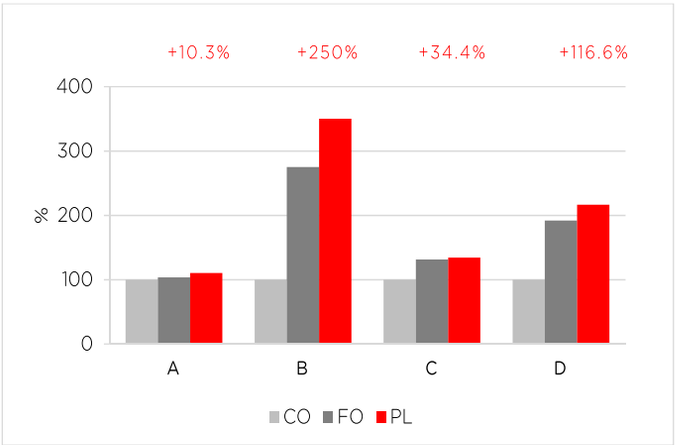
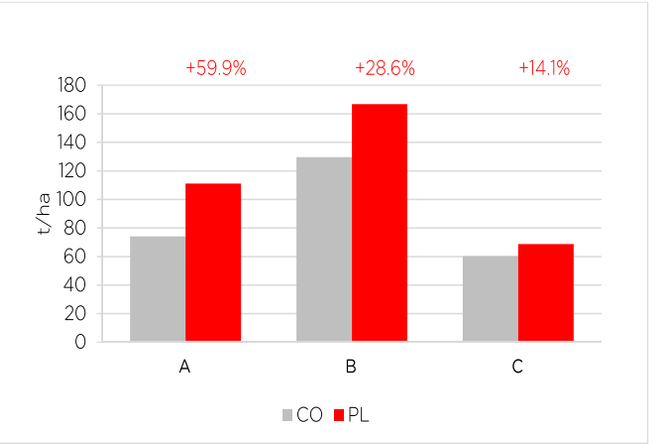
CASESTUDIES

CROP ROTATION: SUGAR BEET - MAIZE - WHEAT



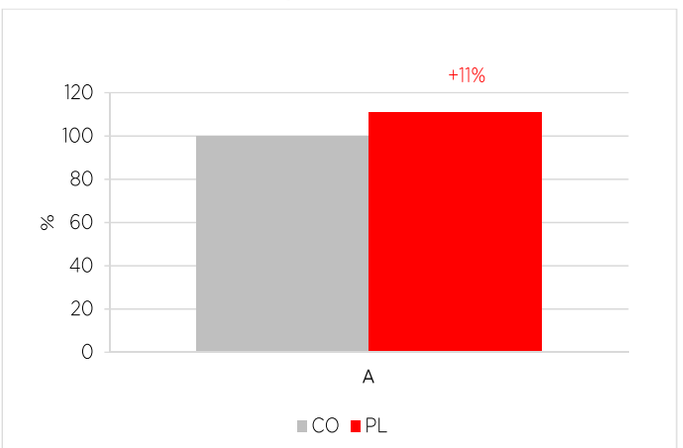
CO=Control (untreated lot)
PL=PLANTA (treated lot)
2016: Sugar beet „Annika“, Tröglitz, Germany, 1.5kg/ha PL
A=Yield B=Sugar yield C=Potassium D=Natrium E=AminoN
2017: Maize „Ricardo“, Tröglitz, Germany, 1.5kg/ha PL
F=Yield G=TS Protein
2018: Winter wheat, Tröglitz, Germany, 2x1.5kg/ha PL
H=Yield, I=Protein

