HDC Herbaceous Perennials Technical Discussion Group

‘Summer Nursery Meeting – North Hill Nurseries and W. Godfrey and Sons’

Wednesday 10 July 2013
Event Programme

Morning session (and lunch) at The Lord Roberts Centre, Brookwood, Woking

Afternoon sessions at North Hill Nurseries and W. Godfrey and Sons, Surrey

<table>
<thead>
<tr>
<th>Time</th>
<th>Subject</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>9.45</td>
<td>Registration and refreshments</td>
<td></td>
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<tr>
<td>10.00</td>
<td>Welcome</td>
<td>Paul Howling, HPTDG Chairman</td>
</tr>
<tr>
<td>10.05</td>
<td>Optimising irrigation for container-grown plants in various growing media (HNS 182)</td>
<td>Mark Else, EMR</td>
</tr>
<tr>
<td>10.35</td>
<td>Disease baiting techniques for stored irrigation water (HNS 188)</td>
<td>Erika Wedgwood, ADAS</td>
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<tr>
<td>11.05</td>
<td>Powdery and downy mildew disease prediction (HNS 165 and HNS 173)</td>
<td>John Adlam, Dove Associates</td>
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<tr>
<td>11.35</td>
<td>Technical updates – A propagators perspective of Heuchera rust and Where next with neonicotinoids? Followed by questions and discussion</td>
<td>Patrick Fairweather, Fairweathers Nursery and Bolette Palle-Neve, HDC Crop Protection Liaison Officer</td>
</tr>
<tr>
<td>12.05</td>
<td>Lunch</td>
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<tr>
<td>13.15</td>
<td>North Hill Nurseries – nursery tour</td>
<td>Robert Small</td>
</tr>
<tr>
<td>14.30</td>
<td>W. Godfrey and Sons – nursery tour and further discussion about on-site disease baiting techniques and disease prediction</td>
<td>Bill Godfrey, Erika Wedgwood and John Adlam</td>
</tr>
<tr>
<td>15.30</td>
<td>Refreshments and depart</td>
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HDC is a Division of the Agriculture and Horticulture Development Board (AHDB)
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<td>9</td>
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<td>31</td>
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</table>
Developing optimum irrigation guidelines for peat, reduced-peat and peat-free substrates

HNS 182 (2010-2013)

Dr Mark A. Else

Resource Efficiency for Crop Production

Water availability for HNS production

- 75% of HNS growers farm in water-stressed areas
- Mains water for HNS production will become increasingly expensive
- Trickle / drip irrigation to be brought under WFD legislation in April 2014

Matching demand with supply

- Plant daily water use can vary up to 15-fold
- Growers will need to use water more efficiently
- Need effective irrigation systems... and scheduling tools
### Current irrigation systems and scheduling methods

- Overhead, drip, capillary matting, Efford sand bed, boom
- Intuition, experience, subjective score of substrate sample
- Evaporative demand + crop co-efficients
- Substrate water content (single depth)
- Substrate water availability (matric potential)

### HNS 182

- Optimise irrigation of HNS species in industry standard, reduced peat and peat-free media
- Substrates chosen by Project Steering Group
  - Good quality brands
  - Becoming more widely used by industry
- Industry standard: 25% bark, 75% peat - supplied by Sinclair
- Reduced peat: 25% wood fibre, 25% bark, 50% peat - supplied by Bulrush
- Peat free: composted green waste and bark - supplied by Vital Earth
- Substrates analysed for air filled porosity, particle size distribution, pH, density, dry matter, dry density, Ca, Cl, Mg, P, K, Na, N, EC and trace elements

### HNS 182 Plant species

- Species chosen by Project Steering Group
  - *Sidalcea oregana* ‘Party Girl’
  - *Ribes sanguineum* ‘Koja’
  - *Escallonia rubra* ‘Crimson Spire’
- Widely grown
- Moderately resistant to substrate drying
- Good indicator species
Defining the ‘optimum’ substrate moisture content

- Plant physiological responses to decreasing substrate moisture content

Physiological responses to drying substrate

- Irrigation withheld, physiological responses measured daily
  - Stomatal conductance
  - Whole-plant transpiration rate
  - Leaf extension rate
  - Leaf water potential

