

Integrated crop management

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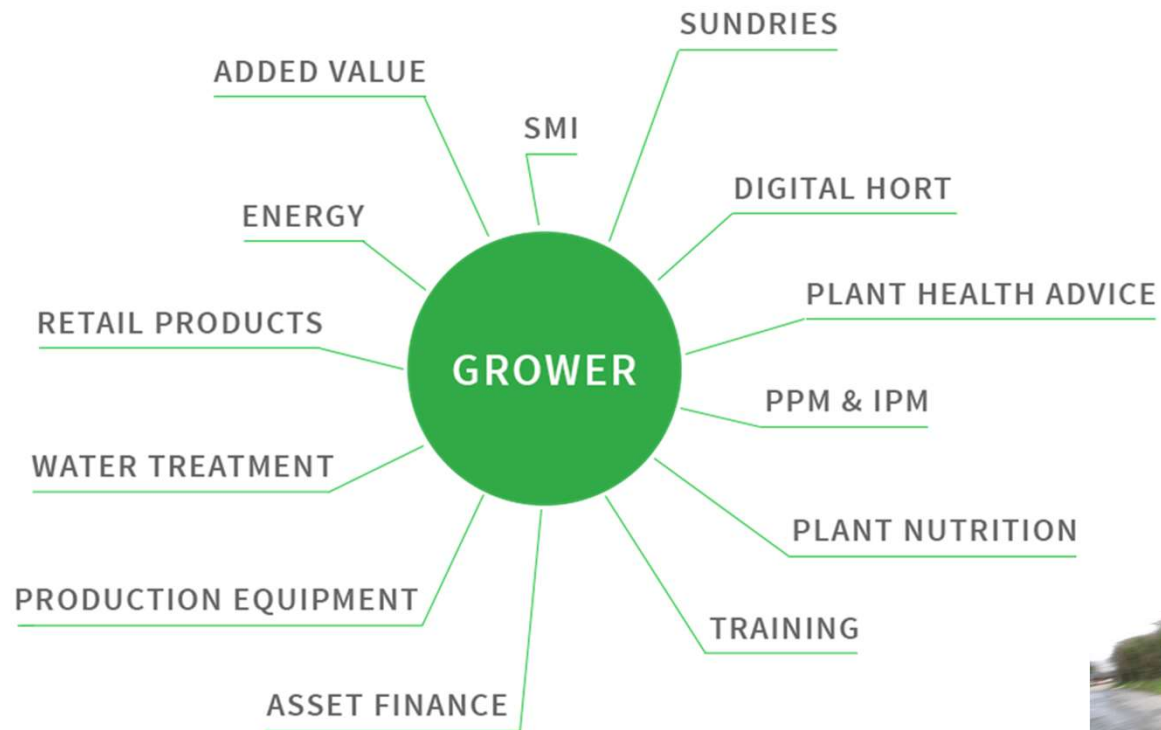
Dave Foster, Koppert UK General
Manager





fargro®

80 Years of Support and Advice for Horticulture



The Fargro Technical Team

Thirteen members of the Technical Team led by Technical Director, Josh Burnstone.



