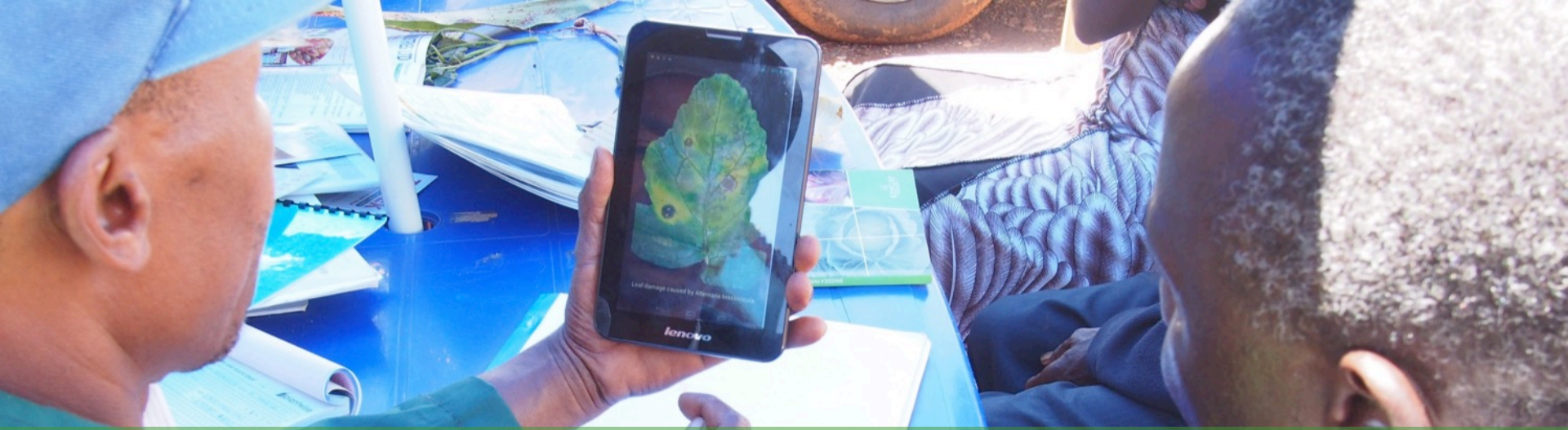


# Biopesticides Portal – an online tool that facilitates the identification, sourcing and application of biological control products

Ulli Kuhlmann, Steve Edgington, Melanie Bateman and Emma Jenner

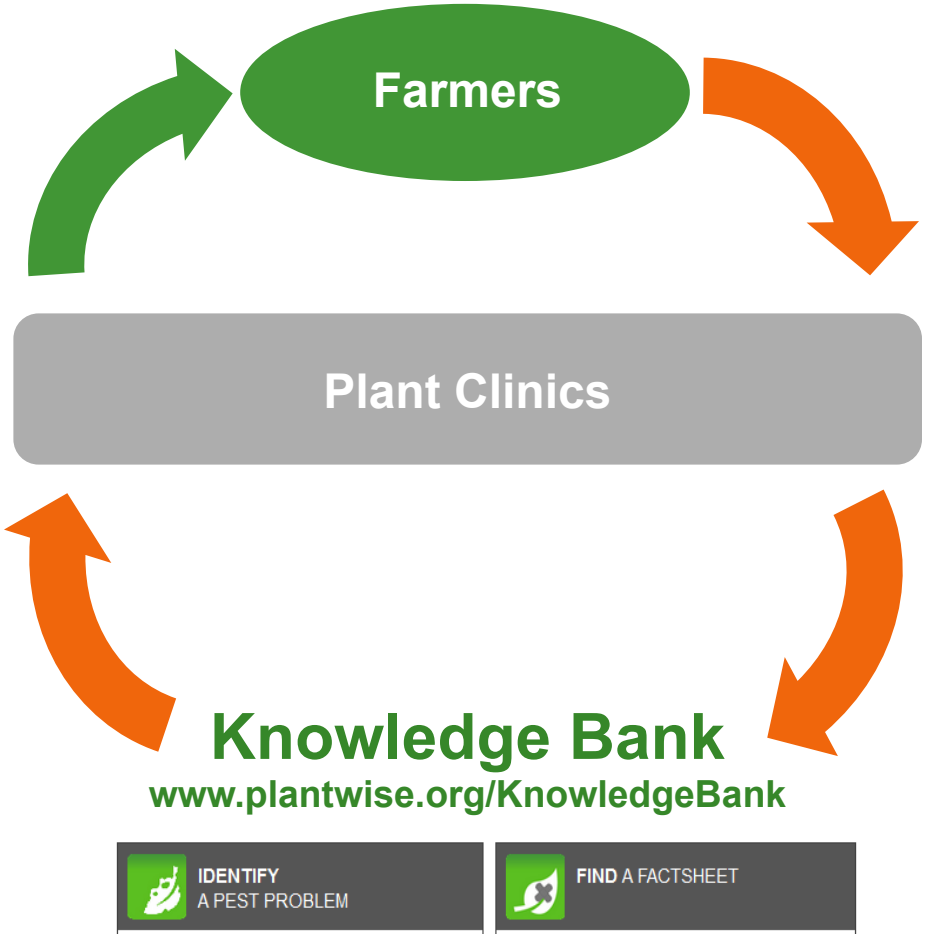
**Member Countries Regional Consultation: Americas and Caribbean**
12-14 September 2018, Ottawa, Canada