Stomatal response to drying substrate

- Reduced stomatal conductance (p<0.05) in Sinclair substrate on 22/03/11
Identifying lower irrigation set points

- VSMC at which physiological responses first triggered identified for each substrate and for each species

Irrigation set points for *Sidalcea*

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Optimum plant-and-pot weights and VSMCs for each substrate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pot weight (g)</td>
<td>VSMC* (m³ m⁻³)</td>
</tr>
<tr>
<td>Industry standard</td>
<td>2052 1420 0.46 0.23</td>
</tr>
<tr>
<td>Reduced peat</td>
<td>2096 1540 0.49 0.34</td>
</tr>
<tr>
<td>Peat-free</td>
<td>2106 1680 0.41 0.29</td>
</tr>
</tbody>
</table>

Values are for 3 L pots

Testing irrigation set points 2011

Drip irrigation

- Optimum VSMCs maintained automatically over season via drip irrigation
Plant physiology unaffected under ‘optimum’ irrigation regimes

Stomatal conductances remained high, indicating that all plants were transpiring freely under ‘optimum’ irrigation regimes.

Reducing run-off under ‘optimum’ irrigation regimes

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Lower pot weight</th>
<th>Irrigation volume giving ≤5% run-off</th>
<th>Number of irrigation events</th>
<th>Mean total volume applied (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry standard</td>
<td>1420</td>
<td>207</td>
<td>2</td>
<td>409</td>
</tr>
<tr>
<td>Reduced peat</td>
<td>1540</td>
<td>205</td>
<td>2</td>
<td>402</td>
</tr>
<tr>
<td>Peat-free</td>
<td>1680</td>
<td>134</td>
<td>4</td>
<td>539</td>
</tr>
</tbody>
</table>

Irrigation volumes identified that resulted in <5% run-off at lower set points.
Estimated water holding capacity lower in peat-free substrate.
More frequent irrigation events of shorter duration needed for peat-free.

Testing irrigation set points 2012
Overhead and sub-surface irrigation

Irrigation applied via overhead sprinklers or capillary matting.
Three species in the same substrate in each irrigation block.
Irrigation scheduled to crop with highest transpiration rate (Escallonia).
‘Closed loop’ irrigation using Delta-T GP1 and SM 200 probe.
Regular measurements of plant physiology.
Plant quality scored by PSG

- No significant effects of substrate on plant quality in any of the three species
- Moss and liverwort coverage significantly higher on peat-free substrate

The ‘summer’ of 2012...!!

- Continuous measure of VSMC can tell you when not to irrigate...

Summary

- VSMC at which physiological responses to drying substrate varied according to crop and substrate
- ‘Optimum’ range of VSMC and plant-and-pot weights in each substrate were determined for Sidalcea, Ribes and Escallonia
- ‘Optimum’ VSMC were maintained throughout the growing season using drip, overhead and sub-surface irrigation
- Water holding capacity was 30-50% less in peat-free substrate
- Irrigation frequency was higher for crops growing in peat-free substrate
- Plant growth and quality in peat-free and reduced peat substrates similar to those in industry standard substrate
- Trickle / drip to be brought under WFD legislation in April 2014...
Scaling up

- How even is your irrigation (HDC Factsheet 16/05)?
  - Design of irrigation system
  - Operating pressures, nozzle selection
  - Uniformity of water delivery (HDC Irrigation Calculator)
- Can your irrigation system cope with the demand?
  - Once irrigation set points are reached, how quickly can you get round?
  - Safety factor incorporated
- How to schedule irrigation?
- Does each species need its own irrigation lower set point?
  - Group species with similar rates of water use
- Drivers for change…?
  - Cost / benefit analysis

Things to do…

- Measure plant-and pot weights at pot capacity and first wilting points
- Measure plant water use by weighing ‘marker’ plants
- Identify an optimal moisture range for your substrates
- Monitor evaporative demand using an evapometer
- Use a moisture probe for spot measurements
- Carry out a water audit
- Measure the uniformity of your irrigation systems
- Install water meters
- Work out how much irrigation to apply to achieve less than 5% run-through
- Know your seasonal water requirements
- Calculate wastage/losses due to over-watering

Acknowledgements

- EMR
  - Fiona Wilson, Mike Davies, Helen Longbottom, Dr Eleftheria Stavridou, Roger Payne, Gary Saunders
- Project Steering Group
  - John Adam (Dove Associates)
  - Dr Bill Godfrey (W. Godfrey & Sons)
  - Alastair Hazell (Darby Nursery Stock Ltd)
  - Susie Holmes (Consultant)
  - Wayne Brough and Katie Irgin (HDC)
- Substrate suppliers
  - William Sinclair Horticulture Ltd
  - Bulrush Ltd
  - Vital Earth Ltd
Why bother to check water?