Head of
Agronomy



Technical
Customer
Service Advisor



Technical
Specialist

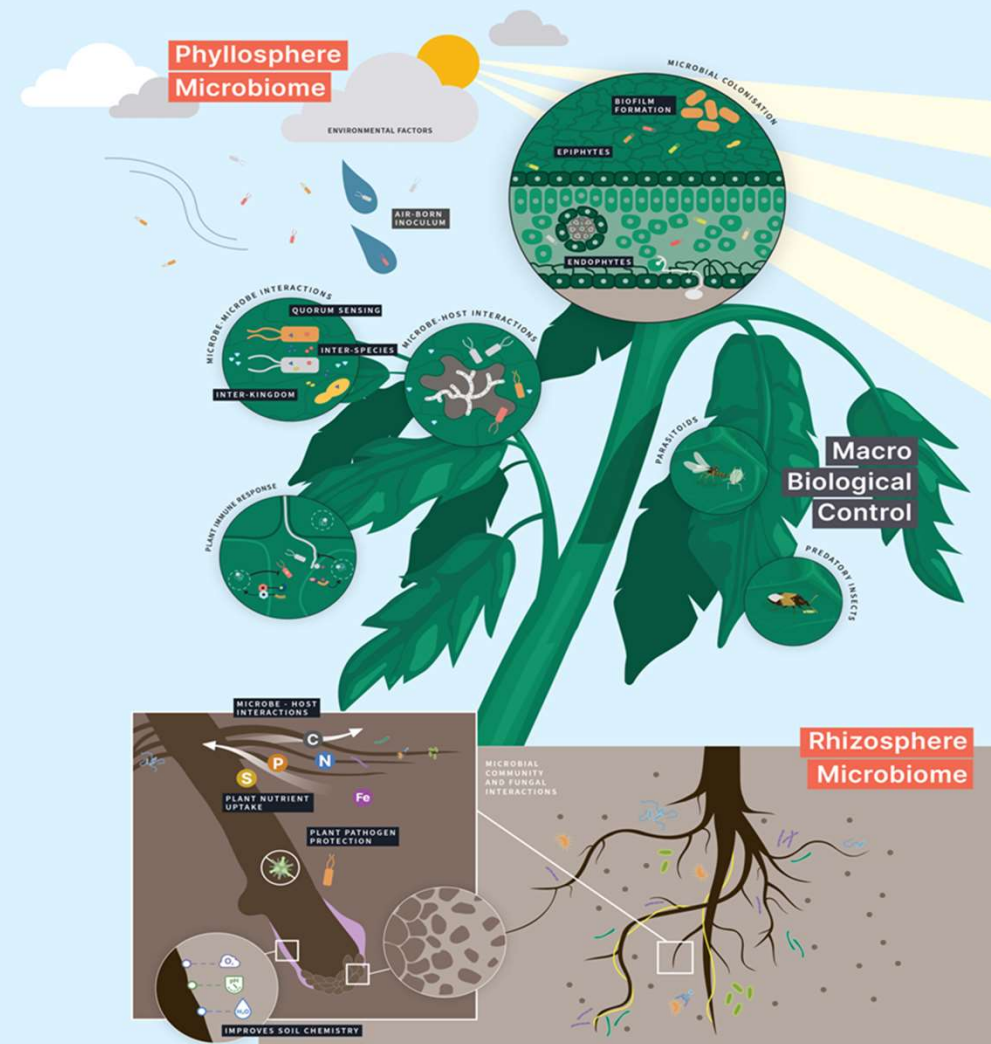


Growing Media &
Fertiliser Specialist



Technical &
Regulatory
Specialist

Fargro's Approach: Holistic Growing



The Challenges

- Limited approvals within the Amenity sector
- Rapid withdrawal of conventional pesticides and fertilisers
- UK Pesticides National Action Plan 2025
 - Aims to reduce the environmental impact of pesticides by 10% by 2030
 - Sustainable management of pests, weeds and diseases across the UK
 - Minimise risk to the environment and human health, whilst maintaining productivity

Policy paper

UK Pesticides National Action Plan 2025: Working for a more sustainable future

Published 21 March 2025

Contents

Introduction

Objective 1: Encourage uptake of Integrated Pest Management (IPM)

Objective 2: Set clear targets and measures to monitor use of pesticides

Objective 3: Strengthen compliance to ensure safety and better environmental outcomes

References

Annex 1: Statutory obligations for a Pesticides National Action Plan

Annex 2: Integrated pest management principles

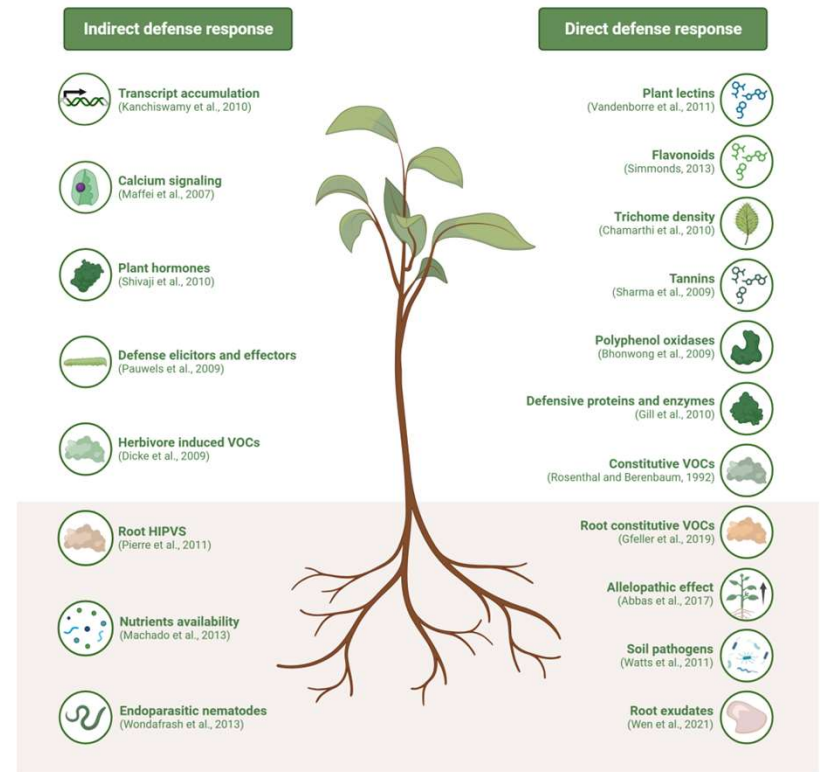
Annex 3: Pesticide facts and figures



How do plants defend themselves?

Plants can't move so they must **adapt or die** to every threat they encounter – both environmental and biological.

