miNature

nano organic biostimulant

PRODUCTS

and

BIOSTIMULANTS RANGE

2022

Biostumulants are:

"A plant biostimulant is a substance or micro-organism that, when applied to seeds, plants, or the rhizosphere, stimulates natural processes to enhance or benefit nutrient uptake, nutrient efficiency, tolerance to abiotic stress, or crop quality and yield."

Biostimulants are playing an increasingly important role with farmers to make their crops more productive thereby increasing farm profitability. [1]

MiNature Biostimulant:

Product Ingredients:

1. Consistent with MiNature's core values, all ingredients listed in MiNature Biostimulant Products are of certifiable natural origin.

2. MiNature Biostimulant Products do not contain any artificial chemicals.

3. None of the products contain any toxins

[1] *(The US Farm Bill 2018)*

PSHB FUNGICIDAL

REG. No. L10670 Act 36 of 1947

PSHB FUNGICIDAL is a liquid specially formulated and intended:

- To provide plants with essential bio-material for it to self-activate effective defense
- To assist plant self-defense by direct attack of fungal infection
- To assist plants to self-repair invasive damage
- In the event of root invasion and symbiont insect activity, to simultaneously enhance root resistance against both invasive pests.
- To help reduce the toxic pesticide build-up and provide a simplified alternative in the Integrated Pest Management Program

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Salicylic Acid and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part PSHB FUNGICIDAL - 1:200
2. Put 200 parts water in a tank.
3. Add 1 part PSHB FUNGICIDAL to water in tank.
4. Mix the water with the PSHB FUNGICIDAL

DIRECTIONS

PSHB FUNGICIDAL can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Foliar (leaf) application has been proven to be the most effective method of treatment.

During and after prolonged exposure to abiotic stressors, plants appear weak and often with low turgor. In this instance trees are infested by massive numbers of beetles that spread fusarium fungus. The fungus expands throughout the Xylem and eventually kill their host. It stands to reason that with a compromised xylem, essential nutrients and water find it difficult to reach and feed the leaves. The following important aspects of treatment are noted:

DEPTH OF PENETRATION.

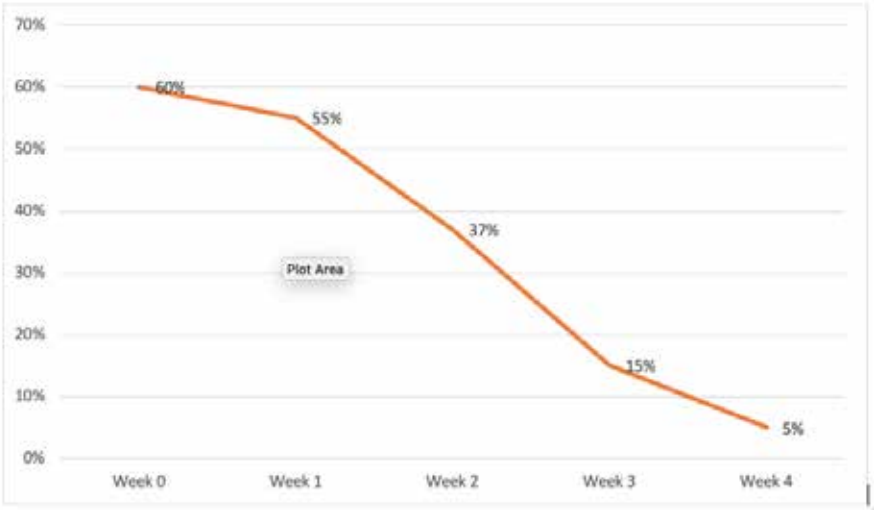
Below are cross sections of tree trunks infested with Fusarium fungus. Depending on the diameter of a tree the fungus can penetrate in excess of 10cm deep.

ACER NEGUNDO TOP

SUMMARY OF FUSARIUM MEASUREMENTS AS PERCENTAGE OF TOTAL TRUNK SURFACE AREA

Tree Species Used	Branch diameter in cm	branch surface area in sq cm	Fusarium surface area in sq cm	Fusarium surface area after 1 week in sq cm	Fusarium surface area / 2 weeks in sq cm	Fusarium surface area / 3 weeks in sq cm	Fusarium surface area / 4 weeks in sq cm
Caesalpinia ferrea Test x 4 Trees	20,20	328,35	200,22	183,36	126,37	57,04	20,22
Platanus x acerifolius Test x 4 Trees	18,22	274,53	163,74	148,74	98,59	42,72	15,23
Olea europea ssp pungens Test x 4 Trees	17,78	249,21	145,05	130,47	81,85	24,70	8,02
Quercus robur Test x 4 Trees	18,23	275,06	164,14	149,14	98,97	46,55	16,21
Acer negundo Test x 4 Trees	20,85	356,21	220,28	202,81	143,57	55,31	16,93
AVERAGE	**19,05**	**296,67**	**178,69**	**162,90**	**109,87**	**45,27**	**15,32**
PERCENTAGE OF BRANCH SURFACE AREA			60%	55%	37%	15%	5%

GRAPH DEPICTING RELATIVE WEEKLY REDUCTION IN FUSARIUM SURFACE AREA

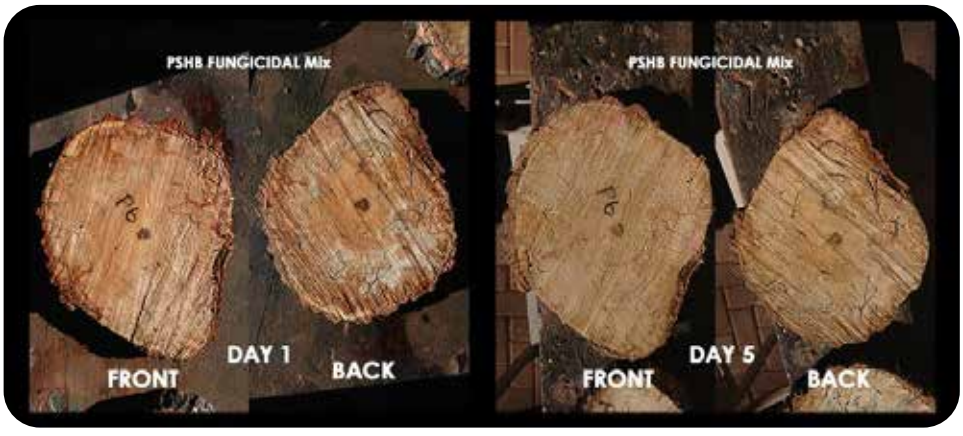


The above confirms the unique penetrating ability of ANODS

REHABILITATING EFFECT.

Cut sections photos; photos on the left shows the presence of Fusarium infestation, and the photos on the right below show the PSHB FUNGICIDAL effect after five days. The absence of Fusarium is clearly visible.

