Herbaceous Perennials Technical Discussion Group

Crop Protection Update

4 July 2019

Syngenta, Jealott's Hill, Warfield, Bracknell RG42 6EY

HORTICULTURE

Event programme

Time	Programme
09.30	**Arrival - Syngenta, Jealott's Hill, Warfield, Bracknell RG42 6EY** Refreshments and event registration in the Elements Building, Egret meeting room.
10.00 11.30	**AHDB funded project updates** *AHDB continually fund a range of crop protection projects, this session covers recent developments within four key projects of direct relevance to herbaceous perennial crops:* • HNS 195 Improving vine weevil control in HNS – Jude Bennison, ADAS • HNS/PO 199a Development of novel control options for agapanthus gall midge – Hayley Jones, RHS • SceptrePlus 32/33 New fungicide products for botrytis and downy mildew control – Dave Kaye, ADAS **Refreshment break** • HNS 198 Improving weed control in HNS – David Talbot, ADAS • BRIGIT: vector-borne diseases of plants – Gerard Clover, RHS **www.jic.ac.uk/brigit** (a John Innes Centre led project examining *Xylella*)
12.30	**Lunch on site**
13.30	**Tour of the various Syngenta facilities/departments** *Each individual tour will take around 30 minutes and cover specific elements in the process of creating new crop protection products and optimising their use, the group will be divided for ease of room access and to facilitate discussion:* • Discovery biology • Pesticide formulations • Pesticide application • Herbicide developments • Microscopy
16:00	**Refreshments and depart**

Contents

HNS 195 Improving vine weevil control in hardy nursery stock

Jude Bennison, ADAS

Improving vine weevil control in hardy nursery stock

AHDB-Funded Project HNS 195

(Jan 2016-Dec 2019)

Jude Bennison, ADAS

Vine weevil control challenges in HNS

- Most serious pest of container-grown HNS
- Limited choice of growing media-incorporated insecticides
- Drenches of entomopathogenic nematodes time-consuming
- Lack of confidence in Met52
- More knowledge needed on biology and monitoring to time controls for adults and larvae
- Adult control – what to apply and when?
- Reliable blueprint for weevil control needed

Summary of talk

- 'Little and often' application of nematodes for control of larvae
- Cold-tolerant fungi for control of larvae
- Biology, monitoring and control of adults
- Final year's work 2019

HNS 195 Improving vine weevil control in hardy nursery stock

Jude Bennison, ADAS

Nematode species

- *Steinernema kraussei* (e.g. Nemasys L) active down to 5°C
- *Steinernema feltiae* (Entonem) active down to 8°C
- *Heterorhabditis bacteriophora* (Nemasys H, Nematop, Larvanem) active 12-33°C depending on product
- *Heterorhabditis downesi* (Nema Trident-CT) active down to 8°C
- Mix of 3 species (SuperNemos) active above 10°C

ADAS

'Little and often' control with nematodes

- Some strawberry growers trying this approach in Scotland
- Idea from Caroline Reid, Bioline Agro sciences Ltd
- Splitting the nematode dose instead of full rate late August/September
- Application of 20% rate every month May to September through drip irrigation
- Growers consider improved control of vine weevil
- Drip irrigation not used much in HNS, so can we use overhead irrigation?

ADAS

'Little and often' experiment with nematodes in HNS

2016 – pilot experiment ADAS Boxworth (all Nemasys L)

2017 – validation trial at Darby Nursery Stock (Nemasys H all treatments except October - Nemasys L)

Treatments:

1. Full rate as drench x2 (Sep and Oct)
2. Full rate through overhead x2 (Sep and Oct)
3. 20% rate through overhead x5 (June-Oct)
4. 40% rate through overhead x5 (June-Oct)
5. Water control drench x2 (Sep and Oct)
6. Water control through overhead x5 (June-Oct)

BASF We create chemistry

ADAS

DNS trial - vine weevil eggs added to growing media every month June - August

Four Fuchsia varieties

Fuchsia 'Tom Thumb' Species 4

Fuchsia Riccartonii Species 1

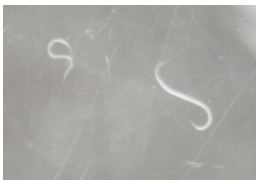
Fuchsia 'Hawkshead' Species 3

Fuchsia 'Mrs Popple' Species 2

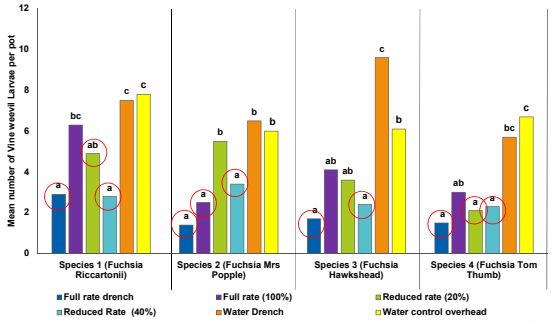
Mixing nematodes for application

Overhead irrigation compared with high volume drench

Checking nematode viability and application rates through sprinklers



Mean live vine weevil larvae per pot



Conclusions

- 'Little and often' overhead at 40% rate x5 was equally as effective as full rate x2 drench in reducing numbers of larvae on all 4 varieties
- 20% x5 was equally effective as x2 drench on 2 varieties
- 'Little and often' system (40% rate) offers 31%-52% cost savings compared with 2 or 3 high volume drenches due to saving on labour time
- Higher cost savings with 20% rate but 40% rate safer bet
- Video on AHDB website https://horticulture.ahdb.org.uk/video/vine-weevil-control-%E2%80%93-overhead-nematode-application

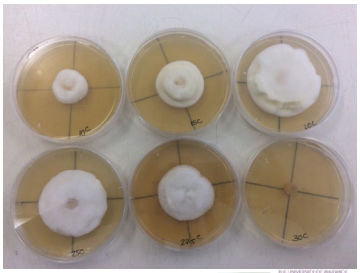
Met52 Granular Biopesticide

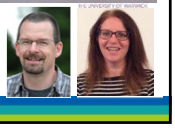
- *Metarhizium brunneum* (*anisopliae*)
- Product details - 15-30°C to be effective against larvae (optimum 27°C)
- Warwick predictive model: No kill below 11.6°C and for 75% control 256 cumulative day degrees needed above this threshold (possible June-Aug in some years and locations)
- Fargro recommend using in spring potting rather than in autumn and as part of an IPM programme
- Can we find a cold-tolerant fungus effective against larvae?

© Fargro

Potential of cold-tolerant fungi?

- 17 isolates from different countries e.g. Finland, Norway, New Zealand
- Test fungal growth and spore germination at 4-35°C
- Then test infection and kill of vine weevil larvae

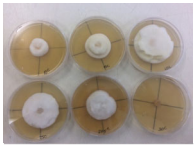


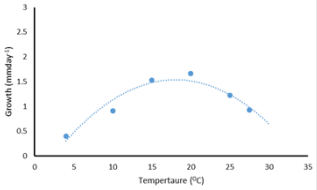


Growth of cold-tolerant fungi

Growth

- Only 4 of the 17 isolates grew at 4°C
- Optimum temperatures for fungal growth ranged from 17.5°C to 24.8°C

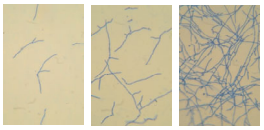


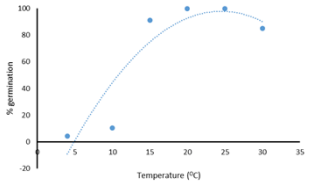


Germination of cold-tolerant fungi

Germination

- Only 2 of the 17 isolates germinated at 4°C and 10°C
- Optimum temperatures for germination ranged from 20 – 28°C





Kill of vine weevil larvae by cold-tolerant isolates

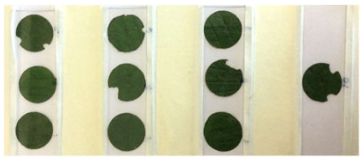
- 2 of the most cold-tolerant isolates tested against vine weevil larvae in lab test
- UP1 (*Beauveria* strain from Poland)
- UP4 (*Isaria* strain from Poland)
- Vine weevil death started at lower temperatures (eg 12.5°C) than with Met52
- But overall control no better than that given by Met52 in previous experiments - possibly lower virulence to vine weevil
- So these isolates do not have potential for development as a new biopesticide for vine weevil control

When do adults start laying eggs? (to time IPM-compatible treatments to reduce egg laying)

Harper Adams University

ADAS

Adults feed and lay eggs at 6°C



Harper Adams University

- Air temperatures in unheated structures in West Sussex in 2017 were 6°C or above for at least 1 hour on most nights
- Overwintered adults need 5 weeks intense feeding before start laying eggs in spring
- Monitor from March onwards to consider treatment (more later)

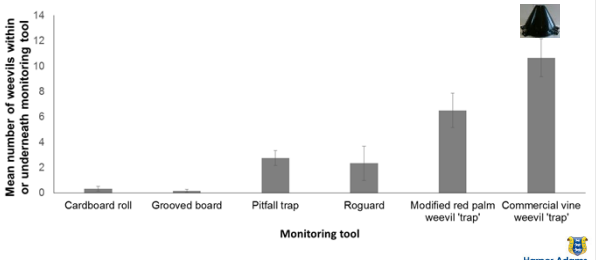
ADAS

How should growers monitor for vine weevil adults?