- Microscopic flagellate spores (zoospores) or their resting cysts can be present.
- Zoospores of water-moulds e.g. *Pythium* and *Phytophthora* spp. are released from infected plants into run-off water.
- Zoospores in detachable sporangia of *Phytophthora ramorum* and *P. kernoviae* are also rain-borne.

Why bother to check water?

- Mains water should be clean, but uncovered storage risks contamination.
- Borehole water likely to be clean, but beware surface / flood water contamination.
Why bother to check water?

- River / ditch water likely to contain pathogens e.g. *Phytophthora* spp. from roots, leaf debris and drainage

Why bother to check water?

- Collected rainwater can be contaminated on falling or from dust / debris on roofs

- Run-off water from standing beds, benches etc. may be contaminated

Why bother to check water?

- Untreated recirculating systems are likely to be carrying fungi and water moulds

- Checking water treated by UV, chemical, iris bed, slow sand filter etc. is clean will give assurance or warn of system failure
What is “baiting”?

- Using something that will attract and / or hold an organism to be able to collect it

Catch depends on using the correct bait

Water mould baiting history

- *Pieris* and *Rhododendron* leaf baits used in water traps for *Phytophthora ramorum* and *P. kernoviae* in rainfall / river water
- Potential pathogens baited out of “dirty” water or soil for lab I.D.; *Ceanothus* leaves, apple, pine needles, lupin radicles etc.
- Researchers noted pathogen sp. found on particular baits; the ideal nursery water bait = readily available “clean” broad host

Why bait water instead of sampling?

- Water samples to be sent to a laboratory to await colony forming units (Cfus) which may include non-water moulds
- Water sampling £60 +p&p per Litre
- Baiting materials cheap and tested on site by Lateral Flow Device (LFD) £8 per LFD
How is identification carried out?

- Water sample filtering > selective agar > colony morphology > water > microscope for experts to distinguish water moulds (Oomycetes) from fungi
- LFDs each for *Phytophthora* and *Pythium* spp. can be used with baits (not cultures)
- Molecular testing (PCR) of culture or bait
- PDPlus of LFD for specific *Phytophthoras*

Cross-checking of diagnostic tools

**HNS 181: Conifer root rot**

- LFD positives confirmed by PCR testing of sampled tissue
- Wide range of *Phytophthora* spp. *cryptogea, cactorum, cinnamomi* .... and *Pythium* spp. e.g. *irregular*, *intermedium, sylvaticum* ..... detected
- PDplus testing (PCR) of LFDs verified for *P. cactorum, P. cinnamomi* and *P. citricola*

**HNS 188: Lab bait selection tests**
HNS 188: Bait bag construction

HNS 188: Selecting and testing baits

HNS 188: Lab baiting results
HNS 188: Reservoir baits and samples

12 mth surveys, 2 nurseries, ongoing:
- How do Cfu match to LFD +ves?
- How many days bait immersion?
- How frequently should checks be made over the year?
- Are some months higher risk?
- How many / best baiting positions?
- Does bait depth affect results?
- Might bait incubation post-immersion increase LFD detection?

Progress with reservoir sampling

- Jan to May 2013 +ve isolations or LFDs of apple baits from nursery reservoir
- Grower bait placement and LFD use
- Cfu from 1 L water sample have matched to +ve LFDs, but PCR of isolates ex 1L water needed to confirm water mould spp.
- 30 mm & 50 mm deep bait results similar

Progress with reservoir sampling

- Some variation in 1 L water Cfu counts between positions, but any number is bad
- 2 days bait immersion gave good results
- In an early (colder?) test post-immersion bait incubation for 5 d caused neg > +ve
- Refinement of bait bag design has ensured consistent floating / sinking
PO / HNS 188 Summary

- 8 apple pieces / fleece bait bag at 30-50mm depth immersion for 2 days can be tested with *Phytophthora* and *Pythium* spp. LFDs
- Procedure from bait bag making to LFD reading can be done by nursery staff at low cost and so should encourage more frequent checks for water contamination
Developing a prediction model for powdery and downy mildew.

