HDC Herbaceous Perennials Technical Discussion Group

Summer Nursery Meeting – Hillier Nurseries, Herbaceous Unit, Romsey

Wednesday 9 July 2014
Event Programme

Morning session (and lunch) at The Potters Heron, Ampfield, Romsey, Hampshire

Afternoon session at Hillier Nurseries, Herbaceous Unit and Harold Hillier Gardens, Ampfield, Romsey, Hampshire

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<td>Registration and refreshments</td>
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<td>10.15</td>
<td>Welcome and matters arising</td>
<td>Paul Howling, HPTDG Chairman</td>
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<td>10.30</td>
<td>Getting the best from biopesticides – a discussion on the practical application of such products</td>
<td>David Hide, Fargro</td>
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<td>11.15</td>
<td>Spray application optimisation in the production of container-grown ornamentals</td>
<td>Bill Basford, Consultant</td>
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<td>11.45</td>
<td>Vine weevil management in container-grown ornamentals</td>
<td>Jude Bennison, ADAS</td>
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<td>12.15</td>
<td>Responsibly sourced growing media – material assessment and characterisation</td>
<td>Paul Alexander, RHS</td>
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<td>12.45</td>
<td>Lunch</td>
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<td>13.30</td>
<td>Hillier Nurseries, Herbaceous Unit – nursery tour</td>
<td>Rolf Hollenstein and Dave Hooker, Hillier Nurseries</td>
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<td>15.00</td>
<td>The Harold Hillier Gardens</td>
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<td>16.30 onwards</td>
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HDC is a Division of the Agriculture and Horticulture Development Board (AHDB)
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HDC is a Division of the Agriculture and Horticulture Development Board (AHDB)
Discussion points

• Introduction
• Storage
• Mixing and application
• Tank mixing and compatibility
• Where and when to apply

What are biopesticides?

• Microbials - micro-organism based products
• Botanicals - plant derived compounds, plant extracts
• Semio-chemicals – pheromones
Why apply?

- Effective
- Manage resistance
- Safer to user and the environment
- Improved residue and harvest interval profiles

Why apply?

- IPM
- SUD

Discussion Points

- Storage
Tank mixes and compatibilities

Mixing and application

Where and when to apply
## Summary of responses to the biopesticide questions posed in the event invite

<table>
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<tr>
<th>What range of bio-pesticides do you use on your crops?</th>
<th>How do you successfully integrate their usage into your pest and disease control programme?</th>
<th>Do the products perform satisfactorily and therefore provide a valuable contribution to your control programme, if not why?</th>
<th>Do you find the label and advisory information adequate and easy to interpret, if not do you seek information from elsewhere?</th>
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<tr>
<td>I am a consultant but advise grower to make use of bio pesticides such as T34, Prestop, Serenade ASO &amp; Naturalis L</td>
<td>Where people embrace additional requirements e.g. apply products such as Naturalis-L at the optimum temperature, humidity etc very well.</td>
<td>Where used correctly yes. Although very disappointing results with Met 52, temperature limitations indicate that it does not always contribute to pest control resulting in unacceptable crop losses.</td>
<td>Yes, people need to be aware of additional requirements such as the need to pre-soak prior to use, such information is detailed on labels / advisory sheets.</td>
</tr>
<tr>
<td>What do I recommend? Serenade, AQ10, T34, Prestop, Dipel, Contans, Nematodes</td>
<td>Within a 'PPU' if edible crops or within a pre-planned programme or as ad-hoc reacting to a problem.</td>
<td>Yes. Main problem is getting the organism in contact with the target. Best used preventatively or before the problem is acute.</td>
<td>Usually ok. Prestop label is rather confusing in parts. Supplier, the web.</td>
</tr>
<tr>
<td>Serenade</td>
<td>Tank mix with copper.</td>
<td>They work fine but the thing they are used for make difficult.</td>
<td>Labels are adequate but also check on line UK Pesticide Guide.</td>
</tr>
<tr>
<td>FinalSan Plus, Mycotal, Met-52</td>
<td>Monitoring all factors meticulously.</td>
<td>Yes, however there are failures on the way of learning about them.</td>
<td>Not enough information on the label. Not any different than any other conventional products, this is where agronomists are filling the gaps.</td>
</tr>
<tr>
<td>Amistar, Serenade, Met 52. Also Compost T, SB Invigorator, Photofinish, Maxicrop as plant tonics.</td>
<td>These are the main stay of control program non bio pesticides used as back up or for &quot;firefighting&quot;.</td>
<td>Yes</td>
<td>Mostly from labels but also help from trade rep (Neil H). Occasionally the internet.</td>
</tr>
<tr>
<td>Fungicide, insecticide &amp; residuals</td>
<td>Insects in tunnels</td>
<td>Yes</td>
<td>Not really</td>
</tr>
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### Summary of responses to the biopesticide questions posed in the event invite

