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# Compost use in Horticulture & Field Horticulture

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# Agenda

- Introduction to WRAP
- How is compost made on a commercial basis?
- BSI PAS 100
- The Benefits of Compost
- Research & Development
- The Growing Media Specification
- Compost use in Horticulture and Field Horticulture
- Case Studies
- Suppliers List
- Contact Details

# The role of WRAP

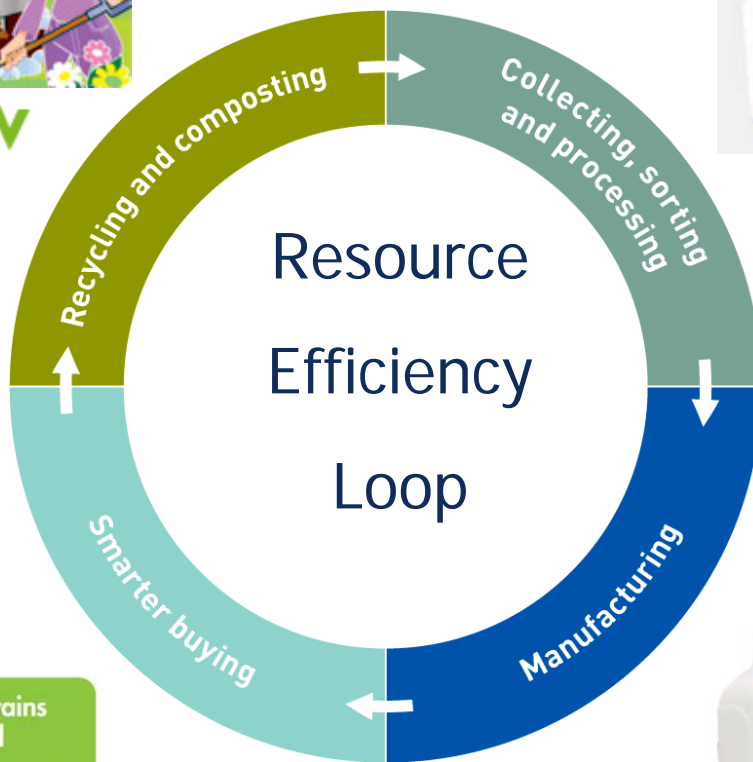
**“to minimise the production of waste  
and maximise the recycling of  
materials”**

Specifically:

- **Minimising household waste** (e.g. food and packaging)
- Promotion of **consumer recycling**
- Increasing **collections** of recyclate
- Increasing recycling **infrastructure**
- Creating **markets for recyclate**