Using the computer to calculate from weather data the development of mildews and predict when to spray.

DM & PM prediction programme

HNS 165 and HNS 173

Work done by Xiangming Xu at East Malling Research

Over the past few years we have lost many pesticide products that have been valuable in enabling us to produce blemish free plants.

This has predictably, and by design, forced us to look at ways in which we can reduce pesticide use.
One method of pesticide reduction is the use of computers to predict when a disease will develop.

- Evaluating infection conditions for landed spores
- Forecasting daily infection intensity (disease)
- Predicting the daily sporulating of powdery and downy mildew

**DM & PM prediction programme**

*Predicting daily rates of conidial development and mortality from*

- temperature
- relative humidity
- leaf wetness
DM & PM prediction programme

The model designed at East Malling gives the following information

– forecasts of daily mildew severity (%)
– forecasts of daily sporulating leaf area (%)
– efficacy of your fungicide programme

DM & PM prediction programme

The system can use a simple battery powered logger to record every hour a snapshot of the air temperature and relative humidity
DM & PM prediction programme

or use the Davis Vantage Pro2

Downy mildew prediction

This uses leaf wetness as part of the process of determining the development of downy mildew

The leaf surface is measured in degrees of wetness for a calculated period of time.
DM & PM prediction programme

Daily the data is downloaded into your computer either directly from the weather station or via the USB port.

You then load the data into the Rose programme.

It will automatically append it to data already loaded
DM & PM prediction programme
Run the programme to calculate the result

DM & PM prediction programme
The programme produces a graph showing the degree of powdery mildew development - without fungicide

DM & PM prediction programme
The programme produces a graph showing the degree of powdery mildew development - with fungicide
DM & PM prediction programme

Enter the fungicide application details for powdery mildew

<table>
<thead>
<tr>
<th>Date</th>
<th>Product</th>
<th>Cost/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-04-10</td>
<td>Systhane</td>
<td>£21.86</td>
</tr>
<tr>
<td>14-05-10</td>
<td>Systhane</td>
<td>£21.86</td>
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<tr>
<td>24-06-10</td>
<td>Folicur</td>
<td>£25.23</td>
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<td>25-06-10</td>
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<td>07-06-10</td>
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<td>24-06-10</td>
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<td>08-07-10</td>
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</tr>
<tr>
<td>09-08-10</td>
<td>Amistar</td>
<td>£40.43</td>
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<tr>
<td>Spraying</td>
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<td>£81.00</td>
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<td>TOTAL</td>
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<td>£411.37/ha</td>
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Fungicides applied to rose crop

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<tr>
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<th>Product</th>
<th>Cost/ha</th>
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<td>Systhane</td>
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<td>14-05-10</td>
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<td>24-06-10</td>
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<td>06-07-10</td>
<td>Folicur</td>
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<td>23-07-10</td>
<td>Folicur</td>
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</tr>
<tr>
<td>09-08-10</td>
<td>Amistar</td>
<td>£40.43</td>
</tr>
<tr>
<td>Spraying</td>
<td>7 x £9.00/ha</td>
<td>£53.00</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>£303.09/ha</td>
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Fungicides data for powdery mildew programme

<table>
<thead>
<tr>
<th>Product</th>
<th>Kick back days</th>
<th>Protect days</th>
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<tbody>
<tr>
<td>Nimrod</td>
<td>2</td>
<td>7 or 14</td>
</tr>
<tr>
<td>Systhane</td>
<td>4</td>
<td>7 or 14</td>
</tr>
<tr>
<td>Topas</td>
<td>4</td>
<td>7 or 14</td>
</tr>
<tr>
<td>Lyric</td>
<td>5</td>
<td>7</td>
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<td>Swift SC</td>
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<td>14</td>
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<tr>
<td>Folicur</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Cercobin</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>
DM & PM prediction programme

This is a start on a journey that will improve as we develop it.

The next stage is to improve the downy mildew module.

Further work is needed in:
- proving the prediction accuracy
- improving the user interface of the programme
- issuing alarms by email or text message

We need your help in running and proving the programme’s efficacy.

