Effect of Nitrogen on Banana Pepper Colour Development.

2005 Research Report

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- Summer Experience Program

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The small plot yields presented in this report are for comparative purposes only and may not accurately reflect commercial yields. We welcome any questions, comments, concerns on this report, particularly suggestions on how to improve or make the trials more meaningful.
Effect of Nitrogen on Banana Pepper Colour Development.

Objectives:
Determine if nitrogen (N) impacts colour development in processing banana peppers.

Methodology:
CROP: Banana peppers  
Variety: Inferno and Super Hungarian  
Plant population: 12000 plants/ac  
Plant spacing: 18 in  
Row spacing: 5 ft between beds with twin rows 18 in apart  
Planting date: 2 June 2005  

DESIGN: Randomized complete block design  
Replications: 4  
Plot width: 20 ft  
Plot length: 26 ft  

NITROGEN rate: 0, 31, 125 lb N/ac  
Source: Ammonium nitrate  
Application: Preplant broadcast incorporated  

SOIL characteristics:  
pH 7.3  
Soil texture Loam  
% sand:silt:clay: 51:33:16  
% OM 4.8  
CEC (MEQ/100g) 23  
P (ppm) 22  
K (ppm) 109  
Ca (ppm) 3928  
Mg (ppm) 167  

RAINFALL:  
June 1"  
July 1.5"  
August 0.8"  
September 1.4"  

HARVEST dates: 12 August, 26 August, and 9 September  
The harvest was an once-over pick of 5 plants for each variety. Marketable and non-marketable fruit yield determined, and individual peppers were sorted into one of 4 colour categories: red, orange, yellow and green.  

PEST CONTROL and other production practices were according to typical Ontario processing banana pepper production.  

2005 Results:  
YIELD: There were no statistical differences in marketable yield between the N treatments (Table 1). The lack of response to N was likely due to the relatively dry growing season, where moisture, not N, limited pepper yields.  

COLOUR development in banana peppers was dependent on N rate. But the colour response to N was different for the two varieties tested (Table 2).  

INFERNO COLOUR: At the early harvest date, the highest N rate tested resulted in the largest percent of yellow peppers with less green and coloured peppers. At the later harvest dates, 31 lb N/ac of ammonium nitrate applied preplant broadcast incorporated
resulted in more yellow. Therefore, to optimize yellow pepper harvest with inferno peppers an early harvest date is recommended and the high rate of N (125 lb N/ac).

Table 1. Banana pepper yield response to different N applications.

<table>
<thead>
<tr>
<th>Date</th>
<th>N lbs N/ac</th>
<th>Inferno Marketable yield (ton/ac)</th>
<th>Super Hungarian Marketable yield (ton/ac)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 August</td>
<td>0</td>
<td>2.76</td>
<td>3.10</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>2.50</td>
<td>2.63</td>
</tr>
<tr>
<td></td>
<td>125</td>
<td>3.10</td>
<td>2.72</td>
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<tr>
<td>26 August</td>
<td>0</td>
<td>3.85</td>
<td>4.04</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>3.15</td>
<td>3.58</td>
</tr>
<tr>
<td></td>
<td>125</td>
<td>3.64</td>
<td>4.7</td>
</tr>
<tr>
<td>9 September</td>
<td>0</td>
<td>4.72</td>
<td>4.86</td>
</tr>
<tr>
<td></td>
<td>31</td>
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</tr>
<tr>
<td></td>
<td>125</td>
<td>4.86</td>
<td>4.73</td>
</tr>
</tbody>
</table>

*Data are expressed as averages of 4 replicates.
**There were no statistical differences in marketable yield between the different N treatments.

SUPER HUNGARIAN COLOUR: The opposite trends were observed for the super Hungarian variety. At the early pick, 31 lb N/ac of ammonium nitrate applied preplant broadcast incorporated resulted in more yellow with less green and coloured peppers. And at the two later picks, there were more yellow peppers at the highest N rate tested.

Table 2. Colour development in banana peppers, expressed as percent of marketable yield.

<table>
<thead>
<tr>
<th>Harvest date</th>
<th>N rate lb N/ac</th>
<th>Inferno Red</th>
<th>Orange</th>
<th>Yellow</th>
<th>Green</th>
<th>Super Hungarian Red</th>
<th>Orange</th>
<th>Yellow</th>
<th>Green</th>
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<td>8/12/2005</td>
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<td>0</td>
<td>6</td>
<td>68</td>
<td>26</td>
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<td>74</td>
<td>23</td>
<td>1</td>
<td>3</td>
<td>76</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>125</td>
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<td>0</td>
<td>76</td>
<td>21</td>
<td>0</td>
<td>2</td>
<td>73</td>
<td>24</td>
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<tr>
<td>8/26/2005</td>
<td>0</td>
<td>16</td>
<td>25</td>
<td>39</td>
<td>21</td>
<td>11</td>
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<td>36</td>
<td>42</td>
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<td>26</td>
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<td>125</td>
<td>14</td>
<td>30</td>
<td>37</td>
<td>19</td>
<td>11</td>
<td>23</td>
<td>49</td>
<td>16</td>
</tr>
<tr>
<td>9/9/2005</td>
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<td>9</td>
<td>33</td>
<td>14</td>
<td>44</td>
<td>9</td>
</tr>
</tbody>
</table>

*Colour development was dependent on nitrogen rate at each harvest date.

CONCLUSIONS: In order to optimize the percent of yellow peppers, it appears that N rate should be modified for different varieties. With only 2 N rates tested, the exact amount of N needed to optimize yellow peppers is not known but appears to be between 31 to 125 lb N/ac. Should growers switch to harvesting all yellow banana peppers then it may be possible to pick the crop twice. In 2005, plants that were picked on 12 August 2005 produced more yellow peppers during the rest of the season. Therefore, like bell peppers, it may be possible to have a second harvest on the same plant. However, further research is needed to fully characterize the influence of N on colour development in banana peppers.