# Plantwise – CABI's flagship programme

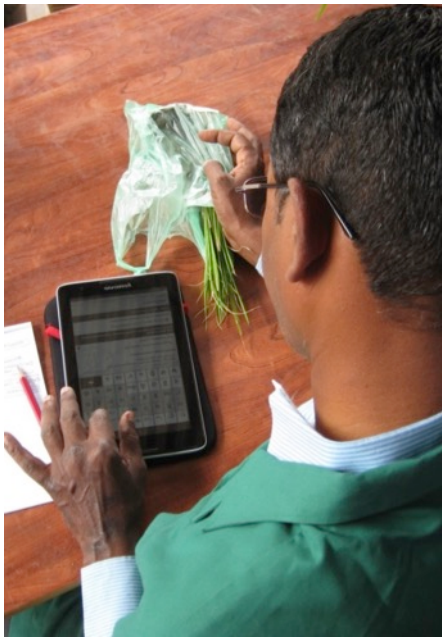
*Plant clinics are channels for the 2-way flow of information to and from farmers*

Diagnosis and recommendation

Extension materials and other support tools




Farmer interviews and data collection



Intelligence on pests causing problems

# Reference materials for plant doctors

# Recent Plantwise study to assess the contribution of the extension service to the uptake of biological control

- Baseline study in six low- to lower-middle-income countries analysing extension material developed within the Plantwise programme and advice given by extension workers relating to the **management of insect pests using microbial and macrobial biocontrol products** (over a one year time period, 1 July 2015 – 30 June 2016)
- We focussed on the following research questions, among others:
  - Do nationally registered biocontrol products make it into the extension material available to the plant doctors?
  - Where extension material does include biocontrol products, how frequently are plant doctors recommending these products to farmers?

# What did we learn from this baseline study?

- Results revealed that nationally registered biocontrol products are not always included in the extension material compiled by national experts in the Plantwise programme; India and Nepal are better in this respect
- Even if biocontrol products are mentioned in the extension material used at the plant clinics, they are only sometimes (or never – in Ghana and Zambia) recommended to farmers by extension workers
- Extension officers have a lack of knowledge / awareness about biocontrol products and their use



- Dougoud, J., Cock, M. J., Edgington, S., & Kuhlmann, U. (2018). A baseline study using Plantwise information to assess the contribution of extension services to the uptake of augmentative biological control in selected low- to lower-middle-income countries. *BioControl*, *63*(1), 117-132.

# Why is the uptake of biocontrol products rather limited in the study countries?

**Knowledge**

Extension officers have a lack of knowledge / awareness about biocontrol products and their use

**Registration**

Some registration pathways make the registration of biocontrol products lengthy and complicated

**Availability / local production**

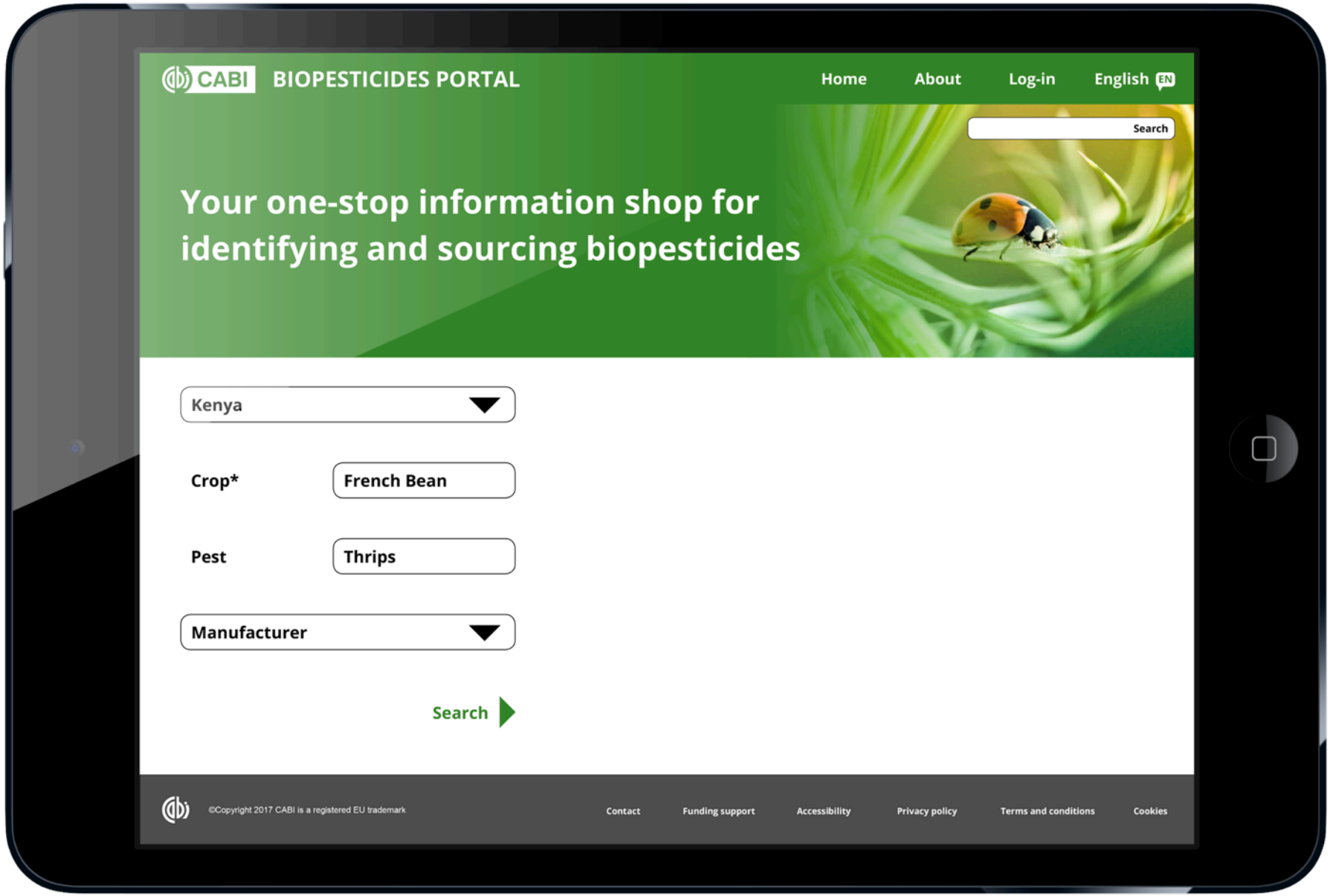
Agro-input suppliers in rural areas often do not have biocontrol products available; local production is rather limited although major efforts are being made in Kenya and India