94% of English households now have kerbside recycling



This product contains recycled material

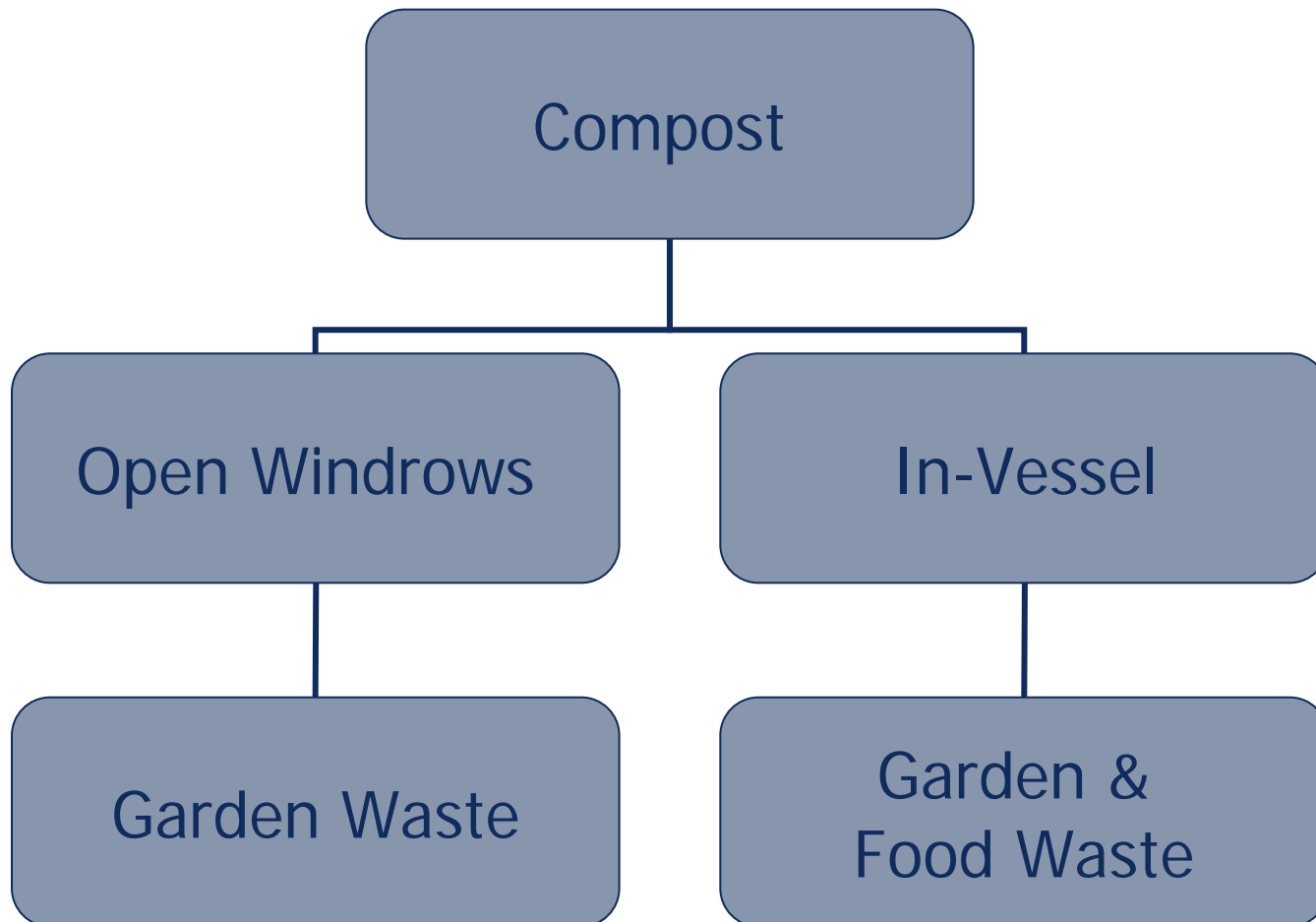




# What is compost made of?



## How is compost made on a commercial basis?



## Open Windrows



## In-Vessel



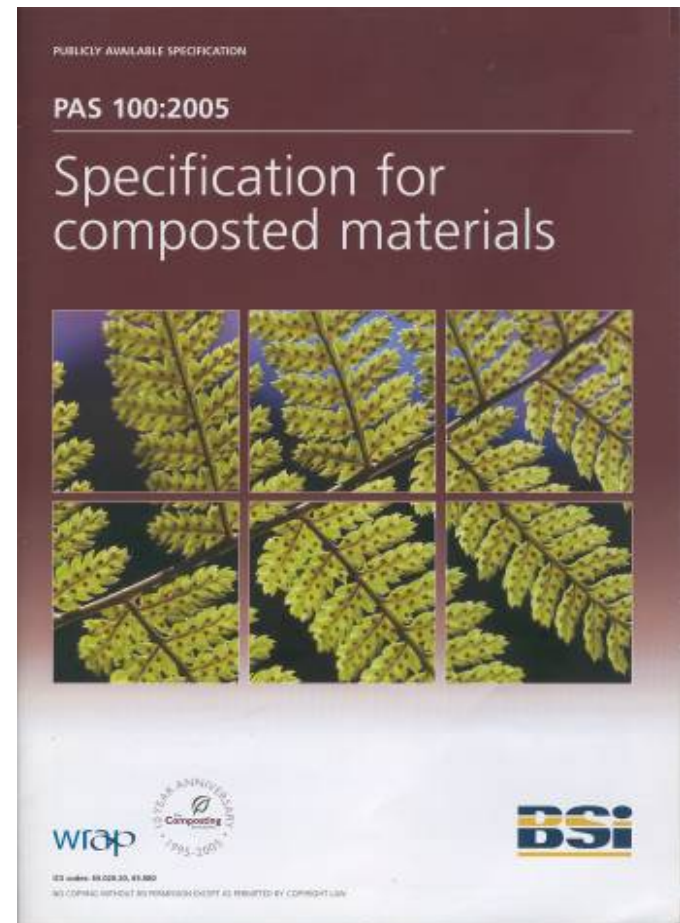
# The Composting Process

- Biodegradable waste
- Shredded
- Formed into windrows
- Turned weekly
- 12 -16 weeks
- **Sanitisation**
- **Stabilisation**
- Monitored temperature & moisture
- Screened
- Sampled and sent to lab for analysis
- Compost product



