

**HARPER ADAMS UNIVERSITY COLLEGE
RESEARCH STUDENTSHIP**

The use of composts and other recycled materials in green roof growing media

Background

It has been known for many years that green roofs have the potential to reduce the risk of flooding through run-off attenuation and energy costs due to heating and air-conditioning owing to their insulating properties. These features along with additional urban biodiversity, increased roof life, reductions in the urban heat island effect and social benefits have resulted in a growing awareness of the benefits of green roofs. It is proposed that many of the permanent structures to be created for the 2012 Olympic Games will have green roofs. Green roof growing media need to have specific properties to help plants cope with environmental extremes of temperature and moisture encountered on roofs. They also need to be of low density to aid installation and reduce forces on buildings' structures. Media are usually based on a mixture of mineral and organic substrates e.g. fired clay granules, crushed brick or tiles or coir. Not all of these substrates are recycled or sourced locally. Choice of these substrates is often influenced by German (FLL) guidelines. Where green-waste compost is used in green roof media its inclusion is based on informal experience rather than objective research. There is therefore a need to develop an in-depth understanding of the issues relating to the use of green compost in green roofs.

Objectives

1. To evaluate the chemical and physical properties of blends of green waste and crushed brick and other recycled materials.
2. To determine the suitability of green compost based media for the development of successful intensive/flower meadow and extensive/sedum planting.
3. To evaluate the performance of green compost based media for run-off attenuation and leaching and stability in use.

Collaboration and Supervision

This project is funded by WRAP (Waste and Resources Action Programme) and Harper Adams University College (HAUC) and is a collaboration between Vital Earth (Derby) Ltd, HAUC and The Green Roof Centre, Sheffield. The student will be based at HAUC and supervised by Dr Martin Hare, Dr Nigel Hall and Dr Jim Monaghan of HAUC and Dr Arnie Rainbow of Vital Earth.

Methodology

A range of growing media based on green compost and unused crushed brick and tile will be evaluated for a range of chemical and physical properties. These laboratory-based bench tests such as organic matter content, cation exchange capacity, bulk density, air-filled porosity and water-holding capacity will be used to identify media for further study. Suitable media will then be evaluated in small-scale simulated green roofs. These deck tests will allow roof incline and simulated rainfall patterns to be investigated. It is envisaged selected media will then be installed and monitored in up to three commercial roofs. Further details of the field and glasshouse research facilities at Harper Adams are available at: <http://www.harper-adams.ac.uk/groups/crops/CERC/>

Library and general facilities:

http://www.harper-adams.ac.uk/prospective/learning_facilities/