Andermatt
Madumbi

Biological Solutions

Disease Management

Double Nickel® 55

Reg. No. L10053, Act 36 of 1947

Root Health | Plant Vitality | Bio Crop Protection

Double Nickel® 55

Reg. No. L10053, Act 36 of 1947

A biological fungicide for the suppression of powdery and downy mildew on table grapes and powdery mildew on cucurbits. Ideal in IPM, zero residue and resistance management programs.

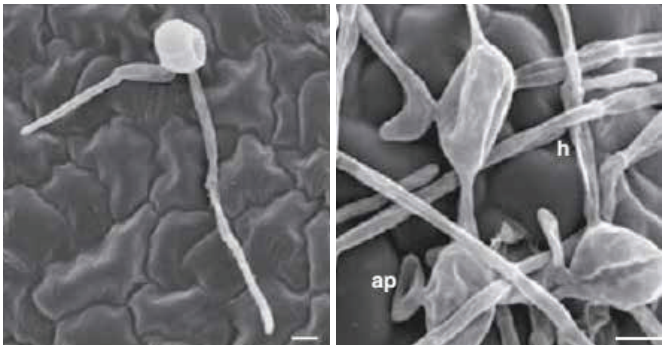
Why use Double Nickel® 55?

Features	Benefits
Broad spectrum biofungicide containing the active ingredient *Bacillus amyloliquefaciens* isolate D747 supplied by Certis Biologicals USA.	Well researched product of high quality delivering consistent results.
Bacteria based active ingredient.	Ideal resistance management option for IPM programs.
Multiple modes of action.	Good efficacy and low risk of resistance build-up. Ideal resistance management option in IPM program with conventional chemicals.
OMRI listed.	Suitable for use in organic production.
No Maximum Residue Limit (MRL).	Helps growers meet demands of export markets in terms of minimal/zero residue pest management programs.
Stable formulation with 2 year shelf life at room temperature.	Limited risk of expiring stock and more consistent results.

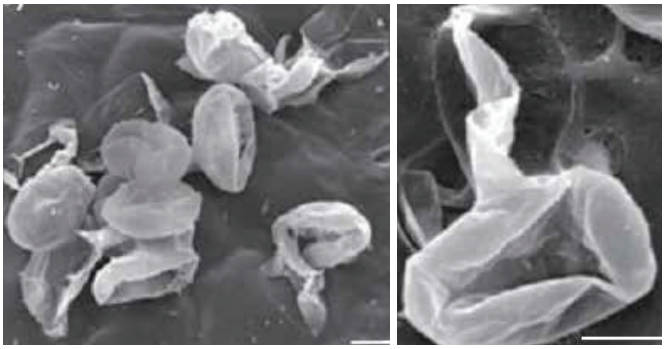
Mode of Action:

1. Production of antimicrobial metabolites

Double Nickel® 55 is capable of producing a number of antimicrobial metabolites such as Iturin and Surfactin which inhibit growth of fungi and bacteria.



Healthy, untreated conidia and hyphae of powdery mildew of cucurbits.

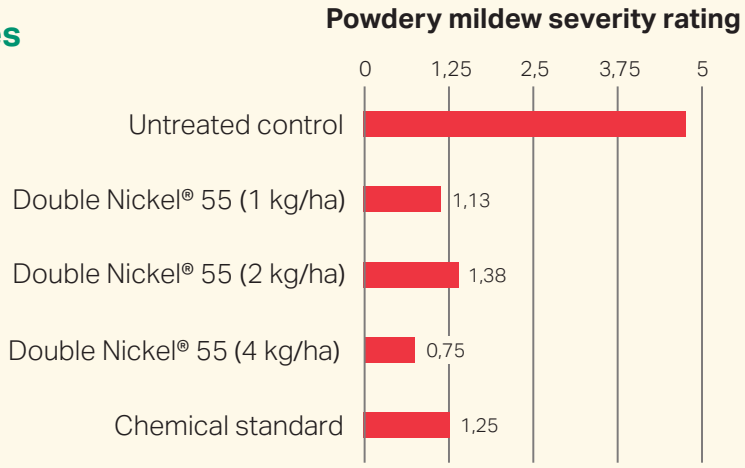


Shrinkage and loss of turgor of powdery mildew conidia after being treated with *Bacillus* lipopeptide extracts.
(Images repro. from Romero *et al*, 2007. J app. Micro.)

