LALGUARD M52 GR

Powerful biological insecticide

For glasshouse, nursery and open field insect pests

Impact for a sustainable future

LALGUARD M52 GR

Lalguard M52 GR is a Metarhizium based product which can be used within growing media for the control of Black Vine Weevil. With the removal of chemical pesticides from the market it is important for growers to implement an IPM strategy towards this pest (amongst others) and Lalguard M52 GR plays an important role within the IPM toolbox.

A changing industry and culture

- We are seeing a big change in the way that plant protection products are being utilised and seen. Legislation and environmental concerns are driving change to more biological methods of control

Laws

- Development of public territories with no chemicals ("zero pesticides")
- Withdrawal of registration of insecticides (bad ecotoxicological or toxicological profile)
- Sustainable Use Directive

Safety

- Increased interest in biological products to lower residues on crops and increase safety for workers and consumer health

Environmental ethics

- Concern for beneficial insects (honeybees)
- Interest in overall reduction in chemical use

Practical benefits

- Limit development of pest resistance by introducing new modes of action
- Biopesticides typically have much lower re-entry intervals (REI)

Features and benefits

- **Highly efficacious, stand-alone bioinsecticide for Black vine weevil control**
- **Consistent efficacy and comparable with many chemicals**
- **Can reduce chemical inputs when combined in a program**
- **Easy to apply and remains viable in the soil for months**
- **Compatible with conventional and organic IPM programs**
- **Compatible with macro beneficials & synergistic with entomopathogenic nematodes (EPNs)**
- **Fills an important niche in the market for black vine weevil**
- **Zero REI for ornamental crops**
- **No residues / exempt from MRLs**
- **Can be used throughout all stages of the production cycle**

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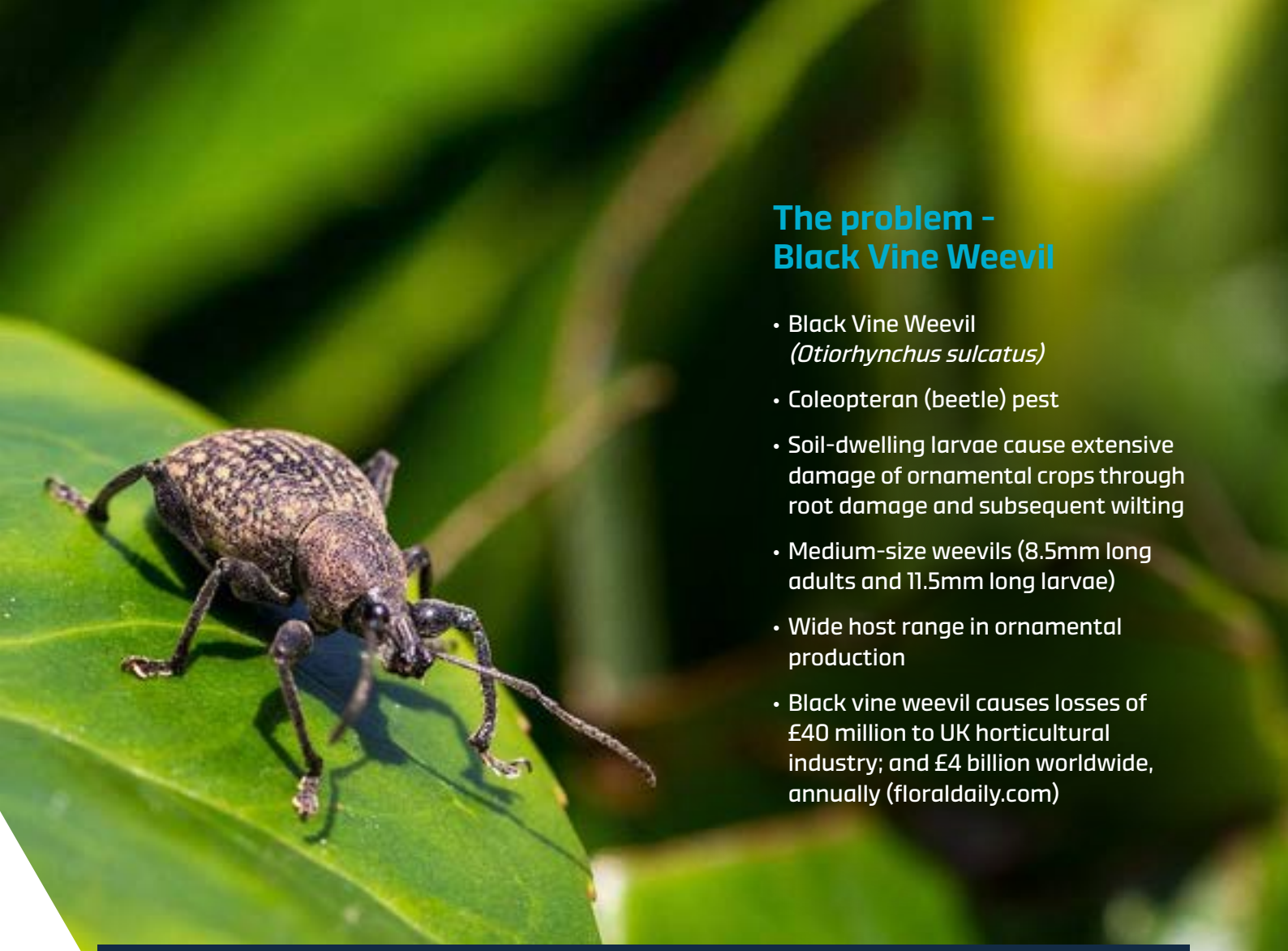