They have a huge number of **mechanisms to protect from these threats.**



Source: War et al. (2012)

Why aren't crops healthy?

Generally, the inputs we use to grow crops provide the plant with the tools to grow big and fast, but not necessarily to protect itself.

By using pesticides and intense fertilisation, we effectively make the plant reliant on chemical control for their protection – putting the plant on 'life support'



Intense fertilisation



Reduced plant defences



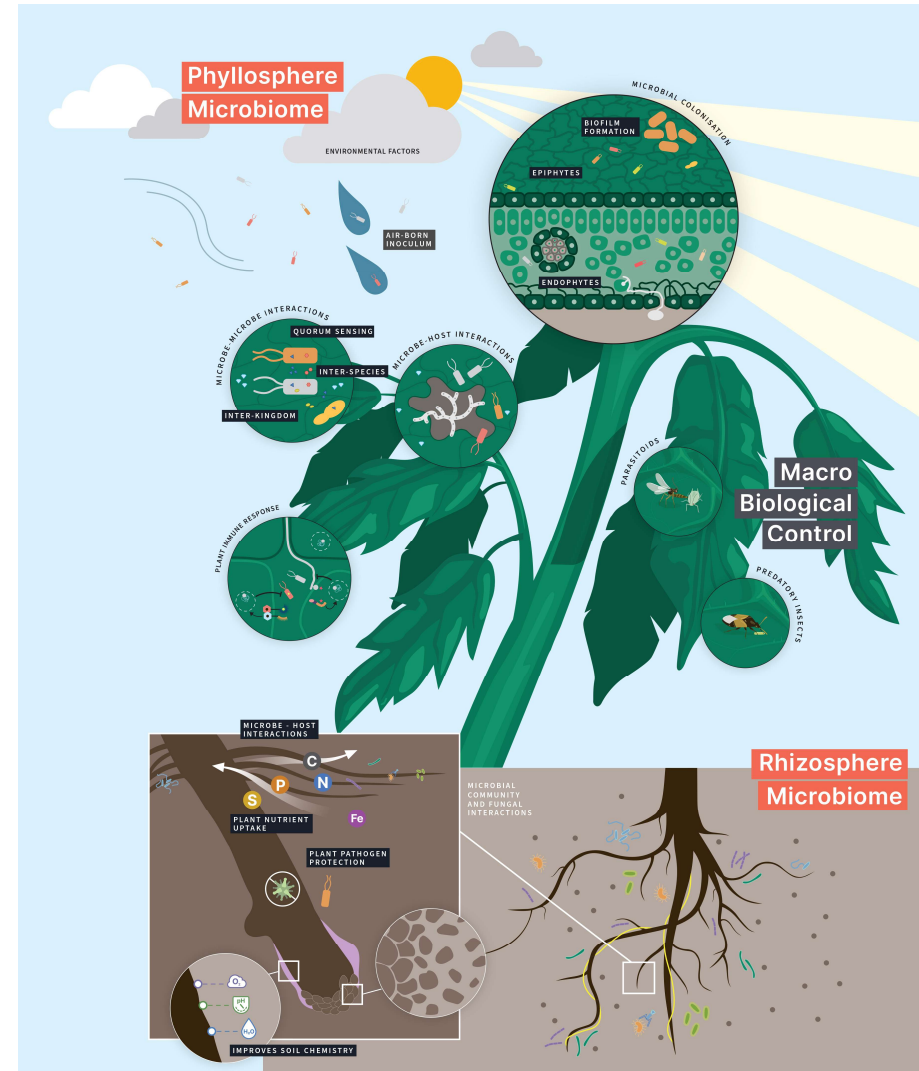
Chemical pesticide application

Fargro's Holistic Approach

We need to shift our understanding of plant biology to a **holistic** one.

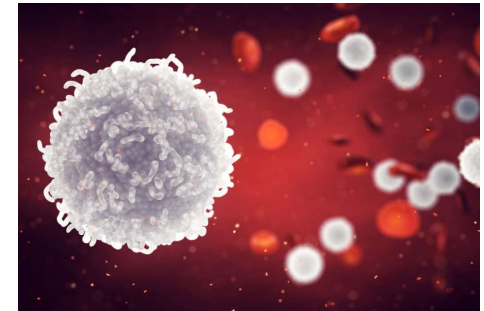
We can arm the plant with **the ability to utilise all its protective functions**. We maximise the biological capacity of the plant – reducing **need for expensive and damaging chemicals**.

This allows us to **harness** and **enhance** the plant's natural processes to grow **strong, healthy crops**.



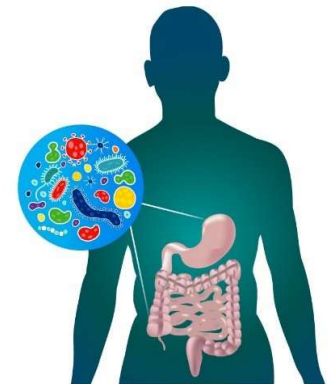
Holistic understanding of the human body

Humans *also* have many important systems to fight disease.