**Affordability**

Price of biocontrol products is sometimes high and only affordable for business-oriented farmers. One exception is India (support of local production and subsidy schemes)

# How can Plantwise/CABI facilitate improved uptake of biological control products by extension and farmers?

- Create a database to **facilitate the identification, sourcing and application of macrobial and microbial products** for particular crop pest problems in a given country
- Develop a **free to use mobile app and/or website** for use on smartphones, tablets and desktop computers to put information about biological control products at the fingertips of farmers and extension workers, both within and outside of the Plantwise programme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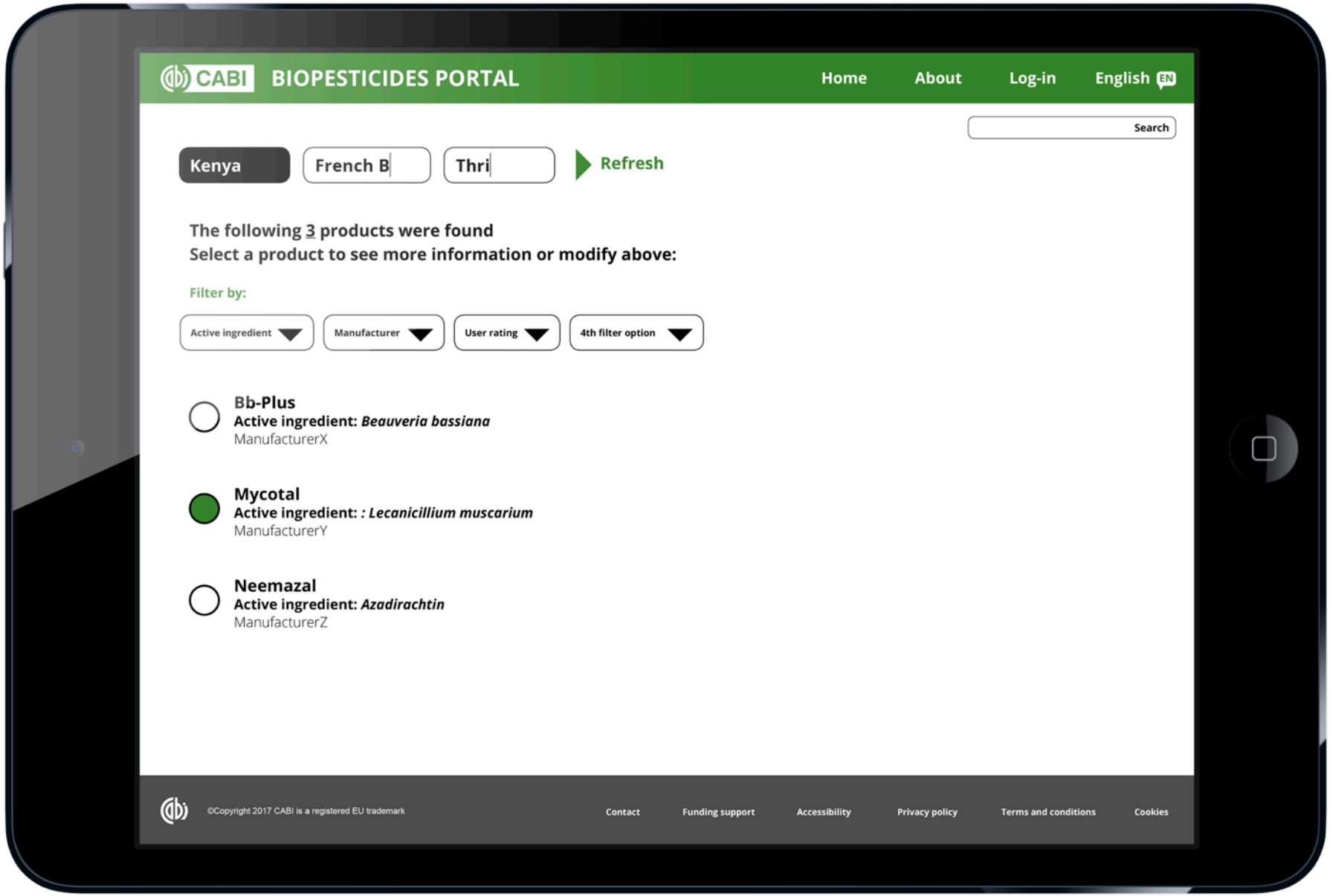
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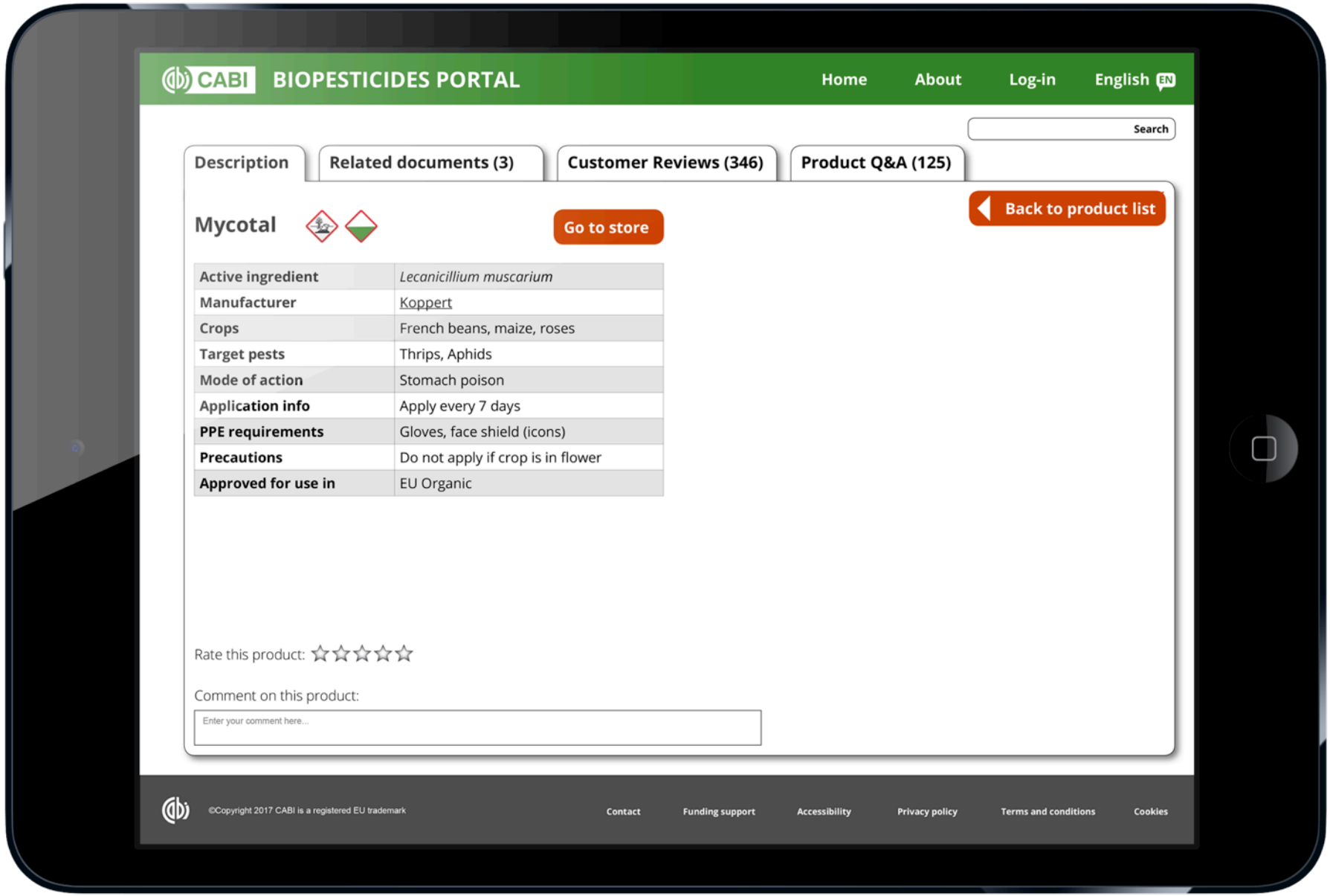
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Related documents (3)
Customer Reviews (346)
Product Q&A (125)
Back to product list
Mycotal
Go to store
Active ingredient | Lecanicillium muscarium
Manufacturer | Koppert
Crops | French beans, maize, roses
Target pests | Thrips, Aphids
Mode of action | Stomach poison
Application info | Apply every 7 days
PPE requirements | Gloves, face shield (icons)
Precautions | Do not apply if crop is in flower
Approved for use in | EU Organic
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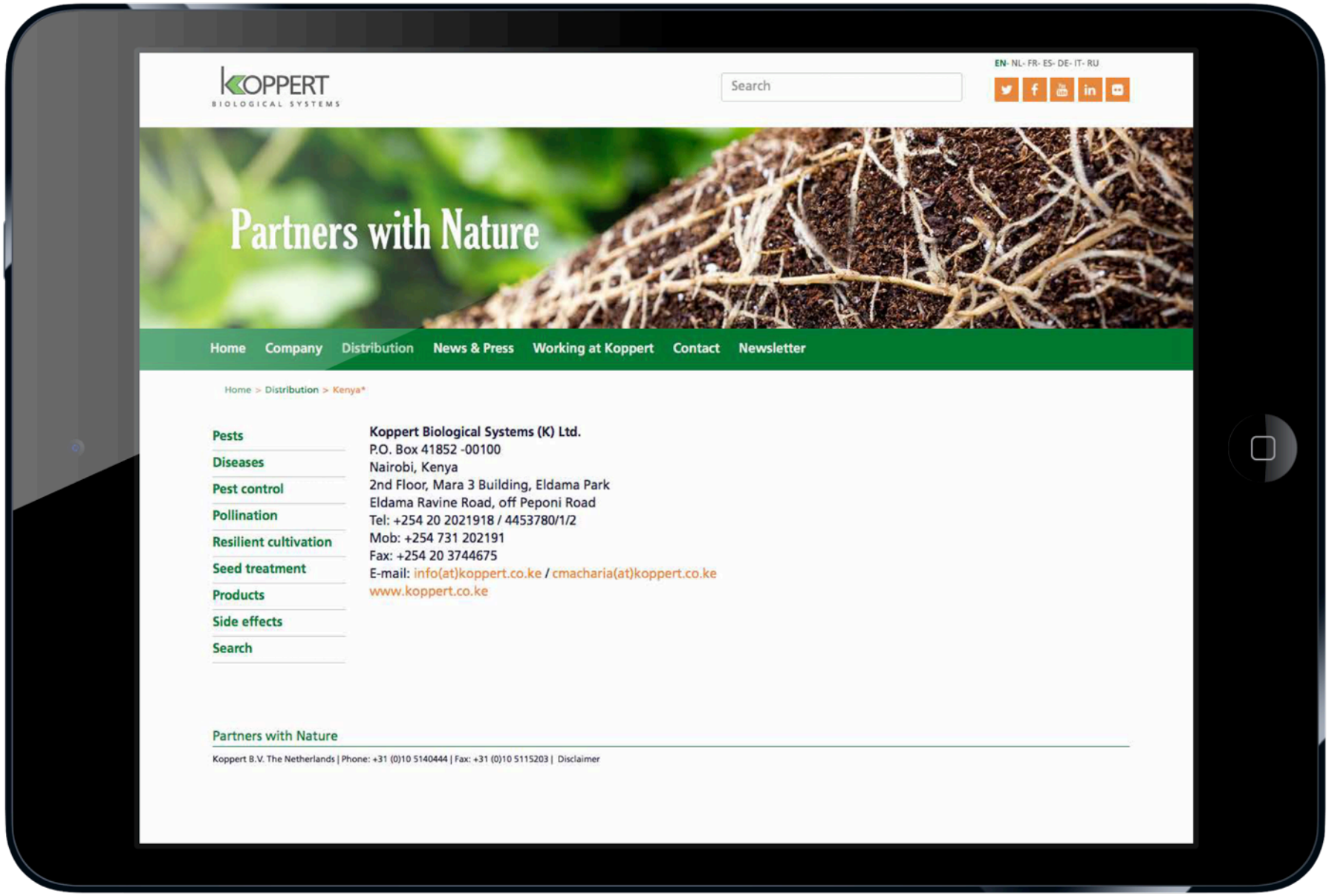
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Koppert Biological Systems (K) Ltd.
P.O. Box 41852 -00100
Nairobi, Kenya
2nd Floor, Mara 3 Building, Eldama Park
Eldama Ravine Road, off Peponi Road
Tel: +254 20 2021918 / 4453780/1/2
Mob: +254 731 202191
Fax: +254 20 3744675
E-mail: info(at)koppert.co.ke / cmacharia(at)koppert.co.ke
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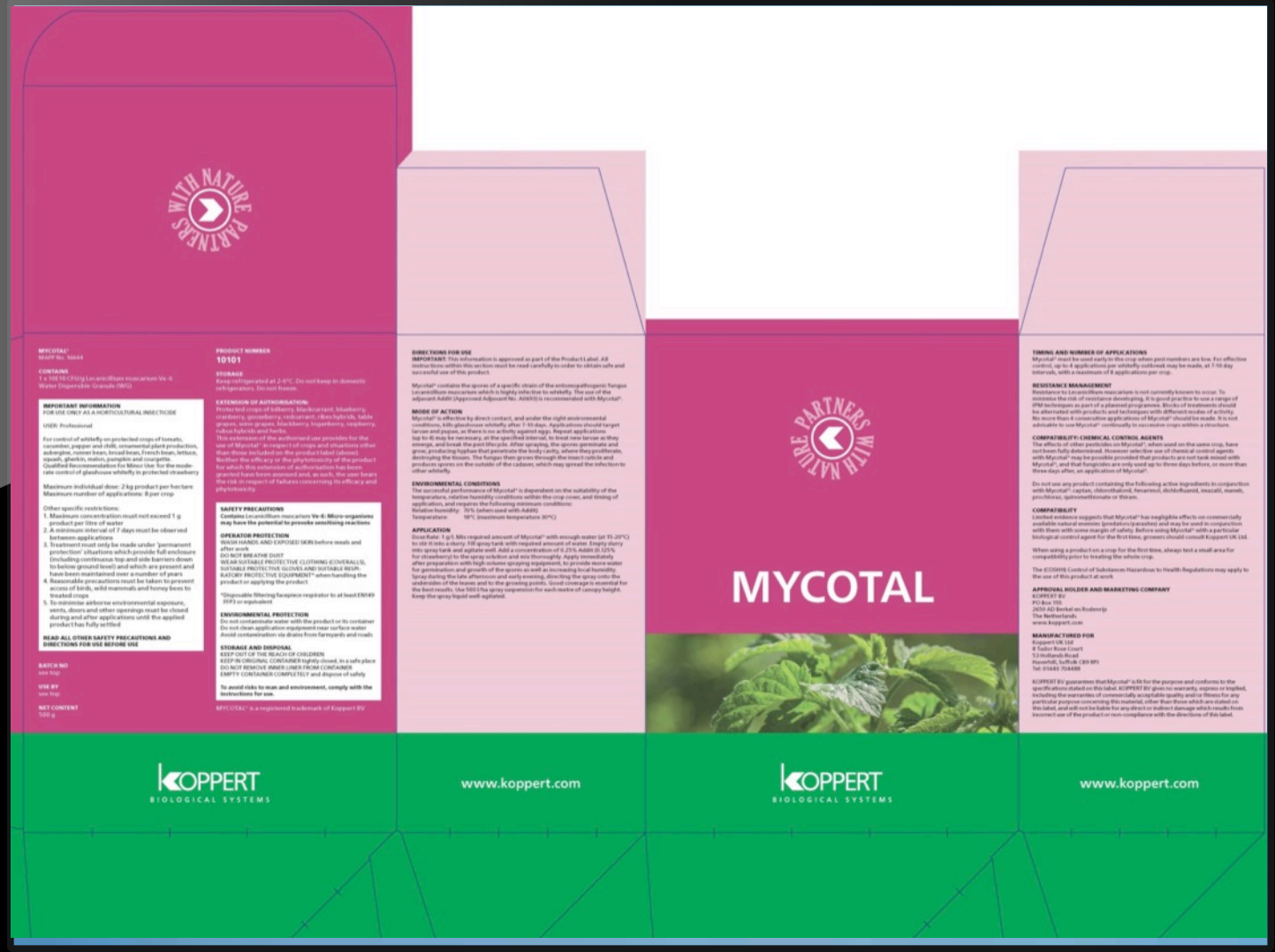
WITH NATURE PARTNERS
MYCOTAL¹
MAPP No. 16644
CONTAINS
1 x 10E10 CFU/g Lecanicillium muscarium Ve-6