The problem - Black Vine Weevil

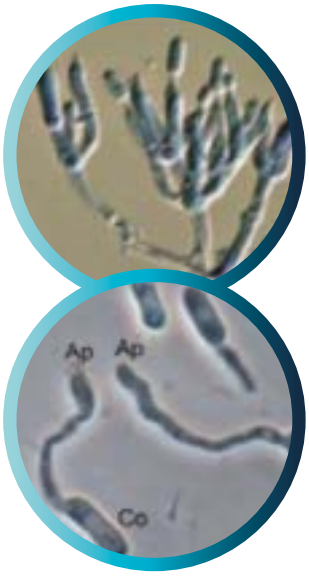
- Black Vine Weevil *(Otiorhynchus sulcatus)*
- Coleopteran (beetle) pest
- Soil-dwelling larvae cause extensive damage of ornamental crops through root damage and subsequent wilting
- Medium-size weevils (8.5mm long adults and 11.5mm long larvae)
- Wide host range in ornamental production
- Black vine weevil causes losses of £40 million to UK horticultural industry; and £4 billion worldwide, annually (floraldaily.com)

Control methods	
Cultural control and prevention	• **Issues to be aware of** - Adult weevils do not fly, so they are difficult to be trapped - No pheromone monitoring available - Larvae are soil-bound, so they are not easily visible • **Monitoring plants is key** - Adult insects are nocturnal - Adults leave characteristic notches in leaf tissue - Monitor susceptiple plants closely • **In case of infection, reduce or avoid the cultivation of host plants for 2-3 years** • **Maintain an adequate general nutritional and phytosanitary level** • **Require certification of the provenance of plants and substrates** • **Keep your surroundings free of weeds and debris**
Biological control	• **Number of products available:** - Lalguard M52 GR - growing media incorporated for larval control - Seeka Nematodes - applied through irrigation for larval control - Pitcher GR - granular application after potting for egg control • **Important: Use products as part of an IPM plan (see page 10)** - Ask a Technical Area Sales Manager regarding ICL's IPM planner providing growers with a tailored package for the growing season
Chemical control	• **Zero growing media incorporated chemical controls for vine weevil due to:** - Reductions in registrations (e.g., Thiacloprid) - Run-off, impact on the environment/workers - Re-entry requirements, pre-harvest interval (PHI) and residues

Powerful biological insecticide

What is Lalguard M52 GR?

- Biological insecticide based on the soil-borne, insect-pathogenic fungus *Metarhizium brunneum* strain Ma43**
- Control for Black Vine Weevil Larvae (*Otiorhynchus sulcatus*)
- Well-suited as a biopesticide because it does not need to be ingested like virus/bacteria to be effective (infect upon contact)
- They can also exist in nature as saprophytes
- High compatibility with existing plant protection products



Granular	
Formulation	Rice colonised with conidia
Active ingredient	*Metarhizium brunneum* strain Ma43
Viable spores	9 x 10^8 CFU/g
Dose rate	0.5 kg/m^3
Shelf life	12 months at room temperature (+20°C)
Crops*	Ornamentals, soft fruits, strawberry, grape, containerised vegetables
Registered insect targets*	Black vine weevil
REI and PHI*	0 hours and 0 days
Protection	Lalguard M52 GR is likely to persist within the growing media for up to 12 months and is most effective against the larval stage of Black Vine Weevil between 15-30 degrees