Corrugated cardboard roll	
Grooved board	
Pitfall 'trap'	
Roguard (cockroach bait station)	
Modified red palm weevil 'trap'	
Commercial vine weevil 'trap'	

Harper Adams University

Mean numbers vine weevils per trap



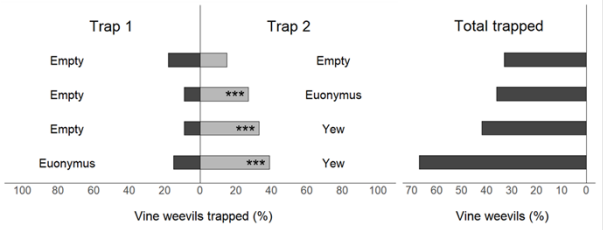
CAN HOST PLANT VOLATILES INCREASE TRAP CATCHES?

- TWO PLANT SPECIES TESTED: *Euonymus fortunei* AND YEW (*Taxus baccata*)
- *PLANT MATERIAL PLACED INSIDE MESH BAGS INSIDE COMMERCIAL 'CHEMTICA' VINE WEEVIL TRAPS*
- *VINE WEEVIL ADULTS SELECTIVELY FED EITHER Euonymus fortune OR* YEW BEFORE START OF EXPERIMENT

Euonymus fortunei *Taxus baccata*

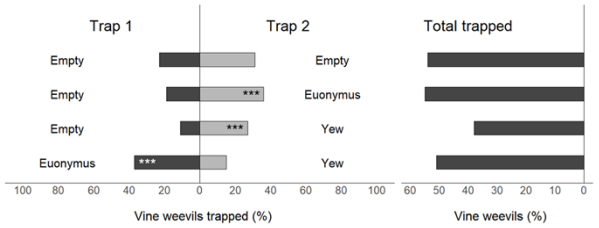
HOW SHOULD GROWERS MONITOR FOR VINE WEEVIL ADULTS?

Weevils preconditioned on yew (*Taxus baccata*):



HOW SHOULD GROWERS MONITOR FOR VINE WEEVIL ADULTS?

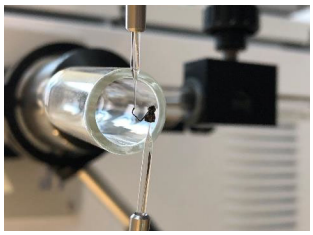
Weevils preconditioned on *Euonymus fortunei*:

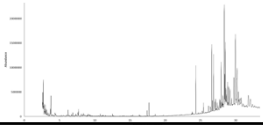


This is the first time plant volatiles have ever increased vine weevil catches in traps

Could we find a lure to improve monitoring?

- Vine weevil aggregation behavior is poorly understood
- Antennal response to volatile compounds from Euonymus e.g. *cis*-jasmone (signalling compound that attracts and repels various insect species)





E-nema 'weevil stop' traps with entomopathogenic nematodes

- *Steinernema carpocapsae*
- Available on home garden market in Germany & UK
- Tested in IPM Fellowship project (CP 89) – 92% kill after 4 weeks. Too expensive for commercial use


Steinernema carpocapsae female and juveniles in vine weevil adult

Could we kill vine weevil adults in alternative traps using nematodes?

- Potted strawberry plants in replicate cages
- 20 or 30 weevils per cage
- 5ml *Steinernema carpocapsae* gel formulation applied to base of plant pot or inside Roguard trap in centre of cage
- No significant increase in % kill compared with controls
- Further work needed to test potential of nematode strategies against vine weevil adults



Sprays for control of adult vine weevils?

- HDC project SF/HNS 112 showed that pymetrozine (Chess WG) and indoxacarb (Steward) gave promising control within IPM
- Pymetrozine approval expires 31 Jan 2020
- Indoxacarb has EAMUs on both outdoor and protected ornamentals lower rate on protected EAMU wasn't tested in SF/HNS 112
- What about other insecticides/biopesticides?
- What about nematode sprays?
- Do sprays need to be applied after dusk?

Sprays for control of adult weevils

- 2 experiments
- Direct contact sprays (do we need to hit them?)
- Indirect effect (sprayed to plants then weevils added to leaves while still wet or when dried) - can we spray during the day then weevils pick up insecticide residues after dusk?
- Lethal and sub-lethal effects

Direct contact experiment 1 (Sep 2018)

Treatments

1. Water control
2. Pymetrozine (Tafari)
3. *Steinernema kraussei* 4L/m2
4. *Heterorhabditis bacteriophora* 4L/m2
5. *Steinernema carpocapsae* 0.1L/m2
6. *Steinernema carpocapsae* 4L/m2

- 10 replicate weevils per treatment
- Sprayed weevils added to dish with Euonymus leaves
- Mortality, behaviour, egg laying, egg hatch and feeding activity recorded over 15 days

Direct contact experiment 2 (Nov 2018)

Treatments

1. Water control
2. Coded conventional insecticide

- Methods as for experiment 1
- Mortality, behaviour, egg laying, egg hatch and feeding activity recorded over 15 days

Indirect (residual) effect Oct 2018

Treatments

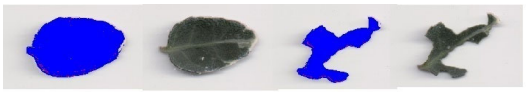
1. Water control
2. Coded insecticide
3. Azadirachtin (Azatin)
4. Diflubenzuron (Dimilin Flo)

- 10 replicate weevils per treatment
- Sprays applied to Euonymus plants
- Weevils added to detached leaves in dishes while wet or when dried after 24 hrs
- Mortality, behaviour, egg laying, egg hatch and feeding activity recorded over 15 days

Effect of coded insecticide as direct contact spray

Still not happy next day….but recovered after a couple of days

Leaf area eaten measured by scanning leaves at start and at each assessment

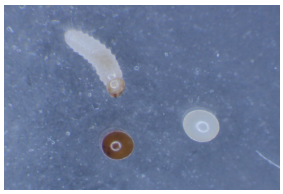


Eaten 43%

or 0.5595 cm2

None of the direct treatments or residual effects significantly reduced mean leaf area eaten compared with the water controls

Number of eggs laid and % egg hatch



- No significant reduction in mean number of eggs laid in direct contact experiment 1 (Sep) but Tafari reduced % egg hatch (65%) compared with water controls
- No eggs laid in any treatment in direct contact experiment 2 or residual effect experiment (Oct & Nov)

HNS 195 Improving vine weevil control in hardy nursery stock

Jude Bennison, ADAS

Final year work in 2019

- Test prototype new UK vine weevil traps compared with Chemtica trap
- Initial tests at Harper Adams University
- Most promising traps tested on commercial nurseries

Thanks:

- AHDB Horticulture for funding
- BASF and E-nema for providing nematodes
- Darby Nursery Stock for hosting the 2017 little and often nematode trial and providing experimental plants
- Research collaborators and ADAS colleagues

Thanks for listening

The agapanthus gall midge
Hayley Jones, RHS

The agapanthus gall midge

- *Enigmadiplosis agapanthi*
- Only observed host is *Agapanthus*
- Larvae develop inside flower buds, which become deformed, discoloured and fail to open

Symptoms

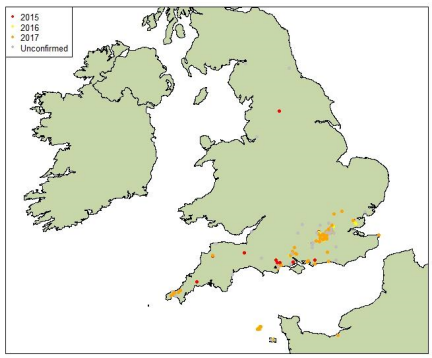
The agapanthus gall midge
Hayley Jones, RHS