IMAGE GROUP N



FUSARIUM INFESTED **PSHB FUNGICIDAL AFTER 5 DAYS**

PSHB SUPPLEMENTARY SURFACTANT

PSHB SUPPLEMENTARY SURFACTANT is a liquid specially formulated and intended:

- To provide a delivery vehicle for the wide spectrum of biomaterials (not incorporated in the current product range) to offer the farmer the opportunity to custom-design speciality solutions for unique problems
- To serve as trans-foliar nutrient system
- To serve as mask to overcome drug resistance of chemicals

ACTIVE INGREDIENTS

Chitosan, Vitamin E

MIXING INSTRUCTIONS

For Pesticides

1. Use 50 part water to 1 part PSHB SUPPLEMENTARY SURFACTANT - 1:5
2. Add 20ml – 40ml of Cypermethrin to 1L PSHB SUPPLEMENTARY SURFACTANT.
3. Put 50 parts water in a tank.
4. Add 1 part PSHB SUPPLEMENTARY SURFACTANT / Cypermethrin mix to water in tank.
5. Mix the water with the PSHB SUPPLEMENTARY SURFACTANT / Cypermethrin.

DIRECTIONS

PSHB SUPPLEMENTARY SURFACTANT can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems. PSHB SUPPLEMENTARY SURFACTANT can be tank mixed with water and pesticides.

PSHB BEETLES:

When using PSHB SUPPLEMENTARY SURFACTANT the toxin is transformed from a contact poison to a systemic poison.

WARNING: When using any toxin with the Surfactant, the user must wear appropriate protective wear

RESULTS:

1304 DEAD BEETLES AFTER 24 HOURS

- The PSHB beetle bores deep into the trunk, and into the Xylem. Normal pesticides are not formulated for penetration and therefore cannot reach the target.
- PSHB SUPPLEMENTARY SURFACTANT enables deep delivery of the Insecticide and the result is shown below. Again, the much reduced amount of Insecticide required is confirmation of superior bio-availability of PSHB SUPPLEMENTARY SURFACTANT
- These photos show many aspects of the PSHB SUPPLEMENTARY SURFACTANT it:
  - Enables penetrate deep into tree trunks.
  - Reduces toxin requirement/dosage by 1/40th of the commercial equivalent.
  - Increases efficiency by 378%

MiNature 1

"Anti-Nematodes"

MiNature 1 is a liquid specially formulated and intended:

- To help contain the scourge, both via the enhanced plant intrinsic self-defense potential, and in-root combat thereof.
- To serve as natural insecticide
- To protect root architecture against invasive pests

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Salicylic Acid and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 1 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 1 to water in tank.
4. Mix the water with the MiNature 1.

DIRECTIONS

MiNature 1 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

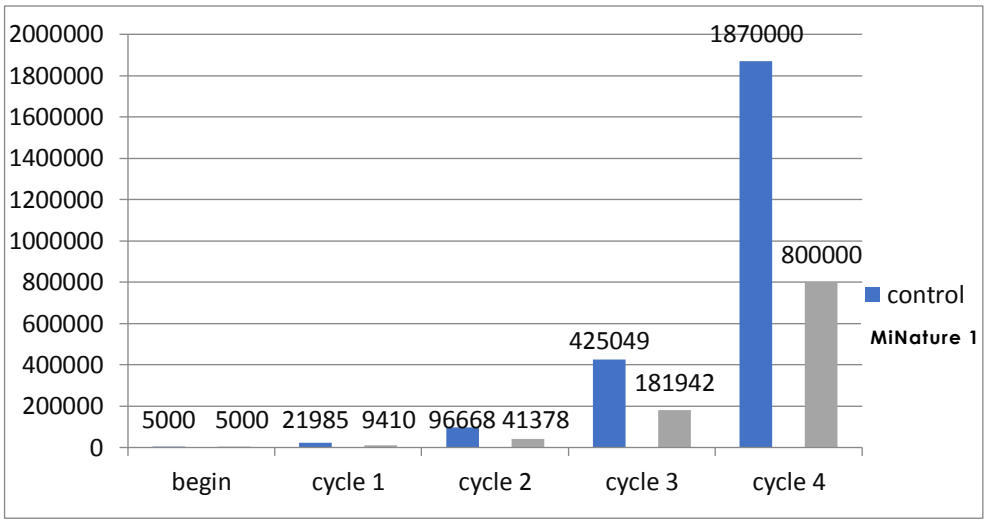
Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Note: For soil application drenching will be advisable.

Foliar (leaf) application has been proven to be the most effective method of treatment.

RESULTS OF POT TRIALS CONDUCTED BY DEPT. NEMATOLOGY, NORTHWEST UNIVERSITY, SOUTH AFRICA, ON TOMATO.



RESULTS:

- The superior and rapid penetrating ability of MiNature 1 ensures the ability to target nematodes deep inside any root structure.
- MiNature 1 is the only known nematicide that has the capacity to penetrate through nematode egg shells and destroy these from the inside.
- The versatility of use of MiNature 1 as either a root application or a foliar treatment and use as an inoculant makes this ideally suitable for this purpose.
- The technology obviates the risk of drug resistance.

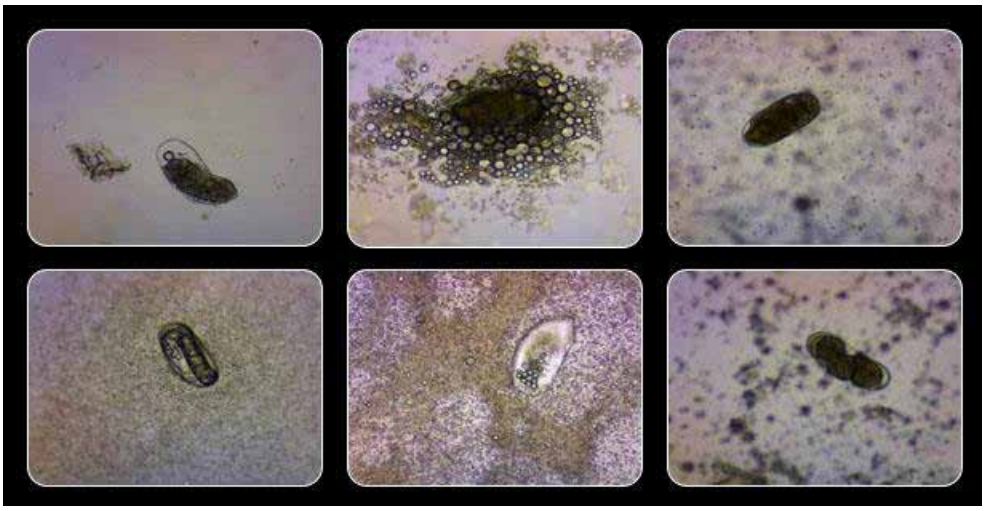
NOTE:

Nematodes are known to render long term nematicidal efficacy almost impossible due to their ingenious defense mechanism and highly sophisticated and rapid drug resistance mechanism.

