Differences in shoot elongation pattern and height increment of hybrid aspen (*Populus tremuloides* Michx. *x Populus tremula* L.) clones

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Introduction

Crossing, selection and testing of hybrid aspen (*Populus tremuloides* x *P. tremula* L.) clones for establishment of short rotation plantation recently has gained more attention in Latvia. On of important traits for selection is productivity of certain clone, reflected in part by height increment.
Climatic data indicates an increase in length of vegetation period, if compare to early 1970th, and this trend is predicted to continue in this century. Therefore it is important to gain more understanding on how much there are differences among hybrid aspen clones in length of used vegetation period and how that relates to total height increment in order to suggest efficient indicators for selection of clones, that would be productive also in future climate.

Test site

Progeny trial of 15 hybrid aspen clones, represented by 24 ramets with initial spacing 3x3m, has been established in former agricultural land in central part of Latvia. Inventory of phenology and measurements have been carried out in 5th growing season, starting from end of April, with an interval of 1 week on average (fig.2).

(a) (b) (c) (d)
Figure 1. Clones with early (a) and late (b) bud flush and early (c) and late (d) autumn leaf coloration

Results and conclusions

Bud burst differs among clones from 12 days at earliest stages of this process to 4 days in latest. Clones with earlier bud burst tend to gave slightly higher height increment (fig. 2).
End of the growing season (indicated by leaf color at the beginning of October) also differs among clones. Those clones with longer growth in autumn tend to have slightly higher increment in most of the measurement periods and also total increment (fig. 3).
Length of used vegetation period varies between 172 and 178 days for particular clones and that is notably more than known for common aspen in Latvian conditions (140 days on average). Total height increment is related to length of used vegetation period (r=0.55, fig.4). In context of predicted climatic changes this finding that is stressing the need to select clones with long used growth period in order to ensure high productivity of hybrid aspen plantations.
Further studies needs to be carried out in larger set of material, applying more exact measurements for determination of start and end of growth period, in order to obtain precise data about length of used vegetation period and ensure, that the conclusions can be generally applied. Detailed analysis in context with meteorological information will provide more insides in the most important factors during the formation of the height increment of hybrid aspen. It will serve as basis to increase efficiency for tree breeding activities and suitability of selected material to climatic conditions, predicted in future, in order to ensure high productivity of hybrid aspen plantations.

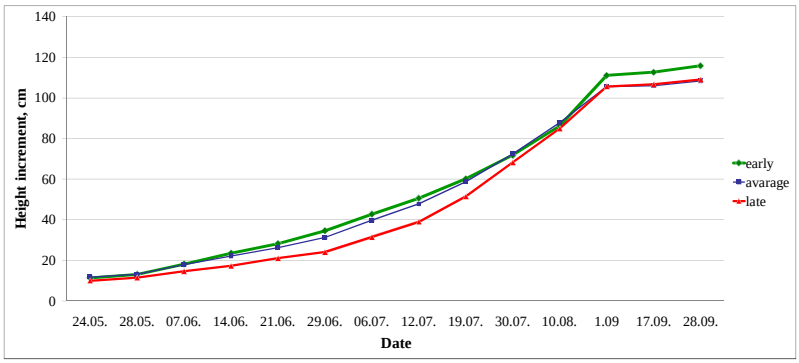

Figure 2. Development of height increment of clones with different bud burst phenology pattern

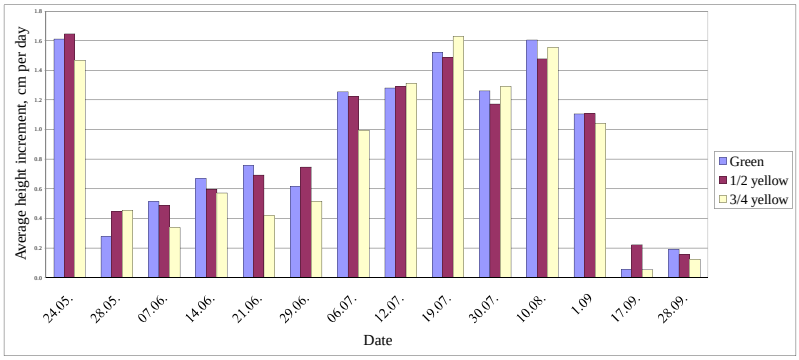

Figure 3. Intensity of height growth of clones with different autumn leaf coloration level at the beginning of October

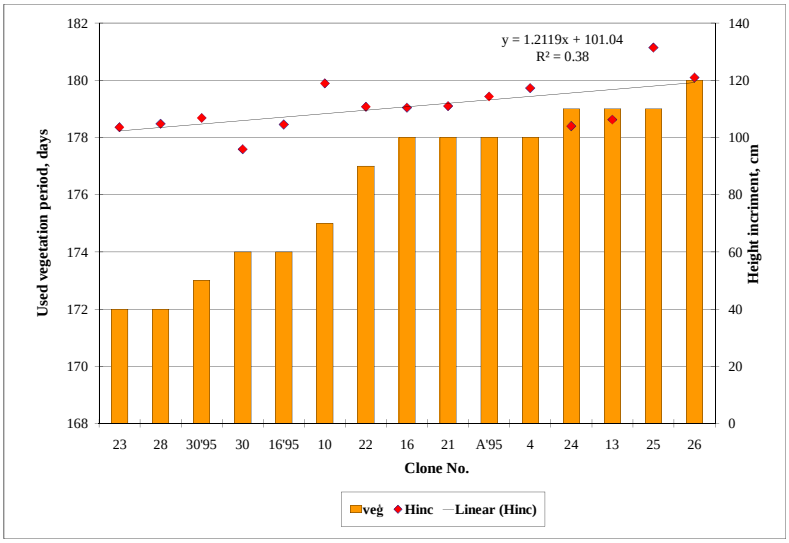

Figure 4. Total length of height increment (Hinc) and length of used vegetation period (veg) for particular hybrid aspen clones