Toxicological Properties

These properties list like toxicological properties for the Aryl-oxy Phenoxy family.

Dinitroanilines are toxic to fish when added directly to bodies of water. Therefore, runoff directly into ponds should be avoided.

Acute Oral Toxicity

Herbicide	LD_{50}(mg/kg)
trifluralin	10,000
benefin	10,000
oryzalin	10,000
pendimethalin	1,250
prodiamine	15,380

DIPHENYL-ETHERS

Important Members

Table 13. Important members of the diphenyl-ether family

Common Name	Trade Name(s)	Manufacturer	Water Solubility (ppm)	Vapor Pressure (mm Hg)
Acifluorfen	Blazer	BASF	infinitely	24
Bifenox	Modown	Rhone-Poulenc	insoluble (0.35)	2.4×10^{-6}
Lactofen	Cobra	Valent	0.1	4×10^{-9}
Oxyfluorfen*	Goal	Rohm and Haas	0.1	2×10^{-6}

*Oxyfluorfen is also sold in combination with pendimethalin as OH-2 and in combination with oryzalin as ROUT.

Uses

Diphenyl-ethers control many annual weeds in several crops with preemergence or early postemergence applications. In general, these herbicides are more effective for the control of broadleaf seedlings. However, they do effectively control species of certain grass weeds. **Oxyfluorfen** is used in tree fruit crops and ornamentals where it has more activity on broadleaf weeds, especially when applied during early postemergence versus preemergence. **Acifluorfen** is used primarily for selective broadleaf weed control in soybeans. **Bifenox** is used pre- and postemergence in corn, rice, small grains, soybeans, and sorghum. **Lactofen** controls broadleaf weeds in soybeans and conifer nurseries.

Behavior in Plants

Absorption

Shoot uptake, which is rapid, is the primarily site of absorption. Injury to crops can occur when excessive moisture is present at the time of emergence due to increased absorption.

Translocation

All have very limited, if any, movement from either root or foliar applications.

Selectivity

Generally more active on broadleaf weeds than on grasses. Crop tolerance to diphenyl-ethers is due to rapid metabolism as compared to susceptible plant species. Susceptibility among cabbage cultivars is determined by the amount of leaf-surface wax.

Mechanism of Action

Contact mode of action occurs when applied postemergence because of limited mobility and rapid activity. Due to this contact action, diphenyl-ethers are not readily metabolized in plants. They disrupt cell permeability and cause watersoaking, wilting, and foliage burn within 24 hours after postemergence treatment. Diphenyl-ethers interfere with ATP production in oxidative and photophosphorylation. These compounds may generate a toxic intermediate which form single oxygen radicals in the light, causing membrane disruption and leakage of cell contents.