Symptoms

Symptoms

Infestation early and late in flower development

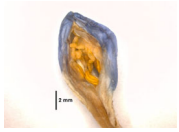
Distribution



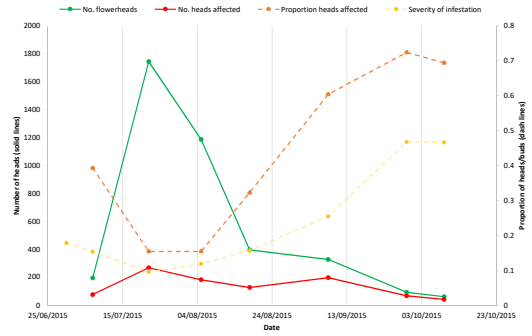
The agapanthus gall midge
Hayley Jones, RHS

Biology and life cycle

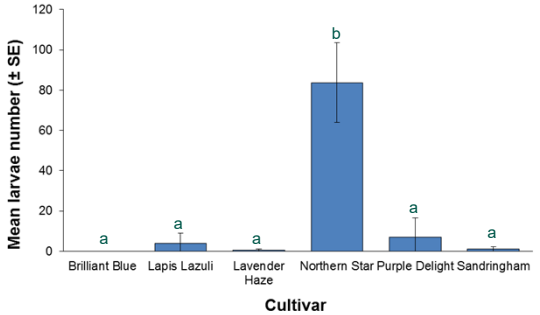
- Eggs laid on flower buds
- Larvae develop inside
- Exit and drop into soil when fully fed
- Pupation time around two weeks
- Overwinter in soil (probably as larvae)
- Multiple generations in the summer



Biology and life cycle



Cultivar susceptibility



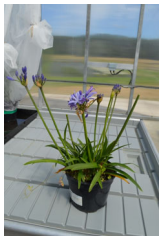
Everatt 2016 (unpublished)

The agapanthus gall midge
Hayley Jones, RHS

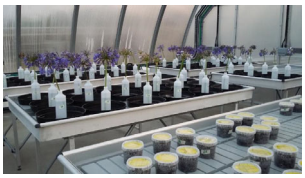
Control

Lack of knowledge means few options:

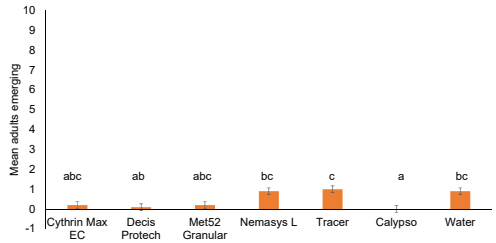
- Remove flower heads and destroy
- Destroy badly infested plants
- Re-pot container grown plants



HNS/PO 199



Treatments targeting ground-dwelling stage



The agapanthus gall midge
Hayley Jones, RHS

Current work

- Field experiment underway – pesticide timing
- Lab work planned – soil treatments

- Summer studentship – life cycle
- David Hall (NRI) – pheromone

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Field experiment

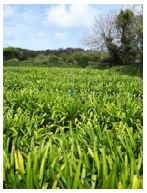
Field-grown *Agapanthus* for cut flowers
Penzance, Cornwall
GREENYARD

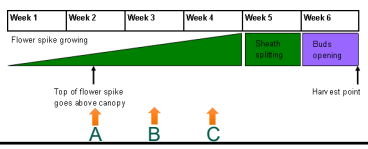
Trapping and timing

Monitoring with water traps, yellow and blue sticky traps

- ID difficult

Flower development timing





The agapanthus gall midge
Hayley Jones, RHS

Spray timing

Tested using Decis Forte (deltamethrin):

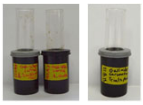
1. Insecticide spray at timing A
   - the first point at which developing flower heads are expected to be susceptible to the midge.
2. Spray at timing B (7-10 days after A)
3. Spray at timing C (14-17 days after A)
4. Spray at A and B
5. Spray at B and C
6. Spray at A and C
7. Spray at A, B and C
8. Untreated control

Laboratory experiments

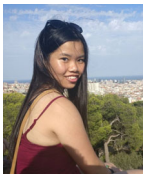
Optimise rearing conditions
Test cultural biological and chemical treatments
- including barriers

Summer student

RSB Plant Health Undergraduate Studentship
- Julie Lin, Imperial College London



Biology and life cycle:
- Pupation timing and depth
- Mating and oviposition behaviour
- Larval entry into flowers



The David Colegrave Foundation

The agapanthus gall midge
Hayley Jones, RHS

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, ADAS

ADAS

SCEPTREPLUS

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AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, RSK ADAS Ltd.

Jealott's Hill– July 2019

HORTICULTURE

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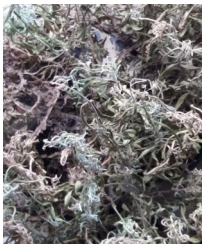
Introducing

SCEPTREPLUS

+ Develop solutions to emerging crop protection issues
+ Reduce adverse environmental impacts of crop protection products
+ Reduce supply chain vulnerability
+ Accelerate the testing process and bring new products to market

Trial overview

- Target: botrytis
- Number of available actives in decline
- Loss of Rovral® WG - iprodione
- Crop safety issues
- Identify crop safe alternatives



Botrytis on English Lavender (ADAS)

HORTICULTURE

AHDB

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, ADAS

SCEPTREPLUS

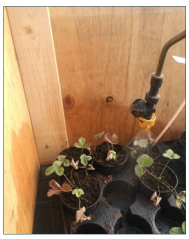
Trial site and design

- Wyevale Nurseries, Hereford
- 9 species
- Plot size - 5 plants
  - 10 treatments
  - 4 application dates (10 day intervals)
  - 4 replicates
- Inoculated with botrytis

SCEPTREPLUS

Plot size

Plot X Plot Y



SCEPTREPLUS

Species

Heuchera

Lavender

	Genus	Species/variety
1	Ajuga	'Chocolate Chip'
2	Dryopteris	*D. erythrosora*
3	(English) Lavendula	'Melisa Lilac'
4	Heuchera	'Liquorice'
5	Polystichum	'Scarlet Starlit'
6	Primula	*P. Beesiana*
7	Rudbeckia	*R. fulgida* var. *deamii*
8	Sedum	'Bertram Anderson'
9	Vinca	'Bowles Purple'

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, ADAS

SCEPTREPLUS

Species

Polystichum

	Genus	Species/variety
1	Ajuga	'Chocolate Chip'
2	Dryopteris	*D. erythrosora*
3	(English) Lavendula	'Melisa Lilac'
4	Heuchera	'Liquorice'
5	Polystichum	'Scarlet Starlit'
6	Primula	*P. Beesiana*
7	Rudbeckia	*R. fulgida* var. *deamii*
8	Sedum	'Bertram Anderson'
9	Vinca	'Bowles Purple'

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Treatments

Treatment	Product / code	A.I. / fungicide type	FRAC code
1	Untreated	-	-
2	Signum	Boscalid & pyraclostrobin	7 + 11
3	AHDB9891	Biological	44
4	AHDB9873	Conventional	9
5	AHDB9926	Conventional	7
6	AHDB9872	Conventional	7
7	AHDB9885	Plant extract	46
8	AHDB9927	Conventional	17
9	AHDB9913	Conventional	7
10	AHDB9871	Biological	44

Water volume – 500L / ha

SCEPTREPLUS

Treatments

Treatment	Product / code	A.I. / fungicide type	FRAC code
1	Untreated	-	-
2	Signum	Boscalid & pyraclostrobin	7 + 11
3	AHDB9891	Biological	44
4	Frupica SC	Mepanipyrim	9
5	AHDB9926	Conventional	7
6	AHDB9872	Conventional	7
7	AHDB9885	Plant extract	46
8	Prolectus	Fenpyrazamine	17
9	AHDB9913	Conventional	7
10	AHDB9871	Biological	44

Submitted for EAMU approval

EAMU gained

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, ADAS

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Assessments

- Botrytis incidence and severity
- Phytotoxicity

No.	Timing	Date
1	Set-up	09/11/2018
2	Treatment application 1	13/11/2018
3	Treatment application 2	23/11/2018
4	Treatment application 3	03/12/2018
5	Treatment application 4	13/12/2018
6	Treatment application 4 + 14 days	27/12/2018