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<td>Try out quite a few. Met 52 was main expense for 2 years, T34. Do you mean predator use as well? Using a lot of predators. Nematodes for vine weevil &amp; trialing for slugs.</td>
<td>Compost incorporation for Met 52 &amp; T34. Predators released regularly. Vine weevil Nematodes used in spring and late summer.</td>
<td>Predators generally ok. Nematodes being assessed. T34, cheap &amp; seems ok but who knows. Met52 ineffective and given up this year in favour of nematodes. Compost was tested and found to be effective in lab conditions, but we had large numbers of weevils building up over the two years of use.</td>
<td>Predator info good on websites.</td>
</tr>
<tr>
<td>Serenade, Naturalis, Dipel</td>
<td>They are normally first choice depending on crop, time of year and weather conditions.</td>
<td>Yes, although Serenade more difficult to be certain.</td>
<td>No, the application rate information can be confusing or misleading at times.</td>
</tr>
<tr>
<td>Bio-Fungus Instant, SBI Plant Invigorator, Dipel, Met 52</td>
<td>-</td>
<td>SBI is our sole pesticide on one site and we get good control of pests and diseases.</td>
<td>I don't think that the information is always as specific as it might be, eg time of day or humidity for best results.</td>
</tr>
</tbody>
</table>
Spray Application

Optimising spraying in container-grown ornamentals

Bill Basford

Improvements necessary

- Use chemical effectively
- Poor control
  - Pest and disease
  - PGR
  - herbicide
- Time involved
- Loss of products
- Safe working

What’s the target?

- Whole plant
  - Size, massive variation
  - leaf surface, vertical, flat
    - angled
    - waxy
    - hairy
    - leaf shaded
- Localised area, underleaves, stems
- Pot surface

Mostly a ‘fine’ or ‘medium’ spray quality is required
Sprayer types in use

- **Trolley sprayer**
  - Spray pistol
  - Lance, 1 or more nozzles
  - Boom, 3 or more nozzles

- **Knapsack**
  - 1 nozzle – herbicides mainly

- **Mistblower**

- **Auto booms**
Deposition variation

- Poor application
  - Equipment
    - Choice
    - Operational settings
  - Operator
    - Skill
    - Knowledge
    - Training
    - Guidance

Equipment

- Pistol guns
  - Simple, available, robust, not really designed for pesticide use
  - Little research advice governing use – HDC now
  - Repeatable settings very difficult
  - Large spray ‘cloud’ affected by wrist movements
  - High volumes usually result

Ripa Gun – pressure 8-30 bar on machine seen

Distance rules – drift?
Other pistol and nozzle types available

HDC project * included spray droplet assessment using a pistol gun

- Laser shadow principle – NIAB spray lab.

* PO 008 Improving the efficiency of spray application for ornamental crops

Worn nozzles increased droplet size and increased flow
Pistol gun flow

- Study visits 5 - 11 l/min at 10 – 30 bar
- Worn nozzle flow increased by 9.6%
- Mean droplet size increased by 7.9%
- Flow rate approximately 4 – 9 x single nozzle flow – care in use and direction
- Fine quality at 8 -10 bar, always set from fully open, set at known pressure, test coverage

Pressure gauges – ‘guns’

- Key feature to setting flow
- 4 of 6 visits had broken or faulty gauge.
- Gauges never at point of spray on ‘guns’
- Friction loss in pipe – 12 mm hose, 0.3 bar per 10 m.

