





NEXT GENERATION BIOTECH

NG Biotechnology is a biotech company established with long-term investments to develop microbial products in line with the sustainability principle in agriculture.

NG Biotech develops microbial products to remove and eliminate persistent organic residues caused by industrial pollution and agrochemicals from soil and crop.

Our main scope is the isolation and development of microorganisms that will contribute positively to soil fertility, plant growth, yield, disease and pest control.

The operations are divided into departments to carry out R&D activities in several areas in a multidisciplinary way. Our company extends its range of products with projects supported by national (TUBITAK, KOSGEB etc.) and international funds.

Today, we have an annual capacity of 150 tons in our facilities based in İkitelli Industrial Area, İstanbul.

In our fully established microbiology and molecular biology laboratory, we can perform the following analyses.



Isolation, characterization
and quantification
of microorganisms



DNA
sequence
analyses



Optimization of
growth media for
industrial production



Analyses of bacterial
enzymes and
proteins



HPLC
analyses





PROJECTS



TUBITAK 1507

Pesticide degradation by microorganisms in agricultural land.

KOSGEB R&D

Development and production of bacterial cultures for post-harvest food protection.

TUBITAK 1507

Development and production of antagonist microorganisms against fire blight disease in fruit trees.

**Horizon 2020
Framework Programme
MICROREAL - MICRObial
REmediation of
Agricultural Land.**



We have been awarded as the national winner of **Global Cleantech Innovation Programme (GCIP)** of **United Nations Industrial Development Organization (UNIDO)** in 2016 with the project "Microbial Remediation of Pesticides from Agricultural Land".

PRODUCT CONTENTS



Microbial content of a healthy soil is around **10^6 (1 million) CFU** per gram. In order to restore the microbial equilibrium of the poor soil, microbial products should be applied at a final concentration of at least **10^6 (1 million) CFU/g**, so that it can adapt to the soil and the plant.

NGB ensures its microbial products contains at least **10^9 (1 billion) CFU/ml** microorganisms. Our products with its high microbial content replenish the microflora of the agricultural lands that has been negatively affected by the intensive use of pesticides and fertilizers in conventional agriculture.



The fertility of agricultural soils is maintained by constantly developing and interactive plant and microorganism systems. Microbial products are vital to regulate the natural symbiotic relationship of these two components.

In general, microbial products offer many advantages over their chemical equivalents. In addition to improve the product yield and reduce the need for pesticides, microbes contribute to the recovery of reduced productivity caused by the widespread use of chemical fertilizers.



RhizoFill

Microbial Biostimulant

The microbial content of RhizoFill;

- Enhance root and canopy development by producing precursors of auxin, cytokinin-like plant hormones and volatile organic molecules such as acetoin, phenylethylene naturally.
- Sequester iron and increase its bioavailability by producing siderophore molecules.
- Increase yield by enhancing flowering of the plant.
- Boost shoot growth by triggering nucleic acid and protein synthesis, which in turn increase cell division and tissue regeneration.

- Enhance plant immune system and reduce the risk of pathogenic attack by competing with other microorganism for nutrients.
- Facilitate absorption of trace elements by maintaining the pH balance of the soil and increasing chelation rate.
- Improve seed and fruit development by increasing the uptake of phosphate in the soil.
- Secure a microbe friendly environment for beneficial microorganisms in the rhizosphere.



GUARANTEED CONTENT

Total viable microorganisms	: 1 x 10 ⁹ cfu/ml
Active ingredients	: <i>Bacillus subtilis</i> , <i>Bacillus megaterium</i> , <i>Pseudomonas fluorescens</i>
pH	: 3,5 - 5,5

RhizoFill enhances development of hairy-roots and as a result increases the efficiency of fertilizers. Following the application of RhizoFill, plants become more tolerant to the environmental stress factors such as drought, salinity and heat.

RHIZOFILL WHEAT TRIALS

	Yield (Kg/da)	Yield Increase	Spike interval (number/m2)	Number of seeds (number/spike)	Plant height (cm)	1000 seed weight (gr)	Straw Yield (Kg/da)
Control	582	--	465	35	87	46	638
1. Trial	617	%6	485	38	94	47	667
2. Trial	640	%10	507	38	96	49	724