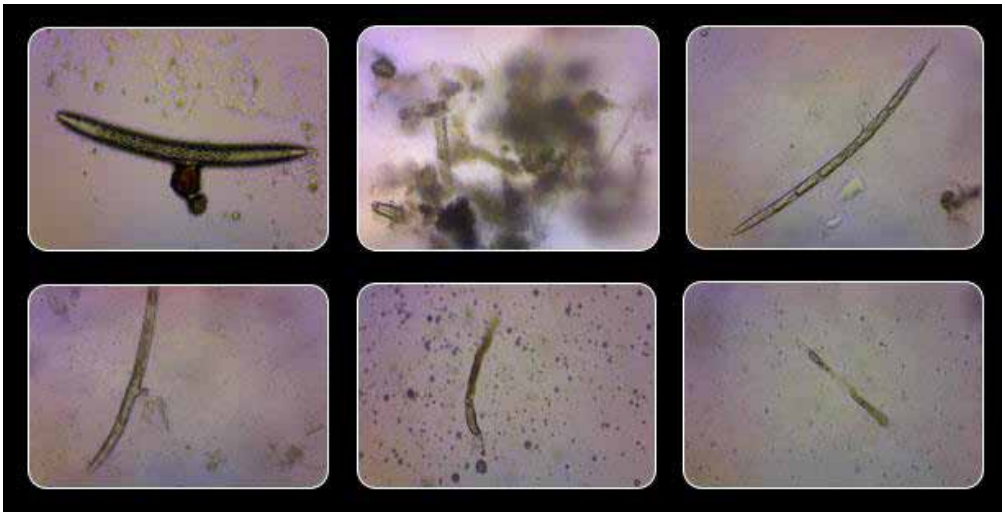
The ANODS formula operates as a Trojan horse where its active ingredient is intended to be readily accepted by cell mitochondria where its active is released and will remain effective for a considerable time in the future.

MICROSCOPY:

All current treatments are focused on killing or repelling worms, and consequently the eggs are left to hatch only to then resume its destructive onslaught. We have shown that the eggs can be effectively destroyed. This has never been previously achieved. Refer to images below of egg damage done by MiNature 1.



One category of treatment, Organophosphates, merely paralyse nematodes and after some time they recover and resume their destructive pattern. MiNature 1 physically destroys nematodes as can be seen from the photos below.



MiNature 2

"Growth Stimulant"

MiNature 2 is a liquid specially formulated and intended:

- To equip plants with the essential biomaterials to ensure that all the growth, maintenance and defense mechanisms function optimally
- To ensure that plants have the necessary biomaterials to cope with biotic and abiotic stressors, and to maintain a healthy growth equilibrium
- To facilitate the biomaterials necessary for optimal photosynthesis, especially under adverse abiotic stress conditions
- To ensure optimal fruiting , flower and pollination functioning

ACTIVE INGREDIENTS

A special blend of Essential oils, Flax Seed Oil and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 2 - 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 2 to water in tank.
4. Mix the water with the MiNature 2

DIRECTIONS

MiNature 2 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

IMAGES OF RESULTS FROM USE OF CHITOSAN NUTRIENT ON PEPPADEW:

The farmer selected to spray a section of his farm with MiNature 2 and the results are clear in the photos below:

PHOTO 1
UNTREATED PLANT

PHOTO 2
COMPARISON OF FRUITS

PHOTO 3
MiNature 2 TREATED PLANT

RESULTS:

- The untreated product ripened earlier than those treated with MiNature 2
- Fruiting in the untreated plant is sparse (PHOTO 1), as compared to bunching in the MiNature 2 treated plants(PHOTO 3)
- The fruit of the MiNature 2 treated plant is much larger(PHOTO 2 left = untreated, right = MiNature 2 treated)
- Final crop yield in terms of fruit volume, quantity and quality was considerably increased when using MiNature 2

RESULTS OF MiNature 2 ON LEAF AND ROOT GROWTH:

MiNature 2 used in Hydroponics:

Lettuce: Lettuce treated with the MiNature 2 is visibly much larger in leaf and root growth 3 weeks after planting.

AFTER 3 WEEKS

LETTUCE TREATED WITH STANDARD HYDROPONICS

LETTUCE TREATED WITH MiNature 2

MiNature 2CS

"Flowering, Fruiting and Buding"

MiNature 2CS is a liquid specially formulated and intended:

- To ensure continuous meristem activity during fruiting/flowering processes
- To, through additional photosynthetic support facilitate optimal glucose production for fruit
- To ensure plant's defense mechanism function optimally so as to avoid or combat fruiting damage from biotic stressors
- With the inclusion of flavonoids, provide fruit with bio-material for quality fruit color.

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Flax Seed Oil and Vitamin E

MIXING INSTRUCTIONS

5. Use 200 part water to 1 part MiNature 2CS1:200
6. Put 200 parts water in a tank.
7. Add 1 part MiNature 2CS to water in tank.
8. Mix the water with the MiNature 2cs.

DIRECTIONS

MiNature 2CS can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

MAIZE HEALTH

MiNature 2CS CONTROL

MiNature 2CS CONTROL

SUNFLOWER HEALTH

- In the comparative photos MiNature 2CS treated plants yielded a 32% better yield than the Standard Treatment.
- There was no additional nutrition administered to the MiNature 2CS treatment. The increased yield was only the result of a healthier and stronger plant.

MiNature 2CS

STANDARD TREATMENT

PUMPKIN HEALTH

STANDARD TREATMENT PUMPKIN

MiNature 2CS TREATED PUMPKIN

MiNature 2CS

Used as a foliar nutrition:

RESULTS:

- Improved leaf nutrition
- The leaf pictured on the left is much smaller than the leaf on the right treated with MiNature 2CS.
- Necessary nutrients are also much lower than with foliar nutrition.

MiNature 3

"Thermotolerance"

MiNature 3 is a liquid specially formulated and intended:

- To equip plants with essential biomaterial for optimal execution of innate maintenance, growth and defense mechanism
- To ensure optimal biotic and abiotic coping functions for plants
- To help plants regain optimal systemic balance following severe abiotic stress events
- To enable plants execute effective self-defense combat against biotic stressors.

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Quercetin and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 3 - 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 3 to water in tank.
4. Mix the water with the MiNature 3.

