ISOCLAST™ ACTIVE
A SULFOXIMINE INSECTICIDE

Isoclast™ is a member of the sulfoximine class of insecticides

Isoclast™ active (ISO common name: sulfoxaflor), discovered by and proprietary to Dow AgroSciences, currently is the sole member the sulfoximine class of insecticides.

The discovery of Isoclast resulted from an investigation of the sulfoximines, a class of chemistry which had not been examined extensively for insecticidal activity and represented an opportunity for development of novel chemistry. Early discovery-phase research of sulfoximine molecules by Dow AgroSciences scientists found high levels of activity against aphids in bioassays. Subsequent improvement in chemistry and biology attributes resulted in the discovery of Isoclast, the first insecticide from the sulfoximine class of insecticides.

Sulfoximines act as agonists at the insect nicotinic acetylcholine receptor (nAChR), a fact that may cause them to be confused with other nAChR agonists, including neonicotinoids. But sulfoximines and neonicotinoids are distinctly different in chemical structure and represent different chemical classes. Additionally, Isoclast demonstrates a robust lack of metabolic cross-resistance with other modes of action (MOA) and MOA sub-groups, including neonicotinoids, due to metabolism that differs from metabolism of neonicotinoids. The distinction of Isoclast as a member of sulfoximines has been clearly established by the responsible body for insecticide MOA classifications (IRAC) and published in the open scientific literature.

Isoclast exhibits lower toxicity and significantly faster environmental degradation, meaning that it presents considerably lower environmental risk than neonicotinoids.

The use of Isoclast will actually help to reduce the use and reliance on neonicotinoids.

Regulatory authorities, including the U.S., Canada, Australia and the EU have made clear statements differentiating Isoclast (sulfoxaflor) from neonicotinoids. For example:

“Sulfoxaflor is a sulfoximine insecticide with a distinct mode of action and it is not a neonicotinoid. Sulfoxaflor has different chemistry since it contains a unique chemical moiety, a sulfoximine. This chemistry confers a unique set of structure/activity relationships compared to other insecticides. Like several chemically diverse classes of insecticides (spinosyns, neonicotinoids, nereistoxin analogs), sulfoxaflor acts on the insect nicotinic receptors (nAChRs). However, it operates at a different target site on the nicotinic acetocholine receptor, thus, the characteristics of the sulfoxaflor-nAChR interaction distinguish it from the other nAChR acting insecticides.

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Sulfoxaflor is effective against a wide range of sap-feeding (piercing, sucking) insect pests that are resistant to other classes of insecticides, including many that are resistant to neonicotinoids. Growers will use sulfoxaflor instead of neonicotinoids because it actually works on pests that neonicotinoids fail to control. Compared to the neonicotinoids, the ecological risk profile of sulfoxaflor is much more favorable which further supports that they are chemically distinct. Sulfoxaflor also poses less risk to fish, aquatic invertebrates, small mammals, wildlife and birds than broad spectrum carbamates, organophosphates and pyrethroids."[1]

"Sulfoxaflor is not a neonicotinoid but a substance belonging to the class sulfoximines."[2]

[1] US-EPA Oct 14, 2016: "Sulfoxaflor; Response to Public Comments. Docket ID: EPA-HQ-OPP-2010-0889-0564"

[2] European Commissioner Response to European Parliament question: E-012947-Consetetur

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