Water Dispersible Granule (WG)
IMPORTANT INFORMATION
FOR USE ONLY AS A HORTICULTURAL INSECTICIDE
USER: Professional
For control of whitefly on protected crops of tomato, cucumber, pepper and chilli, ornamental plant production, aubergine, runner bean, broad bean, French bean, lettuce, squash, gherkin, melon, pumpkin and courgette.
Qualified Recommendation for Minor Use: for the moderate control of glasshouse whitefly in protected strawberry
Maximum individual dose: 2 kg product per hectare
Maximum number of applications: 8 per crop
Other specific restrictions:
1. Maximum concentration must not exceed 1 g product per litre of water
2. A minimum interval of 7 days must be observed between applications
3. Treatment must only be made under 'permanent protection' situations which provide full enclosure (including continuous top and side barriers down to below ground level) and which are present and have been maintained over a number of years
4. Reasonable precautions must be taken to prevent access of birds, wild mammals and honey bees to treated crops
5. To minimise airborne environmental exposure, vents, doors and other openings must be closed during and after applications until the applied product has fully settled
READ ALL OTHER SAFETY PRECAUTIONS AND DIRECTIONS FOR USE BEFORE USE
BATCH NO
see top
USE BY
see top
NET CONTENT
500 g
PRODUCT NUMBER
10101
STORAGE
Keep refrigerated at 2-4°C. Do not keep in domestic refrigerators. Do not freeze.
EXTENSION OF AUTHORISATION:
Protected crops of bilberry, blackcurrant, blueberry, cranberry, gooseberry, redcurrant, ribes hybrids, table grapes, wine grapes, blackberry, hyperberry, raspberry, rubus hybrids and herbs
This extension of the authorised use provides for the use of Mycotal® in respect of crops and situations other than those included on the product label (above). Neither the efficacy or the phytotoxicity of the product for which this extension of authorisation has been granted have been assessed and, as such, the user bears the risk in respect of failures concerning its efficacy and phytotoxicity.
