NICOSULFURON

Selective systemic herbicide

Nicosulfuron, discovered and developed by ISK, is a sulfonylurea herbicide for maize. ISK started to commercialize Nicosulfuron on global basis since in the early 1990's.

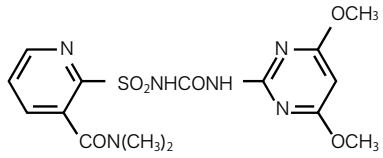
Nicosulfuron controls a wide range of weeds covering not only annual but also perennial species.

Particularly, Nicosulfuron provides so-called inter-genera selectivity between maize and closely related grass weeds, including perennial weeds like Johnson grass.

With the excellent performance, Nicosulfuron has gained public favor in large maize planted areas such as Europe, United States, South America, etc.

Physico-Chemical Properties

Chemical structure



Class : sulfonylurea
IUPAC name : 2-(4,6-dimethoxypyrimidin-2-ylcarbamoylsulfamoyl)-*N*,*N*-dimethylnicotinamide
Molecular weight : 410.4
Molecular formula : $C_{15}H_{18}N_6O_6S$
Vapor pressure : $<8\times10^{-7}$ mPa (25˚C)
Water solubility : 7.5 g/L(20˚C, pH 6.5)
Form : White solid, no characteristic odour
Development code : SL-950

Visual effect of herbicidal activity

Untreated

Nicosulfuron

Application

Uses Selective post-emergence control in maize of annual grass weeds, broad-leaved weeds and perennials grass weeds such as *Sorghum halepense* and *Agropyron repens* applied at 30～70 g a.i./ha.

Phytotoxicity Nicosulfuron may cause yellow bands on leaves for the rare occasion. Research has shown that this symptom is transient and does not affect the yield.

Mode of Action

Plant Uptake Nicosulfuron is rapidly absorbed into the weed leaves and is translocated through the xylem and phloem towards the meristematic zone. In this zone, Nicosulfuron inhibits acetolactate synthase(ALS), a key enzyme for branched-chain aminoacids synthesis, which results in cessation of cell division and plant growth.

Symptoms Following post-emergent application of Nicosulfuron, treated weeds stop growing within a few hours and show gradual discoloration on the newly developed leaves.
This is followed by leaf necrosis, desiccation and ultimate death of the plants.
The visual symptoms appear within three to four days after treatment and the whole plants are normally killed within 20 to 25 days.

Selectivity The selectivity of Nicosulfuron is due to the capacity that the crop has to metabolize the herbicide and transform it into inactive metabolites.

Characterisitics

Easy and convenient to use without additional adjuvant

A selective systemic herbicide and early to mid post-emergence use

Broad spectrum of activity against grasses, broadleaf weeds and sedges

Effective against its target weeds at low rates

Selective to maize

Resistant to wash-off by rain, due to its systemic activity

Safe to birds, fish, bee and other beneficial insects

Toxicology & Ecotoxicology

Rat LD_{50} oral : >5,000 mg/kg bw (m/f)
Rat LD_{50} dermal : >2,000 mg/kg bw (m/f)
Rat LC_{50} inhalation : 5.47 mg/L (4 h)

Skin irritation : non irritant
Eye irritation : non irritant
Skin sensitization : not a sensitizer

Birds :
Acute toxicity : LD_{50} (quail) >2,000 mg/kg bw

Fish :
LC_{50} : (trout, 96 h) 65.7 mg/L
LC_{50} : (bluegill, 96 h) >100 mg/L

Bees : Acute contact toxicity LD_{50} 76 μg/bee

Daphnia magna : EC_{50} (48 h) 90mg/L

ISHIHARA SANGYO KAISHA, LTD.
1-3-15 Edobori,Nishi-ku,Osaka 550-0002
TEL +81-6-6444-7154
URL:http://www.iskweb.co.jp
E-mail:isk.bio@iskweb.co.jp

NICOSULFURON
Selective systemic herbicide

Weed Spectrum

Weed Species Family	Species	Leaf Stage	Dose 40	rate 60
Annual weeds				
Gramineae	*Digitaria sanguinalis*	2	○	◎
	Setaria viridis	2	◎	◎
	Eleusine indica	3	◎	◎
	Avena fatua	3	◎	◎
Cyperaceae	*Ceperus microiria*	3	◎	◎
Compositae	*Galinsoga ciliata*	4	○	◎
Caryophyllaceae	*Stellaria media*	8	○	◎
Polygonaceae	*Polygonum lapathifolium*	3	○	◎
Chenopodiaceae	*Chenopodium album*	2	△	○
Malvaceae	*Sida spinosa*	2	△	△
	Abutilon theophrasti	1	△	△
Leguminosae	*Cassia tora*	1	△	△
Amaranthaceae	*Amaranthus viridis*	2	◎	◎
Solanaceae	*Solanum nigrum*	4	△	△
Portulacaceae	*Portulaca oleracea*	3	○	◎
Commelinaceae	*Commelina communis*	2	○	◎
Cruciferae	*Capsella bursa-pastoris*	4	○	◎
Perennial weeds				
Gramineae	*Sorghum haleoense*	4-5	○	◎
	Agropyron repens	3-4	○	◎
	Cynodon dactylon	15 cm	×	×
Cyperaceae	*Cyperus rutundus*	4-5	×	○

◎：95～100%, ○：70～95%, △：50～70%, ×：～50%　　Dose rate is g a.i./ha

Product

Trade names	Countries
ELITE M	**Portugal, Spain**
GHIBLI	**Italy**
MILAGRO	**Belgium, Czech, France, Greece, Netherland, Poland, Slovakia, Ukraine**
MISTRAL	**Bulgaria, Romania**
MOTIVELL	**Croatia, Germany, Hungary, Serbia, Slovenia**
NISSHIN	**Argentina**
PAMPA	**France**
SAMSON	**Netherland, Spain**
SAMSON	**Brazil**
SL950	**Austria**
玉農楽	**China**
ワンホープ	**Japan**

●Formulation types：SC, WG