DIRECTIONS

MiNature 3 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

THERMOTOLERANCE EFFICACY RESULTS:

During a period of excessive heat where temperatures were consistently above 30°C and 70% of the days recorded temperatures of 34°C and higher:

Untreated

Maize treated with **MiNature 3**

RESULTS:

- Seed formation in the untreated was erratic, whereas the MiNature 3 treated maize was full and orderly.
- The untreated maize showed ineffective pollination as could be seen from poor tassel and silk formation;
- The MiNature 3 treated crop contained 14% more seed rows;
- The Cob weight of the MiNature 3 treated crop was more than 200% heavier (320g vs 105g);
- The MiNature 3 treated had 20% more seeds than the untreated (824 vs. 686).
- Seed formation in the MiNature 3 treated crop also mature, as compared to that of the untreated crop;
- Total crop yield in the MiNature 3 treated maize exceeded that of the untreated by 29%;
- The difference in plant growth, plant structure and plant health (e.g. Photosynthesis) during the 45 day period is clearly visible.

MiNature 3 AS "INSECT REPELLENT"

MAIZE

Jasmonic Acid plays an important role in the defense of plants against stressors, including combating the attack by insects as can be seen in the reduced incidence of Yellow Spotted Maize Beetle in the comparative photos below.

STANDARD TREATMENT
STANDARD TREATMENT COVERED
WITH MAIZE BEETLES

PLANT STRESS
45 DAYS AFTER "BUD+" SPRAYED
NO MAIZE BEETLES

RESULTS:

- As MiNature 3 contains no toxins it can be assumed that the repellant achieved is a direct result of the Immune Stimulating Effect of Jasmonic Acid in the plant, and increased photosynthesis that results in increased carbohydrates, a taste insects are known to dislike.
- MiNature 3 is intended to boosts the plants immune system to overcome both excessive heat, drought and severe cold (2^0C)

GOLF COURSE TURF TREATED WITH MiNature 3 DURING MID WINTER AFTER FROSTING

Johannesburg South Africa

RESULTS:

- Visible grass resistance to frost 1 week after application
- Turf coverage has been maintained and will continue flourishing.

MiNature 4

"Seed Inoculant and Germination"

MiNature 4 is a liquid specially formulated and intended:

- To attain optimal seed germination.
- To clear seeds of fungi and protect radicle against fungal and nematode damage
- To protect the root cap of the apicle meristem against fungal damage to ensure effective cell differentiation
- To enhance seedling resilience against abiotic and biotic stressors
- To ensure optimal photosynthetic process of seedling-stage plants
- To ensure continuous meristem activation.

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Tea Tree Oil, Vitamin E and Papain

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 4 - 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 4 to water in tank.
4. Mix the water with the MiNature 4.

DIRECTIONS

MiNature 4 can be applied through dipping of the seedlings roots before planting, spraying or dipping of seeds.

Select the appropriate inoculant according to specific needs. Add water only when needed. Eg. Peanut seed coats are known to be damaged by water and that inhibits germination. In this instance addition of water is not recommended.

In other instances the inoculant can be diluted as 1 part inoculant to 15 parts water.

Where clogging of seeds after dipping causes a problem, a light spray is recommended.

RESULTS of a field trial on Maize:

A comparative study was conducted to compare the MiNature 4 with 4 commercial inoculants. The objective was to compare maize stand within a heavily nematode infested farm.

INOCULANT COMPARISON: MiNature 4 VS COMMERCIALProducts

DAY 10	PLATRAND NUMBER OF SUCCESSFUL SEEDLINGS	% DIFFERENTIAL MiNature 4 VS COMMERCIAL	DAY 15	PLATRAND NUMBER OF SUCCESSFUL SEEDLINGS	% DIFFERENTIAL MiNature 4 VS COMMERCIAL
COMMERCIAL 1	151.5	17.5%	COMMERCIAL 1	169.5	11.2%
COMMERCIAL 2	122.0	45.9%	COMMERCIAL 2	127.5	47.8%
COMMERCIAL 3	154.0	15.6%	COMMERCIAL 3	168.5	11.9%
COMMERCIAL 4	132.5	34.3%	COMMERCIAL 4	150.0	25.7%
AVG COMMERCIAL	140.0	27.1%	AVG COMMERCIAL	153.9	22.5%
CONTROL	113.0	57.5%	CONTROL	126.5	49.0%
MiNature 4	178.0	27.1%	MiNature 4	188.5	22.5%

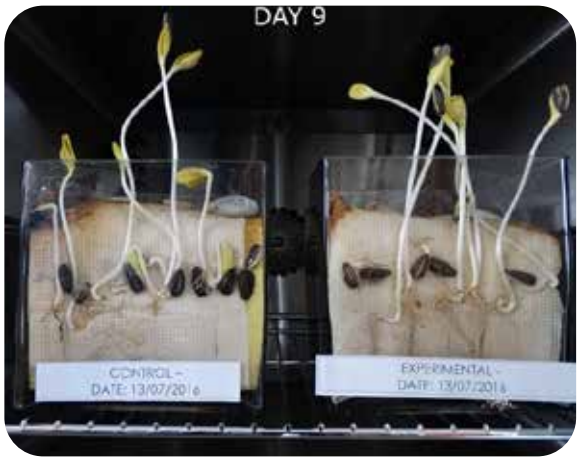
RESULTS:

- 10 days after planting MiNature 4 had 27% more stand than the average of the 4 commercial inoculants, and after 15 days MiNature 4 performed 22,5% better than the average commercial products.
- In terms of relative stand increase from day 10 to day 15, the stand tempo for MiNature 4 only increased by 5,9%, whereas for the average commercial products increased by 9,9% and the control increased by 11,9%. This indicates earlier germination from the use of MiNature 4.

- After 15 days 188 (94%) seedlings treated by MiNature 4 grew, compared to 153,9(76,5%) and 126,5 (63,2%) of the commercial and control respectively.

Sunflower Seeds: Sunflower seeds pre-treated with MiNature 4

On day 5, in the Control Group, the root tips of seeds 1, 2 & 8 are damaged, and also those of seeds 1,4, 6 & 8 of the MiNature 4 group.
As a general rule, when the Shoot Apical caps of Meristem Cells have been damaged, stunted root growth will ensue and consequently stance will be weak and not viable.



In respect of all 3 damaged seeds in the control group confirm this assumption: no, or poor lateral root formation is detected, whereas in the experimental group (MiNature 4) there is clear evidence of lateral root formation despite the Shoot Apical caps damage. Overall, the experimental group showed substantially larger lateral rooting as well as extended primary rooting than the control.

MiNature 5

"Carrier / Delivery"

MiNature 5 is a liquid specially formulated and intended:

- To provide a delivery vehicle for the wide spectrum of biomaterials (not incorporated in the current product range) to offer the farmer the opportunity to custom-design speciality solutions for unique problems
- To serve as trans-foliar nutrient system
- To serve as mask to overcome drug resistance of chemicals
- To increase bioavailability of, and trans-foliar delivery of added ingredient.