Pressure gauges – ‘booms’

3 nozzles, max flow 4.5 l/m
Pressure loss on 12 mm max 0.1 bar per 10 m so gauge like this only 0.5 bar above nozzle pressure
So why 10 bar, nozzle only needs 3 bar max as found, nozzle delivering off scale for manufacturer’s data.
Challenge high flow and high pressures
CALIBRATE
Flow v time
Time v area
Therefore flow per area
Boom systems

- Most even and uniform application.
- Automated booms are the ultimate.
- Simple hand held booms will suffice in most crops and situations.
- Need to select the correct nozzle and pressure as this affects litres/minute

Possible benefits

- 1 nursery challenged boom spray decisions post study visit
- Reduced from 1800 to 600 l / ha
- Nozzles changed
- Pressure down from 10 bar to 4 bar
- Good results, saving in pesticide used, time and labour costs.

Knapsack

- Simple reliable unit
- Complacency?
- Worn nozzles
  - cheap replacements
- If more than 5% from desired – change nozzle
- Pressure gauge or flow control simple
Check nozzle flow frequently

Wide range of nozzles available to suit knapsack and boom use.
Single or multi jet, air induction.
All with supporting data
Price range £1.50 – £5.00

Mistblowers

- Not widely used
- All principles of liquid/airflow apply
- Calibration essential
- Drift control essential
- Operator perceptions are key
Check deposits

- Water sensitive paper
- May not fully replicate target
- Simple and relative judgements

Operator

- Operator
  - Skill, Knowledge, Training, Guidance
  - Conditions, alert, work demand?
- What help available?

Note:
- 6 nurseries surveyed, only 2 sites with NRoSo members or BASIS trained spray management

Reminders

- Can deposit be improved
  - Reduce variability, every part of spraying
- Equipment – really suited to task
- Pressures and flows – high levels – are they necessary – run off is waste and harmful
- Calibrate, calibrate, calibrate!
- Best practice in all

Bill Basford, email: mechbasford@aol.com, Tel 07831 141622
Vine weevil management in container-grown ornamentals – Jude Bennison, ADAS

Summary of talk

- Vine weevil biology and damage
- Current HDC vine weevil review
- Chemical control options
- Biological control options within IPM
- Decision-making through the season
- Key gaps in knowledge / technology

Vine weevil biology and damage

- Adults usually active from May/June
- Eggs usually laid June – September (but overwintered adults can lay eggs in May)
- Larvae usually present August - March
- Pupation usually April / May
HDC Review of vine weevil control and research (CP 111)

- ADAS, Harper Adams University, Warwick Crop Centre
- Review scientific and other literature: biology and control
- Consult growers, advisers, suppliers: control experience
- Produce best-practice IPM protocols
- Identify gaps in knowledge

Questions discussed with growers

Experiences, successes and problems with control:
- Chemical control of adults and larvae
- Use of entomopathogenic nematodes
- Use of *Metarhizium anisopliae* (Met52)
- Gaps in knowledge
- Views on knowledge transfer

Chemical control of larvae

Currently approved products for use in growing media (incorporated products peat-based media only):

- thiacloprid (*Exemptor*) – compost incorporation

Imidacloprid (subject to neonicotinoid restrictions i.e. use only in glasshouses, do not move outside until after flowering)
- *Imidacsect 5GR* – compost incorporation
- *Intercept 5GR* – compost incorporation (approved use until 31 July 2015)
- *Intercept 70WG* – drench (approved use until 31 July 2015)
Chlorpyrifos drench against larvae

- Chlorpyrifos (e.g. Dursban WG, Equity)
- Approved as a post-harvest drench for vine weevil control on strawberry
- Not approved on ornamentals but can still be used under the Long Term Arrangements for Extension of Use (LTAEU)
- Growers own risk
- Can be phytotoxic to some ornamentals
- Not IPM-compatible