Granular formula

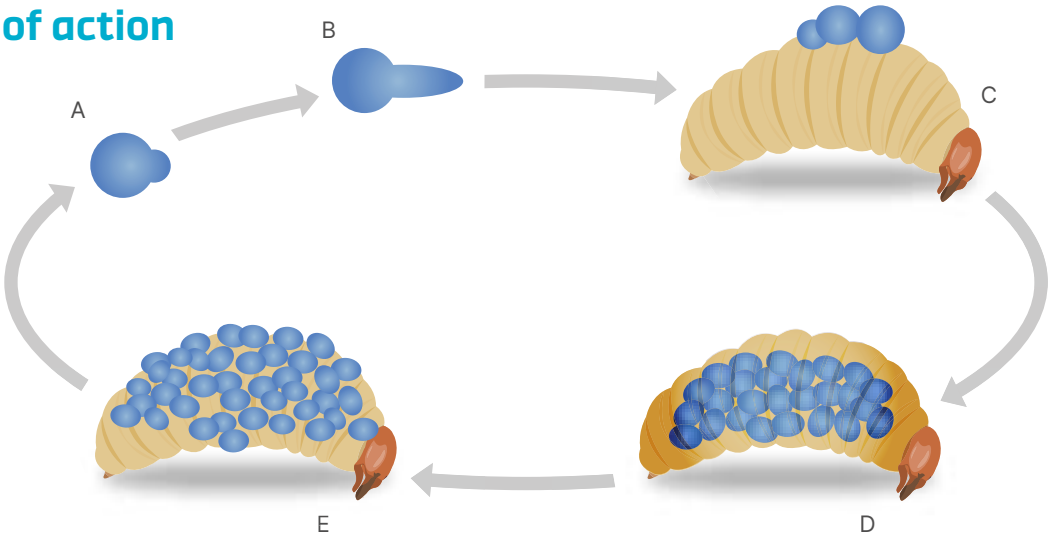
Pack sizes 10kg and 1kg

Mapp No. 19841

PCS No. 04811

* Registered crops, uses, REI and PHI will vary according to geography ** Previously know as Metarhizium anisopliae strain F52

Mode of action

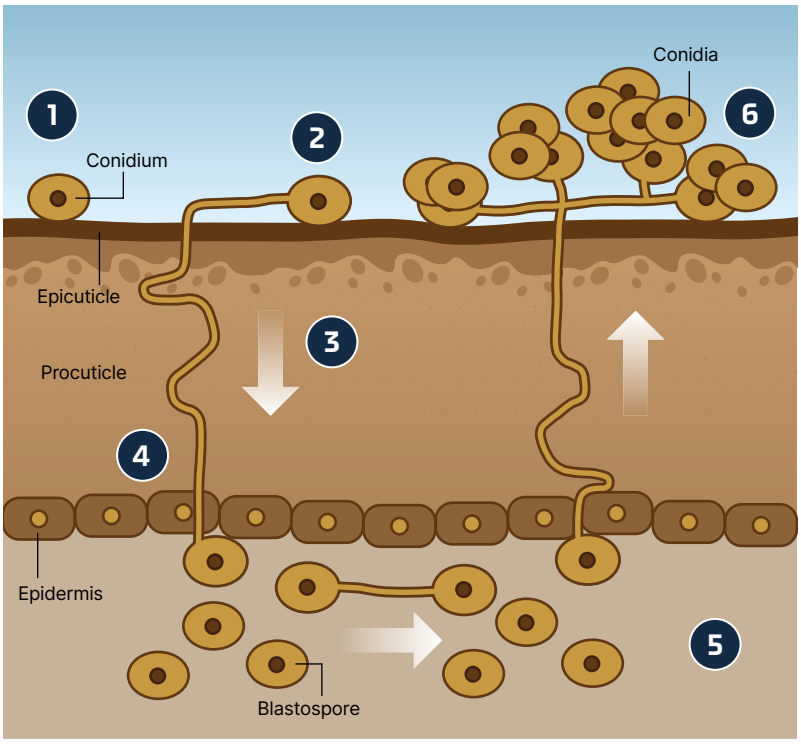


Insects that come in contact with the fungus will become infected:

- The *Metarhizium anisopliae* spores attach to the surface of the insect
- There are six stages to the infection process (please see diagram on the right):

1. **Adhesion**
2. **Germination**
3. **Appressorium formation**
4. **Penetration**
5. **Colonization of hemolymph**
6. **Extrusion and sporulation**

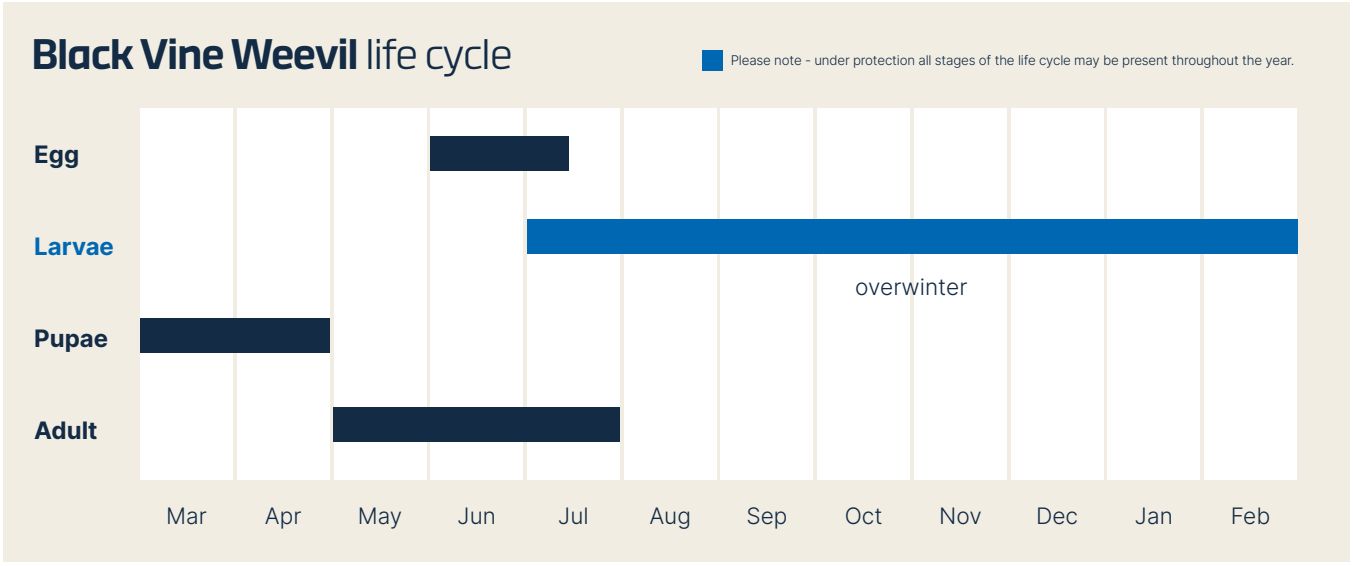
- At 15-30 °C (59-86 °F) temperatures it takes 3 to 7 days to kill, once the insect is exposed
- At very cold or hot temperatures, death may occur more slowly
- Susceptibility to infection varies by host species and life stage



Life cycle targeting

- Mortality is dose–dependent (more spores = quicker death)
- Moisture in the growing media improves the product efficacy
- Temperature is also important (optimal is 23°C) a drop of 3-5°C delays time to death by 1 day (critical in heavy infestations)

Not all developmental stages are equally susceptible



For detailed application rates please refer to label and leaflet incorporated with delivery of product.

Vine Weevil:

Eggs	Some susceptibility
Larval	High susceptibility particularly early instar stages
Pupae	Less susceptible than larvae
Adults	Some susceptibility

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Black Vine Weevil Adult

- Adult weevils chew irregular notches along leaf margins, causing damage that is often confused with a disease or chemical injury.
- Adults cut notches on the margins only; they never make holes in the centre of the leaf.
- Adult black vine weevils are largely nocturnal and feeding occurs mostly at night.
- Adults hide in dark places on the plants or on the soil during the day.
- After two weeks of feeding, adults begin to lay eggs.
- Most adult populations will die in the Autumn.
- A single (adults are parthenogenic) adult can lay up to 830 eggs per year

Black Vine Weevil Larvae

- Black vine weevil larvae feed on roots. When large numbers of larvae feed on the roots, the plants will wilt, turn brown, and die.
- Larval populations may go unrecognized because they are hidden in the soil, and plant decline may be mistaken for a plant disease rather than insect damage.
- Larvae spend the winter feeding on roots deep in the soil; they pupate in April/May. Adults dig their way out of the ground and crawl up the host plants to feed.
- There is only one generation per year.
- It should be noted however that all stages of the vine weevil life cycle can be present in protected/heated glasshouses throughout the year.

