HERBICIDE

Tolpyralate

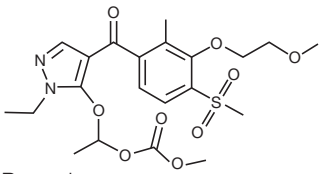
Selective corn herbicide

Tolpyralate is a HPPDi (Hydroxyphenyl Pyruvate Dioxygenase Inhibitor, HRAC Group 27) herbicide discovered by ISK.

Tolpyralate controls a wide range of broadleaf weeds and annual grasses and has excellent safety on all types of corn. Tolpyralate is also effective against weeds resistant to other modes of action including glyphosate and ALS inhibitors. Tolpyralate is a powerful tool for your fields.

Physico-Chemical Properties

Chemical structure



Class : Pyrazole
IUPAC name : (*RS*)-1-{1-ethyl-4-[4-mesyl-3-(2-methoxyethoxy)-*o*-toluoyl]-1*H*-pyrazol-5-yloxy}ethyl methyl carbonate
Molecular weight : 484.52
Molecular formula : $C_{21}H_{28}N_2O_9S$
Vapour pressure : 5.9×10^{-4} Pa (25 ℃)
Water solubility : 26.5 mg/L (20 ℃)
Form : Off-white solid
Development code : SL-573

Toxicology & Ecotoxicology

Rat LD_{50} (oral) : > 2,000 mg/kg (f)
Rat LD_{50} (dermal) : > 2,000 mg/kg (m/f)
Rat LC_{50} (inhalation) : > 2.01 mg/L (m/f)

Skin irritation : non irritant (rabbit)
Eye irritation : GHS Not classified (rabbit)
Skin sensitization : not a sensitizer (guinea pig)

Avian LD_{50} (acute oral) : > 2,000 mg/kg (quail, m/f)
Avian LD_{50} (subacute oral) : > 5,000 ppm in feed (quail)

Fish LC_{50} : > 22 mg/L (carp, 96 h)

Bees LD_{50} (acute oral) : > 107.7 µg a.i./bee (48 h)
Bees LD_{50} (acute contact) : > 100 µg a.i./bee (48 h)

Daphnia magna EC_{50} : > 22 mg/L (48 h)

Application

Use
Post-emergence application of Tolpyralate controls a wide range of broadleaf weeds and grass weeds. Tolpyralate helps you to fight problematic weeds in your corn field with low use rates of 30-50* g a.i./ha .

*Appropriate dose rate is defined to fit your location and weed species. Follow the label instructions in your country.

Mode of Action

What happens after application?
Tolpyralate is rapidly absorbed by leaf and stem tissue and works by disrupting an essential function in the plants physiology. Once absorbed by the plant Tolpyralate blocks the production of the HPPD (4-hydroxyphenylpyruvate dioxygenase) enzyme. This inhibits the plants ability to produce plastoquinone and alpha-tocopherol compounds. Without these compounds the formation of carotenoid pigments is interrupted causing the destruction of chlorophyll by sunlight, which is lethal to susceptible weeds. While complete weed death can take up to two weeks, once treated the weeds no longer compete with the growing corn.

Selectivity
Corn plants can rapidly break down Tolpyralate into non-toxic substances, therefore it has excellent crop safety for all types of corn.

Product

Trade Names	BRUCIA, SHIELDEX, RAKER, RAKER PRO etc.	
Formulations	40%SC, 10%OD etc.	
Registered Countries	Asia	Japan, Korea, Philippines
	Americas	Argentina, Canada, Chile, Mexico, USA

Always read and follow the product label instructions in your country.

ISK
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Characteristics

- HRAC Group 27
- Mode of action: Inhibition of 4-hydroxyphenylpyruvate dioxygenase (HPPD) enzyme
- Excellent safety for all types of corn (field corn, sweet corn, popcorn, seed corn)
- Controls a wide range of broadleaf weeds and annual grass weeds including difficult control weeds, such as *Amaranthus* spp, *Setaria* spp.
- Low-use formulation with application rates between 30 to 50 g a.i./ha.
- Effective for weeds resistant to other herbicide modes of actions including glyphosate and ALS inhibitors, including *Amaranthus tuberculatus*, *Ambrosia trifida* and *Erigeron canadensis*.
- Excellent tank-mix partner with other commonly used herbicides such as chloroacetamides, glyphosate, glufosinate, atrazine, dicamba.

Visual Effect of Herbicidal Activity -Tolpyralate Treated Corn Field-

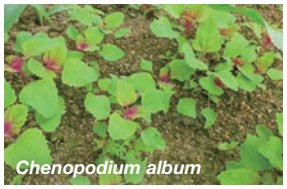
14 days after application

28 days after application

Weed Spectrum

	Weed Spectrum		
	Family	Scientific Name	Common Name
Grass weeds	Poaceae	*Digitaria sanguinalis*	Large crabgrass
		Echinochloa crus-galli	Barnyardgrass
		Eleusine indica	Goosegrass
		Setaria faberi	Giant foxtail
		Setaria pumila	Yellow foxtail
		Setaria viridis	Green foxtail
Broadleaf weeds	Amaranthaceae	*Amaranthus palmeri*	Palmer amaranth
		Amaranthus tuberculatus	Waterhemp
		Bassia scoparia	Kochia
		Chenopodium album	Common lambsquarters
	Asteraceae	*Ambrosia artemisiifolia*	Common ragweed
		Ambrosia trifida	Giant ragweed
		Erigeron canadensis	Horseweed
	Brassicaceae	*Raphanus sativus*	Wild radish
	Caryophyllaceae	*Stellaria media*	Common chickweed
	Lamiaceae	*Lamium amplexicaule*	Henbit
	Malvaceae	*Abutilon theophrasti*	Velvetleaf
	Molluginaceae	*Mollugo verticillata*	Carpetweed
	Polygonaceae	*Polygonum aviculare*	Prostrate knotweed
	Solanaceae	*Solanum nigrum*	Black nightshade

and more



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