Evaluation of neck-clipping length on post-harvest incidence of external and internal bacterial bulb rot in onion, Georgia 2021.

Four rows of ‘Century’ onions were transplanted into 6-ft beds (panels) on 8 Dec at the Vidalia Onion and Vegetable Research Center, Lyons, GA. The fertility program was consistent with University of Georgia Extension Service recommendations. Experimental design consisted of a randomized complete block with four replications. Treated plots were 20-ft long and were separated on each side by non-treated border panels. Plots were separated by a 3 ft bare-ground buffer within the row. Thrips and disease management program was followed according to the UGA Cooperative Extension recommendation. Natural infection was relied upon. At harvest maturity, onion bulbs were undercut using a bed ridge frame undercutter (Parma Inc.,) followed by a three-day field curing period. Following curing, dried neck of onion bulbs were clipped manually at three different lengths; 1-in, 3-in, and 5-in. Roots were also clipped but care was taken not to clip too close to the basal plate. Onion bulbs from replicated plots (four replicates) were bagged and stored at 4°C for one month. After period of storage, onion bulbs were individually cut using a sterile knife to determine the incidence of external and internal rot. Data for mean incidence of bacterial external and internal bulb rot were analyzed using the Fisher’s protected LSD test at $P\leq0.05$ (SAS version 9.4, SAS Institute, Cary, NC). Total rainfall accumulated during Dec 2020 and April 2021 was 14.2 in.

External and internal bulb rot were evaluated in onion bulbs after a month of storage under conditions mentioned above. The onion neck-clipping length had a significant effect on internal bulb rot incidence but not on the external rot. Significantly higher incidence of internal bulb rot was observed with the neck-clipping length of one inch compared with the three and five inches. Internal rot was associated with mainly Pantoea spp., and external rot was associated with Burkholderia spp. and Pectobacterium spp. based on arbitrarily-collected symptomatic samples. Bulb rot due to post-harvest fungal pathogens (Botrytis sp. and Aspergillus sp.) was not observed.

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<table>
<thead>
<tr>
<th>Onion neck-clipping length (in.)</th>
<th>External rot incidence (%)$^a$</th>
<th>Internal rot incidence (%)$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five</td>
<td>10.0 a$^a$</td>
<td>4.5 B$^a$</td>
</tr>
<tr>
<td>Three</td>
<td>9.5 a</td>
<td>4.0 B</td>
</tr>
<tr>
<td>One</td>
<td>14.2 a</td>
<td>19.0 A</td>
</tr>
<tr>
<td>$P$-value</td>
<td>0.634</td>
<td>0.003</td>
</tr>
</tbody>
</table>

$^a$Mean external bulb rot incidence was calculated as number of bulbs with external rot /total number of bulbs evaluated × 100.

$^b$Mean internal bulb rot incidence was calculated as number of bulbs with internal rot/total number of bulbs evaluated × 100.

$^c$Means followed by the same letter(s) within each column are not significantly different according to Fisher’s protected LSD test at $P\leq0.05$. 

ONION (Allium cepa ‘Century’)

Internal bulb rot; Pantoea spp.
External bulb rot: Burkholderia spp., Pectobacterium spp.

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