Application recommendations

- Thoroughly incorporate into growing media prior to planting (even mix with a 1/3 of media before full incorporation) - This can be pre-mixed in to growing media and delivered, please speak with your ICL Technical Area Sales Manager for tailored recommendations for crops
- Culture substrates should not be dry or excessively wet (particularly bark-based, to avoid over-heating)
- Use treated media within 30 days
- Optimum temp 15-30°C (spores survive freezing)
- Limited data support for effectiveness in heavier soil types

Did you know?

ICL can provide a full IPM strategy which includes Lalguard M52, as well as Pitcher GR and Seeka nematodes which will help growers maintain quality plants throughout the growing season.

Ask our technical sales team for a visit (see reverse)

Crops	Application	Method	Timing in crops	Rule	PHI (days)	Pests Targeted
Soft fruit Strawberry, raspberry, blackberry, gooseberry, currant, blueberry	Greenhouse	Potting soil incorporation	At growth stages Jan-Dec (Optimum temp 15-30°C	*0.5kg/m^3 (**150-300kg/ha)	3 (IT)	Black vine weevil
	Open	Soil incorporation		12.5-25kg/ha	2 (FR) 3 (IT)	
Tree nursery crops and perennials	Greenhouse	Potting soil incorporation	At growth stages Jan-Dec (Optimum temp 15-30°C	*0.5kg/m^3 (**150-300kg/ha)	2 (FR) 3 (IT)	Black vine weevil
	Open	Soil incorporation		12.5-25kg/ha	2 (FR)	
Floriculture and ornamental crops	Greenhouse	Potting soil incorporation	At growth stages Jan-Dec (Optimum temp 15-30°C	*0.5kg/m^3 (**150-300kg/ha)	3 (IT)	Black vine weevil
	(Potting) soil incorporation	(Potting) soil incorporation		12.5-25kg/ha	none	

*Max rate per application: 0.5kg/m^3=4.5×1011 CFU/m^3 **Max per crop/season Max number of applications: 2; interval 7 days

Compatibility

LALGUARD M52 GR

Has broad fungicide compatibility

Compatible	Incompatible	Need further testing (microbial products)
• Azoxystrobin • Dimethomorph • Etridiazole • Fludioxonil + mefanox • Fludioxonil • Fosetyl-Al • Iprodione • Mefanoxam • Phosphorus acid/K-salts • Propamocarb • Pyraclostrobin • Quintozene • Thiophanate-methyl • Trifloxystrobin	• Captan • Triflumizole	• Actinovate • Double nickel • LALRISE VITA • LALSTOP G46 • LALSTOP K61 • Serenade ASO • Rootshield Plus

Safe to use with many beneficials

Compatible	Combatibility questions	Need further testing (microbial products)
• Entonem nematode (Steinernema feltiae) • Robe beetle (Dalotia coriaria) • Hypoaspis mites (Stratiolaelaps scimitus) • Gaeolaelaps Mite (Gaeolaelaps gillespie) • Gaeolaelaps Mite (Gaeolaelaps aculeifer) • Scimitus Mite (Stratiolaelaps scimitus) • Earthworm (Lumbricus terrestris)	• Gaeolaelaps gillespiei • Aphidoletes aphidimyza (60% mortality, no effect on fecundity) • Neoseiulus californicus • Orius majusculus (96% mortality; 20% fecundity decrease)	• Orius spp. • Diglyphus isaea • Kampimodromus aberrans • Adalia sp. • Coccinella sp. • Dalotia coriaria • Aphidius rhopalosiphi • Phytoseiulus persimilis*

Please note that pre-mixed Lalguard M52 GR is unlikely to come in to contact with some of these beneficials. Please ask your Technical Area Sales Manager for more details.

Plant Health Planner

To help growers plan ahead and optimise plant health on their nurseries year-round, ICL has developed a ground-breaking new Plant Health Planner.