Trial data

Double Nickel® 55 management of powdery mildew on table grapes

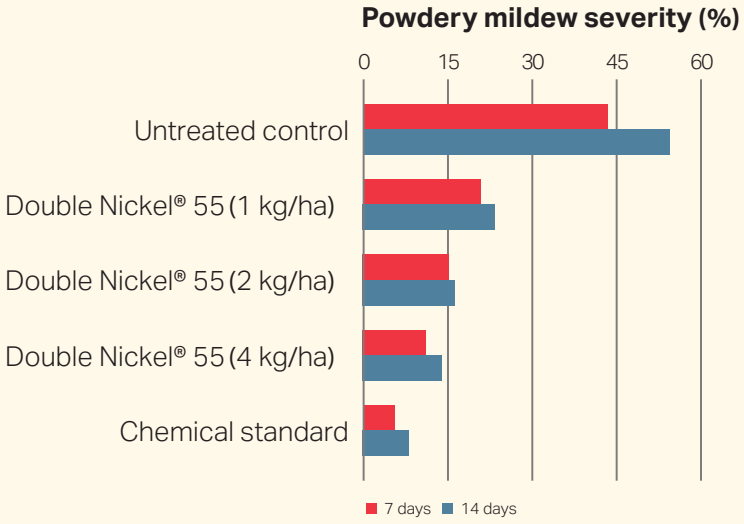
Cultivar = Sugraone
Location = Paarl



Figures right:
3 applications at 7 day intervals as a full cover spray (1000 L/ha).
Evaluation at 14 days after application 3.
Evaluations based on leaf disease severity ratings.

Double Nickel® 55 management of powdery mildew on cucurbits

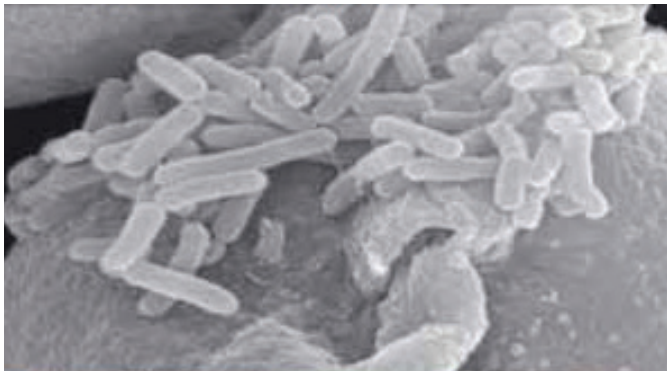
Cultivar = Patty Pan – Sunny Delight
Location = Phillipi



Figures right:
6 applications at 7 day intervals (500 L/ha).
Evaluation at 7 and 14 days after last application.
Evaluations based on leaf disease severity (%).

2. Competition for space and nutrients

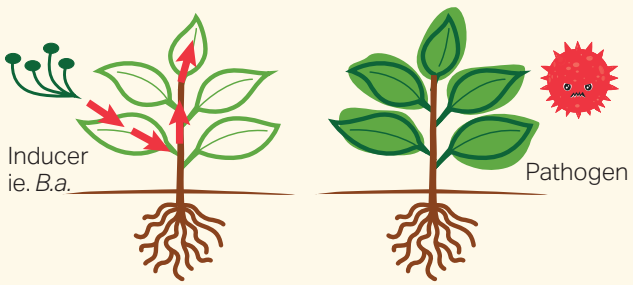
Double Nickel® 55 colonises plant surfaces, occupying space and using up nutrient sources at potential infection sites thus making it difficult for pathogens to get established.