SAFETY PRECAUTIONS
Contains Lecanicillium muscarium Ve-6: Micro-organisms may have the potential to provoke sensitising reactions
OPERATOR PROTECTION
WASH HANDS AND EXPOSED SKIN before meals and after work
DO NOT BREATHE DUST
WEAR SUITABLE PROTECTIVE CLOTHING (COVERALLS), SUITABLE PROTECTIVE GLOVES AND SUITABLE RESPIRATORY PROTECTIVE EQUIPMENT* when handling the product or applying the product
*Disposable filtering facepiece respirator to at least EN149 FFP3 or equivalent
ENVIRONMENTAL PROTECTION
Do not contaminate water with the product or its container
Do not clean application equipment near surface water
Avoid contamination via drains from farmyards and roads
STORAGE AND DISPOSAL
KEEP OUT OF THE REACH OF CHILDREN
KEEP IN ORIGINAL CONTAINER tightly closed, in a safe place
DO NOT REMOVE INNER LINER FROM CONTAINER
EMPTY CONTAINER COMPLETELY and dispose of safely
To avoid risks to man and environment, comply with the instructions for use.
MYCOTAL® is a registered trademark of Koppert BV
KOPPERT
BIOLOGICAL SYSTEMS
DIRECTIONS FOR USE
IMPORTANT: This information is approved as part of the Product Label. All instructions within this section must be read carefully in order to obtain safe and successful use of this product.
Mycotal® contains the spores of a specific strain of the entomopathogenic fungus Lecanicillium muscarium which is highly infective to whitefly. The use of the adjuvant Addit (Approved Adjuvant No. A0693) is recommended with Mycotal®.
MODE OF ACTION
Mycotal® is effective by direct contact, and under the right environmental conditions, kills glasshouse whitefly after 7-10 days. Applications should target larvae and pupae, as there is no activity against eggs. Repeat applications (up to 4) may be necessary, at the specified interval, to treat new larvae as they emerge, and break the pest lifecycle. After spraying, the spores germinate and grow, producing hyphae that penetrate the body cavity, where they proliferate, destroying the tissues. The fungus then grows through the insect cuticle and produces spores on the outside of the cadaver, which may spread the infection to other whitefly.