EAMUs for Chess and Steward, tested against adults in SF/HNS 112

- Chess tested at 400g/ha gave 60% kill
- EAMU 2834/2008 Chess at 60g/100 litres on protected ornamentals (600g/1000 litres)
- Steward tested at 250g/ha gave 71% kill
- EAMU 2905/2008 Steward at 250g/ha on outdoor ornamentals
- Both products more IPM-friendly than pyrethroids or chlorpyrifos, need further testing under commercial conditions

Biological control options

- Pesticide withdrawals / restrictions
- Retail demands
- Sustainable Use Directive (SUD)
  - Integrated Pest Management (IPM) is the way forward
  - IPM: cultural & biological control with compatible pesticides when needed
Entomopathogenic nematodes (various species) for control of larvae

- *Steinernema kraussei* (e.g. Nemasys L) active down to 5°C
- *Heterorhabditis bacteriophora* active 12-33°C depending on product
- Mix of 3 species (SuperNemos) active at minimum 10°C
- Drenching large, dense containerised plants difficult

Met52 for control of larvae (substrate incorporation)

- Entomopathogenic fungus, *Metarhizium anisopliae*
- Active for one year
- Treat substrate in plugs, liners & pots, together with other methods in an IPM programme
- Works faster 20-30°C, very slow below 15°C
- Not effective below 10°C
- Likely to be more effective in spring/summer potting than autumn (larvae from late eggs could survive)

Current research on adult control with fungi (CRD-funded)

Vine weevil adults can also get attacked by entomopathogenic fungi
MOPS (Managing Ornamental Plants Sustainably)

- Testing new chemical pesticides and biopesticides against a range of pests
- Vine weevil experiment 2014
- Host plant Fuchsia, 'standard' pesticide Exemptor
- Coded products in growing medium or drenched

Example IPM programme for vine weevil on herbaceous plants/HNS

- Monitor for live larvae March-April
- Nematodes if temperatures OK
- Consider Met52 in substrate (plugs, liners, pots) for spring/summer potting
- Consider Exemptor in substrate
- Monitor for adults / feeding from April
- Possible adult control (careful selection of pesticide in IPM programme)
- Monitor for live larvae from August
- Nematodes Aug-Oct/Nov if temperatures OK, 2 applications may be needed
Decisions in vine weevil management on susceptible containerised ornamentals

Mid to late-season – April to December

Yes

Yes

No

Is it April to August and leaf notching has been seen within crop?

Yes

No

Is it August to October, larvae found and substrate temperatures are above 5°C?

Consider an IPM-compatible insecticide spray targeted against adult vine weevil.

Monitor for live larvae. If found, move under protection where temperature is suitable for nematodes or wait until spring and treat with nematode drench when substrate temperature above 5°C.

Consider disposing of badly infested plants.

Is it November to December and substrate temperatures are below 5°C?

Yes

If potting on, consider a persistent insecticide or Met52 (Met52 less effective in autumn potting).

Continue to monitor for live larvae and repeat nematode drench after 2-4 weeks if substrate temperatures are still above 5°C.

Key gaps in knowledge / technology

**Vine weevil biology**
- Determine and forecast activity (e.g. egg laying) at fluctuating temperatures at key times of year
- Develop simple practical method for growers to monitor egg laying
- Determine relationship between numbers of adults and larvae (is it worth controlling adults?)
- Identify plant odours/extracts that attract or repel vine weevils (e.g. for lure and kill systems)

**Nematodes**
- Compare species efficacy on HNS
- Train growers to check for viability
- Develop specialist applicator for container plants

**Fungi**
- Develop infection model at different fluctuating temperatures
- Develop cold-active strains
- Train growers in mealworm infectivity test
**Key gaps in knowledge / technology**

**Other IPM methods**
- Potential of plant extracts / botanical biopesticides
- Cultural control eg disturbing pupae (ultrasound?)
- Potential of Atheta against young larvae

**Insecticides**
- Optimum time day/night to spray for adults
- IPM-compatible options and sub-lethal effects
- Novel treatments for growing media
- Is insecticide resistance developing?