ACTIVE INGREDIENTS

Chitosan, Vitamin E

MIXING INSTRUCTIONS

For Liquid Fertilizer

1. Use 200 part water to 1 part MiNature 5 - 1:200
2. Add 100ml – 150ml of the amount of liquid fertilizer to 1L MiNature 5.
3. Put 200 parts water in a tank.
4. Add 1 part MiNature 5/ liquid fertilizer mix to water in tank.
5. Mix the water with the MiNature 5 and liquid fertilizer mix.

For Pesticides

1. Use 50 part water to 1 part MiNature 5 - 1:50
2. Add 20ml – 40ml of Pesticide to 1L MiNature 5.
3. Put 50 parts water in a tank.
4. Add 1 part MiNature 5/ Pesticide mix to water in tank.
5. Mix the water with the MiNature 5 and Pesticide mix.

DIRECTIONS

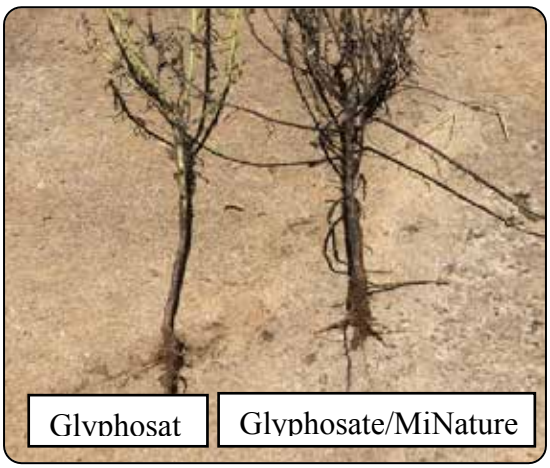
MiNature 5 can be applied through conventional ground equipment, drone or through properly equipped irrigation systems. Avoid mist spray setting.

MiNature 5 can be tank mixed with water and other liquid fertilizers and pesticides.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

USED IN WEED TREATMENT (CONYZA):



This weed is known to be resistant to many known herbicides, and is difficult to eradicate.

WARNING: Where toxic pesticides are used as additive, user must wear appropriate protective clothing

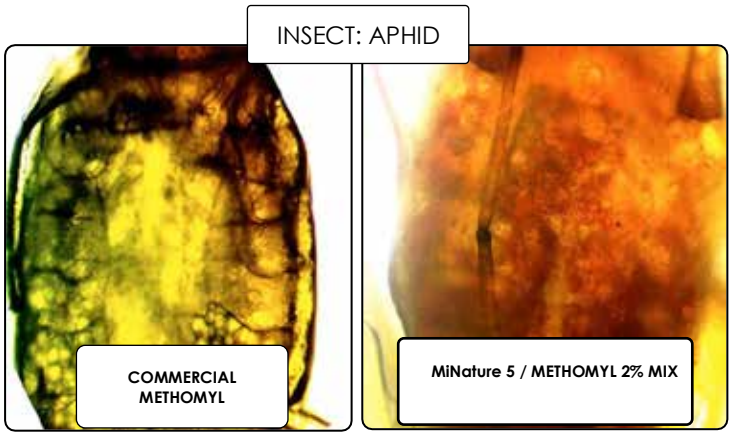
RESULTS:

- The weed on the left still shows signs of life 10 days after using the standard Glyphosate treatment.
- The weed on the right treated with MiNature 5 to which 1/10th of the standard Glyphosate dosage has been added shows no signs of resistance or life in either stem or roots.
- This result is due to the penetrating ability of MiNature 5 formula, where it delivers the herbicide to inner cells and therefore eradicate the plant from inside, as compared to the standard treatment that only kills plant-parts it can readily reach. If the core is still alive, it will simply regrow.
- The much reduced quantum of herbicide required for higher efficacy is indicative of superior bio-availability offered by MiNature 5

DRUG RESISTANCE:

The two photos below demonstrate the ability of MiNature 5 to penetrate as carrier into insects.

NOTE: In this demonstration the methomyl was stained red. It is known that Aphids are resistant to Methomyl and therefore the aphid on the left did not die, but the aphid on the right died within 2 minutes unable to resist the MiNature 5 and Methomyl mix.



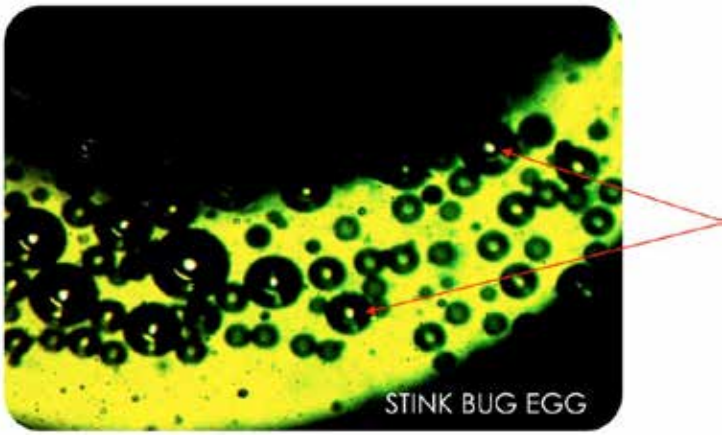
RESULTS:

- Photo, left, shows no sign of poison inside the Aphid.
- Photo, right, shows the insect is pervaded with the MiNature 5 and Methomyl mix.

PENETRATION INTO INSECT EGGS

RESULTS:

MiNature 5 ANODS move through the egg of a stink bug to destroy it internally.



MiNature 5 / Cypermethrin

MiNature 6

"Anti-Fungi"

MiNature 6 is a liquid specially formulated and intended:

- To provide plants with essential bio-material for it to self-activate effective defense
- To assist plant self-defense by direct attack of fungal infection
- To assist plants to self-repair invasive damage
- In the event of root invasion and symbiont insect activity, to simultaneously enhance root resistance against both invasive pests.
- To help reduce the toxic pesticide build-up and provide a simplified alternative in the Integrated Pest Management Program

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Salicylic Acid and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 6 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 6 to water in tank.
4. Mix the water with the MiNature 6.

