Minor Uses – a seed industry perspective

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Outline

• Introduction
• Protecting Seed via Seed Treatment (ST)
• Economics of Seed Treatment
• ST and Minor Use Programs, examples
• Benefits of Authorizing Plant Protection Products for Minor Uses
• Proposed Regulations for ST – a Wish List
Introduction

- **ISF** (International Seed Federation)
  - Non-governmental, non profit organization representing seed industry worldwide
  - Members from >70 countries
  - Representing mainstream of world seed trade and plant breeding community
• **STEC** (Seed Treatment and Environment Committee)
  - Working group of IFS with members from seed companies, applicators and crop protection industry
  - Exchange of information regarding seed treatments (ST) **within** seed industry
  - Creating awareness about good use of ST **outside** seed industry
  - Publications on „**www.worldseed.org**“
Protecting Seed via Seed Treatment (ST)

- **Brief overview: Evolution of ST**
  - 2000 B.C.: soaking techniques (leek sap, others), treatment with ashes
  - Middle ages: soaking in chlorine salts and manure
  - 1750´s: first use of copper salts, arsenic (banned in 1808) and hot water treatment
  - 1915: introduction of organo mercurics (banned in 1980´s in Western Europe)
  - 1960´s: first systemic fungicides
  - 1990´s: new modern fungicides and insecticides
## Protecting Seed via Seed Treatment (ST)

### ST Application today - Technologies and Definitions

<table>
<thead>
<tr>
<th>Technology</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seed Dressing</td>
<td>- True seeds (e.g. cereals, corn, cotton, sugar beet, vegetables)</td>
</tr>
<tr>
<td></td>
<td>- Tubers (e.g. potatoes, ...)</td>
</tr>
<tr>
<td></td>
<td>- Bulbs/Corms/Cloves (e.g. tulips, garlic, ...)</td>
</tr>
<tr>
<td>Film Coating</td>
<td>- Insecticides</td>
</tr>
<tr>
<td></td>
<td>- Fungicides</td>
</tr>
<tr>
<td></td>
<td>- Biological control agents</td>
</tr>
<tr>
<td></td>
<td>- Others (e.g., micronutrients, filmcoatings, enhancing agents...)</td>
</tr>
<tr>
<td>Pelleting</td>
<td>- Spraying (liquids)</td>
</tr>
<tr>
<td></td>
<td>- Dusting (solids)</td>
</tr>
<tr>
<td></td>
<td>- Dipping/soaking (in liquids)</td>
</tr>
<tr>
<td></td>
<td><strong>using appropriate machinery and technology</strong></td>
</tr>
<tr>
<td>Pelleting + Coating</td>
<td>- Before sowing or planting</td>
</tr>
<tr>
<td>Multilayer Coating</td>
<td></td>
</tr>
</tbody>
</table>

(figure provided by Bayer CropScience)
Benefit: Double protection for the seed and the plant (e.g. corn)
Protecting Seed via Seed Treatment (ST)

Benefit: Reduction of application rates by using ST

- Treatment of whole area (spray)
- In-furrow treatment with granules
- Seed treatment

Application rate
- g ai/ha: 1.350 → 600 → 125
- Treated area
- in m²: 10,000 → 500 → 58

(figure provided by Bayer CropScience)
Economics of Seed Treatment (ST)

- 2007: ST market worth 1.5 billion EURO
- Global growth per annum: 5%
- Global seed market: 5% of total crop protection market
  - 48% fungicides
  - 41% insecticides
  - 11% mixed
- Higher value crops experience higher adoption rates (e.g. sugar beet, corn, vegetables)

Percentage of treated seed (blue) in different areas of the world
## Economics of Seed Treatment (ST)

**e.g.: Selected EU outdoor vegetable production**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area sown [ha]</th>
<th>Value of seeds [Mio EURO]</th>
<th>Production value [EURO]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brassica</td>
<td>100.000</td>
<td>65</td>
<td>1.48 billion</td>
</tr>
<tr>
<td>Carrot</td>
<td>75.000</td>
<td>40</td>
<td>310 million</td>
</tr>
<tr>
<td>Onion</td>
<td>100.000</td>
<td>30</td>
<td>250 million</td>
</tr>
<tr>
<td>Lettuce</td>
<td>100.000</td>
<td>50</td>
<td>1.12 billion</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185</strong></td>
<td></td>
<td><strong>3.06 billion</strong></td>
</tr>
</tbody>
</table>

(data provided by ESA, 2007)
Seed Treatment and Minor Use

- Example Germany („Lückenindikation“)

Possibilities to close minor uses gaps (PflSchG/PPA)