A healthy lifestyle will boost the ability of the body to use these systems.

The **gut microbiome** is a perfect example: we need a diverse, wholefood diet to support a good gut microbiome.

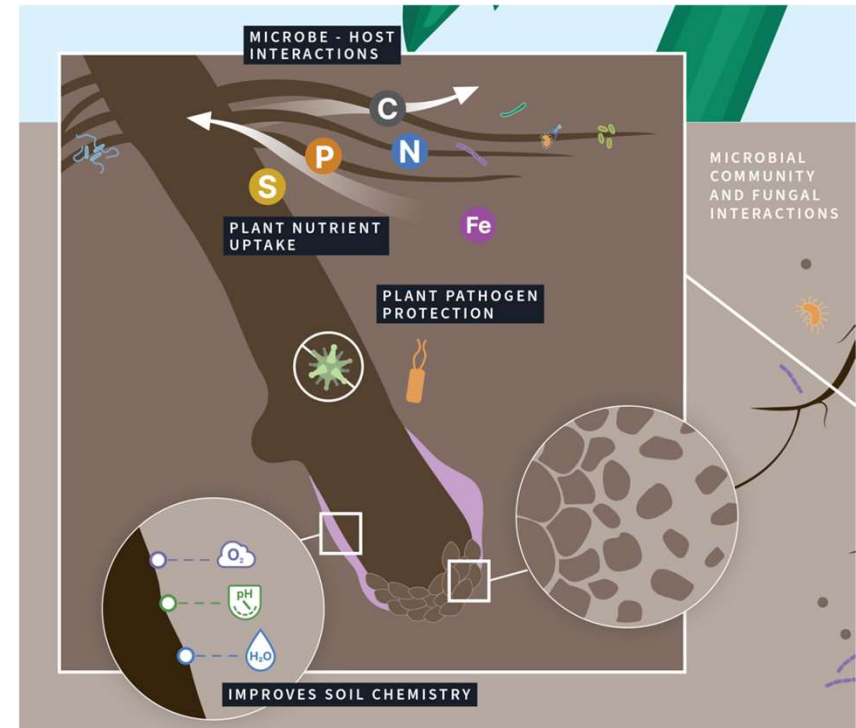


The Rootzone Microbiome

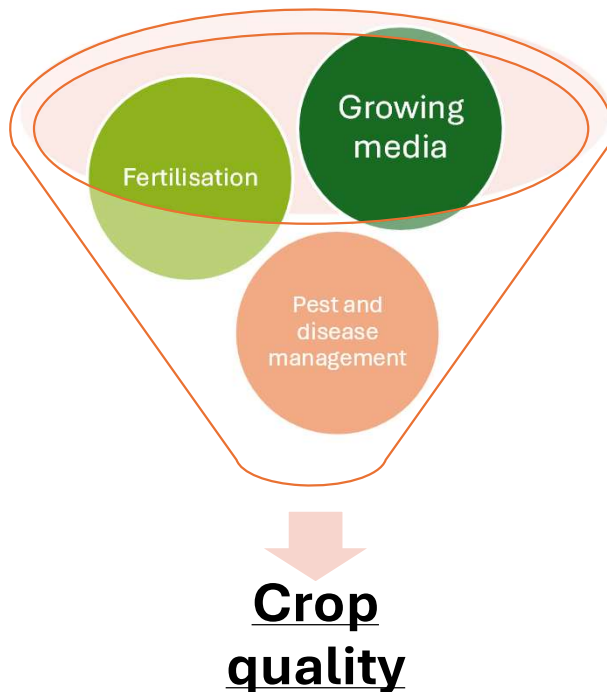
In a natural system, a complex and **diverse community of microbes** exists around the **roots**.

The form that nutrients are applied is vital for **feeding the microbes**.

Artificial nutrients bypass the microbes – starving them and impacting plant health.



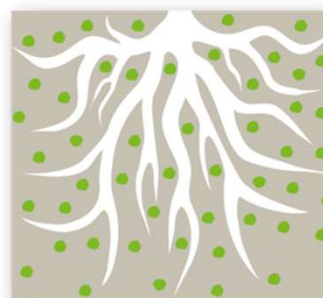
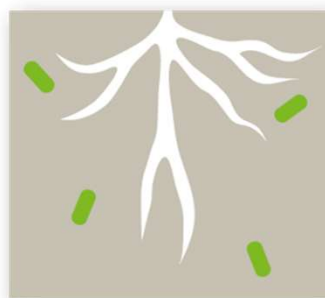
Small changes, big improvements



- Simple adjustments can deliver significant gains
 - *When was your water last tested?*
 - *When did you last test your soil/growing media?*
- Water quality and fertilisation can sometimes be overlooked but can have a big impact on plant quality and performance.
- Potential reduction in fertiliser use. Better efficiency.
- Better management of pest and disease

DCM Organic Fertilisers

- Mixture of vegetable, animal and mineral ingredients
- Each ingredient has a specific release pattern and NPK content
- Efficient Controlled Organic Release (ECOR) – 100-150 day release
- Minigran Technology – uniform distribution





Aiva Augment

Fuelling Nutrient Use Efficiency

AUGMENT

A concentrated seaweed, amino acid and humic technology designed for fertigation systems and foliar application. Fulvic acids enhance root nutrient uptake.