RESISTANCE against PATHOGENS



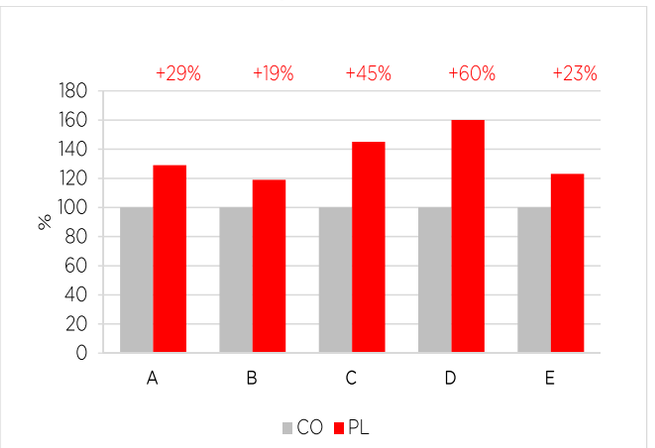
CO=Control (untreated lot) PL=PLANTA (treated lot)
A=Sweet pepper, Bekalta, Tunisia, 2016, 3.7 kg EP + 3.7 kg/ha PL, no impact of ***Fusarium oxy.*** infection was observed
B=Tomato „Sahel“, Bekalta, Tunisia, 2016, 4 kg/ha EP + 4 kg/ha PL, no impact of ***Mildew*** infection was observed
C=Pear „William“, Bekalta, Tunisia, 2018, 3x 1.5 kg/ha PL, reduced impact of ***Fire Blight*** infection was observed

Effects of PLANTA on yield of POTATOES



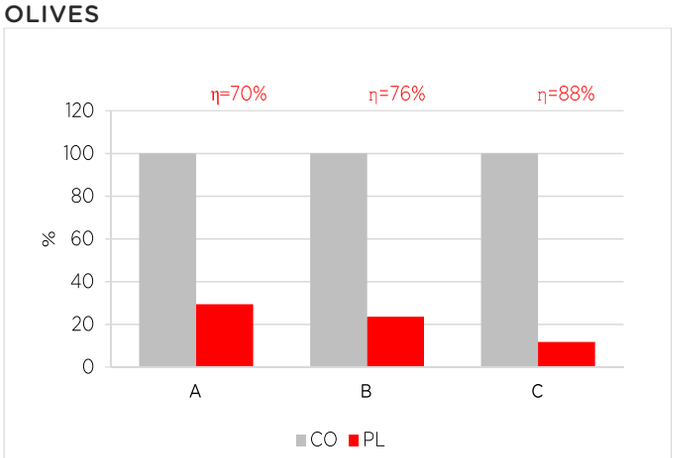
CO=Control (untreated lot)
PL=PLANTA (treated lot)
A=Potato „Spunta“, Teboulba, Tunisia, 2017, 0.65kg PL + 1.3kg EP

Effects of PLANTA on yield of FRUITS



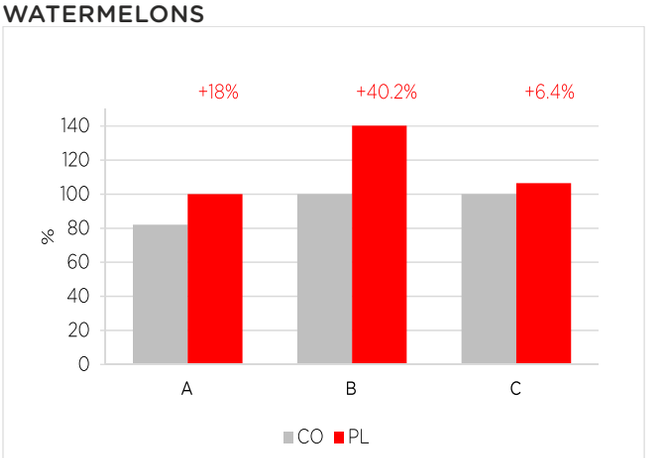
CO=Control (untreated lot) PL=PLANTA (treated lot)
A=Citrus „Thomson Navel“, B=Meksi Ansli, C=Washington Navel“, Bou Argoub, Tunisia, 2015, 2.5kg/ha EP + 2.5kg/ha PL
D=Table grapes „Muskat Italia“, Mornag, Tunisia, 2015, 1kg/ha EP + 1kg/ha PL + 2.5L/ha VI
E=Strawberry „Camarosa“, Tazerka, TN, 1kg/ha EP + 1kg/ha PL