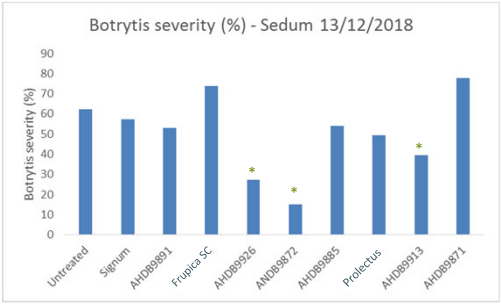
SCEPTREPLUS

Results

EFFICACY

- Low levels of botrytis developed in most species
- Significant reductions in disease severity in Sedum and Heuchera compared to the untreated control

SCEPTREPLUS



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SP 32: Control of fungal diseases in ornamental plants

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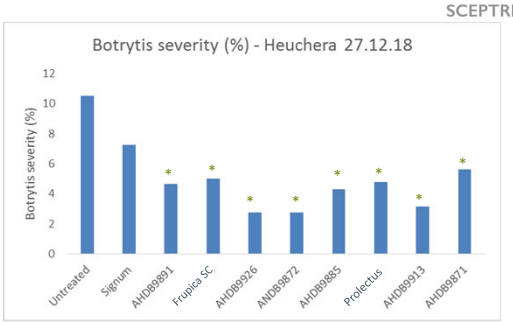

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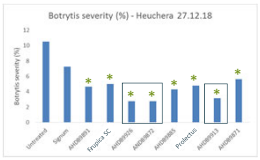
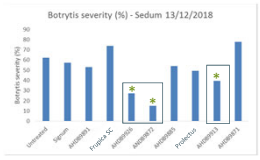
Boxed treatments are SDHI fungicides





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Phytotoxicity

No phytotoxicity observed in:

- Ajuga, Heuchera, Lavender, Primula, Rudbeckia, Sedum or Vinca

Very slight phytotoxic affects observed in:

- Dryopteris and Polystichum (ferns)
- All phytotoxicity at commercially acceptable levels

SP 32: Control of fungal diseases in ornamental plants

Dave Kaye, ADAS

Conclusions

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- Products tested in SP 32 reduced the severity of botrytis
- All test products reduced botrytis severity at the last assessment on Heuchera
- Three products, AHDB9926, AHDB9872 and AHDB9913 gave the best control
- No phytotoxicity occurred as a result of any treatment in Ajuga, Heuchera, Lavender, Primula, Rudbeckia, Sedum or Vinca
- Slight phytotoxicity, at commercially acceptable levels occurred in Dryopteris and Polystichum
- EAMU status gained for Frupica SC and Prolectus

Acknowledgements

AHDB Horticulture

Wyevale Nurseries

Agchem companies

David Talbot (ADAS)

Tom Millward (ADAS)

SP 33: Evaluation of the safety of promising downy mildew fungicide products on ornamentals

Dave Kaye, ADAS

ADAS

AHDB

AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD

SP 33: Evaluation of the safety of promising downy mildew fungicide products on ornamentals

Dave Kaye, RSK ADAS Ltd.

Jealott's Hill– July 2019

HORTICULTURE

SCEPTREPLUS

Overview

- Follow-on from SP07 Lettuce work
- Number of available actives in decline
- Loss of Fenomenal
- Phytotoxicity issues
- Need to identify crop safe alternatives

Downy mildew on Buddleja (photo: Horticulture Week)

HORTICULTURE

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Trial site and design

SCEPTREPLUS

- Wyevale Nurseries, Hereford
- 7 species
- Plot size – 5 plants
  - 10 treatments (at 10 day intervals)
  - 4 replicates

HORTICULTURE

AHDB

SP 33: Evaluation of the safety of promising downy mildew fungicide products on ornamentals

Dave Kaye, ADAS

Species

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	Genus	Variety
1	Buddleja	'Buzz Velvet'
2	Aquilegia	'Red Hobbit'
3	Digitalis	'Pam's Choice'
4	Lamium	'Beacon Silver'
5	Veronica	'Ionian Skies'
6	Monarda	'Fireball'
7	Potentilla	'Scarlet Star'





Products

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Treatment	Product	Chemical or biological	M.o.A	FRAC code
1	Water	-	-	-
2	Fubol Gold + Revus	Chemical	Multi-site activity and DNA interference + cell wall synthesis	M03 + 4 and 40
3	AHDB9959	Chemical	Unavailable	Unavailable
4	AHDB9958	Chemical	Fungal respiration	45
5	AHDB9963	Chemical	Cell wall synthesis and multi-site activity	40 + M03
6	AHDB9962	Chemical	Cell wall synthesis and cell membrane disruptor	40 + 49
7	AHDB9870	Chemical	Cell structure and unknown activity	22 + 27
8	Ranman Top	Chemical	Respiration	21
9	AHDB9967	Biological	Plant extract (oil)	46
10	AHDB9885	Biological	Cell membrane disruption	46

Phytotoxicity assessments

SCEPTREPLUS

No.	Timing	Date
1	Set-up	09/11/2018
2	Treatment application 1	13/11/2018
3	Assessment 1, treatment application 2	23/11/2018
4	Assessment 2, treatment application 3	03/12/2018
5	Assessment 3, treatment application 4	13/12/2018
6	Assessment 4	27/12/2018

SP 33: Evaluation of the safety of promising downy mildew fungicide products on ornamentals

Dave Kaye, ADAS

Phytotoxicity

SCEPTREPLUS

- No phytotoxic effects by any treatment, on any species.

Phytotoxicity

SCEPTREPLUS

- No phytotoxic effects by any treatment, on any species.

Powdery mildew

- Some plants arrived with powdery mildew infection. One application of Nimrod (bupirimate) at label rate cleared further infection of new leaves.

Botrytis

- Botrytis infection observed on Monarda (27 December 2018), but no differences were seen between treatments.

Conclusion

SCEPTREPLUS

- No phytotoxic effects by any treatment, on any species.
- All treatments eligible for further work including efficacy testing.

Downy mildew in Lamium photo credit UMass

Downy mildew in Aquilegia photo credit Carrie Thomas

SP 33: Evaluation of the safety of promising downy mildew fungicide products on ornamentals

Dave Kaye, ADAS

Future work

SCEPTREPLUS

- Further ornamental SCEPTREplus work tbc
- Potential for efficacy work
- Continuing **SCEPTRE**PLUS

  →let us know your crop protection priorities

Ruth.Durban-Jackson@adas.co.uk Dave.Kaye@adas.co.uk

Acknowledgements

AHDB Horticulture

Wyevale Nurseries

Agchem companies

Ruth D'urban-Jackson (ADAS)

David Talbot (ADAS)

Tom Millward (ADAS)

Weed control update for herbaceous crops
David Talbot, ADAS

Weed control update for herbaceous crops

David Talbot, ADAS Ornamentals Consultant

www.adas.co.uk

AHDB ADAS

Presentation objectives

- How to get the best results from residual herbicides
- To ensure legal compliance with label restrictions on herbicides used by herbaceous growers
- Current herbicide options for container-grown plant production/control programmes
- Non-chemical approaches to weed control in container-grown plant production
- Potential alternative chemical and non-chemical weed control options for field-grown production

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Nursery hygiene

- No herbicide programme will work without good nursery hygiene to minimise weed pressure
- Keep plugs and liners clean, remove all weeds prior to potting
- Control weeds on beds, paths and non-cropped areas – aiming never to let them set seed
- Segregate old and new stock
- Realistically evaluate stock with high weed burdens
- Note problem areas when crop walking and remove weeds prior to them setting seed

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Weed control update for herbaceous crops
David Talbot, ADAS

Production beds - hygiene

- Patch or replace ripped woven bed coverings to prevent weed growth
- Well constructed, well drained, covered beds should stay clean
- Gravel or sand beds should be sprayed with Chikara to give residual weed control whilst preventing rooting through
- Trial other residuals as bed treatments
- Dryer regimes will help to prolong herbicide longevity and reduce weed pressure

Residual herbicides – container-grown herbaceous crops

Recent changes

- Flexidor (isoxaben) limited to one application per crop but still approved for outdoor and protected use
- Devrinol (napropamide) LTAEU outdoor and protected, **pre-emergence**
- Venzar 500 SC (lenacil) LTAEU outdoor and protected

Residual herbicides – container-grown herbaceous crops

Current herbicides for use over the crop

- Devrinol (napropamide)
- Venzar 500 SC (lenacil)
- Flexidor (isoxaben)
- Dual Gold (s-metolachlor)
- Springbok (dimethenamid-p + metazachlor)

Weed control update for herbaceous crops
David Talbot, ADAS

Devrinol (napropamide)

- Lower rate than previously authorised
- Outdoor and protected but **pre-emergence only**
- Only 1 application per crop, Max rate now 2.5 L/ha
- Control of chickweeds, groundsel and grass weeds at reduced rate?
- Likely to be less effective/persistent at lower rate
- No herbaceous species known to suffer unacceptable damage from previously higher rates
- Poor control of hairy bittercress