Ground-breaking Plant Health Planner

A digital web-based tool has been designed to both simplify and optimise plant health programmes on UK nurseries.

In line with the Sustainable Use Directive, our Plant Health Planner also helps growers reduce their reliance on chemical crop protection products.

New era

We have entered a new era for plant health. With an ever-diminishing range of available chemicals, growers are adopting a different mindset and a more sustainable IPM approach to keeping their crops healthy.

Cultural control is growing in importance again, as the first line of defence, followed by a programmed biological approach to boost plant health and control target pests and diseases. As a last resort, growers still have a small range of chemical products to fall back on.

Planned approach

To be successful, it is key to have a planned approach!

At the outset, we recommend growers meet their ICL Technical Area Sales Manager (TASM) to pinpoint the particular plant health problem areas on the nursery; likely time of year; crops impacted; geographical location of the nursery and products currently used to address the issues.

Plant health planner **features**

Vine weevil – full season recommendations

- **Vine weevil control products**
  - Vine Weevil Seeka
  - Vine Weevil Seeka CT (Cold Tolerant)
  - Pitcher GR
- **Nematode calculator**
  - By inputting basic data this tool works out the quantity of stock solution required for individual spray tank
- Recommendations for use of Fungus Gnat Seeka also available

Plant health recommendations – when to use biostimulants

- Vitalnova Prime
- Vitalnova Guardian
- Hicure

Plant protection products

- Amistar
- Prestop
- Incorporate to a full plan with other active ingredients

Mobile friendly

- Can be used during crop walks for instant advice and recommendations
- Recommendations accessible when required

User friendly

- Growers are able to access rates for products
- Provides instant access to product labels and safety data sheets
- User guides for products also available for download

More products will come online as the ICL portfolio grows and potential to be integrated with third party products to help growers create a one stop shop planner which can be used effectively on nursery.

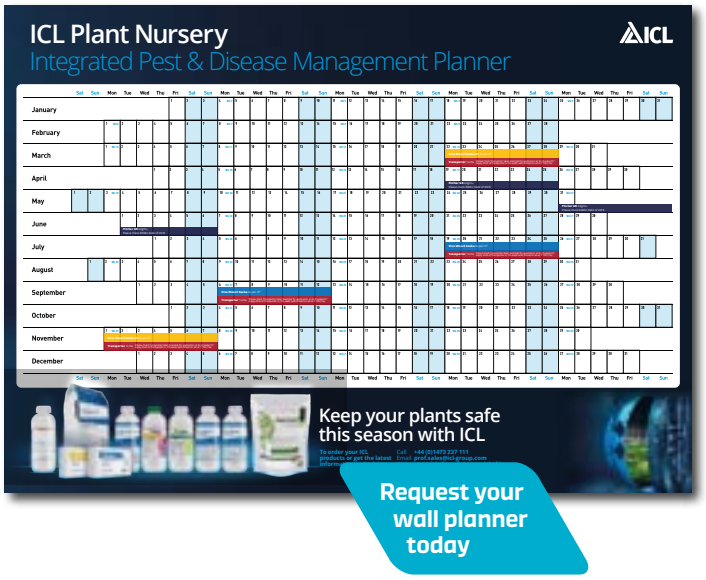
Armed with this information, ICL's TASMs can identify and discuss any cultural improvements that could be made and develop an accompanying Plant Health Plan. Depending on the plant health issues identified, this plan might be for a limited period – say 12 weeks - or a year or more.

Easy to use

Once set up, nursery production staff can access their bespoke plant health plan via a mobile, tablet or desktop computer. Simply click on the week number to view the recommended course of action.