Product efficacy of PLANTA on major pathogens on OLIVES



Product efficacy of PLANTA on major pathogens causing root rot and wilt diseases wiltering (**Fusarium solani, F. oxysporum, Pythium sp, Rhizoctonia solani verticillium dahliae**)
CO=Control (untreated lot) PL=PLANTA (treated lot)
A=Disease incidence, treatment one week after inoculation
B=Disease incidence, treatment and inoculation at the same time
C=Disease incidence, treatment one week before inoculation

Efficacy of PLANTA on major pathogen on WATERMELONS



Efficacy of PLANTA on major pathogen **Fusarium oxy.**
CO=Control (untreated lot) PL=PLANTA (treated lot)
A=Percentage of healthy non-infested melon plants after infestion of plot by Fusarium oxy. infestion evaluated two days after treatment
B=Yield of watermelon „Cariston“, 1.5kg PL + 1kg EP
C=Sugar content melon, 1.5kg PL + 1kg EP

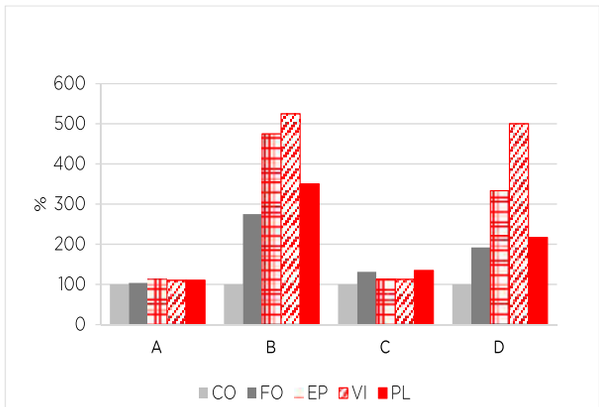
GROWTH & DEFENSE

The effectiveness of PLANTA on growth and defense mechanisms on tomato and melon has been recorded seven days after inoculation with soil borne pathogens causing wilting (*Fusarium oxy.*) and air borne pathogen causing gray mold (*Botrytis*), Laboratory of Genetics and Plant Breeding, INAT, Molecular Plant Microbe Interactions Institut, Tunisia, 2015

CO FO EP VI PL

CO=Control (untreated lot)
FO=Fosetyl-AL, Bayer Crop Science (treated lot)
EP=EPSOMIT (treated lot)
VI=VITAL (treated lot)
PL=PLANTA (treated lot)

Growth performance: A=Leaves, B= Roots
Defense activity: C=Peroxydase D=Release of phenolic compound



Maize

DIRECTIONS OF USE

PLANTA is designed for use in the cultivation of all types of agricultural and horticultural crops.

FERTIGATION APPLICATION

Crops	Application time	Dosage
Soil-grown agricultural crops Cereals, Pulses, Vegetables and Melons, Fruits, Nuts, Oilseeds, Sugars and Starches, Fibres, Beverages, Narcotics, Spices, Condiments, Rubber Forages, Green and Green leaf manure, Lawns	First application should be done in the early growth period (tillering, 3-5 leaves visible, stem elongation). Subsequent applications can be done optional during the shoot phase until end of flowering phase.	1.5 kg/ha
Trees	First application should be done in the early growth period at white/colored bud stage. Subsequent applications can be done optional during the shoot phase until end of flowering phase.	1.5 kg/ha/1m crown-height
Substrate	Prior sowing	0.75 kg/m3

Administer by fertigation. Apply onto ground close to the plant. Repeat on demand. Wait at least 14 days between two applications.

SEED COATING: Use working solution of 0.5 – 2 L per 1 ton of seed, containing ca. 0.5 kg PLANTA per 1 L of water.

OPTIMAL WORKING SOLUTION: Fill tank with 500 Liters of water. Add 1.5 kg of PLANTA. Agitate well. Wait 15min for maturing. The working solution should be applied promptly. Maintain agitation throughout the fertigation process.

OPTIMAL NUMBER OF TREATMENTS: 1-2.