Venzar 500 SC (lenacil)

- Lower rate than previously authorised
- Outdoor and protected uses under LTAEU
- Maximum individual dose 0.4 L/ha (200g/ha)
- Maximum of 500g/ha every third year
- Short persistence
- More effective in containers
- Winter treatment
- Lower risk of damage with low rates
- Activity against mosses, liverwort, hairy bittercress, willowherb and chickweeds

Flexidor (isoxaben)

- Current formulation is 4 x concentration of previous; 0.25L/ha equivalent to 1L/ha of old 125 formulation
- Outdoor and protected
- Only 1 application per crop
- Good control of bittercress species
- Lasts 8 to 12 weeks
- Some subjects are sensitive
- Poor control of willowherb and groundsel
- No control of grasses, moss and liverwort

Weed control update for herbaceous crops
David Talbot, ADAS

Dual Gold (s-metolachlor)

- EAMU **outdoor** ornamentals May 1 – 31 application window
- Also used as tank mix with Flexidor 500
- Adds willowherb, grass and some groundsel control
- Can cause slight damage to tips
- Potential for use on herbaceous crops

Springbok (dimethenamid-p + metazachlor)

- EAMU **outdoor** ornamentals; maximum dose 1.66L/ha
- Herbaceous subjects found to be tolerant to higher rates
- Cannot be applied by hand-held equipment
- Must not enter treated crops for 6 days
- Have to wear gloves within the crop for 50 days post-treatment
- Improved control of cleavers, crane's bill, poppy and small nettle compared to metazachlor

Grass control in container-grown production

- Sunfire - good residual control of annual meadow grass, control of other weeds in growing media rather limited – one application per year
- Centurion Max (clethodim) LTAEU selective contact grass control – **once per crop**
- No crop safety data for herbaceous crops

Weed control update for herbaceous crops
David Talbot, ADAS

Potential programmes

- February or earlier – Devrinol and Venzar 500 SC prior to crop emergence
- Where crop does not die down either Venzar 500 SC or Venzar 500 SC + Flexidor (February or earlier)
- May - Dual Gold and Flexidor where no Flexidor applied previously and crop safe
- Dual Gold alone in May where crop not tolerant of Flexidor or Flexidor already applied
- Flexidor alone where not previously applied or Dual Gold not an option
- Springbok when growth has hardened later in season if restrictions are workable

New herbicides from 2014 herbaceous trial - pethoxamid

- HDC H22/H43 (both pethoxamid, different codes in different trials)
  - Good residual control pearlwort, moderate control of groundsel, willowherb
  - Majority of 20 shrub species tested considered tolerant by 12 WAT (weeks after treatment)
  - Awaiting EAMU
  - Potential partner for Flexidor if crop safe

New herbicides from 2014 herbaceous trial - MossKade

- MossKade (plant derived starch, proteins, oils, lactic acid)
  - Not particularly damaging (post-June potting when soft), but plants rapidly grew away from any damage
  - Contact liverwort and moss control

Integrate pot mulches with herbicides

- Pot mulch after potting
- Limited herbicide options so embrace mulches – every little helps
- Follow up with herbicides if required

Pot mulches

Container Mulch

- economical alternative to pine bark
- attractive appearance
- good capping (adhesion)
- good suppression of weed

- 100 % pinewood (2 – 10 mm) without bark from sustainable forestry (PEFC)
- Mineral colour pigments basing on iron oxide
- Good plant tolerance and ecological benign
- Good processability on automatic covering lines

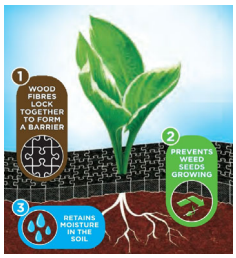
Sinclair pot topper

Sinclair pot topper can be used as a pot topper or for mulching beds and borders. It is an alternative to bark, not only because it prevents weed seeds from germinating but due to its adhesive properties which also lock the fibres together to stay in situ.

Sinclair pot topper - weed suppressant effect

Visible Weeds without Pot Topper

Weed Suppression with Pot Topper



Melcourt EcoBark® Topper

Weed control update for herbaceous crops

David Talbot, ADAS

New publication - weed resistant covering materials for sustainable container cultivation

Weed control pre-planting – field-grown herbaceous crops

- Various products (glyphosate) to control annual and perennial weeds
- May need a fallow period/stale seedbed to control weeds or volunteers (e.g. potato)
- Basamid (dazomet) where high weed pressure/few in crop options

So few options may have to consider mulches post planting?

Residual herbicides – field-grown herbaceous crops

Current herbicides for use over the crop

- Devrinol (napropamide)
- Venzar 500 SC (lenacil)
- Flexidor (isoxaben)
- Dual Gold (s-metolachlor)
- Stalwart (metazachlor) used but little published data; Max legal rate of 1.5 L/ha = 750g per year, **not more than 1,000g in 3 years** / 0.66L/ha year = 333g

Weed control update for herbaceous crops
David Talbot, ADAS

Contact acting herbicides – field-grown herbaceous crops

Herbicides to control emerged seedlings within crop

- Corzal SC (phenmedipham) EAMU outdoor ornamental plant production, can get transient yellowing
- Goltix 70 SC (metamitron) EAMU
- Both used in herbaceous crop production
- Centurion Max (clethodim) LTAEU selective grass control

Inter-row options – hooded sprayers

- Shark (carfentrazone-ethyl) EAMU
- Mission 200 SL (diquat – final use 04/02/20)
- Finalsan (pelargonic acid)

Residual herbicides – not tested on herbaceous crops

EAMUs

- Defy (prosulfocarb)
- Sencorex (metribuzin)
- Sunfire (flufenacet)
- Stomp Aqua (pendimethalin)

Possible new products in the pipeline

- HDC H43
- HDC H47

Defy (prosulfocarb)

- EAMU 1 per crop **before crop emergence**
- Residual herbicide, likely to be more effective in soils than in growing media
- Controls **grasses** and some broad leaved annual weeds (including black nightshade, chickweed, cleavers, fat hen, fumitory, speedwell, knotgrass and mayweeds, w**illowherb**)
- Could tank mix with Flexidor but still leaves groundsel OR mix with Sencorex Flow if safe

Weed control update for herbaceous crops
David Talbot, ADAS

Sencorex (metribuzin)

- EAMU allows 1.15 L/ha – do **not** use the maximum rate, unlikely to be safe on herbaceous crops
- Residual herbicide - one application per year
- Dormant crops only, will scorch young growth
- Not thought to be safe over container-grown plants
- Controls grasses and some broad leaved annual weeds (including cleavers, fat hen, groundsel, knotgrass, mayweeds, pansy, redshank, shepherds purse, small nettle and willowherb) pre-emergence with some post-emergence action

Sunfire (flufenacet)

- Available in UK EAMU for ornamentals includes use under protection
- Residual herbicide, more effective in soils than in growing media
- Controls grasses (including resistant blackgrass) and some broad leaved annual weeds (including chickweed, speedwell, pansy, penny cress, mayweeds, shepherds purse, cleavers) pre-emergence with some post-emergence action
- Partner for Sencorex Flow

Stomp Aqua (pendimethalin)

- EAMU in place, widely used in HNS field production
- Good control of knotgrass, annual meadow grass and some broad leaved annual weeds (including black bindweed, chickweed, cleavers, fat hen, fumitory, groundsel, pansy, mayweeds and red dead-nettle) pre-emergence
- Could tank mix with Flexidor OR Sencorex Flow if crop safe

Weed control update for herbaceous crops
David Talbot, ADAS

Possible new products

- HDC H43 (pethoxamid)
  - Good residual control of pearlwort, moderate control of groundsel and willowherb
  - Awaiting EAMU
  - Potential tank mix partner for Flexidor
- HDC H47 (confidential)

Electric weeding

One hour post-treatment

Four weeks post-treatment

Creeping thistle *Dock*

Untreated control | Treated: complete kill | Treated: re-growth | Untreated control

AHDB ADAS

Ubiqutek electric weeder 'Touch'

AHDB ADAS

Ubiqutek electric weeder 'Touch'

AHDB ADAS

Ubiqutek – tractor mounted rig


Zasso tractor mounted rigs



Zasso - use in sugar cane in Brazil

Electric weeder - summary

- Systemic action on fleshy perennials e.g. thistle
- Lower energy consumption than flame weeder
- Less risk of collateral damage than with a weed wiper
- Needs direct contact with weeds for control
- New designs enable use closer to ground for smaller weeds
- Field prototypes for agriculture/horticulture under development
- Zasso already has tractor mounted equipment available in Germany

AHDB ADAS

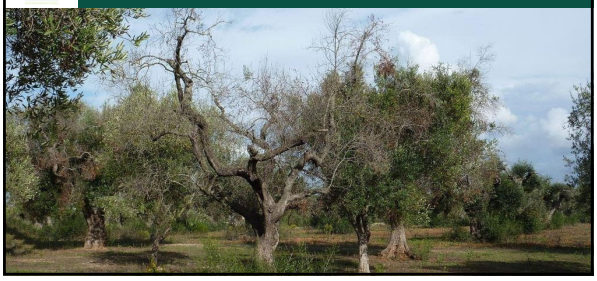
Any questions, thank you ?