# BSI PAS 100

- Developed in partnership with The Association for Organics Recycling (AFOR) formerly TCA and in consultation with the industry
- Ensures quality of compost available in the UK is safe, consistent, reliable
- Provides a tool to allow customers to specify quality composted materials
- Specification covers process controls and product quality limits
- 2005 - updated to include reference to ABPR
- Currently being review and due to be published in Summer 2009
- 3rd party certification provided by independent bodies – Organic Farmers & Growers and Checkmate International



# Compost Products

- Soil Conditioner – Typical grades include:
  - 0-10mm
  - 0-20mm
  - 0-25mm
  
- Mulch 40mm+
  
- Growing Media Component
  - 0-5mm
  
- Top Dressing
  - 0-10mm
  
- Lawn Dressing
  
- Topsoil



# Benefits of Compost Use

- Reduced need for fertilisers
- Increased crop yield and plant quality
- Better plant establishment, survival & growth
- Improved water conservation & reduced watering requirements
- Disease suppression and reduced incidence of plant disease
- Reduced pesticide usage
- Greater workability of soil and increased traffic tolerance
  
- Environmental benefits
  - Reduced soil erosion
  - Reduced leaching of nitrate into groundwater
  - Flood prevention

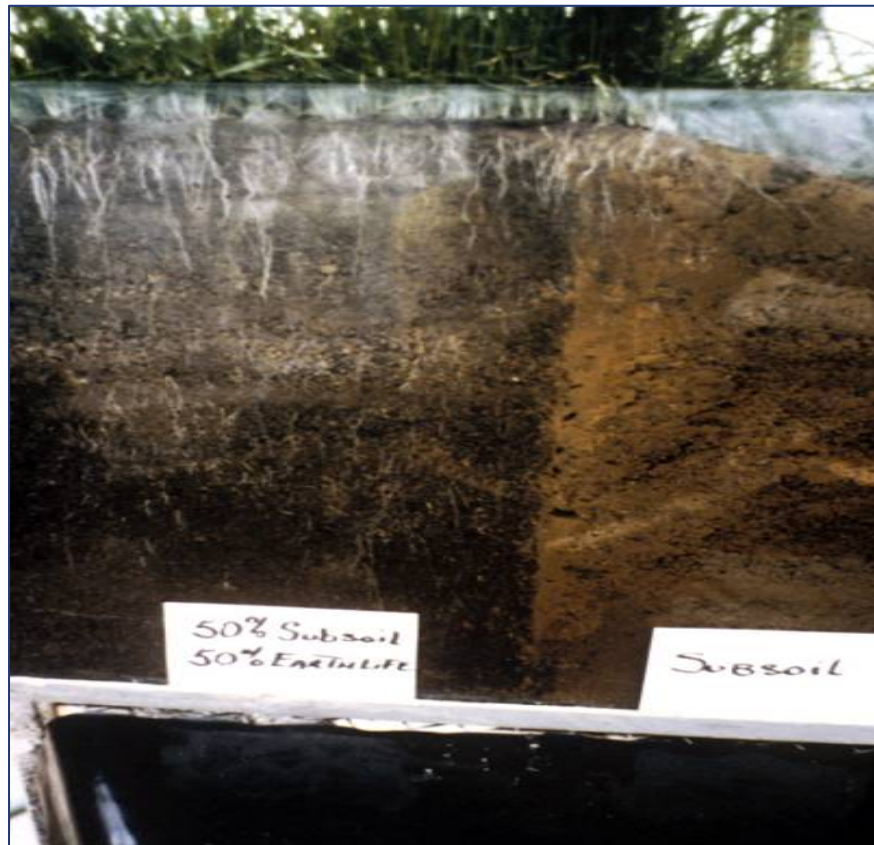
# Increased soil water holding capacity



# Improved root growth



## Reduction in soil bulk density



# Research and Development



## Research & Development

### **Growing trials year long trials 2006, 14 nurseries**

Peat free & peat-reduced mixes & standard grower mixes  
185 species of plant, 8000 plants

### **Research into pathogen eradication**

Addressed concerns over contamination of the compost product by potential pathogens in the feedstock.

Suppression of Liverwort and Moss in peat free mixes

Liverwort on ivy – Star Plants, Sussex

Moss on holly – Smyths Nursery, N.I.