COMPATIBILITY: Mixing with most fertilizers is possible. Do NOT apply PLANTA with plant protection agents at the same time. Wait 14 days to use PLANTA in that case.

APPROVALS: 100% natural. PLANTA is approved for organic farming and meets numerous international standards.

AVAILABLE PACKAGES: 1 kg

SANBIO
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SANBIO® COMPO

MICROBIOLOGICAL ACTIVATOR AND DECOMPOSER FOR RAPID COMPOSTING OF ORGANIC RESIDUES AND WASTE

RAPID PROCESSING PERFORMANCE

The advantages of **COMPO** are:

- Optimal rotting process
- Fast decomposition
- Reduced formation of odor and smell
- Best output quality rich on nutrients and elements
- Improvement of soil fertility and nutrient content.

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DESCRIPTION

COMPO is a natural microbiological activator and decomposer for rapid composting of organic residues and waste at private and commercial composting facilities. COMPO also can be used for soil improvement in agriculture, landscaping, parks and greens.

COMPOSITION

Activated*) biopreparation containing: Calcium carbonate, Bentonite-Montmorillonite-Illite (1m558), micronized to particle size of <=100micron, consortium **) of high concentrated living microorganisms isolated from natural environment, species: Mycorrhiza (M. spp, M. Glomus intraradices), Bacillus (B. subtilis, B. lichenformis, B.megaterium, B. amyloliquefaciens), Pseudomonas (P. trivialis), Trichoderma (T. harzianum T58); concentration 2.3 Billion CFU/g, starter food source (nutrients, trace elements, amino acids, vitamins)

*) processed by *SANBIO Biocatalytic Stimulation Technology* **) see legal statement

MODE OF ACTION

COMPO combines the core functions in one product: 1**. KICK-START by inoculation of microbiom and nutrients 2. CONTROL of rotting process 3. ACCELERATION of process**.

The effectiveness of the activator COMPO in powder form is based on the synergistic combination of mineral mix and microbial biopreparation and their activation by the *SANBIO Biocatalytical Stimulation Technology.* The mechanism of **electrical stimulation** makes the difference of COMPO versus conventional products acting on chemical mechanisms only.

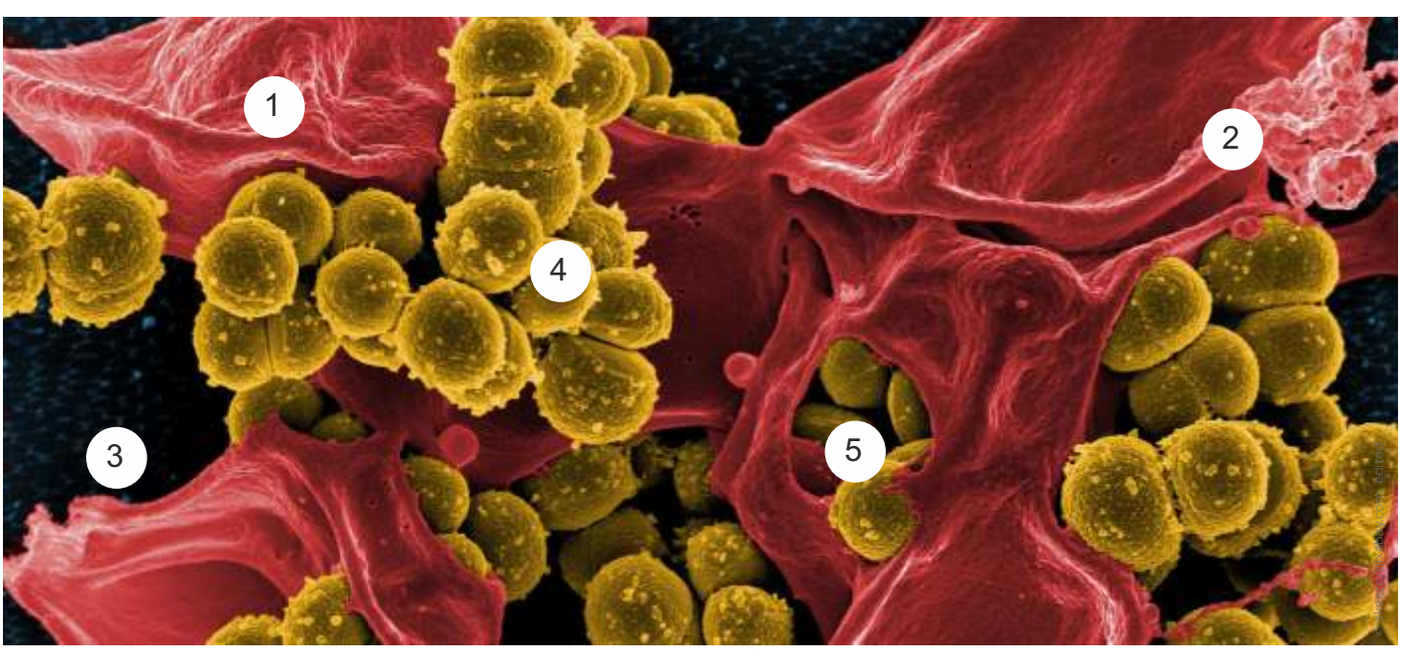
RAPID ACTION. The unique composition and advanced processing of COMPO ensure instant impact on pile.