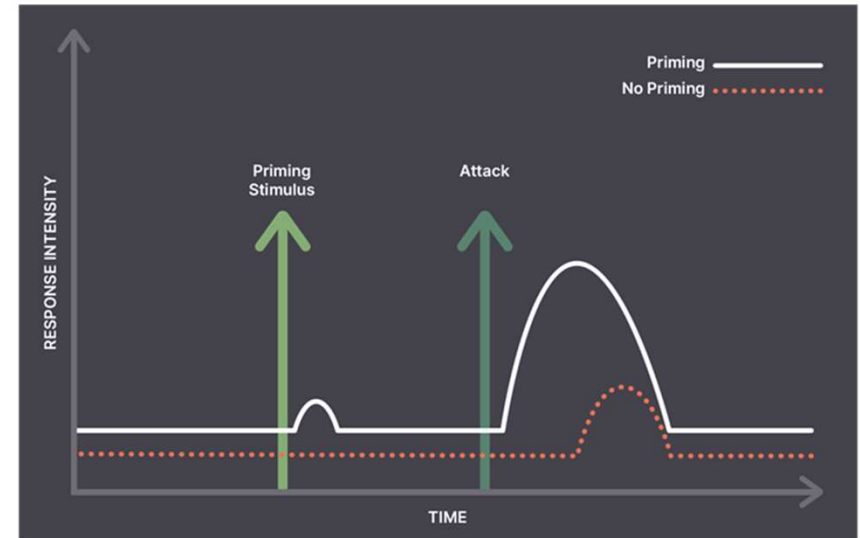
Key Benefits

- ✓ Improves nutrient use efficiency
- ✓ Supports beneficial rootzone biology
- ✓ Enhances root development
- ✓ Reduces nutrient losses
- ✓ Helps maintain healthier, more resilient crops



Plant Primer Range: PhytoPrime

- Specific plant metabolites designed to activate natural defence responses in plants
- Increases the plants' resilience to attack
- Reduces stress response and growth penalties as a result
- Faster and stronger defence response to attack
- Applied as foliar spray or root drench
- Regular applications (7-10 days) to maintain activity within plant





Tree nearest building entrance: December 2025



Tree nearest building entrance: February 2026 shows new growth

PhytoPrime I: Mealybug case study

<https://fargro.co.uk/media/q11jkm2b/phytoprime-i-case-study-25.pdf>

PhytoPrime I: Vine weevil adult



PhytoPrime I treatment



No PhytoPrime I treatment
(a few meters away!)

Biocontrol: an introduction



Koppert

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Biological control

The use of an organism to reduce the population level of another organism

Types of biocontrol



Conservation Biocontrol

Conserve and enhance populations of existing native natural enemies



Rodolia cardinalis -> cottony-cushion scale in citrus

Classical Biocontrol

Introduce an exotic natural enemy to manage the population of an introduced exotic pest (aimed to establish)



Augmentative Biocontrol

The release of a mass-produced natural enemy to control pests (seasonally: 'commercial' biocontrol)

Types of biocontrol agents



Parasitoids

Parasitic wasps (and flies)



