Processing Tomato Research Update

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Winter wheat management practices:
1) no treatment - leaving the straw in the field
2) removing straw after wheat harvest
3) leaving the straw in the field plus fall nitrogen fertilizer at 30 lb N/ac
Methods

- Tomato N treatments
  - 1) no nitrogen fertilizer applied
  - 2) N applied at recommended rate

  Ridgetown: preplant broadcast incorporated
  CAN  130 lb N/ac

  Leamington: preplant and split application
  100 + 100 lb N/ac
  110 + 77   lb N/ac
At Ridgetown site, wheat residue on 6 June 2008 in a) no treatment – straw left in field, b) straw + fall N, and c) straw removed.
## Soil Moisture and Temperature

<table>
<thead>
<tr>
<th>Wheat residue treatment</th>
<th>Ridgetown 2008</th>
<th>Leamington 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moisture</td>
<td>Temperature</td>
</tr>
<tr>
<td>Straw left in field</td>
<td>17.6 a</td>
<td>12.9 a</td>
</tr>
<tr>
<td>Straw removed</td>
<td>15.4 b</td>
<td>13.1 b</td>
</tr>
<tr>
<td>Straw left + fall N</td>
<td>17.5 a</td>
<td>12.9 a</td>
</tr>
</tbody>
</table>

It is doubtful that these differences would have a large impact on planting operations.

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# Nitrogen Dynamics (3 site-years)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>N in shoots at harvest</th>
<th>N in fruit at harvest (Crop N removal)</th>
<th>Soil nitrate-N from 0-30 cm (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb N/ac</td>
<td>fall</td>
<td>planting</td>
</tr>
<tr>
<td>Control treatment – straw left in field</td>
<td>30.0</td>
<td>113</td>
<td>8.4</td>
</tr>
<tr>
<td>Straw removed</td>
<td>28.8</td>
<td>105</td>
<td>5.3</td>
</tr>
<tr>
<td>Straw + fall N</td>
<td>30.3</td>
<td>112</td>
<td>8.7</td>
</tr>
<tr>
<td>Tomato N rate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N fertilized</td>
<td>36 a</td>
<td>135 a</td>
<td></td>
</tr>
<tr>
<td>No N</td>
<td>24 b</td>
<td>89 b</td>
<td></td>
</tr>
</tbody>
</table>

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Soybeans as previous crop

- 2008-09 season only – soybeans plots along with the wheat plots at Ridgetown
- No differences in yield or quality between soybeans and all wheat plots
### Yield – Quality

<table>
<thead>
<tr>
<th>Wheat residue treatment</th>
<th>Quality parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agtron</td>
</tr>
<tr>
<td>No treatment – straw left in field</td>
<td>21.8</td>
</tr>
<tr>
<td>Straw removed</td>
<td>21.2</td>
</tr>
<tr>
<td>Straw left + fall N</td>
<td>21.6</td>
</tr>
</tbody>
</table>

| Tomato N rate                               |               |
| N fertilized                                | 20.7 a        | 5.2 a          | 4.3   |
| No N fertilizer                              | 22.3 b        | 5.0 b          | 4.3   |

| Wheat x N interaction                       | P=              |
|                                           | 0.4242          | 0.9290         | 0.2000|

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Yield - Marketable

No treatment – straw left in field
Straw removed
Straw + fall N

Marketable yield (ton/ac)

Ridgetown
Leamington

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Slow Release Nitrogen

A

% N released

AN
ESN
SCU

Days

% N released

TYPE I
TYPE II
TYPE III

Days

% Release

Ammonium Nitrate
Environmentally Safe Nitrogen
Sulfur coated urea

Days

% Release

Type I
Type II
Type III

Days

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Nitrogen and ECONOMICS
pea – cover crops – sweet corn

3 rotations: 2006-07, 2007-08, 2008-09

May 2007

OSR+Rye  No Cover  Rye  Oat

October 2007

OSR  Oat  OSR+Rye  No Cover  Rye

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Nitrogen and Cover Crops

- Oats, cereal rye, oilseed radish and mix of OSR+Rye
- All covers conserve N over the winter and fall
- Cover crops gave NO nitrogen credit or debit to following sweet corn crop
- Need legume (most over-wintering) for nitrogen credit
Economics Bothwell-2007

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Economics

Ridgetown-2008

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Cover crop – sweet corn – cover crop – spring wheat
Cover crops – Spring wheat

Wheat yield (bu/ac)

Oats
No cover crop
OSR-rye
Oilseed radish (OSR)
Rye

cover crop

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Cover crops – cucumbers

Early planted - 1st week in August
Late planted - 1st week in September

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Cover crops – cucumbers

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New project starting 2010

Literature:
- Many in organic production with legumes as N source
- Yield and quality not compromised with sorghum-sudangrass in Florida (Wang et al. 2005)
Conclusions

- Removing wheat straw or fall applied N are not recommended management practices
  - Potential added expense
  - No yield benefit
- Slow release may be too slow
- Economic benefits to planting cover crops
- Need to study cover crops in tomatoes
Acknowledgements

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  - Ontario Tomato Research Institute
  - OMAFRA

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  - CanGro

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  - A&L Laboratories