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**Thanks for listening**
Decisions in vine weevil management on susceptible containerised ornamentals

Figure 1a. Early season (January to April) decisions in vine weevil management on susceptible containerised ornamentals.

Figure 1b. Mid to late season (April to December) decisions in vine weevil management on susceptible containerised ornamentals.
HDC-funded research on vine weevil

HDC has and continues to support a number of research projects looking at mechanisms to improve vine weevil control. These projects have been listed below for your information and to provide additional information to today’s presentations.

SF/HNS 112 - Evaluation of insecticides and insecticide mixtures for control of adult vine weevil
Undertaken by ADAS from April 2010 to December 2011, this project evaluated the level of control given by Hallmark, Steward, and Chess in semi-field trials. The report can be found here - [http://www.hdc.org.uk/project/evaluation-insecticides-and-insecticide-mixtures-control-adult-vine-weevil-5](http://www.hdc.org.uk/project/evaluation-insecticides-and-insecticide-mixtures-control-adult-vine-weevil-5). It should be noted that variable control was seen in the semi-field trials between years.

SF/HNS 127 - Characterising vine weevil aggregation pheromone for use in traps at soft fruit and nursery sites
This pilot study was undertaken by the James Hutton Institute and NRI between June 2011 and May 2012. The project investigated the volatiles eliciting vine weevil movement and aggregation. The results identified plant-derived compounds responsible for vine weevil behaviour over short distances. The behaviour of adult weevils was not affected by leaf material over long distances in laboratory experiments. Further information on this project can be found in the final report here - [http://www.hdc.org.uk/project/characterising-vine-weevil-aggregation-pheromone-use-traps-soft-fruit-and-nursery-sites-8](http://www.hdc.org.uk/project/characterising-vine-weevil-aggregation-pheromone-use-traps-soft-fruit-and-nursery-sites-8).

CP 089 - Maintaining the expertise for developing and communicating practical Integrated Pest Management (IPM) solutions for horticulture (EMT/HDC/HTA Fellowship)
Awarded to Jude Bennison at ADAS, the funds provide essential underpinning funding to UK-based applied horticultural researchers working in fields of study crucial to the future efficiency and competitiveness of horticultural crops grown in Britain. The project runs from April 2011 to March 2016 and aims to ensure that horticultural businesses benefit from the maintenance of capability for delivering applied research and knowledge transfer to meet the demands for continuing development of practical and cost-effective Integrated Pest Management strategies.

Part of the work included in this fellowship is focused on vine weevil control. Completed trials include the evaluation of the efficacy of entomopathogenic nematodes against vine weevil. The experiment was performed on strawberry plants in growbags at ADAS Boxworth. The report for this element of work can be found here: [http://www.hdc.org.uk/sites/default/files/research_papers/CP%20089_Report_Vine%20weevil trial_2013.pdf](http://www.hdc.org.uk/sites/default/files/research_papers/CP%20089_Report_Vine%20weevil trial_2013.pdf)

CP 111 - A review of vine weevil knowledge in order to design best-practice IPM protocols suitable for implementation in UK horticulture
This project reviewed literature, and consulted with growers, advisers and suppliers to collate current knowledge of vine weevil biology and control. It also aimed to identify key gaps in understanding. The project has designed ‘best practice’ IPM protocols for susceptible crops which will be discussed in today’s presentations. The full report will be available on the HDC website shortly - [http://www.hdc.org.uk/project/review-vine-weevil-knowledge-order-design-best-practice-ipm-protocols-suitable](http://www.hdc.org.uk/project/review-vine-weevil-knowledge-order-design-best-practice-ipm-protocols-suitable). The report discusses in detail the key gaps which could be developed in future research projects as potential mechanisms to improve control. Some of these will be highlighted today and have been copied below as examples:

- The development rates of each stage of the vine weevil life cycle exist for constant temperatures. However, crops grown in the field, polytunnel or glasshouse are subject to different degrees of temperature fluctuation and there may be opportunity to develop vine weevil population/activity forecasting systems, or predict the effect on populations should lethal temperatures occur.

