NEMguard®
(a.s. garlic extract)
for effective and sustainable
control of nematodes
in horticultural crops

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NEMguard – background & active substance

Background

• commonly used in food production, but also as medicine and for crop protection for centuries
• major challenge: development of a high quality garlic-based product providing consistent field efficacy.

ECOspray Ltd characterized and developed quality control for this complex plant extract, and was finally able to prove batch-to-batch consistency.

Active substance

Garlic contains numerous biologically active ingredients, including **allicin** and **polysulfides**.

The active substance of NEMguard, a highly refined food grade garlic extract, contains fingerprinted polysulfides protected by four patent families.
NEMguard – mode of action

• Under certain conditions (injuries, attack by microbials) production of allicin (highly unstable)
• decomposition of allicin into polysulfides, such as diallyl sulfide (DAS), diallyl disulfide (DADS), diallyl trisulfide (DATS), diallyl tetrasulfide (DATTS)
• DATS and DATTS: primary components active against several insects and nematodes.

The full range of ECOspray’s garlic active ingredients was voted through the EU Commission for inclusion into Annex 1 of 91/414 in October of 2008.

EFSA peer review is expected to be completed in December 2012.

Mode of action:
• contact activity
• inhibition of enzyme systems
NEMguard® is registered as a nematicide in the UK, Ireland, and Turkey. Registration is pending in several European and non-European countries.

The liquid concentrate that forms 45% of NEMguard, is registered in the UK and Ireland as a nematicide on Sports and Amenity turf (f.p. Eagle Green Care™).

Biogard – Division of CBC Europe has agreed exclusive distribution rights with ECOspray for NEMguard® in the southern zonal countries of the EU and in North Africa.
NEMguard® - proposed label (Italy)

**Active substance:** garlic extract (purity $\geq 99.9 \%$),

**Formulation:** Granules (GR)

**Concentration:** 45% w/w

**Hazard symbol:** irritant (Xi)

**Crops:** carrot, tomato, eggplant, bell pepper, cucurbits, lettuce and other leafy vegetables

**Targets:** nematodes of the order Tylenchida

**Application rate:** 20 – 25 kg/ha

**Application timing:** before transplanting / sowing

**MRL:** exempt from MRL requirements

**Shelf life:** 2 years at room temperature
NEMguard® - target pests & symptoms on crop

**Target**
Nematodes order
Tylenichida
(eggs & larvae)

**Symptoms**
root lesions, irregular root growth,
disturbance to normal root function,
yield loss, crop destruction
NEMguard® — efficacy against nematodes on carrot

Open-field carrot cv Romance F1 (2011)
Ispica (RG), Sicily, Italy
Root damage (%) = % deformed + forked roots at harvest
NEMguard® – efficacy against nematodes on lettuce

Open-field lettuce cv Nissena (2011)
Vittoria (RG), Sicily, Italy. A=7/11, B=21/11, C=6/12.
Root damage index (scale: 0-5)
NEMguard® – efficacy against nematodes on tomato

Protected tomato cv Piombo (2009)
Santa Croce Camerina (RG), Sicily, Italy
RGS = Root-galling severity (Zeck scale)
A = 8 days before transplanting; B = at transplanting
NEMguard® – efficacy against nematodes on melon

Protected melon cv Cabrera (2009), Vittoria (RG), Sicily, Italy

RGS = Root-galling severity (Zeck scale)
A = 6 days before transplanting; B = at transplanting
NEMguard® – effects on rooting
NEMguard® – benefits

- Highly refined food grade garlic extract formulated with innovative granulation technology
- Highly effective against several nematode species
- Prolonged activity
- Easy to use (apply granules using conventional granule applicator)
- Exempt from MRL restriction
- Safe to humans and the environment
- Can be used in combination with conventional nematicides and mBCAs (Bioact WG®, a.s. Paecilomyces lilacinus strain 251)
- Allowed in organic farming
«... most nematicides have tended to be rather toxic or volatile, with poor target specificity and less-than-perfect human or environmental safety ...»

(Chitwood, 2002)

NEMguard® bucks the trend!

Thank you for your attention!