INFLUENCE OF BIOTIC AND ABIOTIC FACTORS ON THE IN VITRO ROOTING STAGE OF QUINCE

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Abstract - A series of exploring experiences within each stage of the in vitro culture was necessary because of the complexity of the pursuing aspects and because of lacking information in the specific literature. We studied the in vitro rooting capacity of the quince tree function of the cultivar and photoperiodism. Analysing the interaction cultivar x photoperiodism, it confirms that the potential rhysogene exists in the genetic dowry of each cultivar, is a strong genetic characteristic and produces effects irrespectively the photoperiodism level.

Keywords - in vitro biotechnology, cultivar, photoperiodism, pretreatment dark, quince.

I. INTRODUCTION
The necessity to modernize the planting material production technologies for the quince to satisfy the actual standards is also determined by many other considerations such as: increasing the tree density within plantations and adopting intensive culture systems in which the selections of new father plants (predominantly vegetative), creating and introducing new cultivars together with the modernization of tree conduct and carving, let us see a new “era” in cultivating the quince, of course conditioned by the quick providing with bigger and bigger quantities of planting material.

II. PROBLEM FORMULATION
For results to be conclusive as they were designed 12 variations in biphactorial experience (Table 1).

The best results for the quince tree were obtained with variant V.8 (86.0%) for Aurii cultivar. The best results were obtained with the variants undertaking dark pre-treatment for 9 days (Tabel 1).

Follows the order, Moldovenesti cultivar, with a maximum rate of rooting of 78%, obtained with the variants undertaking dark pre-treatment for 9 days (Tabel 1).

The lowest results were recorded on Aurii cultivar, the rooting percentage was between 68 and 74.

The best results (86%) were obtained with the variants undertaking dark pre-treatment for 9 days (Tabel 1). Our results confirm that cultivar play an essential role in inducing and maintaining the rhysogenesis process. Equally important for this stage was the photoperiodism.

III. PROBLEM SOLUTION
Graphical representation by curves of correlation expressed very well in vitro rooting capacity of studied cultivars, function of photoperiodism.

Table 1

<table>
<thead>
<tr>
<th>Variant</th>
<th>% rooting plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>V.1: A 1 x B 1</td>
<td>72</td>
</tr>
<tr>
<td>V.2: A 1 x B 2</td>
<td>76</td>
</tr>
<tr>
<td>V.3: A 1 x B 3</td>
<td>78</td>
</tr>
<tr>
<td>V.4: A 1 x B 4</td>
<td>78</td>
</tr>
<tr>
<td>V.5: A 2 x B 1</td>
<td>80</td>
</tr>
<tr>
<td>V.6: A 2 x B 2</td>
<td>80</td>
</tr>
<tr>
<td>V.7: A 2 x B 3</td>
<td>84</td>
</tr>
<tr>
<td>V.8: A 2 x B 4</td>
<td>86</td>
</tr>
<tr>
<td>V.9: A 3 x B 1</td>
<td>68</td>
</tr>
<tr>
<td>V.10: A 3 x B 2</td>
<td>67</td>
</tr>
<tr>
<td>V.11: A 3 x B 3</td>
<td>70</td>
</tr>
<tr>
<td>V.12: A 3 x B 4</td>
<td>74</td>
</tr>
</tbody>
</table>

A. Cultivar:
⇒ A.1 – Moldoveneşti
⇒ A.2 – Aurii
⇒ A.3 – Aromate

B. Photoperiodism:
⇒ B.1 = Photoperiodism 16 hours for 35 days
⇒ B.2 = Photoperiodism 14 hours for 35 days
⇒ B.3 = Pre-treatment dark for the first 9 days + Photoperiodism 16 hours for 35 days
⇒ B.4 = Pre-treatment dark for the first 9 days + Photoperiodism 14 hours for 35 days

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Expression of rizogen potential by cultivar for different photoperiodism.

Trend by graphical representation of the three cultivars is very suggestive. Analysing the interaction cultivars (Moldovenesti, Aurii and Aromate) x average effect of photoperiodism in rooting process, it observed that the highest percentage of rooting is recorded by Aurii cultivar (82.5%), follows by Moldovenesti cultivar (76.0%) and Aromate cultivar with 69.8%.

For 16 hours photoperiodism, the rizogen potential of Aurii cultivar expressed at the same level with 16 hours photoperiodism. So, the rooting rate is 80.0%, with differences from the other cultivars are statistically assured. At the Moldovenesti cultivar, the level of rooting for 14 hours photoperiodismul is 78.0%, with differences from the other cultivars statistically assured. The lowest rizogen potential it has Aromate cultivar with 70.0% rooted plants.

The highest values were recorded for B.4 photoperiodism. For graduation B.4 photoperiodism (Pre-treatment dark for the first 9 days + Photoperiodism 14 hours for 35 days), rizogen potential at Moldovenesti cultivar it expressed at the same level with B.3, respectively 78.0% degree of rooting. The maximum rooting percentage is recorded by Aurii cultivar at 86.0. The differences from the other cultivars are statistically assured. The lowest rizogen potential is exprimed by Aromate cultivar (74.0%).

Expression of rizogen potential by photoperiodism for different cultivars.

Analysing the rooting degree determined by photoperiodism for average effect-cultivars, we notice that the values are close.

The highest rooting level is determined by pre-treatment dark for the first 9 days + photoperiodism 14 hours (79.3%), which is followed by a difference of 2.0% of pre-treatment dark for the first 9 days + photoperiodism 16 hours.

Follows a group close to the rooting level to 16 hours and 14 hours photoperiodism. At these, rooting values were 73.3% and 74.3% respectively.

For all of photoperiodism graduation, differences are statistically assured (Figure 3).
Analysing the interaction photoperiodism x cultivars we notice that for Moldovenesti cultivar, pre-treatment dark for the first 9 days + photoperiodism 14 hours and pre-treatment dark for the first 9 days + photoperiodism 16 hours led to the same rooting degree, namely 78.0% rooted plants, with differences from other levels of photoperiodism statistically assured.

As in average effect, it follows 14 hours photoperiodism with values of rooting percentage of 76.0%. The lowest values occurred at 16 hours photoperiodism: 72.0% rooted plants.

For Aurii cultivar, photoperiodism influence has the same trend, with higher values in pre-treatment dark for the first 9 days + photoperiodism 14 hours (86.0% rooted plants), followed by pre-treatment dark for the first 9 days + photoperiodism 16 hours, at a difference of 2.0% rooted plants. The differences in both levels of photoperiodism mentioned are statistically assured (Figure 3).

Lies at a lower step 16 hours and 14 hours photoperiodism, with a rooting degree of 80.0% rooted plants. For Aromate cultivar, the expression of rizogen potential, determined by photoperiodism is reflected in lower values, compared with other two cultivars.

The rooting degree for this interaction is between 67.0 to 74.0% rooted plants. The differences from the other cultivars are statistically assured. The differences between the four levels of photoperiodism are statistically assured.

IV. CONCLUSION

- Analysing the interaction cultivar x photoperiodism, it confirms that the potential rhyzogene exists in the genetic dowry of each cultivar, is a strong genetic characteristic and produces effects irrespectively the photoperiodism level;
- The best results were obtained for the variants with pre-treatment dark for the first 9 days;
- The potentially highest rhyzogene was recorded at Aurii, followed by Moldovenesti and Aromate quince tree cultivars;
- The 14-hour photoperiodism preceded by a 9-day dark treatment determined the best rooting capacity.

REFERENCES