Coming soon to a phone near you
Neonicotinoids – where next?

Bolette Palle Neve - HDC

Outline

• Background
  – The science
  – The vote
• The restrictions
  – Exceptions
  – Grey areas
• What next?

Background – the science

• Insect pollinator numbers in decline
• Subtle sub-lethal effect shown in trials
• Some acute bee deaths in Europe
• EFSA review looking at clothianidin, imidacloprid and thiamethoxam
Background – the vote

- April 2013: Waitrose announcement
- 29 April 2013: Appeal Committee vote - 15 in favour, 4 abstained, 8 against (UK incl.)
- 25 May 2013: Restriction adopted by the Commission

Regulation (EU) No 485/2013

- Restricting the use of clothianidin, imidacloprid and thiamethoxam for seed treatment, soil application (granules) and foliar treatment on bee attractive plants and cereals.

Regulation (EU) No 485/2013

- Crops considered attractive to bees include 'Ornamentals flowering in year of treatment'
Some exceptions

- Foliar treatment after flowering in open fields
- Bee attractive crops in greenhouses can still be treated

Shades of grey

- Several grey areas to address

  > How will other EU member states interpret the regulation?
  > What is a greenhouse?
  > How about plants that are destined to be grown outdoors?
  > Year of treatment – is that 12 months following treatment?

What next?

- Regulation comes into force 1 December 2013
- Two year restriction
- Review of approvals within two years
- Review of other neonicotinoids on-going
**Products likely to be affected**

<table>
<thead>
<tr>
<th>Product</th>
<th>Active</th>
<th>Crop</th>
<th>Application type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centric</td>
<td>thiamethoxam</td>
<td>Outdoor ornamentals</td>
<td>Spray</td>
</tr>
<tr>
<td>Actara</td>
<td>thiamethoxam</td>
<td>Outdoor ornamentals</td>
<td>Spray</td>
</tr>
<tr>
<td>Intercept 70WG</td>
<td>imidacloprid</td>
<td>Container-grown ornamentals + hardy nursery stock</td>
<td>Incorporated (granular)</td>
</tr>
<tr>
<td>Imidachem</td>
<td>imidacloprid</td>
<td>Container-grown ornamentals</td>
<td>Spray</td>
</tr>
<tr>
<td>Mido 70%</td>
<td>imidacloprid</td>
<td>Container-grown ornamentals</td>
<td>Drench</td>
</tr>
</tbody>
</table>

Courses, Imidachem, SGR and Intercept 5GR approved for use on protected ornamentals only.

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**What next?**

- HDC working with NFU to seek clarification from CRD
- New joint ornamentals project on the way
- Retailers’ approach?
- Feedback from growers very welcome!

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**Finally…**

Comments, questions, concerns, suggestions?

Email: bolette.palle-neve@hdc.ahdb.org.uk
Predicted daily mildew infection for site: WBG from 02/06/2013 to 02/07/2013

Spray number | Programme 1: Field crop of forest nursery | Programme 2: Protected crop of ornamentals | Programme 3: Field crop of ornamentals
---|---|---|---
1. | Thiovit Jet+wetter | Thiovit Jet+wetter | Systhane 20EW*
2. | Cyflamid | Signum | Signum
3. | Thiovit Jet+wetter | Thiovit Jet+wetter | Cyflamid
4. | Talius | Systhane 20EW | Flexity
5. | Switch | Switch | Systhane 20EW*
6. | Cyflamid | Signum | Signum
7. | Switch | Switch | Cyflamid
8. | Talius | Systhane 20EW | Flexity

*In recent trials (HNB 156), efficacy against powdery mildew on Crataegus was improved by addition of potassium bicarbonate.
Notes
Publications Order Form
Hardy Nursery Stock

Over recent years HDC has produced a wide range of factsheets and publications which you can order by putting a tick next to the publication(s) you require and returning this form to the address below.