- Certain chemicals can stimulate or inhibit feeding by vine weevil adults and particular plant odours can attract vine weevil. There may be potential to use these to reduce or divert damage.

- There is contradictory evidence on the efficacy of nematodes against young and old vine weevil larvae. Although substrate temperature will guide product choice, when temperatures are within the range of all available nematode products, this aspect needs clarifying for current commercial products to aid optimum timing and product choice according to age of larvae.

CP 124 – MOPS (Managing Ornamental Plants Sustainably)

This project is from December 2013 to January 2016 and is being undertaken by ADAS, Harper Adams University College, Stockbridge Technology Centre and Warwick Crop Centre. Supported by the HNS and PO sectors, the project includes a series of work packages screening new experimental plant protection products for priority pests and diseases. These include whitefly, aphids, western flower thrips, carnation tortrix caterpillar, vine weevil, powdery mildew and rust.

The vine weevil trial will compare current (biological control) options with some new experimental plant protection products. The findings will be reported in the annual report which is due in January 2015.

HDC Publications

There are two HDC factsheets available focussed on vine weevil control:


Responsibly Sourced Growing Media - Material Assessment and Characterisation

Paul Alexander (Royal Horticultural Society)

Introduction

- Government Natural Environment White Paper (June 2011) set voluntary peat-free targets (England only):
  - 2015 all government contract
  - 2020 all retail (hobby) products
  - 2030 all commercial horticulture

- Defra
  - Established industry/NGO “task force” (now the Growing Media Panel)
  - Working groups set up within the GMP
  - Road maps were developed

12 Project areas (for the working groups)

1. Defining and agreeing the environmental problem we are trying to solve
2. What are the non-market methods for protecting peat bogs?
3. Clarifying the GHG emissions associated with different growing media.
4. What do sustainable growing media look like?
5. Sustainable growing media stewardship principles and certification.
6. What is the role of public policy (England, UK and EU) in achieving the solutions to the “non-bog” problems?
7. Performance standard for amateur products
8. What are the price issues for growers and what is left (other unique issues)?
9. Consumer messages and green claims
10. How to measure success and progress
11. Engagement and Commitment – establishing a charter
12. What will the horticultural sector look like in 2030?
Project 4

- Project 4: What do sustainable growing media look like?
- All stakeholders
- The “aspiration”
  - "Make horticultural production in the UK more sustainable"
  - Reduce reliance on any one substrate
  - Shouldn’t disadvantage UK horticulture
- Define “sustainable”
  - long philosophical and technical discussion

Responsible not sustainable

- Project 4: “What do responsible growing media look like?”
- Agreed we wanted to design a voluntary scheme-
  - Differentiate a more responsible product from a less responsible one
  - Compare same material from different sources
  - Practical and simple
  - Robust and meaningful
  - Cheap
- “Consumer promise”

“The promise”

- All growing media¹ are made from raw materials² that are sourced³ and manufactured⁴ in a way that is both socially and environmentally responsible⁵.

1. Substrate at the point of being mixed but not bagged, excluding need for consideration of packaging, transport from the manufacturer to the retailer (or direct to the customer), transport by the customer from the retailer, use by the customer and disposal and decomposition.
2. Including all bulk ingredients (organic and inorganic)
3. To cover the processing of the raw materials up to the point of arriving at the growing media manufacturer.
4. To cover the processing of the raw materials from arrival at the growing media manufacturer to the point of being mixed but not bagged, e.g. processing of wood chips into wood fibre, etc.
5. Economics and price dealt with by the market. As we are not covering that pillar of sustainability using the term responsible rather than sustainable.
### Suggested responsibility criteria