Colonisation of kiwifruit by *B.a.* D-747 (spray application).
Source: G. Balestra *et al. L'Informatore Agrario* 22: 50-53.

3. Induced Systemic Resistance (ISR)

Double Nickel® 55 can help activate a plants natural defence mechanisms through ISR. ISR is a state of enhanced immunity to infection demonstrated by plants following an injury or presence of inducer organisms like *B. amyloliquefaciens (B.a.)*.



In response, plants produce substances (represented by red arrows) which, over time, evoke resistance and make it less susceptible to pathogens.

Double Nickel® 55

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Application instructions:

Crop/Disease	Dosage Rates	Remarks
CUCURBITS **Powdery Mildew** (*Podosphaera fusca*)	1 - 2 kg/ha (water volumes 200 - 1000 L)	• Apply full cover spray but not runoff. • Start application at first sign of disease or during periods favourable to disease outbreak. • Repeat at 7-day intervals until disease is under control. • At least 3 applications are recommended.
GRAPES (Table and Wine) **Downy Mildew** (*Plasmopara viticola*) **Powdery Mildew** (*Erisyphe necator*) ***Botrytis*** (*Botrytis cinerea*)	1 - 2 kg/ha (water volumes 200 -1000 L)	• Apply full cover spray but not to runoff. • Start preventative applications with onset of flowering. • Repeat every 7-10 days until harvest.
MACADAMIA NUTS **Flower blight** (*Cladosporium cladosporioides*)	1 kg/ha	**Apply at 14-day intervals.** **1st Application:** Apply at flower initiation or when the first individual flowers are visible (still closed) **2nd Application:** Apply when first flower petals ae visible (petalled forms) **3rd Application:** Apply when first flowers open (sporadically) **4th Application:** Apply at 50 - 100 % full flowers open, first petals may have fallen until disease is under control.
POME FRUIT **Powdery Mildew** (*Podosphaera leucotricha*)	0.5 - 1 kg/ha	• Apply preventatively when weather conditions are favourable for the development of powdery mildew, before visible symptoms appear. • Apply as full cover spray but not to point of run off. • Use as part of an integrated disease management strategy in combination with other management practices. • Repeat applications every 14 days as required. • Do not exceed more than four (4) consecutive applications. • Use the higher dosage rate with increased disease pressure, foliar development and canopy densities. • Curative use after disease onset may result in limited control.
BERRIES & SMALL FRUIT (strawberries, blackberries, raspberries, blueberries, currants, elderberries) ***Botrytis*** (*Botrytis cinerea*)	1 kg/ha (water volume 150 - 300 L)	• Apply as a full cover spray but not to run off. • Start preventative applications with onset of flowering, repeat every 7 - 10 days until harvest.
STONE FRUIT (apricots, cherries (sweet and sour), nectarines, peaches, plums & prunes) ***Botrytis*** (*Botrytis cinerea*)	1 kg/ha (water volume 700 - 1000 L)	• Apply as a full cover spray but not to run off. • Start preventative applications with onset of ripening (3 - 4 weeks before harvest), repeat every 7 - 10 days until harvest, complete at least 3 applications.
CITRUS ***Botrytis*** (*Botrytis cinerea*)	1 kg/ha (water volume 4000 - 6000 L)	• Apply as full cover spray but not to run off • Start application at first sign of disease or during periods favourable to disease outbreak • Focus applications at flowering, which are most vulnerable just before opening. • Repeat at 7-day intervals until disease is under control. Four to six applications recommended

Available in packs: 100 g, 1 Kg, 5 kg and 30 Kg

Manufactured by:

CERTIS Biologicals

Andermatt Madumbi

Healthy Food and Healthy Environment, for all

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