Factsheets from 2013
☐ 04/13 Ornamental plant production: The use of chemical plant growth regulators on protected crops

Factsheets from 2012
☐ 25/12 Non-chemical weed control for container-grown hardy nursery stock

Factsheets from 2010
☐ 18/10 Host plant range of vine weevil
☐ 17/10 Control of powdery mildew diseases on hardy nursery stock and herbaceous perennials

Factsheets from 2009
☐ 15/09 Control of rose downy mildew
☐ 03/09 Biobeds for treatment of pesticide waste and washings

Factsheets from 2008
☐ 20/08 Wet heat treatment to sterilise pots for re-use
☐ 15/08 Pest, disease and weed management in ornamental aquatic plants
☐ 06/08 A guide to best practice in handling bought-in plants
☐ 02/08 Stemphylium leaf-spot and other foliar diseases of hebe
☐ 01/08 A guide to simple and effective nursery trials

Factsheets from 2007
☐ 15/07 Control of leaf miners on pot and bedding plants
☐ 10/07 Guidelines on nursery hygiene for outdoor and protected ornamental crops

Factsheets from 2006
☐ 15/06 Water quality for irrigation of container ornamentals
☐ 14/06 Guidelines and best practice for pesticide spray application in protected ornamental Crops (revised 2007)
☐ 13/06 Caterpillars of protected ornamental crops
☐ 01/06 Capillary irrigation of container grown nursery stock

Factsheets from 2005
☐ 27/05 Winter protection of container grown nursery stock
19/05 Methods and equipment for matching irrigation supply to demand in container grown crops
16/05 Measuring and improving performance of overhead irrigation for container-grown crops
15/05 Use of chemical disinfectants in protected ornamental production
14/05 Control of whiteflies on protected ornamental crops
08/05 The biology and control of two-spotted spider mite in nursery stock
07/05 Securing your water supply for the future
05/05 Nutrition of container-grown hardy nursery stock

Factsheets from 2004
- 16/04 Control of Phytophthora, Pythium and Rhizoctonia in container-grown hardy ornamentals
- 14/04 Hardy nursery stock - management of stock plants
- 12/04 Control of foliar diseases of container-grown roses
- 07/04 Managing rabbit problems associated with horticulture
- 04/04 Control of downy mildew diseases on hardy nursery stock and herbaceous perennials

Factsheets from 2003
- 19/03 Sudden Oak Death / Ramorum Dieback – implications for the HNS industry
- 02/03 Vine weevil control in hardy nursery stock

Factsheets from 2002
- 25/02 Controlling humidity to minimise the incidence of grey mould (Botrytis cinerea) in container-grown ornamentals: heated glasshouse crops
- 23/02 Control of grey mould (Botrytis cinerea) in container-grown ornamentals: heated glasshouse crops
- 18/02 Roses: Increasing basal shoot production
- 08/02 Control of Sciarid flies in protected ornamentals
- 07/02 Integrated control of slugs and snails

Information Sheets
- 01/03 Two new weevils threaten nursery stock - Otiorhynchus armadillo and Otiorhynchus salicicola

Crop Walkers’ Guides
- Hardy Nursery Stock Crop Walkers’ Guide
- Pocket Weed identification guide

Crop Monitoring Pads
- Hardy Nursery Stock Crop Monitoring Pad

Guides
- Practical weed control for nursery stock
- Hardy Nursery Stock Propagation guide
- BOPP Best Practice Guide: Managing water and preventing pollution on ornamental nurseries

HDC is a division of the Agriculture and Horticulture Development Board
HDC, Stoneleigh Park, Kenilworth, Warwickshire, CV8 2TL
Tel: +44 (0)24 7669 2051 Email: hdc@hdc.ahdb.org.uk Website: www.hdc.org.uk
Herbaceous perennials: A guide to the production of container grown plants
HNS Cold Storage – A growers’ guide
Ornamental plant quality – developing a whole business management system - a grower guide
Slow Sand Filtration – A growers’ guide

Review Magazines
Media Review Magazine 2012

DVDs
Spray Check: A Tutorial DVD for Spray Operators.
Health & safety in horticulture - an awareness DVD in ten languages (plus English)

Computer Programmes
HDC Irrigation Calculator – A graphical tool to improve irrigation water distribution (accompanies factsheet 16/05)
ROSIE - A Windows program to assist in the scheduling of containerised roses grown outdoors under UK conditions

Please fill in the form and return it to: Louise Arculus, HDC, AHDB, Stoneleigh Park, Kenilworth, Warwickshire CV8 2TL, or email to: louise.arculus@hdc.ahdb.org.uk.
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