

Gardens in the Sky

Growing Food on Rooftops

What can you do to modify the heat island effect of small, older buildings? Since the owner of this Chicago store could not add too much weight to the roof, a system that contains 80 – 90% perlite by volume was chosen. The result is that each of the sections shown in the photo is covered with a nominal 100 mm (4 inches) of predominately perlite growing medium.



Roof of an organic grocery store in Chicago before and after planting



Photos: Repkin Biosystems

The Process

Each section was formed with an initial layer of horticultural cloth, designed to thwart taproot infiltration through the roof membrane. Then horticultural grade perlite was mounded to approximately 100 mm (4 inches) in the middle with sides that sloped down to a feathered edge. Organic compost or soil amendment dressing was applied over the perlite and to reduce wind loss, the bed is kept moist or protected until plants are established. Ground covering and nitrogen fixing plants, such as clover and legumes, were initially planted. Clover, such as shown below, was later interplanted with a variety of vegetables, herbs, grains and flowers in this no-till system. Complementing the usefulness of the growing system was the ability to harvest and sell the products in the store below the rooftop garden and at a local farmers market.

Recent research performed at the Lady Bird Johnson Wildflower Center in Austin, Texas indicates that the mix chosen for this roof will have the maximum impact in terms of thermal insulation and water retention during “rain events.” As needed, additional watering can be supplied by drip irrigation, conventional sprinklers or manual application.

About Perlite

Perlite is a volcanic mineral that pops like popcorn when heated quickly. Horticultural perlite only weighs 65 – 130 kilograms/cubic meter (4 to 8 pounds per cubic foot). When used in a roof top garden, a maximum, saturated weight of 300 – 520 kilograms/cubic meter (16 – 32 lbs/cubic foot) should be used in calculations to determine structural support needs. Additional facts on horticultural perlite may be obtained from your regional perlite expander. Go to the Perlite Institute website (www.perlite.org) for a list of supplier members.

All this & food too!

In addition to reducing the heat island effect of buildings, storm water runoff is treated, the life of the roofing is extended, and habitat is created for flora and fauna.

Mission Accomplished

The use of this high percentage of perlite in the roof garden achieved the intended environmental and financial goals of:

- plant growth
- low maintenance
- lightweight insulation
- innovative use of space
- water retention
- local sourcing of food
- affordability
- productivity improvement



Swiss Chard planted among clover that is left in place