Erosion Protection and Seed Fixation

For the greening of slopes mostly hydroseedings are used to apply seed, fertilizer and soil amelioration materials in one or several steps onto the more or less inclined surfaces. For this, the sprayed water has to be regarded as the transport modem for the materials to be applied.

Possibilities and limits in the use of soil stabilizers (TERRAVEST)

To avoid erosions of the applied materials by rain or wind **soil stabilizers** are used. The soil stabilizers shall fix seed, fertilizer and soil amelioration materials on top of the soil. From the range of products available soil stabilizers on polymer basis and on alga basis shall be mentioned here. For the use of soil stabilizers it is very important that a fixing layer is built up, which remains completely permeable for water and can be decomposed biologically.

The soil stabilizers can be applied in one step, together with the seed and the other materials. Soil stabilizers on polymer basis can penetrate into the soil - dependent on its structure - up to 15 mm deep and therefore achieve a better fixation with the soil surface.

The erosion protection achievable with soil stabilizers is clearly limited and should not be overestimated. One rule is that surfaces, fixed with soil stabilizers are not allowed to walk or to drive on, as the fixing layer is not able to stand this burden. Additionally, it has to be stressed clearly that the use of soil stabilizers cannot avoid landslides or settings.

Soil stabilizers cannot offer erosion protection against cloudbursts or surface water. Soil stabilizers can fix seed on a roughened soil surface but cannot arm the surface of the soil. The period over which soil stabilizers are effective is limited to a certain time and depends on the necessary quantity chosen, the micro climate and the surface structure of the soil.

Strengthening of the fixation effect by erosion protective fibres

For certain occasions it is useful to strengthen the fixation effect of soil stabilizers by the use of erosion protective fibres. Such fibres are for example made of wood, cellulose or cotton. All of them have the advantage that they can be decomposed biologically and that they give a certain strengthening to the fixing layer due to the fibre structures. Additionally they ameliorate the water content and arrange a better application consistency of the greening mixture.

Seed fixation on plain surfaces

For the fixation of seed with hydroseeders, the surface structure of the virgin soil plays a very important role. The rougher a surface is and the more edges the corn structure has, the better the applied greening mixture remains on the soil. Plain, valenced slope surfaces give rare adhesive points for an effective fixation and also become extremely hard during dry and windy weather conditions. If rain falls onto a fixed and hardened slope, nearly the whole

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quantity of water runs down the surface with a strong erosion power (huge quantity of water with a high speed) and takes down the greening mixture which has only been fixed by a few adhesive points.

For soil types tending to plain surfaces, already during the slope profile attention has to be paid to the fact, that a rough surface develops. Raw soils having a valency should never be plained by treading procedures.

If nevertheless a plain and steep slope surface has to be greened, the installation of erosion protective mats made of jute- or coirfabric should be considered. These erosion protective mats have a structure which can be compared to a fishing net, with a netting width of approx. 2 x 2 cm. After their installation and fixation with special wire hooks the mats with their approx. 3 to 5 mm thick strings create an artificial roughening of the plain surface. These mats fulfil the following purposes:

The greening material can be fixed within the enormous quantity of wires (fields of approx. 2 x 2 cm, approx. 1500 to 2000 per m²). The strings slow down the drying-out of the surface caused by wind and helps the rain to penetrate more effectively into the soil. The consequence is an ameliorated erosion protection for seed, fertilizer and soil amelioration materials.

Because of hundreds of horizontally established strings with a diameter of 3 to 5 mm and a width of approx. 2 cm (approx. 50 strings per meter) rainfall running down on top of the surface is slowed down and therefore its erosion power is less. The consequence is an immense reduction of erosions caused by rainfall and an increase of the water absorption by the soil.

The biologically decomposable erosion protective mats are able to absorb certain tractive powers and therefore decrease the danger of little landslides. But as the mats are only fixed with three to four hooks (length of 15 to 30 cm) per m², it is logic that the effect of those mats on the sector of landslide avoiding is extremely limited.

Important! **Hydroseeding cannot protect a slope construction from landslides, settings, dyke breaks, outcoming stratum water and erosion effects, caused by surface water.**

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