Predators

Mites and insects



**Entomopathogenic
nematodes**

Nematodes



Micro-organisms

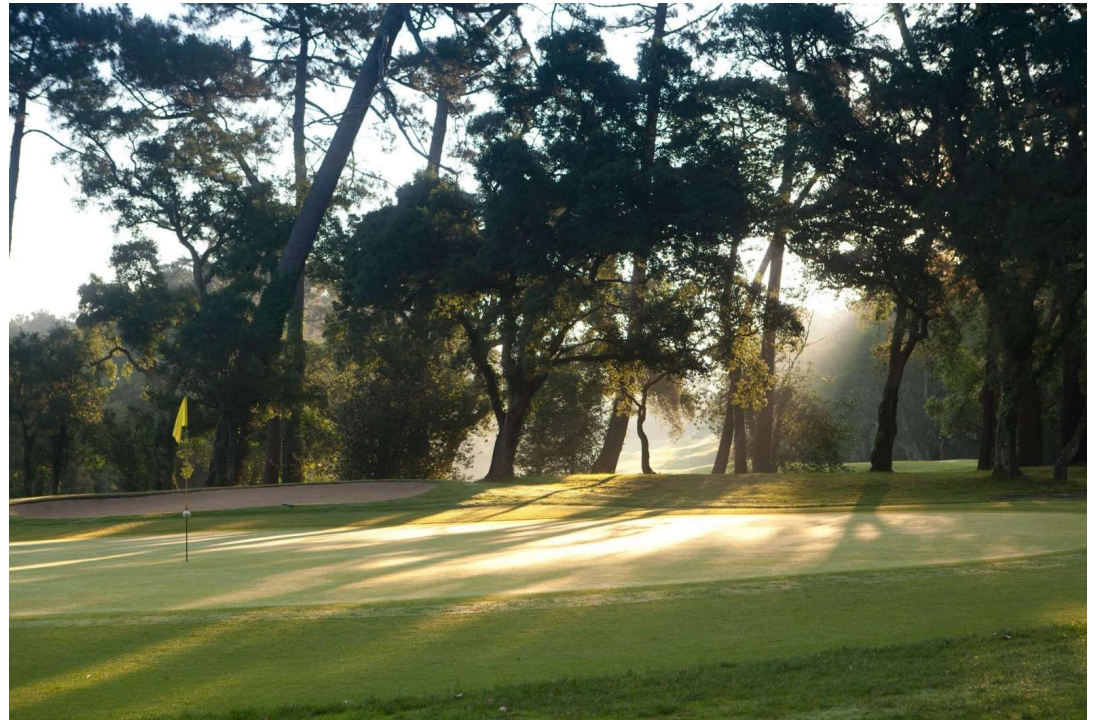
Bacteria, fungi, viruses

Advantages of biological control

- **No toxins:** safe for workers
- **No residues:** food safety
- **Low emissions:** safe for environment
- **No resistance:** long term efficacy
- **Less plant stress:** better yield & quality



Beneficial nematodes in turf & grass

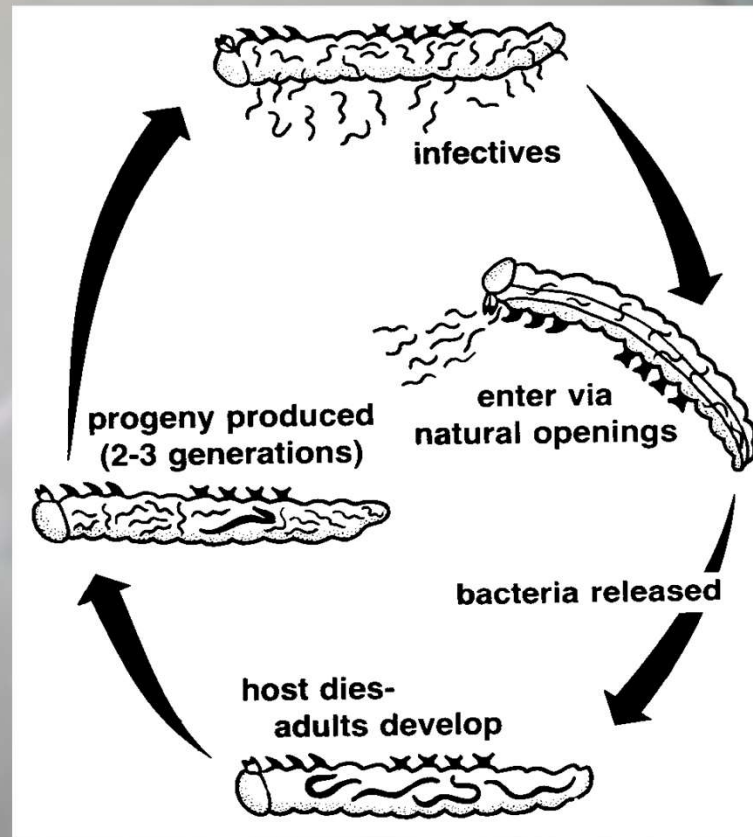


What are entomopathogenic nematodes?

- Natural enemy of soil dwelling insect larvae
- Insect-parasitic or entomo-pathogenic nematodes
- *Steinernema* (~40) or *Heterorhabditis* (~12) species
- Depending on nematode length varies 0.4 – 1.1 mm
- Finds, penetrate and kills → death in 24-48 hours



How do beneficial nematodes work ?



1

Nematodes (L3) seek out and penetrate larvae

2

They release symbiotic bacteria that infect the host

3

The nematodes consume the liquified insect and multiply

Mushroom industry

Mushroom fly
Phorids fly

Fruits

Codling moth
Oriental fruit moth
Plum moth
Fruit tortrix
Red palm weevil
Clearwings
Apple sawfly
Citrus root weevil
Hazelnut weevil
Pecan weevil
Cranberry girdler
Navel orange worm
Chestnut moth
Flatheaded root borer

Protected crops

Sciarid / fungus gnats
Cutworms
Duponchelia

Thrips
Black vine weevil

Home & garden Turf and amenities

Leatherjackets (Tipulids)
White grubs
Gryllotalpa
Red palm weevil
Palm moth
Sycamore lace wings
Bill bugs
Japanese beetles
Ants
Oak Processionary Moth