# Pathogen Eradication, Star Plants, Sussex



# Pathogen Eradication, Smyth's Nursery, N.I.



# Research & Development continued

## Disease suppression

- Particularly noted in peat free mixes
- Leaf disease *Xanthomonas hederae* on ivy – Star Plants, Sussex

## Nutrient content

- Better understanding of level of nutrients within compost
- Generally slow release
- 25% compost inclusion can provide all base nutrients that plant requires (except Nitrogen)

## Star Plants, Sussex



STD



PF

*Hedera canariensis* 'Variegata'

# Growing Media Specification

**Guidelines for the specification of composted materials within growing media**

In partnership with GMA

Defines compost quality for up to 33% incorporation in growing media



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# Compost Use in Horticulture & Field Horticulture



## Where can compost be use ?

- Compost is well established in the horticulture & field horticulture sector
- Opportunities to add value:
  - Tree & Shrub planting
  - Nurseries
  - Soft Fruit & Top Fruit
  - Vegetables

# Tree and Shrub Planting



- Rapid plant establishment
- Improved plant survival and growth - especially in dry conditions
- Tree planting trials with Somerset County Council
- Tree growing trials with Barcham Trees and Trees Please

## Barcham Trees Trial

- Large-scale growing trial at Barcham Trees, using a representative range of twelve popular ornamental tree subjects, a peat-free growing medium based on PAS 100: 2005 green compost (PF) and bark has matched the nursery's standard growing medium (STD) in terms of commercial performance and handling properties.
- **Conclusion:** results of this project show that use of peat free as the basis of a growth medium produces trees with equal vitality, foliar colour, nutrient concentration, stress tolerance and growth in comparison with a standard peat/bark based mix currently used within the tree production industry during the first year of growth.
- [http://www.wrap.org.uk/downloads/ORG33-015\\_-\\_barcham\\_final\\_report\\_-\\_approved.ac21d5c6.4556.pdf](http://www.wrap.org.uk/downloads/ORG33-015_-_barcham_final_report_-_approved.ac21d5c6.4556.pdf)

# Nurseries – Jack Moody Nursery

Established as a landscaping company 1963, nursery opened 1982

Clients include re-distributors, landscape contractors and local authorities

Growing media - peat-free mixes using up to 30% PAS100 compost

Used for growing all the nurseries plants

‘Using compost in the nursery has helped us to reduce the amount of disease we have to treat. It has also led to a reduction in the amount of weeds in pots – which means less time devoted to nursery weeding’

Robert Moody, Managing Director



## Porters Horticulture



Trials of reduced peat growing media in production of spring pansies commissioned by the Clean Merseyside Centre

6 reduced peat mixes - 60% peat, 40% compost + ammonium nitrate and standard nursery mix - 100% peat

Vigour and final plant quality superior in reduced peat mixes

All mixes gave good foliage colour and rooting

## Remade Kent & Medway Compost Mulch Trials, 2004 – Present

- 4 t mulch per 100 m row used for young trees (Braeburn and Cox)
- Moisture levels monitored for 18 months
- Protected trees from moisture stress
- Compost lasts 2 years instead of 1, not blown by wind and less fire hazard than straw
- 36% increase in shoot no., total shoot length doubled

## Remade Kent & Medway Trials 2005

- Yield of Victoria plums 13% higher per tree with compost mulch compared to straw mulch (46% inc. compared to unmulched trees)
- May and June rainfall well below 30 year average
- Annual weeds suppressed but neither mulch controlled perennial weeds



## Results - compost as a mulch



- Conserves soil moisture, better than straw
- Fruit trees less prone to water stress, particularly relevant in drier areas/years
- Extension growth improved
- Annual weeds suppressed
- Nutrients slowly released into soil
- Yield and fruit size can be increased
- Mulch compost should have low fines content (<10 mm particles)

# Top Fruit and Soft Fruit

- Trials on the use of compost as a mulch in apple orchards 2006/2007 following on from those started in 2004
  - Strawberries, raspberries & red currants
- 
- Full Report Published January 2008 and found at :  
[http://www.wrap.org.uk/downloads/Report\\_-\\_Fruition\\_Kent\\_Orchard.98bfcdf0.6251.pdf](http://www.wrap.org.uk/downloads/Report_-_Fruition_Kent_Orchard.98bfcdf0.6251.pdf)