- § 11 authorization of not registered plant protection products (PPP) in case of expected hazard („Gefahr im Verzuge“)
- § 15 authorization procedure
- § 18, 18a special approval procedure (BBA) for extending of uses of an authorized PPP
- § 18b special minor use procedure for a personal approval of a PPP for very minor uses only
# Seed Treatment and Minor Use

## Germany: examples for approvals for seed treatment

<table>
<thead>
<tr>
<th>Active(s)</th>
<th>Pest(s) / Disease(s)</th>
<th>Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>thiram</td>
<td>damping-off (<em>Pythium</em>)</td>
<td>Sweet corn</td>
</tr>
<tr>
<td>propamocarb</td>
<td>downy mildew</td>
<td>Radish</td>
</tr>
<tr>
<td>imidaclorprid</td>
<td>aphids, flea-beetles</td>
<td>Cauliflower, Broccoli, Brussels sprout, swede, Eindivie, Lettuce</td>
</tr>
<tr>
<td>imidaclorprid</td>
<td>onion fly, thrips</td>
<td>Leek</td>
</tr>
<tr>
<td>cypredinil + tebuconazole + fludioxonil</td>
<td>anthracnose</td>
<td>Lupins</td>
</tr>
</tbody>
</table>

(data provided by M. Wick, BBA, 2007)
Seed Treatment and Minor Use

- **Example UK („SOLAs“)***

  *e.g.: Selected active ingredients approved for „off-label use“*

<table>
<thead>
<tr>
<th>Active(s)</th>
<th>Pest(s) / Disease(s)</th>
<th>Crops</th>
</tr>
</thead>
<tbody>
<tr>
<td>thiram</td>
<td>damping-off (<em>Pythium</em>)</td>
<td>Popps, Garlic, Shallot, Lupin, Rhubarb, Swede Cress, Endivie, Frise, Lettuce, Radicchio, Scarole</td>
</tr>
<tr>
<td>tefluthrin</td>
<td>bean seed fly</td>
<td>Angelica, Balm, Basil, Bay, Borage, Burnet (salad), Camomile, Caraway, Chard, Chervil, Chives, Clary, Fenugreek, Feverfew, Green mustard, Hyssop, Fennel, Coriander, Dill, Land cress, Lemon verbena, Lovage</td>
</tr>
<tr>
<td>imidacloprid</td>
<td>aphids</td>
<td>Broccoli, Brussels sprout, Cabbage, Calabrese, Cauliflower, Chinese cabbage, Choi sum, Collard, Kale, Pak Choi, Frise, Lambs lettuce, Lettuce, Radicchio, Scarole</td>
</tr>
<tr>
<td>fludioxonil</td>
<td>not listed</td>
<td>Durum wheat, Rye, Triticale</td>
</tr>
</tbody>
</table>

(excerpt from „www.pesticide.gov.uk“, 2007)
Seed Treatment and Minor Use

• **Example US (IR-4)**
  – EPA 2005 IR-4 Annual Report:
    • seed treatment products under evaluation in close contact to chemical industry include abamectin, boscalid, clothianidin, fipronil, fludioxonil, mefenoxam, methomyl, pyraclostrobin, oxamyl, thiamethoxam

  – IR-4 Strategic Plan 2006-2008:
    • start of a „Seed Technology Program“ that assists in the registration of products as seed treatments
Benefits for Authorizing Plant Protection Products for Minor Uses

- Free movement of seeds for seed and genetic production
- More productive (more competitive) and more sustainable agriculture
- Resistance management
- Key factor for improvements both in farming and plant breeding on minor crops
- Limited amounts in ST = benefits for environment, public health, economics

“Seed technology has recently emerged as the preferred mechanism to deliver crop protection chemicals where they can be most effective and provide the greatest benefit while reducing the chemical load in the environment“

(IR-4 Project, Strategic Plan 2006-2008)
Proposed Regulations for Seed Treatment –
a „Wish List“ of the Seed Industry (part I)

• Include specific provisions for ST as well as for Minor Uses in legal framework (e.g. 91/414/EEC)

• Create a system of funding for the approval of Minor Uses in Europe

• Improve authorization procedure for ST; easy, fast and inexpensive system for registering of PPP for use as ST
Proposed Regulations for Seed Treatment – a „Wish List“ of the Seed Industry (part II)

• Centralized and harmonized authorization procedure as a common standard (e.g. in EU) or automatic mutual recognition of authorizations (could encourage companies to file small-scale applications)

• Cross recognition of Agencies - EPA, EEC

• Minor Uses should be considered in regulatory review and registration process for established active ingredients to maintain uses that present acceptable risk
Thank you for your attention!