DIRECTIONS

MiNature 6 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

MiNature 6 -ANTI-FUNGAL

One need only reflects on the devastating affect that potato blight had on Ireland in the 19th century where some 15% of the Irish population died of starvation to realize the severity of this problem. Researchers from the University of Oxford have estimated that currently some 125 million tons of the top five food crops – rice, wheat, maize, potatoes and soya beans are damaged annually by fungal infections. The lost yield could have fed some 600 million people, and the loss of rice, wheat and maize alone costs the industry $60 billion per annum. The study group estimated that in 70% of cases where infectious disease causes extinction of a type of animal or plant, an emerging species of fungus is behind the problem, and it appears that this tendency is increasing. Prof. Sarah Gurr concluded that: *"Crop losses due to fungal attack challenge food security and threaten biodiversity, yet we are woefully inadequate at controlling their emergence and proliferation. …"*

However, it now appears that even certified seeds are infected with fungi, as can be seen from the slide on right. The effect is that these fungi attack and damage new seedling root and consequently seeds do not grow. Farmers experience a germination rate of as low as 50%

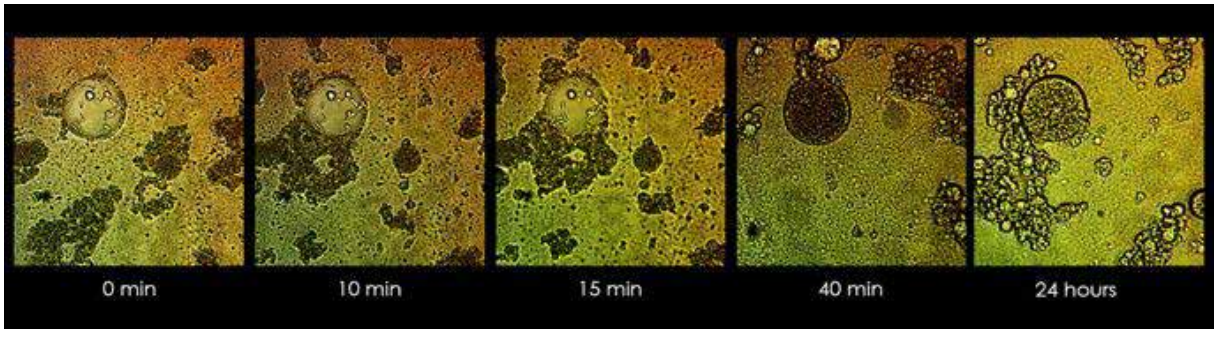
MiNature 6 BENEFITS

- Due to the liposomal base of the formula it offers rapid penetration through the thick and generally assumed to be impenetrable cell wall and also rapid acceptance thereof by the cell membrane, followed by transference beyond this barrier.
- The very lipid nature of the formula overcomes the hydrophobic barrier of the outer surface of the target fungus.
- Due to the polygenic and multi-cite nature of the formula, the risk of drug resistance is low.

- This is compounded by the obscuring role played by the unique technology, were the barrier functions are not exposed to the active ingredients, and therefore makes complete elimination of drug resistance possible
- None of the ingredients are toxic and the products are therefore non-toxic and safe.
- It therefore will also be environmentally safe and will not disrupt the ecology
- There will be minimal damage to the "good" and vital microbes in the soil
- The varied selection of active ingredients makes this formula a "broad spectrum" anti-fungal
- The product also serves as anti-fungal, fungicidal as well as fungi static.
- The formula is varied and can be adapted to serve as inoculant for preventative purposes as well as foliar application.
- There is no substance that may cause cytotoxicity and consequently foliar damage will be eliminated

IN VITRO STUDIES

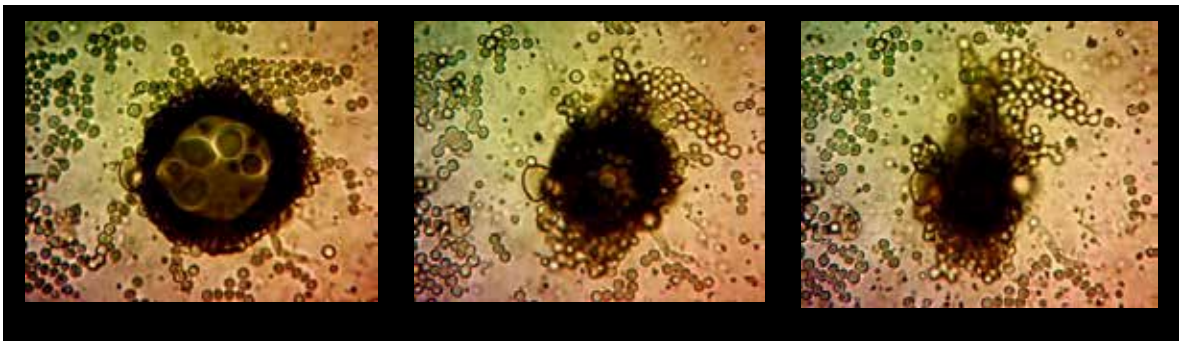
Our initial tests of the formula on a variety of fungi were highly encouraging and we share these results below. However, it stands to reason that extensive in vitro studies will now be necessary to confirm the behaviour of the above formula on as wide a scope of fungal families as possible.



The retention of nano-size vesicles in the cell wall and cell membrane can be clearly seen from a photo taken of the above fungus after 24 hours.

EXPERIMENT 1.

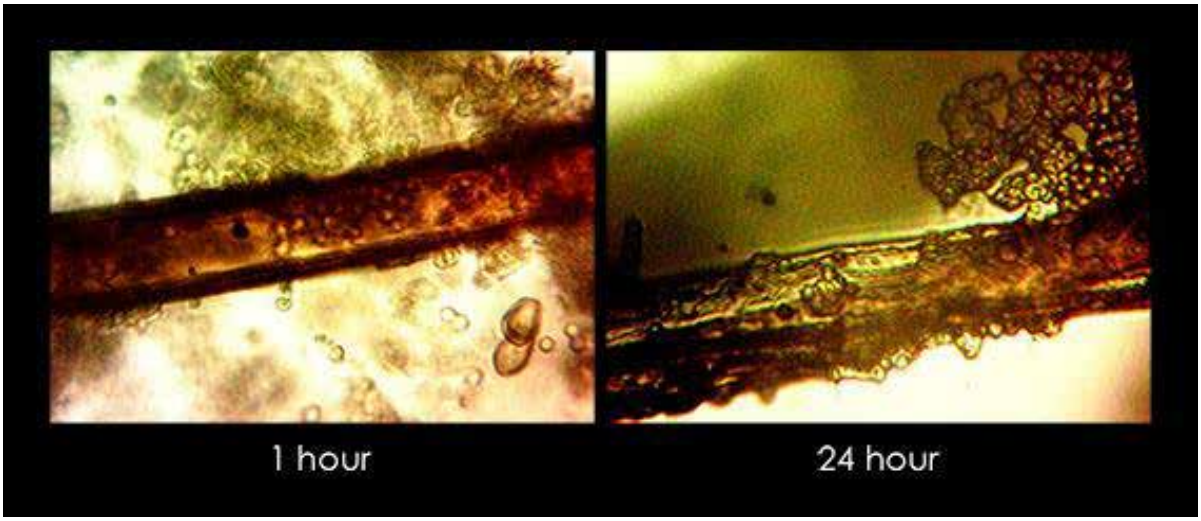
As we are not equipped to identify the various fungal families, it is not possible to name the particular strain used in the images below.