ENVIRONMENTAL CONDITIONS
The successful performance of Mycotal® is dependent on the suitability of the temperature, relative humidity conditions within the crop cover, and timing of application, and requires the following minimum conditions:
Relative humidity: 70% (when used with Addit)
Temperature: 18°C (maximum temperature 30°C)
APPLICATION
Dose Rate: 1 g/L Mix required amount of Mycotal® with enough water (at 15-20°C) to stir it into a slurry. Fill spray tank with required amount of water. Empty slurry into spray tank and agitate well. Add a concentration of 0.25% Addit (0.125% for strawberry) to the spray solution and mix thoroughly. Apply immediately after preparation with high volume spraying equipment, to provide more water for germination and growth of the spores as well as increasing local humidity. Spray during the late afternoon and early evening, directing the spray onto the undersides of the leaves and to the growing points. Good coverage is essential for the best results. Use 500 l/ha spray suspension for each metre of canopy height. Keep the spray liquid well-agitated.
www.koppert.com
PARTNERS WITH NATURE
MYCOTAL
KOPPERT
BIOLOGICAL SYSTEMS
TIMING AND NUMBER OF APPLICATIONS
Mycotal® must be used early in the crop when pest numbers are low. For effective control, up to 4 applications per whitefly outbreak may be made, at 7-10 day intervals, with a maximum of 8 applications per crop.
RESISTANCE MANAGEMENT
Resistance to Lecanicillium muscarium is not currently known to occur. To minimise the risk of resistance developing, it is good practice to use a range of IPM techniques as part of a planned programme. Blocks of treatments should be alternated with products and techniques with different modes of activity. No more than 4 consecutive applications of Mycotal® should be made. It is not advisable to use Mycotal® continually in successive crops within a structure.