RhizoFill

Control

Control Field (25 da)
Chemical Fertilizer

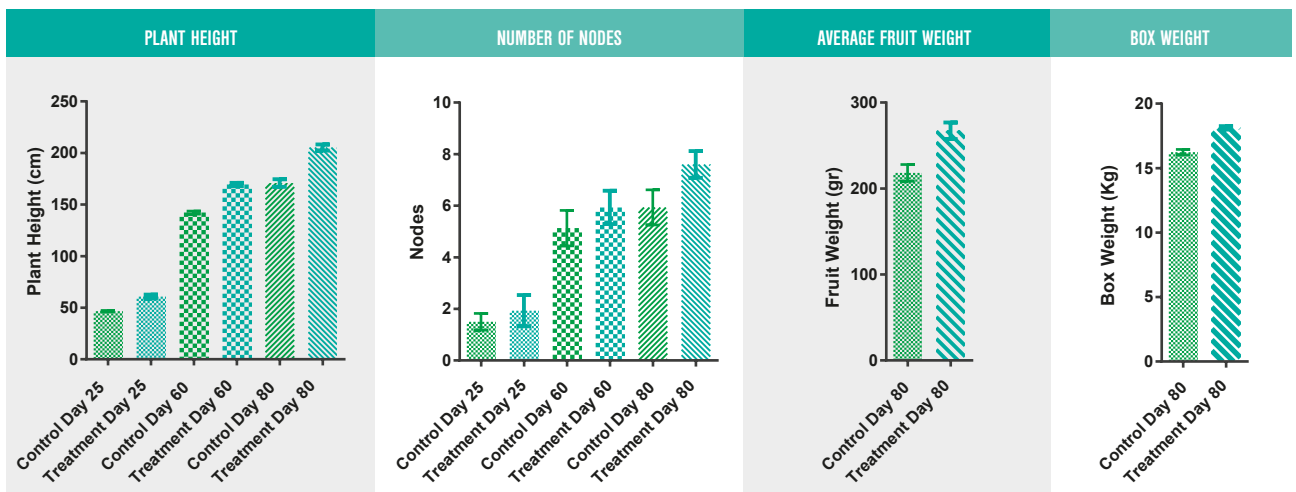
1. Trial Field (25 da)
Chemical Fertilizer
RhizoFill Coated Seeds

2. Trial Field (25 da)
Chemical Fertilizer
RhizoFill Coated Seeds
RhizoFill Application (2 application)



Plants treated with RhizoFill were **at least 20% longer** and have higher number of nodes than the plants in the control areas.

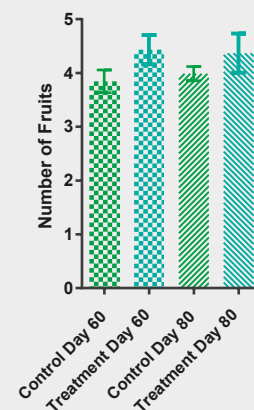
On the 60th day of the application, RhizoFill applied plants reached 6th node, while control plants could only reach 4-5th nodes.



NUMBER OF FRUITS PER NODE



The **yield increased by 30%** in Rhizofill treated areas when average fruit weight and average fruit weight of fruit boxes were compared.





Subtima

Microbial Biostimulant

***Bacillus subtilis* NGSB**
1 x 10⁹ (1 billion) cfu/ml

Bacillus subtilis is a beneficial spore forming bacterium naturally living in the root zone symbiotically with the plant.

Bacterial spores are activated and colonized around the newly formed roots during germination, creating a physical barrier that protects the roots against pathogens.

Spores can stay dormant for longer periods on coated dry seeds. The seeds coated with our product are thus protected during storage.

Bacterial lipopeptides induce the systemic resistance as the first defense mechanism of the germinating seedlings, thus help to respond to the pathogen attacks with the self-defense system.



Before Application



After Application

Capsicum trial (Antalya)

Dosage: 2 litre/da Single application

Duration: 9 Days

Secondary molecules produced by bacteria during the fermentation process are included in the product formulation. These metabolites encourage the seedlings to synthesize plant hormones such as auxin, cytokinin and gibberellic acid, thus accelerating the vegetative growth of the plant, increasing the rate and synchronization of the germination.



PLANT PROTECTION PRODUCT STUDIES

Active Ingredient

Pest and Diseases

***Bacillus subtilis* NGSR**
***Pseudomonas fluorescens* NG28**



Early Blight (*Alternaria solani*)
 Grey mold (*Botrytis cinerea*)
 Fire Blight (*Erwinia amylovora*)
 Wilting (*Fusarium* spp., *Pythium* spp., *Rhizoctonia* spp., *Alternaria* spp.)
 Powdery mildew (*Leveillula taurica*)
 Downy mildew (*Plasmopara viticola*)
 Root rot & Black wart (*Rhizoctonia solani*)
 Monilinia (*Sclerotinia laxa*)
 White mold (*Sclerotinia sclerotiorum*)
 Potato common scab (*Streptomyces scabies*)
 Apple scab (*Venturia inaequalis*)

***Bacillus thuringiensis kurstaki* NG74**



Codling moth (*Cydia Pomonella*)
 Carob moth (*Ectomyelois Ceratoniae*)
 Cotton bollworm (*Heliothis Armigera*)
 Grapewine moth (*Lobesia botrana*)
 African cotton leafworm (*Spodoptera littoralis*)
 Tomato moth (*Tuta absoluta*)

Bacillus thuringiensis israelensis
Lysinibacillus sphaericus



Mosquito (*Aedes aegypti*, *Culex pipiens*)
 Silverleaf whitefly (*Bemisia tabaci*)
 Housefly (*Musca domestica*)
 European red mite (*Panonychus ulmi*)
 Greenhouse whitefly (*Trialeurodes vaporariorum*)

MICROBIAL INSECTICIDE STUDIES

***Bacillus thuringiensis kurstaki* NG74**

The endo-delta toxins produced by this microorganism during the sporulation phase is effective against lepidopteran species such as tomato leafminer, armyworm, cotton bollworm, native budworm, cabbage moth, cabbage white butterfly, loopers and vine moth.