- Proposed environmental criteria
- Habitat (positive and negative impact)
- Fuel/embodied energy/global warming potential – Project 3
- Renewable
- Biodiversity (positive and negative impact)
- Soil conservation
- Resource security/availability/scarcity
- Water use in production
- Waste use/recycling/by-product use
- Pollution (water, soil and air – including odour)
- Alternative market competition (opportunity cost)
- Waste creation and disposal
- Need for additives, e.g. fertilisers
- Land use change
- Hydrological impact
- Proposed social criteria
- Ethical Trading Initiative Base Code (e.g. no child labour, fair wage, etc.)
- Jobs (not exporting industry)
- Community development
- Fair Trade
- Cultural issues
- Rural economy

### Criteria context

- What things are we trying to avoid?
- What do we want to encourage?
  - Good practice / innovation
    - e.g. water recycling / energy capture
  - Avoid double counting
  - Focus on direct implication
  - Where to start and stop measuring
  - Reflect what “we” regard as responsibility
  - “Spirit” of the scheme

### Responsibility criteria to date

1. Energy use (in extraction, transport and production)
2. Water use (in extraction, processing and manufacturing)
3. Social compliance
4. Habitat and biodiversity (impact of gaining the materials)
5. Pollution (effluents as a result of production processes, not fuel use)
6. Renewability (feedstock material)
7. Resource use efficiency (source of material and waste generated in processing)
8. Discussion around land use change and GHG potential
1. This is the replacement time of the material within living cycles at the same site. It is also a proxy for the impact of the material on atmospheric carbon dioxide levels and carbon cycling through the period over which emitted carbon dioxide is recaptured through the regrowth of the raw material on the same site.

2. Renewable materials are considered to be those with a replacement time at the same site within 100 years. For a material to be ‘renewable at all’ it has to have a replacement time at the same site within 1000 years.

3. Unless demonstrated otherwise, on an individual site peat is not normally considered renewable within 1000 years.

4. There is no improvement process for a material within this criterion as a material cannot be made more renewable. Improvement is achieved by replacement of non- or less-renewable materials with more renewable materials.

5 years: “annual” crops
50 years: softwood v hardwood
100 years: common cut off for renewable (human lifespan)
1000 years: geological time frame (perlite etc)
Example - Habitat and biodiversity (Master Tree)

Is the material mineral based?

Is the material wood based?

Is the material coir?

Is the material peat?

Can the batch* be traced back to its original extraction or cultivation site?

Can the batch* be traced back to its original extraction or cultivation site?

Is the site subject to a national / international conservation designation?

Can you prove there were no notified species or priority habitats present before extraction commenced, or could any impact be adequately mitigated against**?

Does further drainage for peat extraction have a negative impact on an adjacent habitat?

Has investment in habitat and biodiversity improvement/ protection occurred on that site or adjacent site within 10 years before extraction commenced?

Was the land previously agricultural/ forestry prior to commencement of commercial extraction?

Example - Habitat and biodiversity (peat)

Can you prove there are no notified species on the adjacent site or it is not a priority habitat, or could any impact of further drainage at the original site be adequately mitigated against**?

Has investment in habitat and biodiversity improvement/ protection occurred on that site or adjacent site within 10 years before extraction commenced?

Was the land previously agricultural/ forestry prior to commencement of commercial extraction?

Scoring (draft approach)

• 0-5 = red (worst practice)
• 6-15 = amber
• 16-20 = green (best practice)

• Every bulk material in a product assessed proportionally (to the mix)
• None of the flow charts return all 20 possible scores (flexible)
• May set limits in certain criteria for unacceptable
Presenting the information

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>18</td>
</tr>
<tr>
<td>Water</td>
<td>20</td>
</tr>
<tr>
<td>Social compliance</td>
<td>20</td>
</tr>
<tr>
<td>Habitat and biodiversity</td>
<td>3</td>
</tr>
<tr>
<td>Pollution</td>
<td>0</td>
</tr>
<tr>
<td>Renewability</td>
<td>5</td>
</tr>
<tr>
<td>Resource use efficiency</td>
<td>11</td>
</tr>
</tbody>
</table>

- Present total score?
- Show all criteria scores?
- Allow for comparison
- Could they still mask problems?