ADVANCED PROCESSING. The minerals are utilized in a special milling and grinding process down to less than 100 micron size. As a result, the micronized very tiny particles have an extremly large reaction surface (host matrix). Subsequently, the particles and microorganisms being charged and polarized in a special electrical process. Now, the refined physico-chemico complex has a huge capability to interact with compounds, and the microrganisms have a higher activity and metabolism.

EFFECTIVE MICROBIOTA. The mineral complex provides the microhabitat (host matrix) for colonialization, carbonates for oxygenation and balance the pH value in the pile. COMPO contains mesophilic and thermophilic bacterial cultures and fungi which work under both, aerobic and facultative anoxic condition. This guarantees the best process performance under all conditions. The optimized conditions promotes the fast reproduction and growth of aerobic microbes. The accelerated metabolism leads to rapid heating upto the maximum temperature shortly after initial inoculation.

DYNAMIC AND STABLE BIO-FERMENTATION. COMPO is specialized in effective decomposition and transformation of Cellulose - the main component of crop residues - and inhibitors as Lignin, Polyphenols, Polysaccharides, etc. The process works fast, stable and safe with low odor and smell emissions.

SOIL IMPROVEMENT. Application of COMPO on fields and land increases the content of nutrients available for plants and humus in soil. Additionally, microorganisms can solubilise insoluble forms of phosphorus and nitrogen. Therefore, plants can more efficiently use it provided by application of standard soil fertilizers.



1 Micronized particles provide an extremely large reaction surface
2 Huge reactivity towards compounds due to charged and polarized physico-chemico complex
3 Fast reproduction and growth of aerobic microbes due to on-board oxygenation and starter food source
4 Fast colonialization of microorganisms at host matrix used as microhabitate
5 Rapid decomposition of organics due to effective high concentrated bacteria and fungi

