**Potential yields from Intercropping Field Pea and Canola**

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**Introduction**

Intercropping is the agricultural practice of cultivating two different crops in the same place at the same time (Andrews & Kassem 1976). Benefits of intercropping can lead to greater than expected yields compared to the sole crop. Reasons for additional yield may be the result of greater efficiency in the use of nutrients, light and water (Staumgallai & Van Ackeer 2008). Intercropping may improve pest control and provide structural support advantages when compared to each being grown as a sole crop. Intercropping is not a new concept and has been used by farmers for several generations. However, recent improvements in farm machinery and individual variety characteristics have once again twisted producers’ interest in intercropping.

Oftentimes, intercropping is not only measured by total yield of products, but as a total economical value (total EScane) by combining each crop's value, or by Land Equivalent Ratio (LER). The LER is a measure of how much land would be required to achieve intercrop yields with crops grown separately as pure stands. When the LER is greater than 1.0, over-yielding is occurring and the intercrop is more productive than the component crops grown as sole crops. When the LER is less than 1.0, no over-yielding is occurring and the sole crops are more productive than the intercrop. For example, a LER rating of 1.20 from an intercrop of pea-canola means it would take 25% more land to equal that final yield if each crop was planted as separate components. The purpose of this trial was to examine the effect of seeding rate combinations of pea-canola intercropping in regards to total yield, separate crop yield components, Land Equivalent Ratio (LER), and final stand characteristics compared to that of the sole crop characteristics.

**Table 1:** Soil fertility of site prior to seeding.

<table>
<thead>
<tr>
<th>Depth</th>
<th>N (lb/ac)</th>
<th>P (lb/ac)</th>
<th>K (lb/ac)</th>
<th>S (lb/ac)</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-6”</td>
<td>12</td>
<td>14</td>
<td>429</td>
<td>76</td>
<td>8.2</td>
</tr>
<tr>
<td>6-24”</td>
<td>21</td>
<td></td>
<td>456</td>
<td>56</td>
<td>54</td>
</tr>
</tbody>
</table>

**Methods cont.**

Results cont.

**Graph 1 (Right):** LER components in intercrops were lower yielding than their sole crop derivatives indicating some sort of competitive effects between each crop component. Treatment No. would be ascending left to right.

**Graph 2 (Right):** Total LER composed of each partial LER component for all treatments. Treatment No. would be ascending left to right.

**Location**

WADO’s Pea-Canola Intercropping Trial at Melita, July 2009 late flowering stage.

**Methods**

Plots were direct seeded with a dual knife system on May 14, 2009 at Melita, MB. Seeding depth was “1” into a loam type soil that was previously sprang wheat. Six rows per plot were spaced at 9.5". Fertilizer was placed in a side band at a rate of 50 lbs/ac N and 30 lbs/ac P. All pea treatments were inoculated with proper granular based Rhizobium leguminosarum bv. Fixace. Residual soil fertility was relatively low (Table 1). Treatments were arranged in a Randomized Complete Block Design (RCBD) and replicated three times. Seeding rate treatments were as follows: 1. Canola Full rate (6 lbs/ac) – variety 71-30 CL 2. Peas Full (200 lbs/ac) – variety CDC Striker 3. Canola 2/3 + Peas Full 4. Canola 1/2 + Peas Full 5. Canola Full + Peas Full 6. Canola 2/3 + Peas 1/2 7. Canola 1/2 + Peas 1/2 8. Canola Full + Peas 1/2 9. Canola 2/3 + Peas 2/3 10. Canola 1/2 + Peas 2/3 11. Canola Full + Peas 2/3

**Results**

There were significant differences in total yield, both crop's partial LER, total LER, and final stand germination (canola only). (Table 2).

**Contact Information**

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**Conclusion**

According to this evidence, significant yield increases are achievable by intercropping canola and peas compared to their sole crop derivatives. Despite stand reductions in canola when intercropped with any pea combination, total yield accumulations with both crops were greater than sole crop values. Their component grain yields were less when intercropped compared to sole crop yields but when they were combined the intercrop yields were always superior. Total LER maintained similar results to that of total grain yield. The combination that resulted in maximum production, whether in total grain yield or LER, was when peas were seeded at their full rate and canola at 1/2, 2/3 or the full rate. Canola maintained a rather large partial LER despite the high population of pea plants in those intercrop plots.

We observed that the emergence of canola was negatively affected by pea intercropping. However, the very high CV's in the plant counts detracts from the certainty of this observation. Possibly there was an adverse effect of competitive effects between pea and canola, or some sort of root or seedling disease issue. There were significant differences in total yield, both crop's partial LER, total LER, and final stand germination (canola only). (Table 2). There were significant differences in total yield, both crop's partial LER, total LER, and final stand germination (canola only). (Table 2).

**Literature Used**

