

Vertical greening with a textile based system

Urban green infrastructure, such as vertical greening is a great tool for a sustainable development of cities.

Hochschule Geisenheim University is testing which plants are suitable for vertical greening. Our goal is to provide a higher selection and diversity of plants.

In our research project "Begrünte Fassadenkacheln" we developed a modular, textile-based system for vertical greening. The textile-based carrier material is constructed from a polyester-spun fabric which is processed to a coarse warp-knit fabric, which contains a water-saving element. There is no substrate so a permanent irrigation with a nutrient solution is essential. In this experiment the textile vegetation layer is constantly irrigated using a closed irrigation system with a nutrient solution.

The green-textile vegetation layer has been examined since June 2017. The panels are fixed on experimentwalls which are angled towards north, south, east and west, after having initially been pre-planted in the greenhouse. We test different plant methods like sowing, seedling, shrub and geophyte. For the plant choice we considered the wall direction, the aesthetic and, depending on the system, whether plants have a moist or wet habitat.

There are three different planting variants: sowing, ground cover(+geophyte), cascade(+geophyte), control (without plants), for sunny (south), semi-shaded (east/west) and shaded (north). Cascade means plants with a hanging growth and height of 40-50cm. Ground coverplants have a creeping growth with a height up to 20cm. The variant sowing is a sowing mix comparable to a marsh area.

We document the development of the plants thus providing a first impression of which plants are suitable for vertical greening.

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