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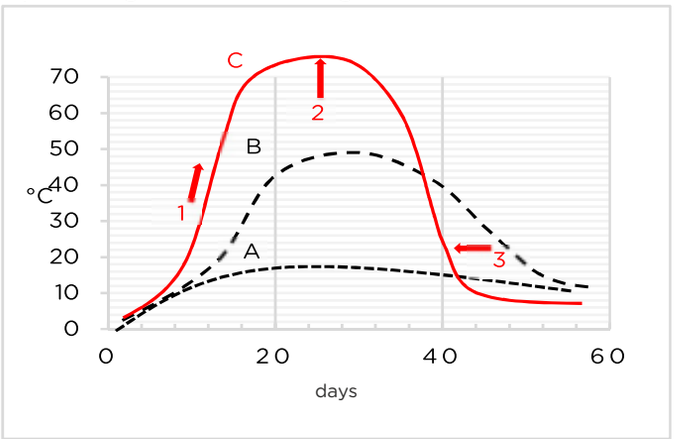
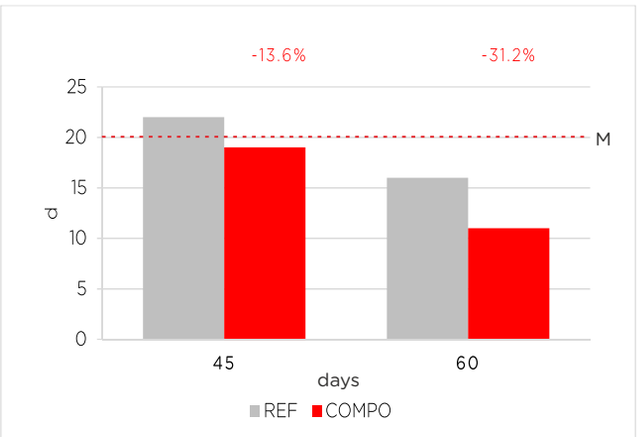
CASESTUDIES

Optimizing and accelerating the **ROTTING PROCESS**



Temperature inside the composting reactor
A= failing process
B= normal process
C= optimal process with Sanbio COMPO
1= Faster temperature rise
2= Higher maximum temperature
3= Shorter processing time
Dosage: 0,5% = 5 kg CO/t substrate

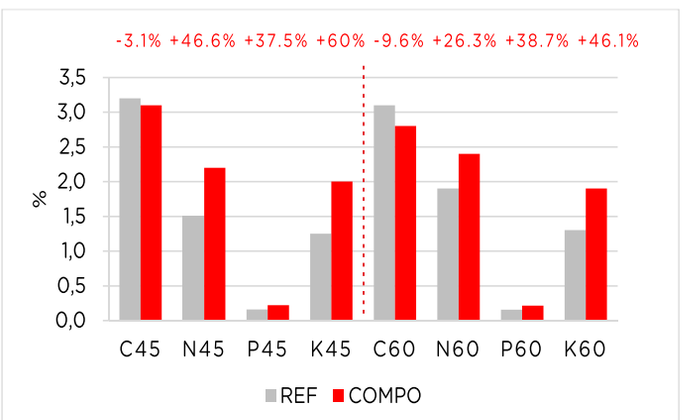
Impact on the **C/N ratio** of final compost quality



REF=rotting process without COMPO
COMPO=rotting process with COMPO
M=mature when C/N<20

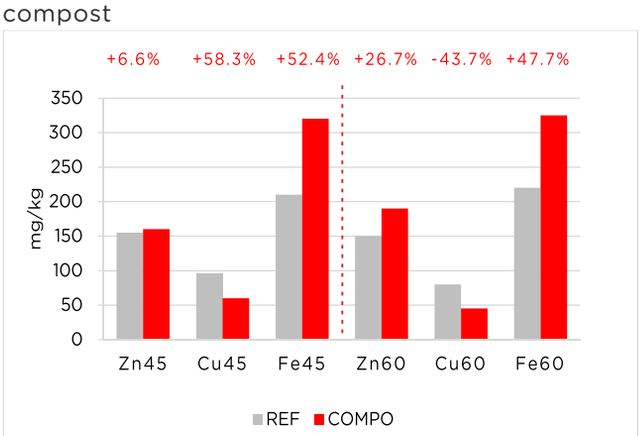
The lower C/N values in COMPO piles are due to the better mineralization of organic matter.
The compost made with COMPO is 15 days earlier more matured.

