

Selectivity

The acetanilides are generally active on monocots or grassy species. Many broadleaf species are tolerant of these herbicides because of limited uptake of the chemical during germination. In addition, tolerant species can internally metabolize these compounds into non-toxic ones.

Mechanism of Action

These herbicides normally kill or affect susceptible weeds before their emergence but do not inhibit seed germination. They are general growth inhibitors, especially of root elongation. Specifically, the acetanilides interfere with protein and chlorophyll synthesis. Cellular membrane disruption may also be a mode of action.

Degradation

As a class, these herbicides are short-lived (< 10 days) within plants and are metabolized by hydrolysis and disconjugation.

Behavior in Soils

Adsorption

Due to relatively moderate water solubility and weak binding forces involved in the adsorption process, acetanilides are adsorbed to some extent by organic matter but not strongly. Acetanilide activity is not strongly diminished with increasing rates of soil organic matter making them useful in muck soils.

Leaching

These compounds exhibit low leaching potential when associated with clay or muck soils. When organic matter content approaches 2.0 percent, no significant leaching would be expected, even under heavy rainfall conditions. Leaching potential is greater if soils are coarse and the ground water is near the surface. Little lateral movement occurs.

Persistence

All the acetanilides are moderate in persistence. Longevity can be prolonged with excessive rates. Acetanilides are readily metabolized by soil microorganisms. Thus, environmental variables which encourage microbial activity will reduce soil persistence of this group. For example, as temperature increases, microbial degradation increases. Alachlor persists for 6 to 10 weeks but may vary depending on soil type and climatic condition. Metolachlor has a half-life of 15 to 25 days in southern soil. Photodecomposition also plays a role in the loss of these herbicides from soils. Soil incorporation prevents significant losses of these herbicides due to reduced photodecomposition.

Distinguishing characteristics

- Moderate water solubility and leaching;
- Moderate soil persistence
- Nonionic compounds
- Controls grasses and certain broadleaf species and nutsedges
- Apoplastic (xylem) movement in plants
- Absorbed primarily by emerging shoot in target plants
- Inhibition of protein synthesis is a suspected mode of action.
- Corrosive to steel and black iron.

Toxicological Properties

<u>Acute Oral toxicity</u>	<u>LD₅₀(mg/kg)</u>
Alachlor	930
Metolachlor	2780

To avoid application exposure, applicants should wear goggles or a face-shield when handling. Contaminated clothing should be removed and washed. Keep the chemicals out of bodies of water to avoid contamination of groundwater.