

Therefore, when applied as soil treatments, seedlings must emerge before herbicide symptoms develop.

Degradation

Cleavage of the ether linkage is the primary means of degradation. Most are, however, subject to photodecomposition.

Behavior in Soils

Adsorption

They are strongly adsorbed by soil colloids and organic matter.

Leaching

Diphenyl-ethers do not readily leach because of low water solubilities and adsorption to soil organic matter and colloids.

Persistence

Relatively short in soils.

- **Oxyfluorfen** - Half-life of 30 to 40 days.
- **Acifluorfen** - Estimated half-life between 14 to 60 days.
- **Bifenox** - Average half-life is between 7 to 14 days.

Distinguishing Characteristics

- Nonionic and have low water solubilities;
- Absorbed by plants but not translocated extensively;
- Light required for activity of ortho substituted diphenyl-ethers;
- More active on annual broadleaf weeds than annual grasses;
- For non-light requiring diphenyl-ethers, mechanism of action is tied into energy relations in plants, possibly ATP production or electron transport;
- Pre and postemergence herbicides; Primarily contact in nature;
- Symptoms are generally expressed on the foliage as a contact burn resulting in leaf crinkling and cupping, interveinal chlorosis and necrosis;
- Surfactant (crop oil) is needed for postemergence activity.

Toxicological Properties

Acute Oral Toxicity (mg/kg)	Oral LD ₅₀
Oxyfluorfen	>5,000
Bifenox	>5,000
Acifluorfen	1,300
Lactofen	2,533

IMIDAZOLINONES

Important Members (Table 14)

Table 14. Important members of the imidazolinone family

Common Name	Trade Names(s)	Manufacturer	Water Solubility (ppm)	Vapor Pressure (mm Hg)
Imazaquin	Image, Scepter	American Cyanamid	60-120	$< 2 \times 10^{-8}$ at 45° C
Imazapyr	Arsenal Chopper	American Cyanamid	10,000 - 15,000 (isopropylamine salt)	$< 2 \times 10^{-7}$ at 60° C
Imazethapyr	Pursuit	American Cyanamid	140	$< 1 \times 10^{-7}$ at 60° C
Imazamethabenz	Assert	American Cyanamid	857 - 1,370	$< 2 \times 10^{-7}$

Uses

Imazaquin provides selective purple nutsedge control in warm-season turfgrasses. Other sedges, broadleaf and several grass weeds have varying degrees of susceptibility. **Imazethapyr** provides

selective broadleaf weed control in soybeans and peanuts. **Imazapyr** is used for deciduous tree, vine and bramble control in noncropland situations and for pine tree release. **Imazamethabenz** is used in small grain production.