Outdoor vegetables & row crops

Asparagus crioceris, root flies
Cutworms
Western corn rootworm

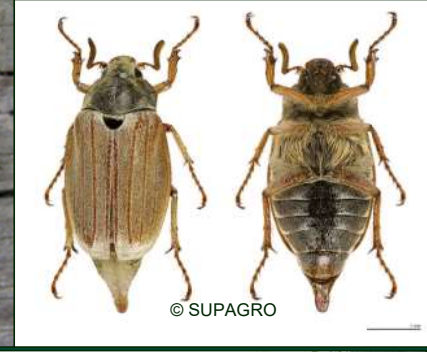
Forestry

Large pine weevil

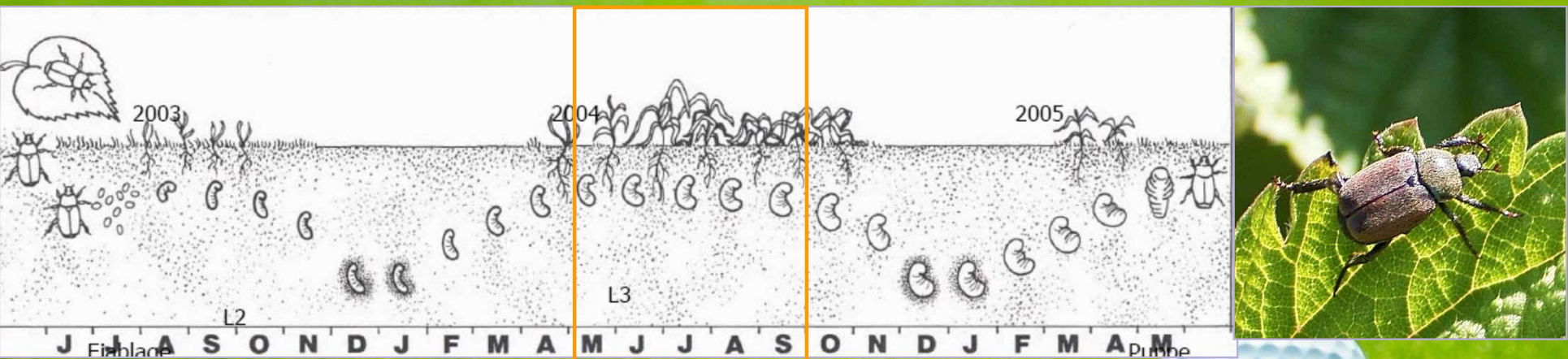
Turf pests biocontrol

Chafer grubs : damage

- **Adults :**
 - Sporadic damage on trees
 - Pheromone traps available
 - for some species
-
- **Larvae :**
 - Direct roots damage
 - Indirect damage are the worst, due to animals digging out the grubs
 - (birds / wild fauna) – intensity depends on the turf surroundings and its capacity to shelter wild animals (woods)