AHDB ADAS

Xylella fastidiosa and BRIGIT project
Gerard Clover, RHS (Hayley Jones)

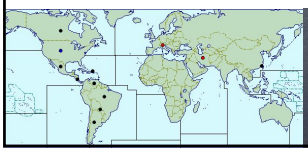
Xylella fastidiosa and BRIGIT project

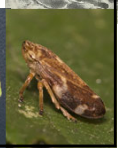
Gerard Clover



Biology of *Xylella fastidiosa*

- Bacterium, infects the xylem (water conducting tissues) of plants
- At least four subspecies of *Xylella – X. fastidiosa* subsp. *multiplex* poses greatest risk to UK plant health
- Huge host range: >500 species in c. 80 families
- Transmitted by froghoppers/leafhoppers (c.18 species in UK); plant trade

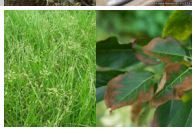




What are the symptoms?

Quercus spp. | *Nerium oleander* | *Polygala myrtifolia* | *Lavendula* spp. | *Prunus* spp.

- Leaf scorch, wilt, chlorosis, die back, poor quality fruit and eventual plant death
- Symptoms can be confused with frost damage, drought, or other plant diseases
- Also occurs as symptomless infections



Xylella fastidiosa and BRIGIT project
Gerard Clover, RHS (Hayley Jones)

Which plants are susceptible?

Herbaceous perennials, e.g. *Lavandula*, *Rosmarinus*

Trees, e.g. *Acer, Liriodendron, Magnolia*

Wild flora, e.g. *Capsella bursa-pastoris, Hedera helix*

Defra consider the following pose highest risk to UK:

- *Coffea* spp. (coffee)
- *Hebe* spp. (hebe)
- *Lavendula sp.* (lavender)
- *Nerium oleander* (oleander)
- *Olea europaea* (olive)
- *Polygala myrtifolia* (myrtle leaf milkwort)
- *Prunus* spp. (cherry family)
- *Rosmarinus officinalis* (rosemary)
- *Spartium junceum* (Spanish broom)

Xylella: status in Europe

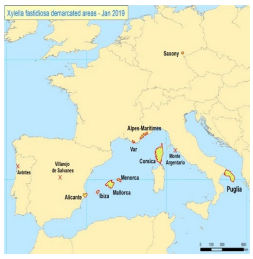
Italy, October 2013
Major outbreak, *Xylella fastidiosa* subspecies *multiplex* and *pauca*
- Killing olive trees in Lecce and Brindisi, Italy
- September 2018,Tuscany: fig, polygala, rosemary, Spanish broom

France, July 2015
Major outbreak, *X. fastidiosa* subsp. *multiplex*
- *Polygala myrtifolia* and other ornamental plants; Corsica and south-east mainland France

Germany, July 2016
Minor outbreak, *X. fastidiosa* subsp. *fastidiosa*
- A single *Nerium oleander* in a nursery greenhouse in Saxony

Spain, October 2016
Major outbreak in Balearic Islands
Xylella fastidiosa subsp. *fastidiosa, multiplex and pauca*
- Grapevine, lavender, olive, oleander, polygala, *Prunus* etc.
- June 2017, Alicante on almond; April 2018, Madrid on olive

Portugal, January 2019
Minor outbreak, *X. fastidiosa* subsp. *multiplex*
- Asymptomatic lavender



Control: Interception vs Outbreak

2015 EU emergency measures (Decision 789/2015/EU)

Interception: disease is found but **unlikely to have spread** to other plants. Destruction of hosts in close proximity and further surveys.

Outbreak: disease is found and **may have spread**, e.g. the plant is mixed with other stock, has been in an environment for some time, or vectors are present.

If an outbreak occurs:
- 100 m destruction of host plants
- 5 km buffer zone:
  - vector control and surveillance
  - restricted movement of 'specified' plants .....for at least 5 years

Xylella fastidiosa and BRIGIT project
Gerard Clover, RHS (Hayley Jones)

- £5 million project over 26 months; led by John Innes Centre with 12 research partners
- Funded by UKRI, with support from Defra and Scottish Government

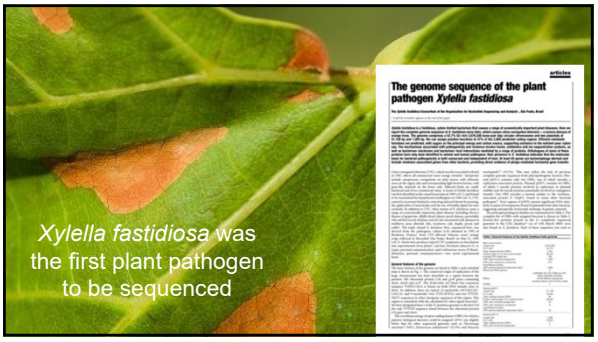
John Innes Centre
Centre for Ecology & Hydrology
University of Sussex
University of St Andrews
University of East Anglia
University of Salford MANCHESTER
national museum wales amgueddfa cymru
fera
Forest Research
Royal Horticultural Society
SASA
UNIVERSITY OF STIRLING

Objectives of BRIGIT

1. Develop the knowledge required:
   a) to reduce risk of *Xylella* being introduced;
   b) to respond to interceptions/outbreaks; and
   c) to mitigate impact if disease becomes established
2. Deliver good quality science and provide information required by industry, policymakers, academics and citizens in the UK and internationally
3. Develop capacity to respond to other plant pests and diseases

Xylella fastidiosa and BRIGIT project

Gerard Clover, RHS (Hayley Jones)



International context

PONTE Pest Organisms Threatening Europe

XYLELLA FASTIDIOSA AND HEMIPTERAN VECTOR SPECIES

CANDIDATUS LIBERIBACTER SOLANACEARUM AND PSYLLID VECTOR SPECIES

HYMENOSCYPHUS FRAXINEUS AND NEW EXOTIC PHYTOPHTHORA SPECIES

CURE-XF

H2020-MSCA-RISE-2016
CURE-XF - 734353

XF ACTORS

XF-ACTORS is a research project to improve prevention, early detection and control of *Xylella fastidiosa* through the establishment of a multidisciplinary research program. XF-ACTORS is a four-year project, started on November 1st, 2016 and funded by the European Union within the Horizon 2020 program.

Ana Perez-Sierra; Steven White, Daniel Chapman and Stephen Parnell

Diagnostic capability

Sampling
- Develop understanding of distribution, and rates of colonisation and symptom expression to optimise sampling strategies
- Evaluate novel approaches to target sampling

Detection and identification
- Harmonise current testing procedures
- Optimise sensitivity of detection in tree hosts
- Evaluate emerging technologies for reliability, sensitivity and specificity of subspecies detection
- Develop tests to identify source of *Xylella* in an outbreak

Lead: John Elphinstone, Fera

Xylella fastidiosa and BRIGIT project
Gerard Clover, RHS (Hayley Jones)

Insect vector biology

- Determine location of potential vectors in the environment
- Determine potential for short-range dispersal of meadow froghopper (*Philaenus spumarius*): mark-release-recapture
- Generate genome sequences of potential vectors (froghopper/leafhopper) to assess (potential) dispersal between habitats and throughout UK

Lead: Saskia Hogenhout, John Innes Centre

Epidemiology and modelling

- Model potential entry and spread within and from the horticultural trade: regulation
- Develop multiscale model of *Xylella* dispersal: surveillance and control
- Assess factors affecting human pathways of *Xylella* spread

