## The affect of drought on artificial regeneration in Slovakia in 2003 and the possibilities to increase plant adaptability after plantation in Central Europe

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Recently, the annual artificial regeneration is made on area about 11 000 ha in Slovakia. The primary species for this regeneration is beech and Norway spruce. The bare-rooted planting stock is dominated by artificial regeneration (95%). Generally, the bare-rooted plants are planted in spring and autumn plantation is connected with using of containerized plantings stock (mainly Jiffy and Lännen 1 or 2-years seedlings).

The extreme weather conditions caused enormous plantation failures in 2003. Generally, the precipitation deficit was about 150 mm from February to September in Slovakia but this deficit reached over 200 mm in Central part of Slovakia. In the summer, it were noted the most temperature extremes during last 200 years. This drought negative affected the afforestation program. The plantation failures for spruce and beech seedlings were 29% and 39% respectively on areas with precipitation deficit > than 45%.

There are many possibilities to increase survival of forest regeneration. Generally, it is increasing of using of natural regeneration under suitable forest stands. The primary goal is decreasing of transplanting shock on plants by artificial regeneration (choice of suitable tree species, planting time, using of containerized planting stock, etc.). The very important factor is planting stock quality (above all physiological quality) and therefore it is necessary to determine the actual physiological injury. The method of measurement of electrolyte leakage from root system is suitable method to prevent using of planting stock with physiological injury.

In addition, the application of new procedure in afforestation program can improve the survival of plants. The significance of hydrogels application increases in Central Europe. During the previous two years, hydrogels STOCKOSORB® have been tested in artificial regeneration and planting stock production in forest nurseries in Slovakia. The results showed that STOCKOSORB application positive effected on adaptability of plants after plantation. The survival rate by treated plants was about 15% higher than by control (untreated) seedlings in year 2003 and the hydrogels application positive affected the growth of plants (height and root collar diameter).

Finally, the affect of drought on forest regeneration is very serious problem and it has many aspects. The solution of this problem need a closely cooperation (at minimum on European level), because the present problems with extreme drought in Central Europe were in South Europe before 10-15 years and probably these problems are going to North Europe during following years.