Effect of environment on yield and grain quality parameters of winter oats in different growing seasons in the United Kingdom

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Introduction
Four winter oat varieties, Gerald, Mascani, Tardis and Balado, were grown in replicated field trials in a range of geographical locations in the UK over four field seasons (2011-2014). These were chosen on basis of differing milling quality characteristics. The aim is to understand the role of genotype and environment on yield and grain quality parameters. Grain yield was recorded along with physical grain quality attributes e.g. kernel content and hullability which can impact on milling quality.

<table>
<thead>
<tr>
<th>Yield T/ha</th>
<th>Kernel Content %</th>
<th>Specific Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerald</td>
<td>8.56</td>
<td>72.8</td>
</tr>
<tr>
<td>Mascani</td>
<td>8.67</td>
<td>78.2</td>
</tr>
<tr>
<td>Balado</td>
<td>9.34</td>
<td>73.6</td>
</tr>
<tr>
<td>Tardis</td>
<td>8.76</td>
<td>72.8</td>
</tr>
</tbody>
</table>

data from UK Recommended List

Results

![Figure 1: Effect of environment and variety on yield of winter oats](image1)

![Figure 2: Effect of environment and variety on kernel content (%)](image2)

![Figure 3: Effect of environment and variety on hullability (%)](image3)

Conclusions
There were no significant differences in yields between varieties, however there were significant differences in yield due to environments (site and year). The lowest yielding trial site was <5 t/ha at ADAS Rosemaund. Highest yielding sites at >10 t/ha were Bidney 2011 and Devon 2013.

Comparisons of kernel content at each location showed Mascani to have highest and most stable kernel content. Balado gave the highest range in kernel content.

Comparisons of hullability at each location showed Mascani was the most stable over all environments tested. Varieties Balado and Tardis were more difficult to dehull.

We are using this data set to better understand how environment and variety can impact on yield and grain quality.

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