## Vegetable crops –Westrope Farms



- 2,100ha light sandy soil,
- Long term field trials (10 years)
- Onions were grown in a difficult season - no rain
- Where compost was applied the onions established more rapidly
- July was very wet but the improved aeration from better structure within the composted plots allowed crops to grow well.
- Soil analysis showed improved organic matter and nutrient levels

## Results

- Improved soil bulk density, structure and soil crumb
- Increased soil organic matter and nutrient levels after long term use.
- Adequate supply of P and K from the compost.
- Winter cabbage and salad potatoes appeared greener with a more even crop canopy, possibly due to additional soil nitrogen released from the compost.
- A 27% yield increase in onions in a difficult season.
- Nitrogen release was confirmed to be slow.
- 10% water savings (equivalent to extra 8mm in the 0 – 40cm profile).

# Langmead Farms

- Largest growers of baby leaf salad in Europe
- 4 replicated trials - 2 on Spinach and 2 on Romaine lettuce in 2007. Both on intensively cropped farms (different soil types)
- 3 different application rates 15, 30 and 45 t/ha and a control with no compost
- All plots received basal and top dressing of fertiliser

## Results

- Compost increase yield spinach by 9% in first trial and 10% in second
- Romaine crop showed 0.1, 6 and 7.2% increase with rising compost rate and 2, 6 and 17% on second trial

## Langmead Farm case study



The following was unaffected by compost applications:

- Crop nutritional value
- Shelf life and taste
- Weed populations
- Levels of nitrate within crop

Further information:

[http://www.wrap.org.uk/downloads/Report\\_-\\_Langmead\\_Farms\\_Ltd1.d287cba7.6220.pdf](http://www.wrap.org.uk/downloads/Report_-_Langmead_Farms_Ltd1.d287cba7.6220.pdf)

## Current WRAP trials

### **Marshall Brothers Ltd, Butterwick, Lincolnshire**

- Warwick HRI Kirton – food included compost use on cauliflowers.
- Assessments are showing encouraging results which will be published later in 2009.

### **Bagthorpe Farm, Docking, Norfolk**

- Garden Organic (formerly HDRA) – green compost use in the organic sector on calabrese and parsnips.

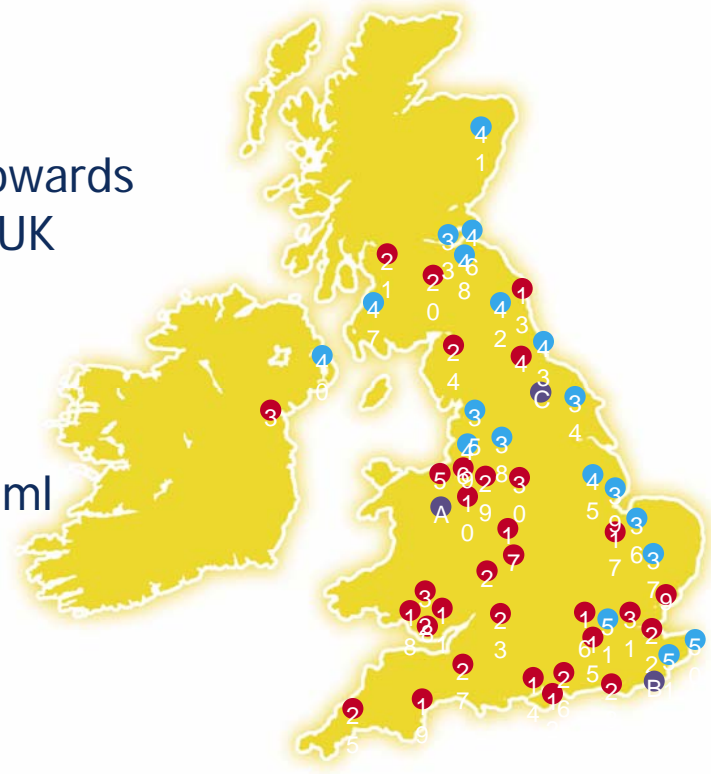
# Suppliers of BSI PAS 100 compost

165 quality assured (certified to or working towards PAS 100) compost producers throughout the UK

3 sites in Northern Ireland

Supplier List:

<http://www.wrap.org.uk/composting/index.html>



## Contact Details

[www.wrap.org.uk](http://www.wrap.org.uk)

<http://www.wrap.org.uk/composting/index.html>

<http://www.wrap.org.uk/composting/publications/horticulture.html>

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