

BIOCYCLE

JOURNAL OF COMPOSTING & ORGANICS RECYCLING

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BIOSOLIDS HELP FIGHT THE BATTLE AGAINST GLOBAL WARMING:

Increasing soil carbon reserves via products like biosolids is a logical way to sequester carbon — a critical step in combatting climate change.



GREEN ROOFS GROW WITH COMPOST • RESIDENTIAL ORGANICS COLLECTION OPTIONS
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POSTPETROLEUM AGRICULTURE • UTILITY TURNS BIOMASS INTO RENEWABLE ENERGY

Photos courtesy of Chuck Friedrich



An intensive green roof uses media over 4-inches in depth, and is the more traditional roof top garden. A green roof project in Atlanta — under construction (inset) and completed — is shown.

Green Roofs Grow... With Brown Compost

Benefits include runoff reduction, storm water flow mitigation, extended roof life, improved air quality and better insulated buildings.

Ron Alexander

LONG USED for aesthetic reasons in the landscaping industry, rooftop gardens are increasingly recognized for their environmental benefits. Regardless of the reason, composters are benefiting — because compost is a popular component of green roof media.

Green roofs are typically classified into two categories: intensive (traditional rooftop gardens) and extensive gardens. Generally, extensive gardens use a more shallow layer of growing media (2 to 4 inches), while intensive gardens use media over 6 inches in depth. Some even add a third category — semi-intensive gar-

dens which use media 4 to 6 inches in depth. Traditional rooftop gardens are more expensive to construct than are extensive gardens, and usually establish larger plant materials. Extensive gardens often use a lighter weight media and establish specialty plants that are more self-sustaining (e.g., sedums). Both intensive and extensive gardens are good for reducing storm water runoff (up to 78 percent was found in a recent North Carolina State University study) and have shown the ability to bind heavy metals found in degrading roofing materials. Overall, benefits of green roofs include:

- Precipitation retention and runoff reduction;
- Storm water flow mitigation;
- Pollutant reduction;
- Extended roof life (from 20 to 40 years because it absorbs destructive ultra violet rays);
- Helping to cool urban areas and insulate buildings;
- Potential to improve air quality (oxygen release, carbon sequestration);
- Creates wildlife habitats;
- Buffers noise.

Green roofs can even provide additional value in cities as they can allow for land usage for agricultural production, health/recreation, aesthetics/art, as well as provide therapeutic value. However, since the conditions on green roofs are somewhat hostile, choosing both the proper plant materials and media recipe are crucial.

Green Roof conditions include:

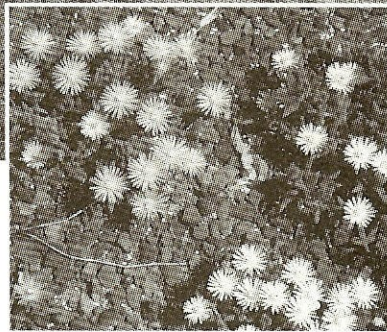
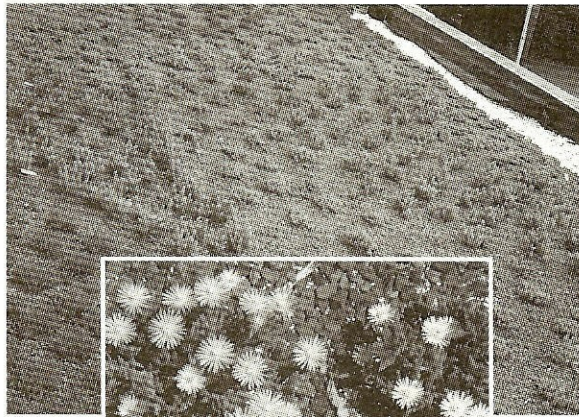
- Thin media, primarily mineral media based;
- Fractured media, little or no capillary action;
- Long periods of drought and heat;
- Wet and cold in the winter;
- Windy;
- Low maintenance.

For these reasons, plants used in green roof construction must meet the specialized requirements of the particular green roof project. Succulent and desert plants are often used in ex-

tensive gardens. Sedums are one of the most popular plants used, as they have the ability to go 60 to 80 days without water.

Like any good growing media, a green roof media should consist of 50 percent solid particulate matter, 25 percent water and 25 percent air. A combination of lightweight aggregate, sand and compost are often specified to meet the media requirements. Lightweight expanded shale, slate and clay are the most popular aggregates. They are produced by firing shale, slate and clay in a rotary drum at temperatures in excess of 2,000 F°. A proper green roof media will possess the following properties: Good drainage and aeration; Good water holding capacity; Good nutrient holding capacity (CEC); and Permanent, light weight, but sturdy, and stable media (must physically support the plants).

The lightweight aggregates are completely mineral in nature, so a high quality organic matter source is required within the media to help with moisture and nutrient retention. Compost has become the obvious choice in many areas of the U.S. However, a balance must be created between plant and project require-



An extensive green roof garden uses a shallow layer of growing media, typically 2- to 4-inches. Desert plants, such as sedum (inset), are often used as they have the ability to go 60 to 80 days without water.

ments, competing plant species and the weight of the media (based on the roofs allowable "load"). It is also desirable for the surface of media to be dry to reduce weed competition, but moist below. Keeping the mois-

ture deep into the media will encourage the plant roots to grow deep, thereby being more drought tolerant. Therefore, the use of organic matter in the media, especially in extensive systems, is more limited. Of course, the overriding goal is to create a media that allows for the plants to quickly "knit" into.

Green roof media recipes must be designed with the specific project in mind, and for that reason, it is difficult to provide a media recipe that will perform well in all situations. Some examples are:

Wayne King of EARTH Products offers an extensive green media containing 75 percent expanded clay, 10 percent river sand, 10 percent sandy clay loam and 5 percent STA approved compost. King has found that expanded clay is the lightest and most porous material to use, which is attractive in that it can be mixed with organic components like compost in greater amounts (thus improving water and nutrient holding capacity) and still meet the load bearing requirements of most roof designs. Chuck Friedrich of Carolina Stalite Company produces green roof media containing 55 percent expanded slate, 30 percent USGA approved sand and 15 percent compost.

High quality composts (and even vermicomposts) are now being used as the organic component in many green roof media. Compost's ability to hold moisture and nutrients, as well as bind and degrade certain pollutants, makes it an almost perfect fit in this application. However, this niche application will require high quality and consistent composts to be used in order to assure both quick plant establishment and long-term success. These composts must be stable/mature, to assure minimal shrinkage and no plant damage, and they must possess the horticultural characteristics (pH and soluble salt content) compatible with the plants being established. Remember, market-wise composters must be assured that they are making high quality products (that means testing regularly) before they try to sell into a new specialty market and niche application. Marketing your compost as a green roof media component is yet another opportunity for the market-wise composter. ■

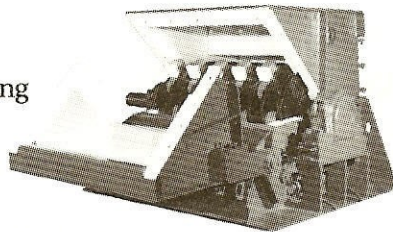
Author of the The Practical Guide to Compost Marketing and Sales, Ron Alexander is a trained horticulturist with 20 years of experience in compost end use.

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