Brassica Flowering Date Trial, 2007

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Abstract

The flowers of canola/rapeseed are attractive to bees and could considerably affect the pollination of specialty seed crops, particularly carrots, in central Oregon. An experiment was conducted to determine the flowering date of several brassica species, including spring and winter canola, brown mustard, and several brassica vegetable species that can or have been grown in central Oregon. The brown mustard and spring canola flowered during the key period of late June through early August, when the carrots are typically flowering after they were sown from mid-April until early July. One cultivar of winter canola flowered in late July when it was sown in the early spring. This may be a concern from the standpoint of volunteer seed. Several brassica vegetables flowered at the same time as the carrots when sown between mid-April and the end of May. When planted after this date they either failed to emerge or failed to flower. Cabbage and rutabaga appeared to have had strong vernalization requirements and did not flower during the growing season.

Introduction

There is considerable concern in several specialty seed growing areas of Oregon, including central Oregon, regarding the growing of canola/rapeseed for grain due to the possibility of a flowering field attracting bees away from a flowering field of carrots or other specialty seed crop. Carrot seed crops generally flower from late June until early August in central Oregon. Also, a small vegetable brassica seed industry exists in central Oregon and there is concern that the brassicas could cross pollinate with canola/rapeseed crops. The objective of this experiment is to determine when various brassica species will flower when planted on a variety of dates throughout the growing season in order to take into account not only all possible sowing dates but also when volunteer seed may germinate.

Methods and Materials

Ten species or cultivars of open-pollinated brassica species were planted every two weeks at the Central Oregon Agricultural Research Center near Madras from early April (just prior to irrigation water becoming available), through early August. Seed was planted in rows 1 m long and thinned to four or five plants/m shortly after germinating. After sowing the area was hand watered. Species were chosen to represent all of the brassica species that have been or could be grown in central Oregon for seed. The species chosen were:

*Brassica juncea*, var. ‘Pacific Gold’ – a spring type, brown mustard from the University of Idaho
B. napus, var ‘Gem’ – a spring type canola, early flowering from the University of Idaho
B. napus, var ‘Clearwater’ – a spring type canola, late flowering from the University of Idaho
B. napus, var ‘Virginia’ – a winter type, open pollinated canola from Croplan Genetics
B. campestris, var ‘Salut’ – a winter type canola, early flowering from Svalof-Weibulls
B. napus, var ‘Marian’ – a winter type, open-pollinated rutabaga from Territorial Seeds
Raphinus sativus, var ‘Cherry Belle’ – a spring type, open-pollinated radish from Territorial Seeds
B. campestris, unnamed cultivar – a spring type, open-pollinated tatsoi from Territorial Seeds
B. juncea, var ‘Osaka Purple’ – a spring type, open-pollinated mustard green from Territorial Seeds
B. oleracea, var ‘Derby Day’ - a spring type, open-pollinated cabbage from Territorial Seeds

The date on which the plants first flowered was noted and the number of growing degree days (GDD) determined.

**Results and Discussion**

Many species failed to germinate when sown at the warmest part of the year (late June through early August) and this may be a survival mechanism that prevents these seeds from germinating when conditions may not be conducive for growth (Table 1). Others, such as rutabaga and cabbage, failed to flower before the end of the growing season. These cultivars obviously have a vernalization requirement and may flower in the spring of 2008. These plants have been retained to see if they do indeed do this. The brown mustard and spring canolas had no trouble emerging throughout the season and typically emerged within a few days of being sown. However, when the GDD was calculated using a variety of base temperatures, an accurate prediction of GDD to flowering could not be developed. It appears as though these cultivars respond to photoperiod, because when base temperature was altered there was still little consistency in flowering date between sowing dates. Pacific Gold, for example, took 1,325 GDD to flower when sown on April 11, 1,096 GDD when sown on May 29, and 1,932 GDD when sown on August 7.

It was interesting to note that the winter canola cultivar Virginia did flower when sown in early spring. This is of concern as volunteer seeds may germinate in the spring and attract bees away from flowering specialty seed crops. The spring canola also appeared to flower during the carrot flowering period if sown between mid-April and late June, the main time when they would be sown in central Oregon. The radish and mustard greens both appeared to flower between late June and July when sown in the early spring, but if sown later than late May, they either failed to germinate or failed to flower.

**Conclusion**

Spring canola and brown mustard will overlap in flowering with seed carrots in central Oregon if sown from mid-April until late June. Depending on the variety, the winter
canola could flower at the same time as the carrots if it germinates in the early spring. The brassica vegetable crops grown in central Oregon would appear to flower from mid-June until the end of July when sown in the spring. They failed to either emerge or flower if sown in the late spring and summer.

Acknowledgements

This project was funded by the Agricultural Research Fund (Oregon), project ARF7017. The assistance of Bob Crocker, farm manager at Central Oregon Agricultural Research Center, is greatly appreciated.
Table 1. Flowering date of *Brassica* and *Raphinus* species plated throughout the growing season at Central Oregon Agricultural Research Center, Madras.

<table>
<thead>
<tr>
<th>Botanical name</th>
<th>Species</th>
<th>Cultivar</th>
<th>Apr 11</th>
<th>Apr 30</th>
<th>May 14</th>
<th>May 29</th>
<th>Jun 11</th>
<th>Jun 25</th>
<th>Jul 9</th>
<th>Jul 23</th>
<th>Aug 7</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>B. napus</em></td>
<td>Canola (spring)</td>
<td>Gem</td>
<td>Jun 9</td>
<td>Jun 21</td>
<td>Jul 2</td>
<td>Jul 10</td>
<td>Jul 29</td>
<td>Aug 18</td>
<td>Aug 31</td>
<td>DNE(^1)</td>
<td>DNE</td>
</tr>
<tr>
<td><em>B. napus</em></td>
<td>Canola (winter)</td>
<td>Virginia</td>
<td>Jul 30</td>
<td>Aug 31</td>
<td>DNF(^2)</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
</tr>
<tr>
<td><em>B. campestris</em></td>
<td>Canola (winter)</td>
<td>Salut</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
</tr>
<tr>
<td><em>B. napus</em></td>
<td>Rutabaga</td>
<td>Marian</td>
<td>DNF</td>
<td>DNF</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
<td>DNF</td>
</tr>
<tr>
<td><em>R. sativus</em></td>
<td>Radish</td>
<td>Cherry belle</td>
<td>Jul 1</td>
<td>Jun 16</td>
<td>Jul 31</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
</tr>
<tr>
<td><em>B. campestris</em></td>
<td>Tatsoi</td>
<td></td>
<td>Jun 13</td>
<td>Jul 10</td>
<td>Jul 10</td>
<td>Jul 29</td>
<td>Aug 14</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
</tr>
<tr>
<td><em>B. juncea</em></td>
<td>Mustard green</td>
<td>Osaka purple</td>
<td>Jun 21</td>
<td>Jul 2</td>
<td>Jul 11</td>
<td>Jul 31</td>
<td>Jul 30</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
<td>DNF</td>
</tr>
<tr>
<td><em>B. oleracea</em></td>
<td>Cabbage</td>
<td>Derby day</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNF</td>
<td>DNE</td>
<td>DNE</td>
<td>DNE</td>
</tr>
</tbody>
</table>

\(^1\)DNE – Did not emerge.  
\(^2\)DNF – Did not flower.