“Red lines”

- Does the product total score meet the promise in every sense?
- Do all of the criteria scores meet the promise?
- Do all of the ingredient scores meet the promise?
  - Minimum acceptable score?
  - Risk of “greenwash” or worse?
- Should anything be completely excluded no matter what proportion it is in a mix?
  - Child labour?
  - Peat from a newly opened pristine habitat?
- This discussion continues

How could the scheme work?

- Independent management body using auditors
- Retailer led (asking suppliers to be part of scheme)?
  - Continual improvement mechanism?
    » Retailer to set minimum score?
    » Revised scores?
    » Choice editing?
- Initial aim is to target the manufacturer to retailer link
  - business to business
**Project 7 – Performance standard**

- Multipurpose product
- Based on growth of 3 indicator species
- Performance standard should increase
  - Retailer confidence
  - Gardener confidence
- Experience of this should feed into other products

**Influencing practice – “pull through”?**

- Product choice (for all) based on:
  - Accessibility in the market place
  - Delivery time availability
  - Cost
  - Quality
  - “Responsibility”
  - The “buyer”
- Choice edit for the gardener?
- Logo may help sales
- Growers?

**Where do growers fit in?**

- Focus on the plant not the media
- Media small proportion of the value of your finished product
  - Changing the media could increase:
    - Costs
    - Increase other environmental issues e.g. increased water or electricity use
    - Risks (consistency and reliability)
Grower “benefits”?  

- GMP proposed combining P4 and P7  
  - “Responsible” sourced  
  - Media performance standard “assurance”  

- Is this enough of a reason for growers?  

- Are there other potential incentives?  
  - Water saving?  
  - Different (shorter?) growing period?

Europe  

- UK NGO's led the debate  

- Responsibly Produced Peat (RPP)  
  - RHP, Dutch government etc.  
  - Good and bad points (same as P4!)  

- EPAGMA (European Peat and Growing Media Association)  

- Conversation on-going  

- This is not a competition for schemes!

Where are we?  

- On-going work  

- Accompanying document  
  - Details, information, assumptions and default values  

- “Calculator” being developed  

- Scheme management (and auditing process)  

- Manufacturers are testing the questions / scoring system  
  - Different interpretations  
  - Flushing out problems
What we do have? (In my opinion)

- Industry led
- Differentiate a more responsible product from less responsible product
- Not ruling in or ruling out materials
- Crude in places
- Improvements in the supply chain
- Improving the sustainability of horticulture

Thank you for your attention

Any questions?
Notes
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

- 16/13 Bacterial diseases of herbaceous perennials
- 15/13 Management of bacterial canker of cherries and plums during nursery production
- 12/13 Lupin anthracnose
- 04/13 Ornamental plant production: The use of chemical plant growth regulators on protected crops
- 01/13 Practical measures to prevent and manage insecticide, fungicide and herbicide resistance for horticultural crops
- 25/12 Non-chemical weed control for container-grown hardy nursery stock
- 18/10 Host plant range of vine weevil
- 17/10 Control of powdery mildew diseases on hardy nursery stock and herbaceous perennials
- 15/09 Control of rose downy mildew
- 03/09 Biobeds for treatment of pesticide waste and washings
- 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
- 15/07 Control of leaf miners on pot and bedding plants
- 10/07 Guidelines on nursery hygiene for outdoor and protected ornamental crops
- 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
- 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
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
19/03 Sudden Oak Death / Ramorum Dieback – implications for the HNS industry
02/03 Vine weevil control in hardy nursery stock
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

Sector Review Magazines

- Media Review magazine 2012
- Ornaments Reviews 2013

Crop Walkers’ Guides

- Hardy Nursery Stock Crop Walkers’ Guide
- Pocket Weed identification guide - out of stock until August 2014

Wall Charts

- Common pests and diseases of hardy nursery stock

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
- 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

**DVD’s**

- 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

**Your Order**

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.

Name..............................................................................................................................................................................
Address......................................................................................................................................................................................
Email.........................................................................................................................................................................................
Tel No .........................................................................................................................................................................................
HDC Levy payer/Associate No............................................................................................................................

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