

## INTRODUCTION

Green roofs have been standard construction practice in Europe since 1970 resulting in 10 million m<sup>2</sup> of planted roofs today.

Initially the green roof systems consisted of developed swards of selected meadow grass and wildflower mixtures. A good example of this type of roof can be seen at the Shropshire Hills Discovery Centre, Craven Arms, Shropshire (Fig 1). Although relatively successful the system has various establishment and long term maintenance issues which include the difficulty in the establishment of an effective sward and high ongoing maintenance.

Meadow grassland systems have subsequently been replaced with planted systems utilizing shallow rooting Sedum species and in some cases ornamental perennials and shrubs.

## SYSTEM TYPES

The system which would be of most interest to CALU would be the one which incorporates alpine plants such as Sedums. A successful application of this type of system can be seen at the Welsh Assembly Government business park development at Parc Aberporth in Aberporth Ceredigion (Fig 2). This particular development was planted with Sedum turfs from a mixture of different species installed on 60mm of soil media in 2005 and has now established into an attractive close knit sward of flowering plants attracting wildlife and providing many environmental benefits

Current systems employ the use of lightweight modules constructed from recycled plastics which allows for rearrangement or removal for roof maintenance access. The modules are placed directly onto the roof membrane. Such module systems incorporate 60mm depth of soil media and are planted with a mixture of sedums. Box 1 shows suggested sedums and other species to use.

Generally no irrigation, fertilization or maintenance is required. A fully saturated 60mm module system weights approximately 48kg/m<sup>2</sup>.

Other Sedum turf systems can be produced more conventionally as a field grown crop. Sedum is 'sown' or planted into a 50-60mm lightweight soil medium on porous membrane strips laid directly over a prepared bed or field base. Turfs are harvested after two years as cut rolls similar to grass turf.



Fig 1: Shropshire Discovery Centre



Fig 2 Parc Aberporth



Fig 3: Sedums in green roof

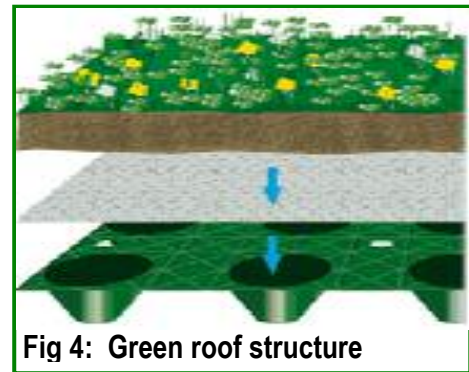
### Box 1: Suggested plants for green roofs

*Sempervivum* sp, *Sedum acre*, *Sedum spurium*, *Sedum spurium reptestre*, *Sedum album*, *Sedum floriferum*, *Sedum hybridum*, *Sedum sexangulare*, *Sedum 'Coral Carpet'*. Other mixtures can include *Dianthus deltoides*, *Origanum vulgare* and *Prunella grandiflora*.

## GREEN ROOF BENEFITS

The benefits of green roof installation are many and include: -

- **BIODIVERSITY**  
Creating a rich food source for insects and birds and contributing a valuable link in the food chain
- **AESTHETICS**  
The visual appearance can significantly improve the qualities of building development projects by the creation of roof gardens.
- **ROOT WATER MANAGEMENT**  
Rainwater runoff is reduced by the retention of water within the planting.
- **SOUND INSULATION**  
Tests have shown that indoor noise pollution is reduced by the combination of plants, soil medium and layers of trapped air.
- **INSULATION**  
Green roofs can significantly reduce the heat load of a building during warm weather and can provide thermal insulation during cold weather.



**Fig 4: Green roof structure**

## PRODUCTION POTENTIAL

The rapidly increasing market for green roofs will create a market for Sedum production in the Principality. Currently there are no large-scale producers in Wales, the nearest being in the East Midlands and Somerset. Production is a relatively straightforward process if the turf system is adopted.

The Welsh Assembly Government has invested heavily in sustainable development. Sustainability is one of the corner stones of environmental policies in Wales and green roofs can contribute significantly to their sustainability policy.