Time 3 Minutes

EXPERIMENT 2.

The objective of this experiment was to confirm the penetrating potential of the formula to the cell wall of a fungus. In the photos below the presence of our technology are clearly noticeable inside the Cell wall after 1 hour. After 24 hours this wall was severely damaged and disrupted.



MiNature 7

"Biotic Stress"

MiNature 7 is a liquid specially formulated and intended:

- To offer a systemic solution for bacterial infection of crops
- To equip plants with the necessary bio-materials for it to self-defend against fungal and bacterial infections
- To ensure that plants have the necessary biomaterial for self-repair following fungal and bacterial damage

ACTIVE INGREDIENTS

A special blend of Essential oils, Glutathione, Zinc Sulphate and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature 7- 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 7 to water in tank.
4. Mix the water with the MiNature 7.

DIRECTIONS

MiNature 7 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

Soil Application: 1L per hectare.

Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

MiNature 7 HAS BEEN TESTED FOR

Both fungicidal and bactericidal efficacy by Envirocare Laboratories, South Africa,

RESULTS:

1. Fungicidal efficacy

Protocol: Analysis performed according to SANS 51276:2011

Product tested: MiNature 7A and MiNature 7B

Test result:

	MiNature 7A **BN MBA0001 PD12/04/2021**	MiNature 7B **BN MBB0001 PD12/04/2021**	**Organism concentration**	**Organism reduction**	**Validation**
	CFU/ml after 15 minutes contact time	CFU/ml after 15 minutes contact time	CFU/ml	%	Pass / Fail
A. brasiliensis	ND	ND	11.1 X 10^5	100	Pass
C. albicans	ND	ND	23.9 X 10^5	100	Pass

2. Bactericidal efficacy (Gram Negative Bacteria)

Test Result:

Organism	**Formulation** ***Cfu/ml***	**Control** *Cfu/ml*
Klebsiella aerogenes ATCC 13048	0	288 x 10^6
E. coli ATCC 10536	0	116 x 10^6
S.aureus ATCC 6538	0	241 x 10^6
Salmonella typhimurium ATCC 13311	0	253 x 10^6
Pseudomonas aeruginosa ATCC 9027	0	272 x 10^6

MiNature 8

"Meristem Accelerant"

MiNature 8 is a liquid specially formulated and intended:

- To obviate desiccation of scion by acceleration of joining process
- To enhance meristem cell accumulation at shoot-scion connection and grafting wound for expedited healing
- To help scion-leafs to continue normal photosynthesis and avoids leaf senescence.

ACTIVE INGREDIENTS

Chitosan, Vitamin E and Glutathione

MIXING INSTRUCTIONS

For Spraying

1. Use 200 part water to 1 part MiNature 8 -1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 8 to water in tank.
4. Mix the water with the MiNature 8.

For Grafting

1. Use 15 part water to 1 part MiNature 8 - 1:15
2. Put 15 parts water in a tank.
3. Add 1 part MiNature 8 to water.
4. Mix the water with the MiNature 8.

DIRECTIONS

MiNature 8 can be applied through conventional ground equipment, aerial application, or through properly equipped irrigation systems.

MiNature 8 can be tank mixed with water and other liquid fertilizers and pesticides.
Soil Application: 1L per hectare.
Leaf Application: 1L per hectare.

MiNature 8 FOR GRAFTING

- MiNature 8 as a promotor of, and supporter of stem cell activity was used in grafting as shown below.
- In grafting process all activities involved are highly dependent on 'meristem' (or Stem Cell) activity.

RESULTS:

The first indication that grafting was successful is when the first scion appears on the upper section of the joint. In the example below we show the first scion after 3 weeks.

MiNature 10

"Photosynthesis"

MiNature 10 is a liquid specially formulated and intended:

- To enhance photosynthetic efficiency
- To enhance light utilization
- To enhance carbohydrates production
- To optimize photo damage protection, especially UV radiation damage

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Salicylic Acid and Vitamin E

MIXING INSTRUCTIONS

1. Use 200 part water to 1 part MiNature10 - 1:200
2. Put 200 parts water in a tank.
3. Add 1 part MiNature 10 to water in tank.
4. Mix the water with the MiNature10.

DIRECTIONS

MiNature 10 can be applied through conventional ground equipment, drone application, or through properly equipped irrigation systems. But avoid using "mist" spray setting.

Soil Application: 1L per hectare.

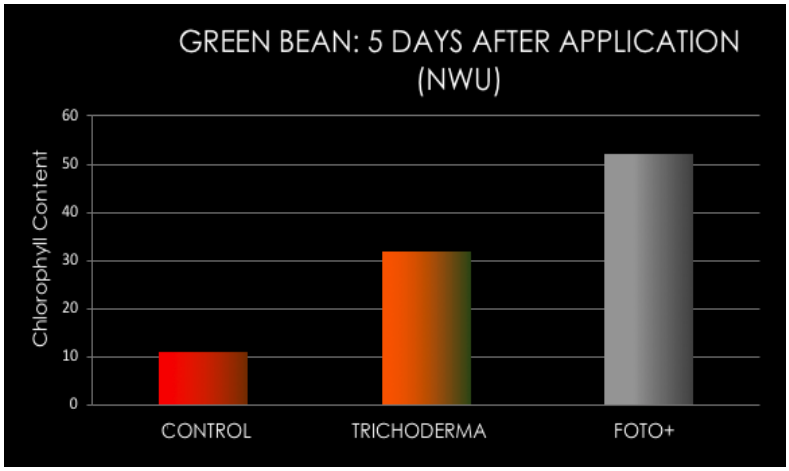
Leaf Application: 1L per hectare.

Foliar (leaf) application has been proven to be the most effective method of treatment.

BENEFITS:

MiNature 10 is intended to increases Photosynthesis and Chlorophyll.

- The Department of Botany at NWU, South Africa did a comparison of leaf surfaces treated and untreated to assess the effect on Photosynthesis and Chlorophyll.
- The graph shows that MiNature 10 increases Photosynthesis 5-fold.
- Increased Photosynthesis has a chain-effect on the energy potential of the plant, and its resilience and growth.



STANDARD TREATMENT

MiNature 10

- Photo, left, the Soya plants have been treated with the standard Treatment.
- Photo, right, shows Soya plants treated with MiNature 10

RESULT:

The Soya plants on the right are nearly double the size, in height, leave size and growth:-

- MiNature 10 treated Soya plants yielded a 30% higher yield.