Impact on the **NUTRIENT** content of final compost



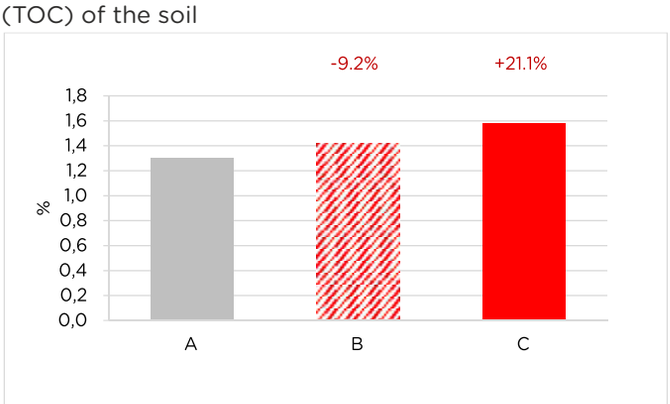
REF=Rotting process without COMPO
COMPO=Rotting process with COMPO
C=TOC Total carbon [value x 10]
P=Phosphor
45=45 days process time period
60=60 days process time period
N=Nitrogen
K=Potassium

Impact on the **TRACE ELEMENTS** content of final compost



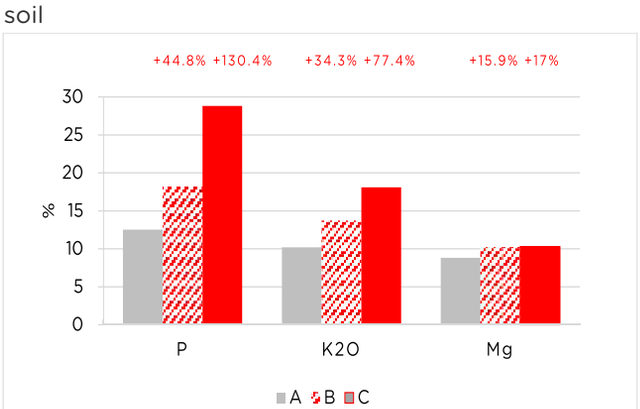
REF=Rotting process without COMPO
COMPO=Rotting process with COMPO
Zn=Zinc Cu=Copper Fe=Iron [value x 10]
45=45 days process time period
60=60 days process time period

Effects as soil fertilizer on **ORGANIC MATTER** content (TOC) of the soil



A=Untreated control
B=Field with COMPO 2kg/ha
C=Field with COMPO 4kg/ha

Effects as soil fertilizer on **ELEMENTS** content of the soil



A=Untreated control
B=Field with COMPO 2kg/ha
C=Field with COMPO 4kg/ha

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DIRECTIONS OF USE

Place of use	Application time	Dosage	Supplementary information
Compost plant	Initial: build-up of piles	50g/cbm of raw material	Prepare the organic bulk raw substrate according best practice (composition, ratio mixing, C:N:P ratio, particle size, porosity, moisture). Built-up the pile: Stackthe bulk raw material in layers of 20cm thickness each. Spray the working solution uniformly over the each layer. Use 10L of working solution for 10-15m2. Spray the solution on each layer generously. Use of turning machine: Spray the working solution direct into working area of machine.
	Maintenance: each compost turning	20g/cbm of raw material	
Soil	Crop residues (chopped straw, stubble), after the harvest of all species of crops.	2–4 kg/ha dilluted in 300–400 L water (=working solution)	Medium-droplet spraying is recommended. Before application, it is advisable to crush crop residues. After spraying, mix topsoil with the formulation and crop residues. At the time of spraying avoid excessive sunlight – it is best to perform the treatment in the evening.

OPTIMAL WORKING SOLUTION: suitable for 1 cbm of raw material: Fill tank with 2 Liters of lukewarm water. Add 50g of COMPO. Agitate well. Wait 15min for maturing. The working solution should be applied promptly. Maintain agitation throughout the fertigation process.

Bacteria in COMPO preparation are in a spore form. Therefore, the product retains its beneficial properties over a period of at least 3 years.

APPROVALS: 100% natural. COMPO is approved for organic farming and meets numerous international standards.

AVAILABLE PACKAGES: 5 kg / 25 kg

LEGAL LIMITATIONS AND ASPECTS

Certain statements may not be applicable in all geographical regions.

Product associated claims may differ based on government requirements.

Product composition and availability may vary by country.

Please contact SANBOS for further information.

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GET IN TOUCH WITH US

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Nutrition. Stimulation. Protection.