COMPATIBILITY: CHEMICAL CONTROL AGENTS
The effects of other pesticides on Mycotal®, when used on the same crop, have not been fully determined. However selection use of chemical control agents with Mycotal® may be possible provided that products are not tank mixed with Mycotal®, and that fungicides are only used up to three days before, or more than three days after, an application of Mycotal®.
Do not use any product containing the following active ingredients in conjunction with Mycotal®: captan, chlorothalonil, fenarimol, dichlofluanid, imazalil, maneb, prochloraz, quinomethionate or thiram.
COMPATIBILITY
Limited evidence suggests that Mycotal® has negligible effects on commercially available natural enemies (predators/parasites) and may be used in conjunction with them with some margin of safety. Before using Mycotal® with a particular biological control agent for the first time, growers should consult Koppert UK Ltd.
When using a product on a crop for the first time, always test a small area for compatibility prior to treating the whole crop.
The (COSHH) Control of Substances Hazardous to Health Regulations may apply to the use of this product at work
APPROVAL HOLDER AND MARKETING COMPANY
KOPPERT BV
PO Box 155
2650 AD Berkel en Rodenrijs
The Netherlands
www.koppert.com
MANUFACTURED FOR
Koppert UK Ltd
8 Tudor Rose Court
53 Hollands Road
Haverhill, Suffolk CB9 8PJ
Tel: 01440 704488
KOPPERT BV guarantees that Mycotal® is fit for the purpose and conforms to the specifications stated on this label. KOPPERT BV gives no warranty, express or implied, including the warranties of commercially acceptable quality and/or fitness for any particular purpose concerning this material, other than those which are stated on this label, and will not be liable for any direct or indirect damage which results from incorrect use of the product or non-compliance with the directions of this label.
www.koppert.com

