A note on Dwarfing of Pinus patula grafts

By W. G. Dyson

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Effects on Seed Yield

The second substantial crop of cones from the Sao Hill orchards was harvested in December 1973, 6½ years after planting. The number of cones collected, the weight of seed extracted and the germination capacity of samples of the seed, were recorded for each clone separately. Because the data had been recorded by clones, it was not possible to assess the effects of the stock species on all ramets of all clones, but partial comparisons could be made. The mean yield of cones per ramet for 25 clones was compared by regression with the proportion of each clone grafted on radiata stocks but no significant relationship could be found. Mean cone and seed yields from 73 ramets representing 17 clones grafted on patula stocks and from 154 ramets representing eight clones on radiata could be extracted from the data and are compared in table 2. It will be seen that ramets grafted on radiata stocks produced very slightly fewer cones with a slightly higher seed content than those on patula, but the differences are not statistically significant.

The use of special stocks, often of a different species or variety from the scion, has long been practiced in fruit orchards (GARDNER et al., 1922) to reduce the stature of the grafts and to encourage early fruiting. The observations reported above suggest that a similar effect has occurred in Pinus patula grafts made on P. radiata stocks. It remains to be seen if the heterospecific grafts will live long enough for the technique to be of practical value.

The adjoining photograph shows a severely dwarfed ramet of clone K37 on a P. radiata stock bearing 18 month old cones.

Acknowledgements

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Summary

A grafted seed orchard of Pinus patula SCHIEDE et DEPPF, planted at Sao Hill, Tanzania in 1967, includes both heterospecific grafts of Pinus patula scions on Pinus radiata D. DON stocks and homospecific grafts. Later it was noticed that many heterospecific grafts were dwarfed in stature. Measurements made in 1974 confirm that 38% of the hetero-specific grafts are conspicuously dwarfed and the remainder show reduced height and diameter growth and impaired stem and crown form. Upto 1973, there were no significant differences in seed yield from the two kinds of grafts.

Key words: Heterospecific grafting, Pinus patula SCHIEDE et DEPPF, Pinus radiata D. DON, Seed-Orchards.

Zusammenfassung

Table 1. — Growth of Pinus patula grafts in seed orchards at Sao Hill, Tanzania.

<table>
<thead>
<tr>
<th>Character Assessed</th>
<th>Pinus radiata</th>
<th>Pinus patula</th>
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<tbody>
<tr>
<td>Number of grafts surviving</td>
<td>318</td>
<td>253</td>
</tr>
<tr>
<td>Proportion of number originally planted</td>
<td>76%</td>
<td>80%</td>
</tr>
<tr>
<td>Mean Height (aged 5yr. 4 months)</td>
<td>4.17 m</td>
<td>6.90 m</td>
</tr>
<tr>
<td>Mean breast Ht. Diameter (5yr. 4m.)</td>
<td>6.33 cm</td>
<td>11.20 cm</td>
</tr>
<tr>
<td>Mean Crown Form Score (aged 6yr. 11m.)</td>
<td>2.76</td>
<td>2.17</td>
</tr>
<tr>
<td>Mean Stem Form Score (6yr. 11m)</td>
<td>3.54</td>
<td>1.77</td>
</tr>
<tr>
<td>Number of stems manifestly dwarfed</td>
<td>120</td>
<td>6</td>
</tr>
<tr>
<td>Proportion of surviving grafts dwarfed</td>
<td>37.7%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Figure 1. — A dwarfed ramet of Pinus patula, clone K. 3T, grafted on 2 Pinus radiata stock aged 6½ years. Note typical swelling of the upper part of the stock and abundant maturing cones on the Scion.

Table 2. — Seed Yield of Pinus patula Grafts at Sao Hill, Tanzania.

<table>
<thead>
<tr>
<th>Stock species</th>
<th>Pinus radiata</th>
<th>Pinus patula</th>
</tr>
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<tbody>
<tr>
<td>Number of clones represented</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Number of ramets</td>
<td>154</td>
<td>73</td>
</tr>
<tr>
<td>Mean No. of cones/ramet</td>
<td>22.8 ± 6.2</td>
<td>22.4 ± 5.0</td>
</tr>
<tr>
<td>Mean Wt. of seed/cone</td>
<td>118 ± 16 g</td>
<td>168 ± 30 mg</td>
</tr>
<tr>
<td>Germination capacity</td>
<td>72%</td>
<td>68%</td>
</tr>
</tbody>
</table>

1773 auf Höhen- und Durchmesserwachstum, Kronenform, Zapfenbehang usw. ergab z. T. erhebliche Wachstumsunterschiede, jedoch bis dahin noch keine signifikanten Unterschiede in der pro Pfropfling geernteten Samenmenge. Die Untersuchungen werden fortgesetzt.

References