MiNature 13

"Shelf life extender"

MiNature 13 is a liquid specially formulated and intended:

- To offer a non-toxic alternative treatment for post-harvest fruit with the view of extending produce shelf life
- To reduce mass loss during shelf life period
- To reduce the need for chlorine washing and wax removal

ACTIVE INGREDIENTS

A special blend of Essential oils, Chitosan, Zinc Sulphate and Vitamin E

THE EFFECT OF MiNature 13 : On the prevention of post harvest blue and green mould of mandarin. NJR Roets *(M.Sc., Cand. Sci. Nat.)*

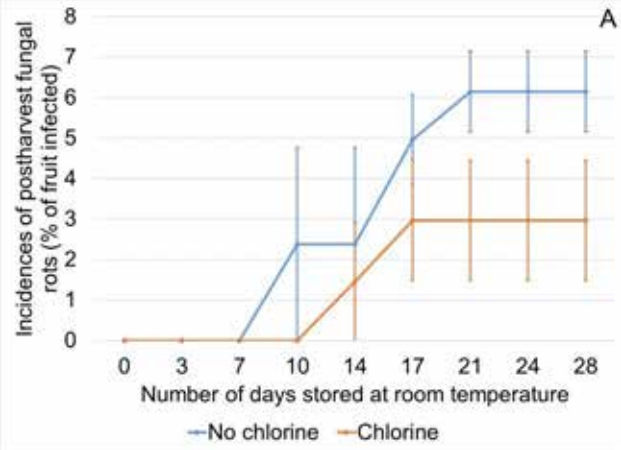
AIM:

To determine the effect of MiNature 13 on the prevention of post harvest blue and green mould infection on mandarin fruit

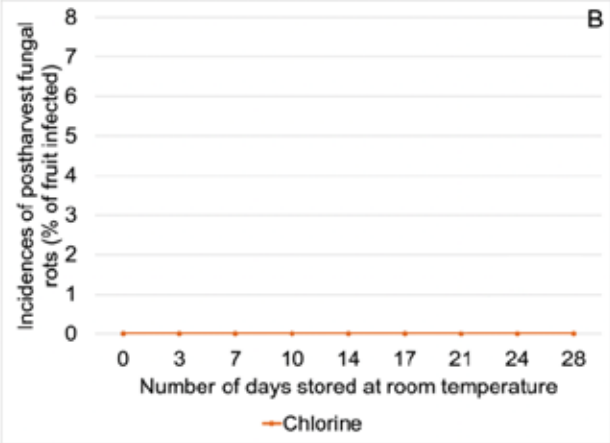
RESULTS AND DISCUSSION

the 1:20 MiNature 13 treatment with chlorine that had no mould infection. This was similar to the standard commercial fungicide treatment that also had no mould infection.

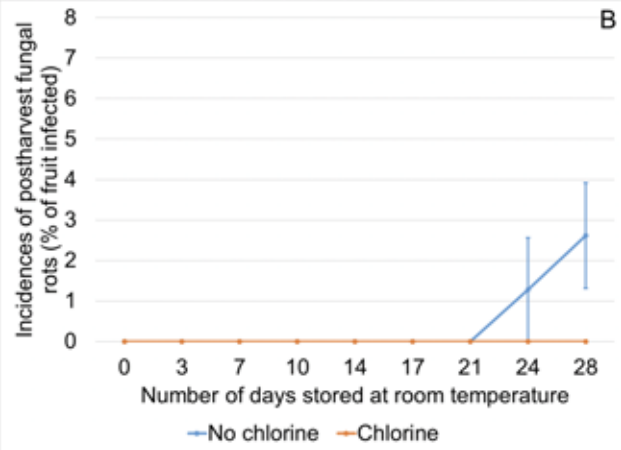
CONTROL



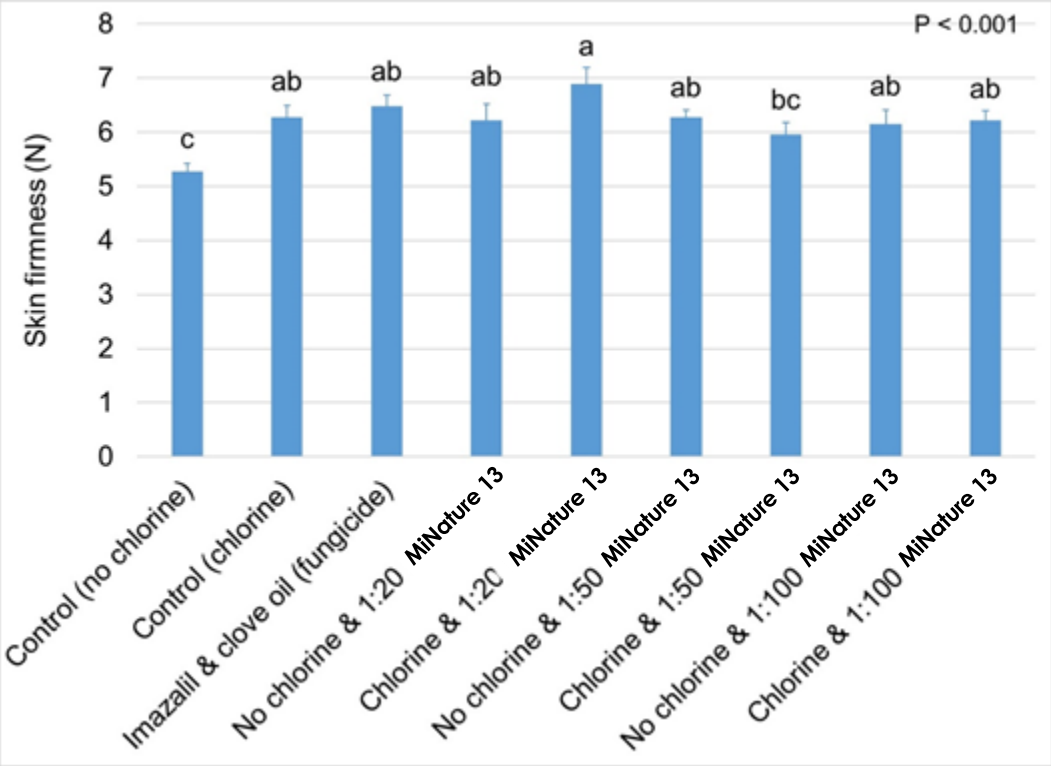
IMAZALIL & CLOVE OIL



MiNature 13



Fruit firmness serves as an indication of water loss by the fruit. The control group showed the highest degree of firmness loss, and MiNature 13 showed the least water loss, slightly better than the standard treatment. (See table below)



The effect of different MiNature 13 treatments on the firmness of 'Nadorcott' mandarin fruit

CONCLUSION:

From this study it was evident that MiNature 13 at a concentration of 1:20 hold potential to effectively control blue and green mould on mandarin fruit. We found that MiNature 13 is comparable to the standard commercial fungicide treatment. In view of the impending withdrawal of IMAZALIL from the market,
alternative, especially when we consider that this is an all-natural and non-toxic alternative.