Intercropping Chickpea and Flax
ADOPT Chickpea Intercroo
Reasons to Consider Intercrops

• Agronomic Obstacles
  – Weeds (especially resistant weeds)
  – Disease pressure (including resistant diseases)
  – Maturity effects ???

• Over-Yielding
  – Sometimes the yield or value of two crops is higher than one.
  – Sometimes there is no difference
Reasons to Consider Intercrops

• Biodiversity
  – Rotations are generally 2 to 3 years
  – Wheat and canola predominate
  – Intercropping adds extra biodiversity without lengthening rotations
  – Spreads risk in case one crop fails

• Desire to complicate your life ??
Obstacles to Intercropping

- Both must be compatible with herbicide
- Complicates seeding, weed control, harvest
- Over-yielding is elusive, inconsistent
- Practical separation of harvested product
Types of Intercropping

- **Mixed Intercropping**
  - Seeded together, harvested together

- **Row Intercropping**
  - alternate rows or sections.
  - alley cropping with trees
  - strip cropping

- **Fast Crop / Slow Crop**
  - Seeded together, not harvested together

- **Relay Cropping**
  - Second crop sown after first, but before harvest of first
  - Harvest of first crop allows second crop to fully develop
Example? Chickpea-Flax Combination

Why this combo?

• High value chickpeas, large agronomic problems
• Flax as ‘nurse crop’ for chickpea; flax yield is a bonus
• Herbicide: Authority pre-seed registered on both
• Low levels of shattering prior to harvest for both
• Low cost of flax seed

Potential Benefits:

• Late competition affects chickpea maturity ??
• Lower chickpea disease pressure ?? (Aschochyta blight)
• Both are Arbuscular Mycorrhiza Fungi (AMF) associated
  – Sharing fixed N through fungus ??
Mid-July, 2012, SERF
The yield was 1500 lb/ ac of harvested chickpea.
Intercropping Chickpea Flax Trial – 2013, Redvers

3 rates of Kabuli Chickpea
3 rates of Desi Chickpea

Compared with

Monocropped Flax (high N)
Monocropped Flax (low N)
Monocropped Kabuli
Monocropped Desi
Monocropped Flax (low N)

- Poor competition with weeds
- Low yield
Monocropped Flax – 50 lb/ac N
Desi Chickpea (40 pl/m2) and Flax
Chickpea Flax
Sept 17 High Rate Desi Chickpea
Monocropped Desi Chickpea

Sept 7, 2013

Desi chickpeas established well but were lodging under very moist conditions.
Monocrop Desi
<table>
<thead>
<tr>
<th></th>
<th>Desi Yield (kg/ha)</th>
<th>Flax Yield (kg/ha)</th>
<th>Flax (bu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monocrop</td>
<td>1131</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercrop 1</td>
<td>1012</td>
<td>693</td>
<td>10</td>
</tr>
<tr>
<td>Intercrop 2</td>
<td>1195</td>
<td>672</td>
<td>10</td>
</tr>
<tr>
<td>Intercrop 3</td>
<td>1389</td>
<td>796</td>
<td>12</td>
</tr>
<tr>
<td>Flax</td>
<td></td>
<td>1130</td>
<td>17</td>
</tr>
<tr>
<td>Flax with N</td>
<td></td>
<td>1694</td>
<td>26</td>
</tr>
<tr>
<td>Chickpea</td>
<td>Desi Intercrop</td>
<td>Desi Monocrop</td>
<td>Kabuli intercrop</td>
</tr>
<tr>
<td>----------</td>
<td>----------------</td>
<td>---------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>Yield</strong></td>
<td>1200 lb/ac 12 bu flax</td>
<td>1100 lb/ac</td>
<td>1400 lb/ac 12 bu/ac flax</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td>$315 + 150 = $465/ac</td>
<td>$297</td>
<td>$490 + 150 = $640/ac</td>
</tr>
<tr>
<td><strong>Seed costs</strong></td>
<td>36 + 11</td>
<td>36</td>
<td>69 + 11</td>
</tr>
<tr>
<td><strong>Fertilizer</strong></td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td><strong>Herbicide/Fungicide</strong></td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td><strong>Inoculant</strong></td>
<td>11</td>
<td>11</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total Input Cost</strong></td>
<td>107</td>
<td>96</td>
<td>143</td>
</tr>
<tr>
<td><strong>Return over inputs</strong></td>
<td>350</td>
<td>200</td>
<td>500</td>
</tr>
</tbody>
</table>
Nitrogen dynamics are unknown

Left – Intercropped Flax - Low N

Right – Monocropped Flax – Low N
Colin Rosengren

Reducing your use of chemicals and getting more out of what you already have.

Utilizing resources that we have and not relying on Chemicals.

Colin Rosengren, grain farmer with Rosengren Farms in the Midale area says mixing crops can help save you money.

Rosengren adds it’s good for the environment, cutting down on fungicide use and it’s good for your pocketbook, not having to have fungicide applications during the year.

Rosengren says an good example is Chick Peas mixed with Flax.

The alternate rows of Flax worked as a physical barrier from disease, making growing Chick Peas without fungicides possible.
• Colin has grown flax and chickpea together in alternate rows for several years on field scale
• Combined with rotary combine
• Set for chickpeas, they will thresh the flax
Colin Rosengren – alternate rows
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