Fate of Pesticides in the Environment

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To Reduce Tracking Risk

- Spray after traffic has left for the day
- Water lightly (5 minutes) to remove dew. Should be done next morning prior to traffic.

Movement of SU Herbicides and Kerb WSP Following Irrigation on a 28° Slope

- Monument 0.33 oz/A*
- Monument 0.56 oz/A*
- Kerb WSP 3 lb/A*
- TranXit GTA 2 oz/A*
- Manor 0.5 oz/A*
- Revolver 17 oz/A

Check

Applied Dec 16, 2003 beside perennial ryegrass
Irrigation: 2.5" on Dec 17 and 0.5" on Dec 18

Nontreated trifloxysulfuron 17.4 g/ha
What Happens to a Pesticide in the Environment?

- All pesticides are degraded.
- The speed at which they are degraded differs.

An Example

- Suppose you apply a herbicide a 1 lb ai/a every year on February 15
- Suppose that only 50% of that herbicide breaks down from one year to the next.
- How much will be accumulated in soil after 10 years??

Example of Herbicide Accumulation in Soils

- Lbs ai remaining
- Lbs ai after appl.
- Year
**Conclusion from Example**

Herbicide never exceeds 2 lbs at any one given time

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**Forces That Act on Pesticides**

*Degradation Processes:*
Processes that break down a pesticide and change their chemical composition

*Transfer Processes:*
Processes that may remove a pesticide from a particular site but the pesticide is not broken down.

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**Degradation Processes**

1. *Biological Degradation*
2. *Chemical Decomposition*
3. *Photodecomposition*

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**Degradation Processes**

1. *Biological Degradation:*
   Degraded by living organisms (microbes and plants)

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**Degradation Processes**

1. *Chemical Decomposition:*
   Chemical reactions that cause a chemical change in the pesticide molecule

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**Degradation Processes**

1. *Photodecomposition:*
   Degradation by uv light (sunlight).
Transfer Processes

Absorption and exudation:
Pesticides are absorbed and exuded by plants and animals. Example: Pesticides are absorbed by turf and

Adsorption by soil particles:
Pesticides transfer from solution to a solid surface (soil

Volatilization:
Pesticides are changed from a solid or liquid state to a gas or vapor.

Soil runoff:
Pesticides are dissolved or suspended in water or adsorbed to soil particles and removed from

Leaching:
Pesticides move downward through the soil profile by capillary flow.
Reduce Environmental Impacts of Pesticides and Nutrients

- Use buffers.
Herbicides that are to bentgrass

What Makes Certain Herbicides Risky Around Bentgrass?
- Mobility of herbicide
- Toxicity to bentgrass

Turfgrass Herbicides Dangerous to Bentgrass

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<thead>
<tr>
<th>Common Name</th>
<th>Trade Name</th>
<th>Reason</th>
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</thead>
<tbody>
<tr>
<td>metribuzin</td>
<td>Sencor</td>
<td>mobile, toxic to cool-season</td>
</tr>
<tr>
<td>atrazine</td>
<td>Aatrex, others</td>
<td>mobile, toxic to cool-season</td>
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<tr>
<td>simazine</td>
<td>Princep, Regal Wynstar</td>
<td>mobile, toxic to cool-season</td>
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<tr>
<td>imazaquin</td>
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<td>pronamide</td>
<td>Kerb</td>
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<tr>
<td>chlorsulfuron</td>
<td>Corsiar</td>
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