Evaluation of *Agrobacterium radiobacter*-K84

and Bleach Against Two Strains of *Agrobacterium tuberfociens* (Crown Gall) on Walnuts

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ABSTRACT

K84 gave complete control of gall formation when applied to injuries treated with C58 strain of crown gall, the common strain of crown gall found on walnut. But did not control gall formation when applied to injuries treated with A49, a strain of crown gall not known to be found on walnut. Also a 10 percent bleach solution did not control gall formation caused by the C58 strain of crown gall.

OBJECTIVE

It has been suggested that *Agrobacterium radiobacter* K84 (“Galltrol”) was not effective in preventing gall formation on walnut. The objective of this trial was to evaluate its effectiveness on the C58 strain of crown gall, the common strain found on walnut, and on A49, another strain of crown gall not known to occur on walnut. Also, a bleach treatment was compared to K84 for prevention of crown gall caused by the C58 strain of crown gall.

PROCEDURE

In a nursery row, on 50 seedling paradox walnut trees, create four injuries along each trees trunk about 3 inches apart.

Randomly, on 30 of the trees, treat the four injuries with the C58 strain of crown gall and on 20 of the injured trees with the A49 strain of crown gall.

Randomly, on the 30 trees treated with C58, treat 10 with K84 "Galltrol", 10 with a 10% bleach solution and leave 10 trees untreated.

On the 20 injured trees treated with A49 treat 10 with K84 "Galltrol" and leave 10 untreated.

Cover each injury with masking tape to slow down drying and evaluate for the formation of galls in 90 days.
RESULTS

Out of a possibility of 4 galls per tree, the C58 strain of crown gall alone caused an average of 3.6 galls per tree. When K84 "Galltrol" was added no galls were formed. When 10% bleach was applied after the C58 treatment 2.8 galls per tree formed. The A49 strain of crown gall alone averaged 3.3 galls per tree. When K84 "Galltrol" was added the number was reduced to an average of 2.1 galls/tree.

See table.

CONCLUSION

The common strain of crown gall found on walnut (C58) can be successfully eliminated by proper application of "Galltrol" (K84). A 10 percent bleach treatment gave no statistically significant improvement over no treatment. The A49 strain of crown gall, not known to be present on walnut, is not controlled by K84 "Galltrol".

TABLE

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Mean # Galls/Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>C58 Crown Gall</td>
<td>3.6 A</td>
</tr>
<tr>
<td>A49 Crown Gall</td>
<td>3.3 AB</td>
</tr>
<tr>
<td>C58 Crown Gall Followed by 10% Bleach</td>
<td>2.8 AB</td>
</tr>
<tr>
<td>A49 Crown Gall Followed by K84 &quot;Galltrol&quot;</td>
<td>2.1 B</td>
</tr>
<tr>
<td>C58 Crown Gall Followed by K84 &quot;Galltrol&quot;</td>
<td>0.0 C</td>
</tr>
</tbody>
</table>

1) out of a possible 4 galls/tree

2) means not followed by a common letter are significantly different according to LSD.