These endo-delta toxins are activated by the high pH inside the guts of the larvae of lepidopteran species and damage the epithelia, block their feeding at the larval stage causing death.



Bacillus thuringiensis israelensis ***Lysinibacillus sphaericus***

The endo-delta toxins produced by these microorganisms during the sporulation phase is effective against red mite, silverleaf whitefly, mosquito and housefly.

The endotoxins are activated in the digestive system when consumed by the larvae and the nymphs, thereby damage the intestinal membranes of the larva which in turn prevent feeding, causing death.





POST HARVEST PROTECTION STUDIES

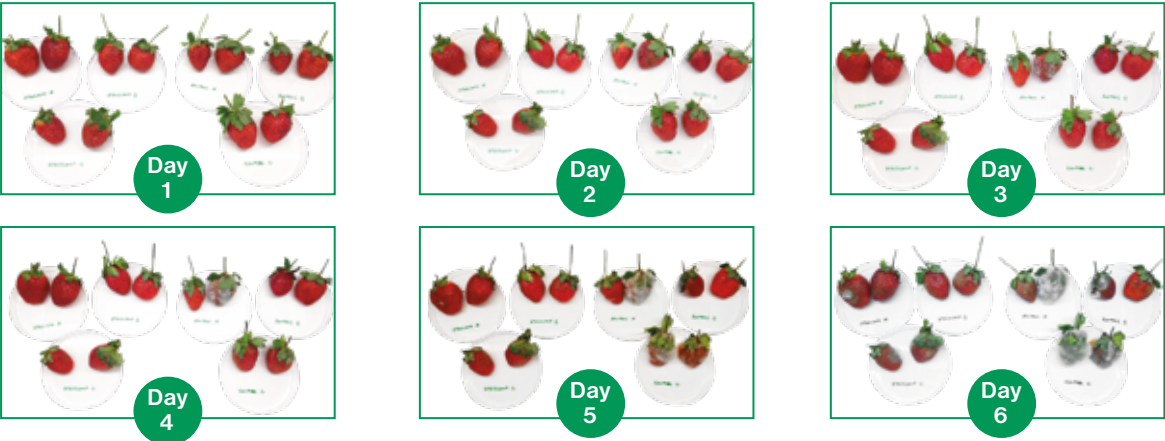
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The United Nations Food and Agriculture Organization states that only two-thirds of the fresh fruit and vegetables produced are consumed, while the rest is wasted. These losses are caused by physiological and pathological factors in harvesting, storage and marketing processes. Among pathological factors, saprophyte fungi and molds constitute the most important part.
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Chemicals that prevent deterioration against pathological factors penetrate inside of the tissue. The residue of these chemicals threaten human and environmental health, harm beneficial organisms, causing an imbalance in the ecosystem and the emergence of pathogenic strains resistant to chemicals. This situation increases the use of those chemicals every other year.
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The most important advantages of the biological control agents are that they contain microorganisms that are naturally present on the plants, can be easily rinsed from the vegetables and fruits and that they do not possess any threat to human health. Thus, they are sustainable and environmentally friendly alternatives to the toxic chemicals.
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Our microbial product preventing post-harvest decay eliminates losses due to pathogenic factors during storage and transportation.



DISEASE	PATHOGEN	FRUIT
Grey mold	<i>Botrytis cinerea</i>	Apple, cherry, peach, tomato
Brown mold	<i>Lasiodiplodia theobromae</i>	Apricot, plum
Brown mold	<i>Monilinia fructicola</i>	Cherry, peach
Grey mold	<i>Botrytis cinerea</i>	Grape, kiwi, banana
Citrus green mold	<i>Penicillium digitatum</i> <i>Penicillium italicum</i>	Citrus





MICROBIAL ALGAE REMOVER

Copper sulfate treatment is the most common method for removing algae in irrigation canals. Although copper sulfate eliminates the algae problem in a short time, the degraded algae mass leads to water and energy losses due to the clogging in the canals, lids, tunnels and dripping systems.



Copper Sulphate



Microbial Application



Copper Sulphate



Microbial Application

Clogs in the dripping systems and in the intermediate channels bring extra cost to the farmers by causing product losses due to flooding and cause disputes between farmers. Additionally, as copper sulfate provides temporary solution to algae problem, the treatment has to be repeated several times during the season, thus increases the labor costs.

PRODUCT BENEFITS

- Prevents algae growth.
- Therefore, reduces time and canal cleaning costs (excavator, labor, fuel, etc.) at the end of the season.
- The algae problem is eliminated by two applications in total, once after the pre-season cleaning and once in middle of the season.
- The total cost is less than copper sulfate.



Copper Sulphate



Microbial Application



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