Lead: Steven White, CEH

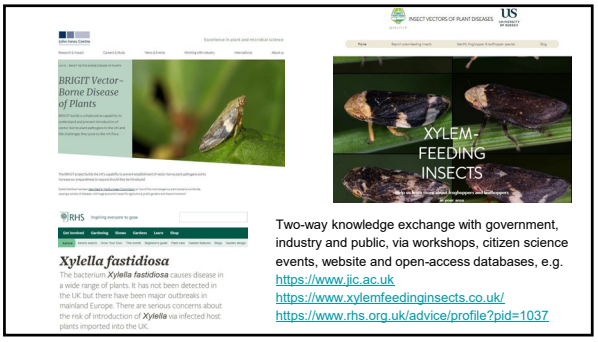
Citizen science and knowledge exchange

- Establish integrated project websites to engage citizens, stakeholders and policymakers – raising public awareness
- Provide accessible information on *Xylella* vectors, including:
  - taxonomy;
  - geographical distribution;
  - plant host range; and
  - sequence

Lead: Ana Perez-Sierra, Forest Research

Xylella fastidiosa and BRIGIT project

Gerard Clover, RHS (Hayley Jones)



Two-way knowledge exchange with government, industry and public, via workshops, citizen science events, website and open-access databases, e.g.
https://www.jic.ac.uk
https://www.xylemfeedinginsects.co.uk/
https://www.rhs.org.uk/advice/profile?pid=1037

Extension of Authorisation Number: 1294 of 2019

EXTENSION OF AUTHORISATION FOR A MINOR USE OF A PLANT PROTECTION PRODUCT

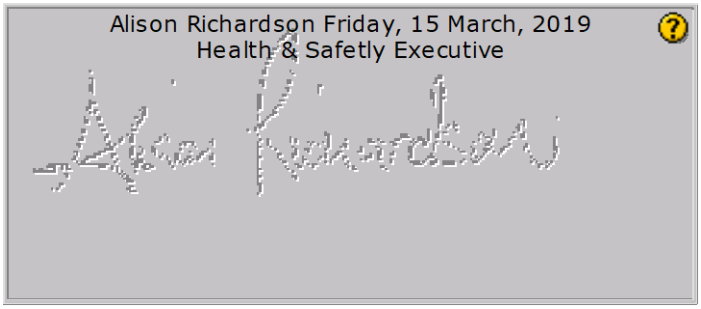
PLANT PROTECTION PRODUCTS REGULATION (EC) No. 1107/2009

Product name*:*	Frupica SC
Active ingredient*:*	449.4 g / l mepanipyrim
MAPP number*:*	12067
Product authorisation holder*:*	Certis Europe BV (Registered Company no. FCO22685)
Marketing company*:*	Certis
This Extension of authorisation ends:	on the final expiry date of use for the authorised product (unless otherwise stated)

If the authorisation of the above product is withdrawn or amended before the end date above, this Extension of authorisation will end on the same date as the authorisation for the product. This Extension of authorisation will be withdrawn or amended before its end date if a decision is taken to withdraw or amend this Extension of authorisation under Regulation (EC) No 1107/2009 on any other grounds.

Extent of authorisation: United Kingdom

This extension of authorisation for minor uses applies to all UK parallel trade products issued under Article 52 of Regulation (EC) No 1107/2009 for which Frupica SC with MAPP 12067 is the reference product.



HSE Digital Signature

This and the attached Appendices 1 and 2 are signed by the Health and Safety Executive (“HSE”) for and on behalf of the Secretary of State, the Welsh Ministers,

the Scottish Ministers and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland.

Date of issue: 15 March 2019

EXPLANATORY NOTES

1. This is Extension of authorisation number 1294 of 2019.

2. This Extension of authorisation will be published on the website of the Chemicals Regulation Division of the HSE.

3. Application reference number: COP 2018/00500

4. Persons using the product to which this Extension of authorisation applies should acquaint themselves with and observe all requirements contained in the Regulation (EC) No 1107/2009, including the duty on the holder of any Extension of authorisation to notify information on potentially dangerous effects, a contravention of which is a criminal offence under those Regulations.

5. Neither the efficacy nor the phytotoxicity of the product for which this Extension of authorisation has been granted has been assessed and, as such, the user bears the risk in respect of failures concerning its efficacy and phytotoxicity.

ADVISORY INFORMATION

IMPORTANT: When applying this product under the terms of this Extension of Authorisation, comply with any resistance guidance or restrictions stated on the product label.
Total reliance on one pesticide will hasten the development of resistance. Pesticides of different chemical types or alternative control measures should be included in the planned programme. Alternating with different modes of action is a recognised anti-resistance strategy.

Frupica SC is an anilinopyrimidine fungicide. Do not use more than two applications of Frupica SC or other anilinopyrimidine containing products per crop.

This Extension of Authorisation relates to the use of ‘Frupica SC’ (M12067) for use on outdoor and protected ornamentals for the control of Botrytis (Sphaerotheca) and Powdery Mildew (Erysiphe) . Application is to be made using Tractor mounted sprayer, knapsack sprayer or rotary atomiser in 500 to 1000 litres water per hectare. Crops should be allowed to dry before re-entry into crop.

APPENDIX 1: CONDITIONS OF EXTENSION OF AUTHORISATION

The conditions below are obligatory. They must be complied with when the Extension of authorisation occurs. Failure to comply with the following conditions will result in the withdrawal or amendment of the Extension of authorisation under Regulation (EC) No 1107/2009 and may result in other enforcement action, including prosecution. For the purposes of this Extension of authorisation only, the conditions and/or requirements shown below supersede any corresponding conditions and/or requirements set out on the label or otherwise provided for under the product authorisation **which would otherwise apply**.

Use:

Field of use: **ONLY AS A FUNGICIDE**

User: Professional

Crops/situations:	Maximum individual dose: (litres product / ha)	Maximum total dose:	Maximum number of treatments: (per crop)	Latest time of application:
Protected and outdoor ornamental plant production	0.9	-	2	-

Operator Protection:

(1) Engineering control of operator exposure must be used where reasonably practicable in addition to the following personal protective equipment:

Operators must wear suitable protective gloves when handling the concentrate or applying by hand-held equipment.

(2) However, engineering controls may replace personal protective equipment if a COSHH assessment shows that they provide an equal or higher standard of protection.

Environmental protection:

(1) Crops/situations with 5m buffer zone:

Since there is a risk to aquatic life from use, users not applying the statutory buffer zone must either themselves carry out or ensure that someone else has carried out a Local Environment Risk

Assessment for Pesticides (LERAP) on their behalf before each spraying operation from a horizontal boom sprayer. Users must not allow direct spray from horizontal boom sprayers to fall within 5m of the top of the bank of any static or flowing waterbody or within 1m of a ditch which is dry at the time of application (these distances to be measured as set out in the guidance documents available from HSE Chemical Regulation Division's website and any amendments that are made to it) unless:

(a)The LERAP indicates that a narrower buffer zone will be sufficient; and

(b)Any measures indicated by the LERAP as justifying the narrower buffer zone are complied with in full and in accordance with any conditions applicable to them.

Spray must be aimed away from water.

Spray from hand-held sprayers must not be allowed to fall within 1m of the top of the bank of a static or flowing waterbody. Spray must be aimed away from water.

(2) The results of the LERAP must be recorded in written form and must be available for a period of three years for inspection to any person entitled to exercise enforcement powers under or in connection with the Plant Protection Products Regulations 2011 or the Plant Protection Products (Sustainable Use) Regulations 2012. (An electronic record will satisfy the requirement for a written record, providing it is similarly available for inspection and can be copied).

(3) Detailed guidance on LERAPs and how to conduct a LERAP are contained in the guidance documents available from HSE Chemicals Regulation Division's website. All LERAPs must be carried out in accordance with this Guidance and any amendments that are made to it.

Other specific restrictions:

(1) This product must only be applied in accordance with the terms of this extension of authorisation, the product label and/or leaflet and any additional guidance on extensions of authorisation.

(2) The product must only be applied using horizontal boom sprayer or hand held downward directed sprayers.

(3) Application to outdoor ornamentals must only be made between 15 May and 30 September.

(4) Application to outdoor ornamentals must only be made after 1st flower (BBCH 49), immediately post trimming .

APPENDIX 2: GENERAL CONDITIONS FOR AN EXTENSION OF AUTHORISATION

Failure to comply with the following conditions will result in the withdrawal or amendment of the Extension of authorisation under Regulation (EC) No 1107/2009 and may result in other enforcement action, including prosecution.

Adverse effects:

The authorisation holder must immediately notify the Secretary of State, the Scottish Ministers and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland (care of the Health and Safety Executive), if they have any new information on the potentially adverse effects of the authorised product, or of residues of an active substance in that product when used in accordance with the conditions of this Extension of authorisation. For those products authorised under Regulation (EC) No 1107/2009 authorisation holders must also tell the other relevant competent authorities of the EC Member States (a list of which is available from the Health and Safety Executive) and the EC Commission. Failure to comply with this requirement is an offence.

