

Use of *TURF* for Tree Fertilization

Problem

Trees fulfil numerous ecological purposes and are extremely valuable for the shaping of free landscapes and settlements. The new planting, preservation and care of trees therefore is very important.

Unfortunately, our trees are exposed to many stress situations which restrict their vitality and shorten their life. The following reasons may restrict the growth of trees:

- small space for the roots
- hardened soils
- nutrient deficiency
- small water- and nutrient storage capacity of the soil
- small biological soil activity
- lack of water during drynesses
- construction activities
- injuries
- illnesses
- air pollution
- salinity

Besides the possibilities of soil loosening, tree plate optimisation and the watering, for certain deficiencies, trees may be given specific fertilization. For this it is important to know that trees - under optimal conditions as from a healthy forest soil - receive their nutrients directly from the scattered covering (foliage covering) as well as from deeper soil layers. The combination of *TURF activ* and *TURF forte* this fact is taken into account.

Technical descriptions and effects of *TURF activ* and *TURF forte*

TURF activ is an organic nutrient carrier with a total nitrogen content of 9 % and a phosphate content (P₂O₅) of 11 %. The quantities of nitrogen and phosphate included in *TURF activ* are connected with sugar molecules and form energy-bearing organic compounds. *TURF activ* consists of numerous different sugar phosphorus compounds. In connection with water *TURF activ* produces gels and sols. The highly molecular gels, which are hardly mobile in the soil, serve to increase the water and nutrient storage capacity.

TURF activ activates the soil life, optimises the nutrient supply of the plants in the deeper root regions and ameliorates the nutrient storage capacity of the soil by taking up of cations onto its colloidal acting surface. Due to its negative charged endings, **TURF activ** is able to take up cations from the liquid phase and therefore to lower the osmotic pressure of the soil solution. This makes it easier for the tree roots to receipt the nutrients from the soil solution.

TURF activ and its most important contents:

<i>organic substance</i>	50 %
<i>nitrogen in total (organically bound)</i>	9 % N
<i>phosphorous in total (organically bound)</i>	11 % P ₂ O ₅

TURF forte is an organic slow-release fertilizer with an ameliorating effect to the soil. It is made of microbial biomass from soil bacteria and soil funghi, as *Pinicillium chrysogenum*. After its application and rehumidification the dried and granulated biomass acts as a slowly flowing nutrient resource. **TURF forte** contains 8 % of nitrogen, organically bound. The contents of phosphate and potassium are approx. 2 % each. Additionally, **TURF forte** contains important trace elements and vitamins.



Due to its biological nature (died substance of micro-organisms) **TURF forte** disposes a well-balanced nutrient composition and therefore is optimal adapted to microbial decomposition processes within the soil. Dead soil funghi and soil bacteria are also very important ingredients of the nutrient chain of natural soils. 5 thousand millions of micro-organisms may live in one cm³ of healthy soil.

Examinations show that the application of **TURF forte** is ecologically recommendable and from the hygienic point of view absolutely harmless.

TURF forte and its most important contents:

<i>organic substance</i>	80 %
<i>nitrogen in total (organically bound)</i>	8 % N
<i>phosphorous in total</i>	2 % P ₂ O ₅
<i>water-soluble potassium oxide</i>	2 % K ₂ O
<i>magnesium oxide</i>	1 % MgO

other contents: trace elements and vitamins

Table 1: Necessary quantities for tree fertilization (new planting)

height of the tree in m	diameter of the crown in m	TURF activ in g per plant	TURF forte in g per plant
up to 1 m	approx. 0,5 m	50 g	100 g
up to 2 m	approx. 1 m	100 g	200 g
up to 5 m	approx. 2 m	250 g	500 g
up to 10 m	approx. 5 m	750 g	1500 g
up to 20 m	approx. 10 m	2500 g	5000 g
more than 20 m	approx. 10 m and more	5000 g	10000 g

Table 2: Necessary quantities for tree fertilization

height of the tree in m	diameter		basic area crown eave in m ²	TURF activ	TURF forte
	stem in cm	crown in m		per tree in kg	per tree in kg
ab 5 m	5 - 10 cm	ca. 2 m	ca. 6	ca. 1 - 2 kg	ca. 2 - 3 kg
ab 10 m	10 - 20 cm	ca. 5 m	ca. 15	ca. 3 - 4 kg	ca. 4 - 6 kg
ab 20 m	20 - 40 cm	ca. 10 m	ca. 30	ca. 6 - 8 kg	ca. 8 - 12 kg
ab 30 m	40 - 80 cm	ca. 20 m	ca. 60	ca. 12 - 16 kg	ca. 16 - 24 kg

In case of a lack of potassium in the soil (this happens rarely and only in certain soils) the fertilization may be a supplementary potassium component. For this, the application of patent potassium, which also contains a share of magnesium is recommended. The necessary quantity is - depending on the lack - 10 to 20 % of the necessary quantity of **TURF forte**.

The exact quantities of **TURF forte** and **TURF activ** can be determined after a soil valuation at the location and/or respecting existing results from a soil analysis.

For a small tree disk with a diameter of only a few centimeters, not more than 1000 g **TURF forte** per m² should be spreaded. If higher quantities of **TURF forte** per tree are requested, they can be replaced by **TURF activ** at a rate of 2 : 1. This quantity of **TURF activ** will be applied additionally to the suggested quantity of **TURF activ**.



Application periods and -techniques for tree fertilization

For older trees, the application period is from early spring until summer (March until June) . Newly planted trees may also be fertilised during the planting periods. The fertilizer should not be applied onto frozen soils.

Normally, a single application is sufficient. Under extremely worse soil conditions, several repetitions (1 - 3) are recommended within a period of 1 - 3 years. The trees should be inspected during several years for this procedure.

TURF activ and **TURF forte** have to be applied separately. **TURF activ** has to be dissolved in water and to be sprayed out. This can also be done during normal watering. The application of further fertilizers (e. g. patent potassium) can be combined with **TURF activ**.

TURF forte also has to be applied onto surface within the diameter of the crown. **TURF forte** can either be spreaded or spread out together with **TURF activ**. The last is only possible if the hydroseeder has an agitator.