

### Application of hydroseedings in the field of roof-grassing

Regarding the grassing of roof tops, aspects such as heat exchange and water balance as well as the nutrient supply play an important role. In general, it can be said that roof tops to be grassed are subject to drying out easily and to lacking a sufficient nutrient supply. The water supply of plants growing on a roof depends on the amount and distribution of the precipitations as well as on the water storage capacity of the substrate. The nutrient supply depends on the amount of organic substance contained in the substrate and its biological degradability as well as on the additionally supplied nutrient resource and its long-lasting effect.

The plants which are used for roof grassing must have the following properties:

- Resistance to dryness
- Good rooting
- No deep-reaching roots
- Low growth
- Low nutrient demand
- Easy care

Sedum-sprout-mixtures are used in roof grassing in the amount of 50 g/m<sup>2</sup> or grass-weed-mixtures of up to 5 g/m<sup>2</sup>.

To prevent the seeds and sprouts from being blown away by the wind and washed away by rain, respectively, the plants can be *fixed* in a suitable way. This can be done by simple fixation of the sprouts or by the combined method of *hydroseeding* (seeds, fertilizer, stabilizer, erosion protection fibres).

As regards the *hydroseeding* method, the seeds, stabilizers and erosions protection fibres and, if required, suitable fertilizers or nutrient carriers are mixed with water in a tank with a stirring device. The so-obtained solution is pumped up via hoses and sprayed by nozzles onto the roof; the water is serving as the transportation medium. Therefore, care has to be taken that the hoses are intact and clean, so that no part of the building is getting dirty because of the hydroseeding. The grassing mixture has to be spreaded via hand nozzles at short distance.

The hydroseeding method allows to distribute even very small quantities of seeds, e.g. 1 g/m<sup>2</sup>, on the roof. It is almost impossible to apply such small quantities in a correct way manually.

Whether it is possible to apply sedum sprouts in this way, depends on the pumping system and the size of sprouts in the first instance. It has to be guaranteed that the sprouts reach the roof surface without any damages. Stabilisation and/or hydroseeding are especially important in case of *inclined roof surfaces*. In that case, protective measures against erosions by wind and water are necessary to fix the sprouts, seeds and fertilizer particles.

Depending on the final state of grassing and the kind of substrate used, fertilization should be done by using organic nutrient carriers. We recommend in this case our product **HYDROSEED** which is a long-lasting nutrient source with slow-release effect.

### Technical description of **HYDROSEED**

**HYDROSEED** is an organic slow-release fertilizer with a soil-improving effect (melioration). It is made of microbial biomass from soil bacteria and fungi (*Penicillium chrysogenum*). After being applied and watered, the dried and granulated biomass takes over the function of a slow-release nutrient supplier.

Due to its biological nature (withered substance of soil micro-organisms), **HYDROSEED** is a well-balanced nutrient source, and it is therefore optimally adapted to the microbial decomposition processes in the soil. Investigations have shown that the use of **HYDROSEED** is recommendable in ecological aspects, and it is hygienically harmless.

### **HYDROSEED** and its valent components:

Organic substance	80 %
Total nitrogen (organically bound)	8 % N
Total phosphorus	2 % P <sub>2</sub> O <sub>5</sub>
Water-soluble potassium oxide	2 % K <sub>2</sub> O
Magnesium oxide	1 % MgO

### Quantities to be applied in hydroseedings in the field of roof grassing

Purely mineral roof substrates require more **HYDROSEED** than the ones added with organic substances. In the latter case, the proportion of C and N of the applied organic substance has to be taken into account.

Clay minerals (bentonite) are only needed in purely mineral roof substrates. They serve as an exchanger which is able to bind and store the nutrients to their electrically charged surfaces.

The erosion protection fibres (wood fibres) are meant to establish a protection cover. This cover prevents erosions by wind and rain and guarantees a better absorption of water.

**TERRAVEST** fixes the applied components of the mixture in a way that a three-dimensional structure is formed which reaches several millimeters into the substrate. The wood fibres even reinforce this network; however, it remains fully water-permeable.

**Quantities to be applied in roof hydroseeding**

Components of the mixture	Mineral substrates	Organ./mineral substrates
<b>HYDROSEED</b> (slow-release fertilizer)	200 to 300 g/m <sup>2</sup>	100 to 150 g/m <sup>2</sup>
bentonite (nutrient storage)	20 to 50 g/m <sup>2</sup>	not required
wood fibres (erosion control)	40 to 60 g/m <sup>2</sup>	20 to 30 g/m <sup>2</sup>
seeds (suited to the location)		up to 5 g/m <sup>2</sup>
Sedum sprouts		up to 50 g/m <sup>2</sup>
Inclination		
TERRAVEST (stab.) up to 15°		10 to 15 g/m <sup>2</sup>
TERRAVEST (stab.) up to 30°		15 to 25 g/m <sup>2</sup>
TERRAVEST (stab.) up to 45°		20 to 30 g/m <sup>2</sup>

Regarding the composition of the seed mixtures and the quantities of seeds and sedum sprouts to be applied, it is recommended to use the common mixtures (e.g. RSM 6.1) or to consider the requirements in the tender documents.

**Periods during which hydroseedings should be done**

Favourable times for hydroseedings are: early spring (March till May) and the beginning of autumn (September till October). Hydroseedings can be performed at any other time as well, but it has to be considered that unfavourable mirco-climatic conditions would lead to delayed germination and inhibited growth. Hydroseedings cannot be performed in case of heavy rainfalls and frost.