Provision of information:

The authorisation holder must comply with all requests for information required by, or on behalf of, the Secretary of State, the Scottish Ministers or the Department of Agriculture, Environment and Rural Affairs in Northern Ireland in accordance with Regulation (EC) No 1107/2009.

Extension of Authorisation Number: 0784 of 2019

EXTENSION OF AUTHORISATION FOR A MINOR USE OF A PLANT PROTECTION PRODUCT

PLANT PROTECTION PRODUCTS REGULATION (EC) No. 1107/2009

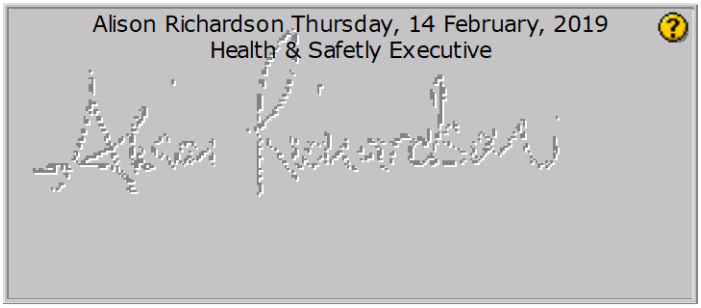
Product name*:*	Prolectus
Active ingredient*:*	500 g / kg Fenpyrazamine
MAPP number*:*	18891
Product authorisation holder*:*	Sumitomo Chemical Agro Europe SAS (Registered Company no. R.C.S 379603087)
Marketing company*:*	Sumitomo Chemical (UK) Plc

This Extension of authorisation ends: on the final expiry date of use for the authorised product (unless otherwise stated)

If the authorisation of the above product is withdrawn or amended before the end date above, this Extension of authorisation will end on the same date as the authorisation for the product. This Extension of authorisation will be withdrawn or amended before its end date if a decision is taken to withdraw or amend this Extension of authorisation under Regulation (EC) No 1107/2009 on any other grounds.

Extent of authorisation: United Kingdom

This extension of authorisation for minor uses applies to all UK parallel trade products issued under Article 52 of Regulation (EC) No 1107/2009 for which Prolectus with MAPP 18891 is the reference product.



HSE Digital Signature

This and the attached Appendices 1 and 2 are signed by the Health and Safety Executive (“HSE”) for and on behalf of the Secretary of State, the Welsh Ministers,

the Scottish Ministers and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland.

Date of issue: 14 February 2019

EXPLANATORY NOTES

1. This is Extension of authorisation number 0784 of 2019.

2. This Extension of authorisation will be published on the website of the Chemicals Regulation Division of the HSE.

3. Application reference number: COP 2018/01760

4. Persons using the product to which this Extension of authorisation applies should acquaint themselves with and observe all requirements contained in the Regulation (EC) No 1107/2009, including the duty on the holder of any Extension of authorisation to notify information on potentially dangerous effects, a contravention of which is a criminal offence under those Regulations.

5. Neither the efficacy nor the phytotoxicity of the product for which this Extension of authorisation has been granted has been assessed and, as such, the user bears the risk in respect of failures concerning its efficacy and phytotoxicity.

ADVISORY INFORMATION

This Extension of Authorisation relates to the use of 'Prolectus' (M18891) as a fungicide for the control of botrytis spp. on the crop of Ornamental Plant Production grown outdoors, under protection or under permanent protection with full enclosure. Applications can be made between 1st March and 30th September.

Application must be made using conventional hydraulic sprayers (including air-assisted sprayers) or hand-held sprayers or gantry sprayers in a minimum water volume of 500 litres/ha. Alternatively apply at a concentration of 120 g/product per 100 litres of water.

IMPORTANT: When applying this product under the terms of this Extension of Use Notice, comply with any resistance guidance or restrictions stated on the product label.
Total reliance on one pesticide will hasten the development of resistance. Pesticides of different chemical types or alternative control measures should be included in the planned programme. Alternating with different modes of action is a recognised anti-resistance strategy.
PROLECTUS contains fenpyrazamine, which is a FRAC group 17 ergosterol biosynthesis inhibitor.
PROLECTUS can be sprayed as part of a programme of sprays, but to prevent or limit the development of Botrytis strains less sensitive to the product, applications of PROLECTUS should not be made consecutively and should be used in alternation with botryticide products which have a different mode of action. No more than a third of the intended botryticide applications made per crop, per year, should contain 3-keto reductase (FRAC code 17) fungicides.

APPENDIX 1: CONDITIONS OF EXTENSION OF AUTHORISATION

The conditions below are obligatory. They must be complied with when the Extension of authorisation occurs. Failure to comply with the following conditions will result in the withdrawal or amendment of the Extension of authorisation under Regulation (EC) No 1107/2009 and may result in other enforcement action, including prosecution. For the purposes of this Extension of authorisation only, the conditions and/or requirements shown below supersede any corresponding conditions and/or requirements set out on the label or otherwise provided for under the product authorisation **which would otherwise apply**.

Use:

Field of use: **ONLY AS A FUNGICIDE**

User: Professional

Crops/situations:	Maximum individual dose: (kg product / ha)	Maximum total dose:	Maximum number of treatments: (per year)	Latest time of application:
Ornamental plant production	1.2	-	3	1 day before harvest

The following Aquatic Buffer Zones must be observed:

Crops/situations:	Aquatic buffer zone distance (metres):	Comment:
Ornamental plant production	5	see Environmental Protection Phrase 1

Environmental protection:

(1) Crops/situations with 5m buffer zone:

Since there is a risk to aquatic life from use, users not applying the statutory buffer zone must either themselves carry out or ensure that someone else has carried out a Local Environment Risk Assessment for Pesticides (LERAP) on their behalf before each spraying operation from a horizontal boom sprayer. Users must not allow direct spray from horizontal boom sprayers to fall within 5m of the top of the bank of any static or flowing waterbody or within 1m of a ditch which is dry at the time of application (these distances to be measured as set out in the guidance documents available from HSE

Chemical Regulation Division's website and any amendments that are made to it) unless:

(a)The LERAP indicates that a narrower buffer zone will be sufficient; and

(b)Any measures indicated by the LERAP as justifying the narrower buffer zone are complied with in full and in accordance with any conditions applicable to them.

Spray must be aimed away from water.

Spray from hand-held sprayers must not be allowed to fall within 1m of the top of the bank of a static or flowing waterbody. Spray must be aimed away from water.

(2) The results of the LERAP must be recorded in written form and must be available for a period of three years for inspection to any person entitled to exercise enforcement powers under or in connection with the Plant Protection Products Regulations 2011 or the Plant Protection Products (Sustainable Use) Regulations 2012. (An electronic record will satisfy the requirement for a written record, providing it is similarly available for inspection and can be copied).

(3) Detailed guidance on LERAPs and how to conduct a LERAP are contained in the guidance documents available from HSE Chemicals Regulation Division's website. All LERAPs must be carried out in accordance with this Guidance and any amendments that are made to it.

Other specific restrictions:

(1) This product must only be applied in accordance with the terms of this extension of authorisation, the product label and/or leaflet and any additional guidance on extensions of authorisation.

(2) All dilute pesticide waste resulting from use of this product in recirculating water systems must be disposed of safely and legally to protect humans, wildlife and the environment, especially groundwater and surface water. Pesticide disposal advice is detailed in the 'Code of Practice for Using Plant Protection Products (Section 5: Disposing of Pesticide Waste)'.

APPENDIX 2: GENERAL CONDITIONS FOR AN EXTENSION OF AUTHORISATION

Failure to comply with the following conditions will result in the withdrawal or amendment of the Extension of authorisation under Regulation (EC) No 1107/2009 and may result in other enforcement action, including prosecution.

Adverse effects:

The authorisation holder must immediately notify the Secretary of State, the Scottish Ministers and the Department of Agriculture, Environment and Rural Affairs in Northern Ireland (care of the Health and Safety Executive), if they have any new information on the potentially adverse effects of the authorised product, or of residues of an active substance in that product when used in accordance with the conditions of this Extension of authorisation. For those products authorised under Regulation (EC) No 1107/2009 authorisation holders must also tell the other relevant competent authorities of the EC Member States (a list of which is available from the Health and Safety Executive) and the EC Commission. Failure to comply with this requirement is an offence.

Provision of information:

The authorisation holder must comply with all requests for information required by, or on behalf of, the Secretary of State, the Scottish Ministers or the Department of Agriculture, Environment and Rural Affairs in Northern Ireland in accordance with Regulation (EC) No 1107/2009.

Notes