Imazapyr is considered very water soluble, adheres poorly to soil and organic matter, and has been found to leach into soils after terrestrial applications. Imazapyr is considered high in mobility hazard after terrestrial applications.

### Mobility

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Reference</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solubility (mg/L)</td>
<td>1,110</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>Soil Sorption (Kd=mL/g)</td>
<td>0.64</td>
<td>2</td>
<td>High</td>
</tr>
<tr>
<td>Organic Sorption (Koc=mL/g)</td>
<td>142</td>
<td>1</td>
<td>High</td>
</tr>
</tbody>
</table>

**Mobility Summary:**

Imazapyr is considered very water soluble, adheres poorly to soil and organic matter, and has been found to leach into soils after terrestrial applications. Imazapyr is considered high in mobility hazard after terrestrial applications.

### Persistence

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Reference</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapor Pressure (mm Hg)</td>
<td>0.0000002</td>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>Biotic or Aerobic Half-life (days)</td>
<td>&gt;365</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Abiotic Half-life (days)</td>
<td>Not found</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terrestrial Field Test Half-life (days)</td>
<td>up to 141</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Hydrolysis Half-life (days)</td>
<td>negligible</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Anaerobic Half-life (days)</td>
<td>insignificant</td>
<td>1</td>
<td>High</td>
</tr>
<tr>
<td>Aquatic Field Test Half-life (days)</td>
<td>14</td>
<td>1</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

**Persistence Summary:**

The primary route of degradation of imazapyr is by photolysis. Light can break down this chemical in a few days but, if it is kept out of sunlight the chemical is broken down very slowly by microbial degradation. If imazapyr is applied to sandy soils and leaches down below 18 inches (where microbial activity is limited) the chemical can be expected to persist for more than a year.

In aquatic environments imazapyr is expected to be low to moderately persistent, likely due to dispersion and chemical breakdown by sunlight.

### Bioaccumulation

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Reference</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulation Factor</td>
<td>Not found</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bioconcentration Factor</td>
<td>Not found</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>20</td>
<td>1</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Bioaccumulation Summary:**

Imazapyr is very water soluble and has a low octanol/water partition coefficient making it unlikely to accumulate in tissue. Bioaccumulation hazard of imazapyr is considered low.
Acute Toxicity Summary:

In single dose testing, imazapyr is considered practically non-toxic to mammals, bees, fish, crustaceans, oysters, and only slightly toxic to some birds. Aquatic toxicity was tested on embryos and fry sac from rainbow trout and fathead minnows without any adverse effects on hatching or survival.

The worst-case exposure scenarios for a terrestrial application or aquatic application of imazapyr is to a toddler performing high contact activities in treated turf in a residential setting (which was considered moderate in hazard for toxicity). As of 2008, there are no imazapyr containing products registered for use in Washington State that allows it to be used on residential lawns. All other short-term exposure scenarios were 100 times less than the EPA’s level of concern for acute toxicity.

The hazard for acute toxicity from the use of herbicides, with imazapyr as a sole active ingredient, is considered low.

Subject and Scenario | Dose of Concern | Exposure | Margin of Safety | Route | Reference | Rating |
---|---|---|---|---|---|---|
Adult mixing and applying herbicide | 2.5 mg/kg/day | 0.01 mg/kg/day | 250 | Dermal & Oral | 2 | Low |
Toddler swimming in treated water | 2.5 mg/kg/day | 0.0037 mg/kg/day | 680 | Ingestion - swim | 2 | Low |
Post-application exposure #2 was not evaluated | | | | | | |
Toddler playing in treated vegetation | 2.5 mg/kg/day | 0.61 mg/kg/day | 4.1 | Dermal, oral, incidental | 2 | Moderate |

Acute Toxicity Risk Assessment Summary

The worst-case exposure scenario for a terrestrial application of imazapyr is to a toddler performing high contact activities in treated turf in a residential setting. As of 2008, there are no products registered for use in Washington State that allows imazapyr products to be used on residential lawns. All other short-term exposure scenarios were 100 times less than the EPA’s level of concern for acute toxicity.

The worst-case exposure scenario after an aquatic application was performed for a swimmer entering treated water on the day of application. The risk of toxicity due to incidental ingestion was 600 times less than the EPA’s level of concern.

The worst-case scenario for an applicator is through the combined activities of mixing, loading, and applying an emulsifiable concentrate. The applicator exposure scenario has a safety factor 250 times the exposure of concern for acute toxicity.

The risk for toxicity from a short term exposure to imazapyr after herbicidal use is considered low in hazard.
CHRONIC TOXICITY

Degradation Products:
- In aquatic testing, half-lives of imazapyr degradation products are less than or equal to 3 days.
- Breakdown products from metabolism of imazapyr are <3%.

Imazapyr is not known to have any common mode of toxicity with any other chemicals. Including imazethapyr, imazamethabenz-methyl, imazameth, or imazapic.

The reason imazapyr is more toxic to plants is because it stops a plant's ability to make an essential chemical (aliphatic three branched-chain amino acids) that birds and animals also require but do not make themselves (they eat plants that already contain them). So, that specific toxic affect can only happen in a plant, all other identified toxic affects occur at a much higher dose.

Irreversible eye damage can be caused by imazapyr (toxicity category I) - imazapyr is not irritating to skin and is not considered a skin sensitizer.

References:

Subject and Scenario | Dose of Concern | Exposure | Margin of Safety | Route | Reference | Rating
--- | --- | --- | --- | --- | --- | ---
Exposure to treated vegetation was not evaluated | | | | | | Low
Aggregate exposure was not evaluated | | | | | | Low
Adults or kids drinking water containing imazapyr | 2.5 mg/kg/day | <0.0025 mg/kg/day | >1,000 | Drinking water | 2 | Low
Children (1-2 yrs) eating treated food | 2.5 mg/kg/day | 0.00083 mg/kg/day | 3,012 | Ingestion | 2 | Low

Chronic Toxicity Risk Assessment Summary:
The chronic dietary analysis for imazapyr shows that the exposure for all population subgroups (eating treated food and water) does not exceed the EPA's calculated level of concern. All population subgroups are predicted to have exposures < 0.1% of the dose of concern (>1,000 times safer than required by EPA). The risk for chronic toxicity from the use of imazapyr containing herbicides is considered low.

Chronic Toxicity Summary:
Developmental and reproductive toxicity testing did not illicit adverse affects up to the highest dose tested, although maternal toxicity was noted at 300 mg/kg/day (mid dose level). Imazapyr is classified as an EPA Group E chemical for no evidence of carcinogenicity. In toxicity testing, there was no evidence of neurotoxicity, mutagenicity or endocrine disruption (Reference 2).

In the chronic toxicity tests there were no compound-related effects in toxic signs, mortality, body weight, food consumption, hematology, clinical chemistry, urinalyses, gross pathology, organ weights, and non-neoplastic and neoplastic lesions. The NOAEL is >10,000 ppm (250 mg/kg/day). Skeletal muscle effects were seen with the chemical analog imazapic at 250 mg/kg/day.

The hazard for toxicity from the use of herbicides with imazapyr as a sole active ingredient is considered low.