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Butterflies and moths
- Cutworm
- Tuta absoluta
Flies
- Leatherjackets
- Sciarid flies
- Stable fly
Leaf miners
Mealybugs
Spider mites
Thrips
True bugs (capsids)
- Sycamore lace bug
Whiteflies
Diseases
Pest control
Pollination
Resilient cultivation
Seed treatment
Products
Side effects
Search

# MYCOTAL

*Lecanicillium muscarium*

*(formerly Lecanicillium lecanii)*

**Unit of packaging**
Lecanicillium muscarium (entomopathogenic fungus)
Pack size: 500 gram bag in a box
Contains: 500 grams of wettable powder with 10E+10 spores/gram

Material Safety Datasheet (pdf)

**Preparation of solution**

- Mix the required amount of MYCOTAL with water (15-20°C/59-68°F), stir into a slurry in a bucket, use 3-4 litres water per 500 grams of MYCOTAL
- Fill the spray tank with the required amount of water
- Empty the slurry into the spray tank and agitate well
- Add the correct amount of ADDIT to the MYCOTAL spray solution and mix thoroughly
- Spray immediately after preparation

**Target**
Whitefly larvae, with significant side effect on thrips larvae and spidermite.

| Rates | | | | | |
|---|---|---|---|---|---|
| MYCOTAL | rate | m²/unit | interval (days) | frequency | remark |
| preventive | - | - | - | - | - |
| curative light | 0.1% | 2,000 | 7 | 2-3x | - |
| curative heavy | 0.1% | 2,000 | 7 | 3-4x | - |

**Application and dose**

- With high volume spraying equipment
- Late afternoon or early evening

Side effects MYCOTAL
More information?
Distribution addresses

**Product against thrips**

ENTOMITE-M
*Stratiolaelaps scimitus*
ENTONEM
*Steinernema feltiae*
LIMONICA
*Amblydromalus limonicus*
MACRO-MITE
*Macrocheles robustulus*
SWIRSKI-MITE
*Amblyseius swirskii*
SWIRSKI-MITE LD
*Amblyseius swirskii*
SWIRSKI-MITE PLUS
*Amblyseius swirskii*
THRIPEX
*Neoseiulus cucumeris*
THRIPEX-PLUS
*Neoseiulus cucumeris*
THRIPEX-V
*Neoseiulus cucumeris*
THRIPOR-I
*Orius insidiosus*
THRIPOR-L
*Orius laevigatus*
ULTI-MITE SWIRSKI
*Amblyseius swirskii*

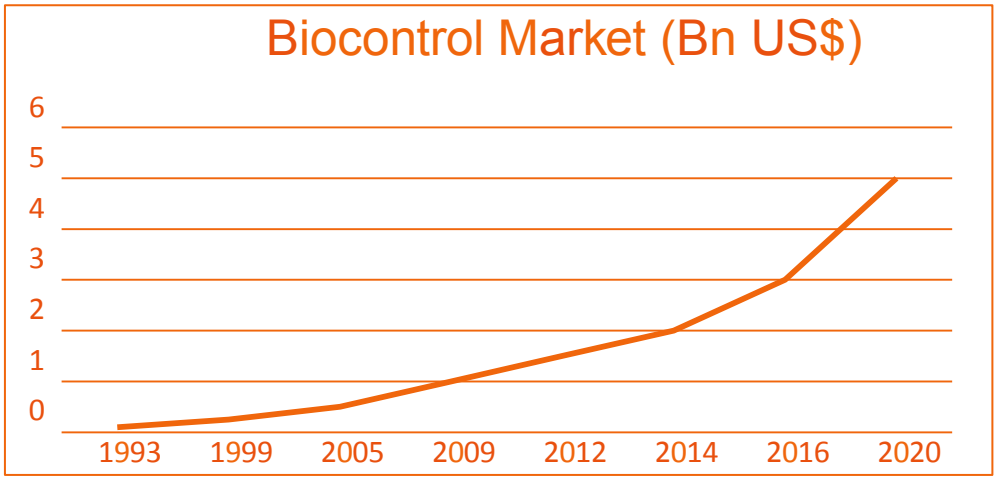
# Potential users

- Farmers and extension workers
- Governmental regulators (pesticide registrars)
- Private sector decision-makers: out-grower schemes, cooperatives, organisations operating voluntary certification schemes
- Biological control manufacturers


# In partnership with the biocontrol manufacturers

- The Biopesticides Portal concept was presented at the Annual Biocontrol Industry Meeting in Switzerland in 2017
- Concept was very well received
- Manufacturers are keen to sponsor such an information portal so that farmers and extension workers can access it for free
- This partnership would also enable users to access factsheets to facilitate correct application as well as local distributor information to facilitate sourcing of products

# Market development




Source: Dunham Trimmer LLC

- Market anticipated to reach US$ 8.8 billion by 2022 and US$ 11 billion by 2025
- Through the improved knowledge and awareness of extension agents, the uptake of biological control products could be significantly enhanced, which in turn could contribute to an increase in the global biocontrol market

# Next steps to reach prototype launch at Annual Biocontrol Industry Meeting 2018

- Quality assurance activities
- Construction of full version of the portal with full functionality and features for 2-3 selected countries (including Kenya)
- User-testing in Kenya
- Final decision on the name of portal
- Development of sponsorship mechanism with the biocontrol manufacturers to ensure sustainability


Contact us to find out more: Ulrich Kuhlmann, Executive Director Global Operations **u.kuhlmann.cabi.org**

CABI is an international intergovernmental organisation, and we gratefully acknowledge the core financial support from our member countries (and lead agencies) including:

UKaid from the British people

Ministry of Agriculture, People's Republic of China

Australian Government
Australian Centre for International Agricultural Research

Agriculture and Agri-Food Canada

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