Hoplia philanthus (aka « welsh chafer ») 2 years life cycle

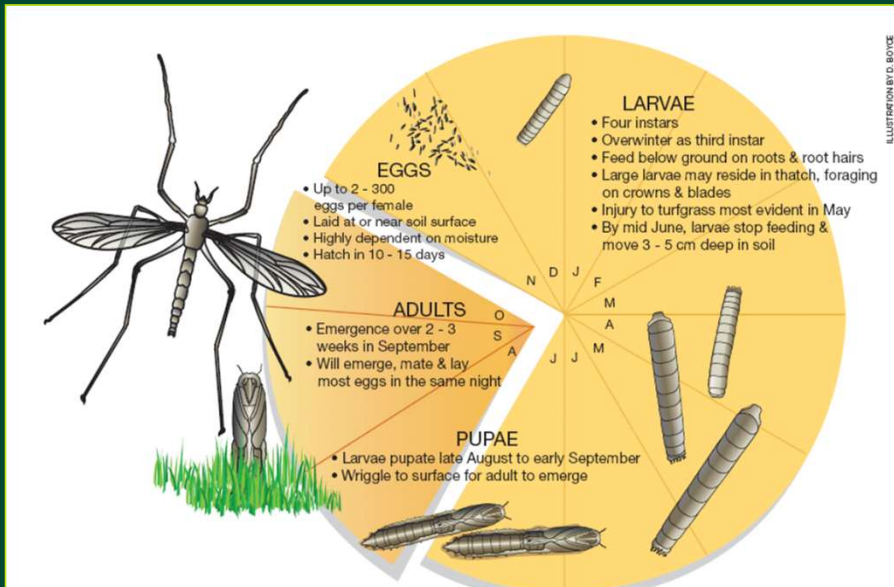


Leatherjackets control



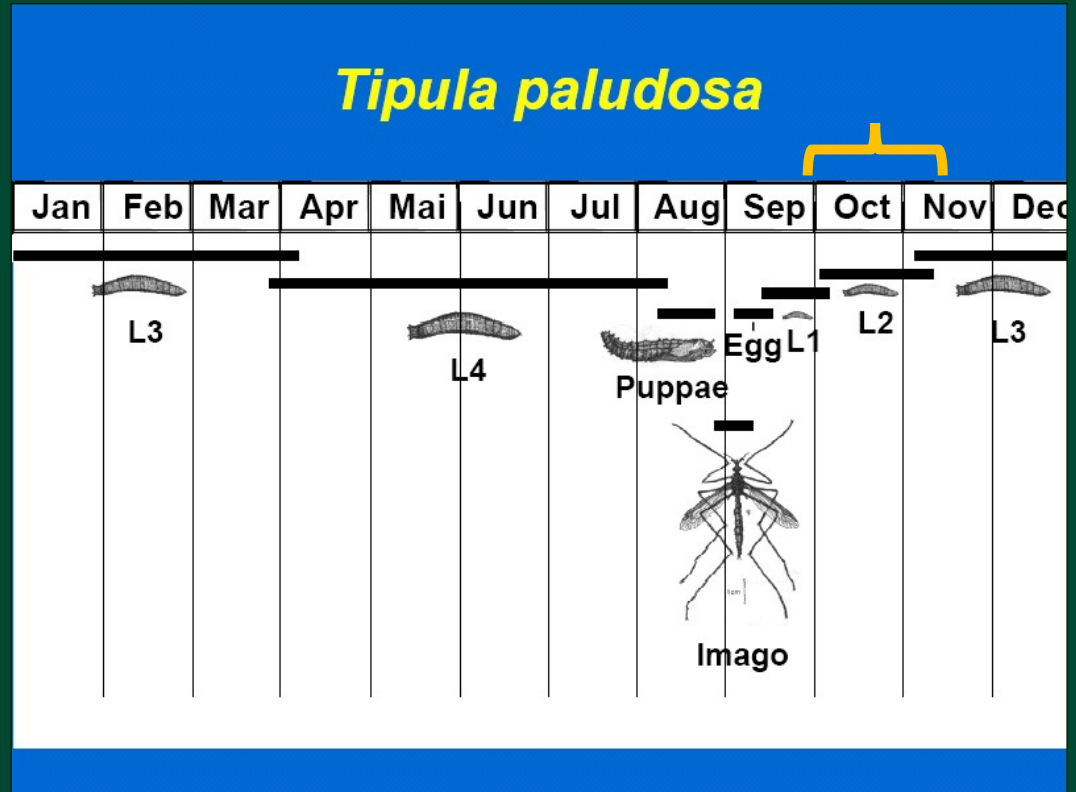
Tipulids / leatherjackets

- 2 main species in Europe
 - *Tipula paludosa* : 1 generation / Year
 - *Tipula oleracea* : 2 generations / year



Tipula paludosa and *Tipula oleracea*

- Optimal application periods on L1-L2
- 2 weeks after main flight
- *T. Paludosa* : September/October
- *T. Oleracea* : September/October and April-May



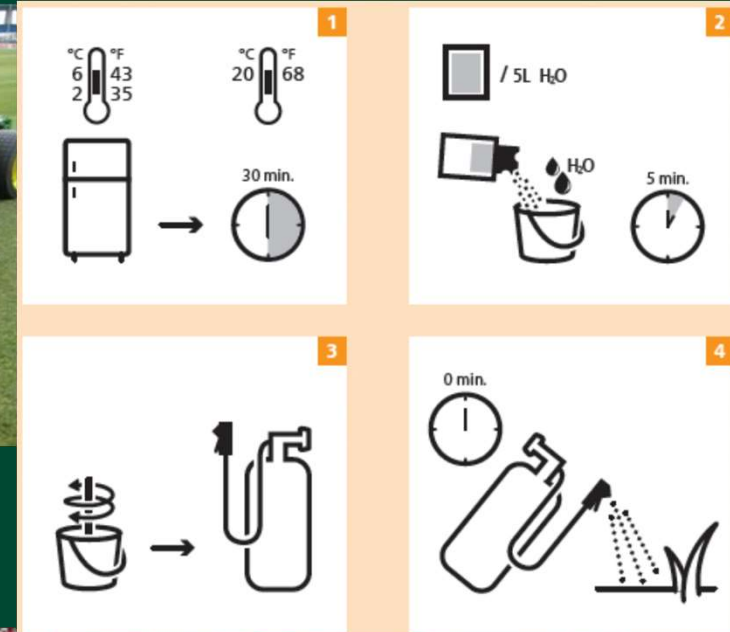
How to use

How to use



Tips for a succesful application

- Soil temp. $>14^{\circ}\text{C}$ / 57°F
- Pre and post irrigation : 4 mm (post application straight after application)
- Application after soil **Mechanical works** (slitting/verti-draining)
- Adjuvants/wetters
- Soil injectors... if available



Thank you

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