How can automatic seed sampling enhance sampling

ISTA Sampling Seminar
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Edinburgh, Scotland, UK

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Senior officer/
seed plants, sampling, field inspection, certification
• What is an automatic seed sampler?
• How do automatic seed samplers work?
• Why to use automatic sampling?
• How to approve automatic seed samplers?
• How to keep records of automatic seed samplers?
• Annual check
What is a automatic seed sampler?

- A device taking primary samples
  - Mounted in the seed stream
- A timing device
  - Systematic sampling
- An outlet and duct for primary samples
  - Closed and sealed
- A container for composite sample
  - Closed and sealed
How do automatic seed samplers work?

Requirements

• Sample the entire cross section uniformly
• Not damage the seeds
• Not select
• Seed not bounce out
• Last step before filling
• Self-cleaning or easily cleaned

In the ISTA rules
Types and brands are not
How do automatic seed samplers work?

- Primary samples collected directly from seed stream

Function of devices
- Seed stream diverted to sample outlet
- Inserting and withdrawal of a box
How do automatic seed samplers work?

- Primary samples collected directly from seed stream
- Function of devices
  - Moving a beak from one side to the other side
  - Moving the seed stream over a fixed beak
How do automatic seed samplers work?

• Closed duct
  – transporting primary samples

• Container for the composite sample
  – Plastic sausage
  – Carousel
  – Bucket
Why to use automatic seed samplers?

Advantages

- Can be used in closed processing system
- Less human work and impact
- Seed sample is more representative
- Systematic sampling
- Seed plant:
  - sampling while no seed sampler present, less space to be used
- Seed sampler:
  - Easier to plan work, safer, not so heavy work
Disadvantages

- Can be too robust for fragile seeds (e.g. pulses)
- Can be big composite samples
- Less human impact
- Can be difficult to check homogeneity of the samples, primary and composite sample
- Can be more “administration” for company
  - To document sampling for every seed lot
  - During approval process
How to approve automatic seed samplers?

Conditions

Ensure that sampling process is correct maintained and a representative sample is taken.

Minimum no of primary samples, sample size

• For the automatic seed sampler
• For installation
• For operation
How to approve automatic seed samplers?

Responsibility

• Company, seed plant
  – Operation, that sampling fulfils ISTA requirements
  – all parts must be clean when changing from one seed lot to the next one
  – ISTA lab must be informed about any substantial changes or procedures before changing

• Seed sampler
  – Checking the operation and that sampling fulfils ISTA requirements
  – Dividing, labelling and sending sample
Approval process

- Sampled manually and automatically
- 4 groups of seeds
  - Different: shapes, sensitiveness, stickiness, flowing,
    - Big seeds and big sensitive seeds
    - Small seed, chaffy and non-chaffy
- Testing plan
  - Analyses, two traits, show if automatic sampler effects the sample
  - 10 seed lots, 7 approved
## How to approve automatic seed samplers?

### Dactylis glomerata "Luxor"

<table>
<thead>
<tr>
<th>Sample</th>
<th>Weight of sample</th>
<th>Festuca rubra</th>
<th>Festuca pratense</th>
<th>Vicia hirsuta</th>
<th>Lolium spp</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manually</td>
<td>16,24</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Original</td>
<td>15,81</td>
<td>5</td>
<td></td>
<td>20</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Average Man/org</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>12,5</td>
<td>18,5</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>-2</td>
<td>1</td>
<td>1</td>
<td>15</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Tolerance</td>
<td>6</td>
<td>x</td>
<td>x</td>
<td>10</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

### Other seeds

<table>
<thead>
<tr>
<th>Sample</th>
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<th>Festuca rubra</th>
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<td>x</td>
<td>x</td>
<td>10</td>
<td>13</td>
<td></td>
</tr>
</tbody>
</table>

### Average of the two test results

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>5–8</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>7–8</td>
<td>8</td>
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<td>9–10</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>11–13</td>
<td>10</td>
<td></td>
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### Tolerance

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**Note:** The table above lists the weights of different samples for various species. The tolerance values are provided for reference.
How to approve automatic seed samplers?

Annual check

• Automatic samplers are reliable
• Annual check
• Sampler checks that the automatic sampler
  – Works correct
  – Is adjusted correct
  – Not damaged or worn out
• Checklist

<table>
<thead>
<tr>
<th>Criteria checked</th>
<th>Complies</th>
<th>Description of non-conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Reception of primary samples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Closed circuit/duct between sampler and sample reception container</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>b. Well cleaned</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>c. No seed can be added or withdrawn</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>d. Sample containers uniquely identified before sampling</td>
<td>yes</td>
<td>no</td>
</tr>
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Filing

- Application of approval
  - Responsible in seed plant, settings
- ID of each automatic sampler
- Approval
  - Function of sampler
  - with calculations
  - which group of species
  - date
- Annual checks