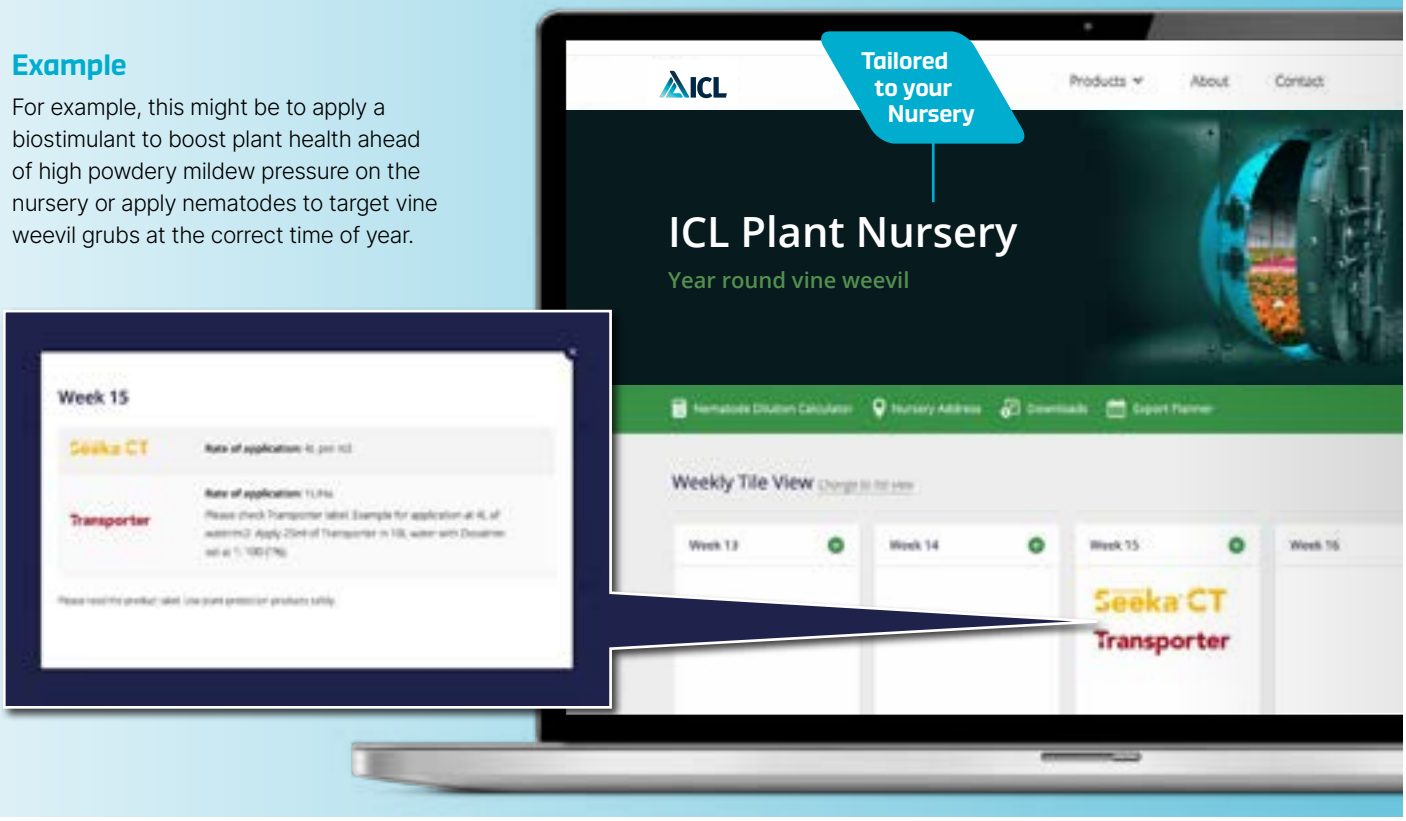
Also available

If you have a programme which is set for a year you are also able to request a wall planner - please speak to your local TASM for details.



Example

For example, this might be to apply a biostimulant to boost plant health ahead of high powdery mildew pressure on the nursery or apply nematodes to target vine weevil grubs at the correct time of year.



Levington® Advance Solutions

At ICL we know that grower requirements vary geographically and from crop to crop, therefore we offer a complete solutions package designed to produce growing media for our customers' individual needs.

To optimise crop value and performance you can add:

Osmocote® 5	Features an NPK release pattern that matches the plant needs closer than before
Osmocote® Exact	Maximise the efficiency of your feed regime
Micromax® Premium	Enhance the performance of your trace element package
PRESTOP®	A multi use biological fungicide for protection against damping off and root rot diseases
H2Gro®	Increase the water efficiency of your growing media
LALGUARD M52 GR	A powerful biological insecticide for glasshouse, nursery and open field insect pests

Did you know?

ICL can supply growing media in various formats suitable to your nursery from 75L and Bulk Bags to Probales and Bulk deliveries.

Our Technical Area Sales Managers will be pleased to discuss the effect and benefits of all the different materials available and suggest the best mixes for growing the crops on your nursery.

To order your ICL products or get the latest information and advice

Call **+44 (0)1473 237 111**
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