Efficient use of fungicides on malting barley

Liz Glynn
Teagasc CELUP
Oak Park Crops Research
Outline

♦ Yield formation
♦ Application timings
♦ Optimum rates
♦ Product choice
Leaf emergence

- Leaf emergence is controlled by thermal time
- Each leaf emerging at a set number of day degrees after the previous one – Phyllochron
- Average phyllochron – 82°C days
- Generally the earlier a crop is sown the longer its phyllochron
- Later sown crops catch up with earlier sown crops by producing less leaves and having a shorter phyllochron
Tiller production and ear number

♦ Tiller production and survival are the most important factors determining yield in spring barley.

♦ Maximum tiller number usually occurs just before stem extension (1100 shoots/m²).

♦ Final ear number is set by flowering, thus crops with low ear numbers will generally have a low yield potential.

♦ Target ear number is approx. 950 ears/m².
Target ear number = $950/m^2$
Grain number determines yield
Optimum timing of application

- Looked at 4 application timings, in all combinations
- 2012-2015 (Oak Park, Wexford Wicklow and Kildalton)
- 8 site-seasons

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;GS30</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GS31/32</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GS39/49</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GS59</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>
Tillering and awn emergence gave best response

![Bar chart showing response at different growth stages.](chart.png)

- **Mid-late tillering**
- **GS31/32**
- **GS39/49**
- **GS59**

The Irish Agriculture and Food Development Authority
Even as single applications

![Bar chart showing application timing for different growth stages (GS) from mid-late tillering (GS31/32) to GS59. The bars indicate t/ha for each application timing, with GS31/32 having the highest t/ha and GS59 having the lowest.](image-url)
No benefit from more than 2 applications

- Mid-late tillering, GS31/32, GS39/49, GS59
- Mid-late tillering, GS39/49
- GS31/32, GS39/49
- GS31/32, GS59
- Untreated
The Effect of Rhynchosporium Resistance Rating on Fungicide Requirements for Disease Control in spring barley
Deirdre Doyle & Joseph Lynch

- 3 varieties: Sanette (8), Concerto (5), KWS Irina (4) – AFBI ratings
- Disease assessments: GS30, GS39, GS55 & GS77

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate (proportion of full label rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>***</td>
</tr>
<tr>
<td>Proline</td>
<td>¼, ½, Full, Double</td>
</tr>
<tr>
<td>Siltra xpro</td>
<td>¼, ½, Full, Double</td>
</tr>
<tr>
<td><strong>Spray timings</strong></td>
<td>Tillering, GS39-45</td>
</tr>
</tbody>
</table>
Disease severity correlated to Rhynchosporium rating

Oak Park 2014

The Irish Agriculture and Food Development Authority
No justification for more than half rate even at high grain prices

€130/ton – Optimum rate 0.41

€200/ton – Optimum rate 0.49
No justification for more than half rate even at high grain prices

€130/ton – Optimum rate of 0.29

€200/ton – Optimum rate of 0.37
Winter barley dose response


♦ 3 site seasons (2014-2016)

♦ Tipperary (2014), Oak Park (2015,2016)

♦ ¼, ½, full & double rate

♦ 1 application – GS31/32
2016 curative performance

The Irish Agriculture and Food Development Authority
2016 yield

![Graph showing yield (t/ha) vs. Percentage of full label dose for different treatments: Siltra Xpro, Elatus era, Ceriax, Priaxor, and Frelizon. Proline, Comet, and Bravo are also shown.](image-url)
3 year protectant performance

% Rhy on leaf 2

Percentage of full label dose

Siltra Xpro
Proline
Frelizon
Cerix
Priaxor

The Irish Agriculture and Food Development Authority
Spring barley programmes trial


♦ 5 site seasons (2015-2016)


♦ 2 applications (Tillering & awn emergence)

♦ Fungicide spend: €40 - €100/ha
No significant difference between programmes

P = Proline  B = Bravo  M = Modem
Product choice

♦ SDHI products – Plenty to choose from
♦ Triazoles – Good disease control spectrum
♦ Strobilurins - Good mix partner
♦ Multisites – Always included @ GS39/49
♦ Morpholines/Mildewcides – When required
# Programme for 2017

<table>
<thead>
<tr>
<th>Target diseases</th>
<th>GS &lt;30</th>
<th>GS 39/49</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhynchosporium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Blotch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Mildew)</td>
<td></td>
<td>Rhynchosporium</td>
</tr>
<tr>
<td>(Rust)</td>
<td></td>
<td>Net Blotch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ramularia</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Mildew)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Rust)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Programme</th>
<th>Mixtures</th>
<th>Mixtures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SDHI/azole/Strob/multisite</td>
<td>SDHI/azole/Strob</td>
</tr>
<tr>
<td></td>
<td>Mildewicide where required</td>
<td>Mildewicide where required</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chlorothalonil needed here for Ramularia control</td>
</tr>
</tbody>
</table>
Take home messages

♦ Know your crop

♦ No benefit from more than 2 applications

♦ Use a minimum of 2 actives at each timing

♦ Equal spend at each timing

♦ No more than half rate doses of each mix partner required
Acknowledgments

Jim Grace
Oak Park farm staff
Deirdre Doyle
Dr. Joseph Lynch
Dr. Steven Kildea
Thank you for listening and best wishes for the season ahead.