Short Note: Time of GA4/7 application may affect the sex of Scots pine flowers initiated

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Summary

May and June treatments with GA4/7 mixture significantly increased male flowering while the July and August application resulted in significant increase of female flowering of Scots pine grafts. The relation between time of GA4/7 application and stage of seasonal development of bud structures is shortly discussed.

Key words: Flower induction, GA4/7, Pinus sylvestris L.

Zusammenfassung


Introduction

The differential action of GA's on stimulation of flowers of different sex is well known for some species of the Pinaceae family. The listing of data available so far suggested that GA4/7 applied in the first part of growing season influenced male flowering initiation while the extension of the time of treatment to the latter part of growing season resulted in female flower initiation (Chalupka 1980). Some further observations (Ross et al. 1981, Chalupka 1981) substantiated this regularity, which was also the case with an experiment on GA4/7 application during various parts of the same growing season.

Materials and Methods

The experiment was conducted in 1981 on five clones of Scots pine growing in a seed orchard at Kornik and each of the clones was represented by twelve 20-year-old grafts.

Two branches were selected in the middle part of each crown and one of them was treated with GA4/7 while the second one was a control. The treatments were done at four time variants: (1) May—June (spraying on May 21 and 27, June 3, 9 and 19), (2) July—August (spraying on July 9, 16, 23 and 30, August 6), (3) May—August (spraying on May 27, June 10, July 9 and 23, August 6), and (4) control (spraying on May 20, June 3 and 19, July 16 and 30). GA4/7 mixture was applied in a water solution of 200 mg/l containing 0,05% Aromox C surfactant. Control branches were sprayed with water and the surfactant. The experiment was replicated thrice.

In Spring 1982 the number of shoots flowering male, number of shoots flowering female and total number of female flowers were counted (Table 1), and evaluated by an analysis of variance.

Results

Spraying of branches with the GA4/7 mixture during May and June compared to those sprayed later or not at all (May—June + May—August vs July—August + control) significantly increased the percentage of shoots flowering male from 13.2% to 29.3% while the July and August spraying compared to the earlier period of spraying or control (July—August + May—August vs May—June + control) significantly improved female flowering (Table 2). Percentage of shoots with female flowers and the number of female flowers per 100 shoots increased from 0,5% to 3,4% and from 2,3 to 6,4 respectively. The interclonal variation both in male and female flowering was also statistically confirmed.

Discussion

The results obtained support an earlier suggestion about the relation between the time of GA4/7 application and the sex of Scots pine flowers initiated (Chalupka 1980). The
Table 2. — Results of analysis of variance. Calculated values of F: ** - significant at 0.01 level, * - significant at 0.05 level.

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>df flowering</th>
<th>% of shoots flowering male</th>
<th>% of shoots flowering female</th>
<th>No. of female flowers per 100 shoots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>59</td>
<td>1,14</td>
<td>1,75</td>
<td></td>
</tr>
<tr>
<td>Treatment periods</td>
<td></td>
<td>3</td>
<td>4,69</td>
<td>0,08</td>
</tr>
<tr>
<td>May - June</td>
<td>1</td>
<td>12,86</td>
<td>0,00</td>
<td>0,06</td>
</tr>
<tr>
<td>July - August</td>
<td>1</td>
<td>1,19</td>
<td>10,14</td>
<td>4,64</td>
</tr>
<tr>
<td>May - August</td>
<td>1</td>
<td>0,00</td>
<td>0,08</td>
<td>0,54</td>
</tr>
<tr>
<td>Clone /♂</td>
<td>4</td>
<td>22,09</td>
<td>2,05</td>
<td>2,68</td>
</tr>
<tr>
<td>T x O</td>
<td>12</td>
<td>1,54</td>
<td>0,77</td>
<td>0,70</td>
</tr>
<tr>
<td>Residual</td>
<td>40</td>
<td></td>
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</tr>
</tbody>
</table>

It is possible that the application of GA4/7 during May and June or during July and August modifies the development of newly formed primordia and promotes their sexual differentiation, male from dwarf shoots and female from lateral buds.

Acknowledgements

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Literature


Short Note: A Commercially Feasible Micropropagation Method for Aspen

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Abstract

A relatively simple two-step method for the rapid clonal propagation of mature elite aspen clones (Populus tremula, Populus tremuloides and their hybrids) is described. Meristematic explants from buds were cultured on a modified Woody Plant Medium, here designated Aspen Culture Medium (ACM), supplemented with low levels of a cytokinin and an auxin. Following shoot differentiation/proliferation on the bud explants of the responsive aspen clones, the microshoots are rooted in soil-free potting mixture. A few thousand plantlets from a large number of mature selected aspen clones have been regenerated by this two-step micropropagation method.

Kew words: Aspen (Populus), micropropagation, bud meristem culture, microshoots, plantlets.

Zusammenfassung


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