

Flupyradifurone Insecticide: A New Active Ingredient for Use on Soybeans

Flupyradifurone is a systemic insecticide registered for use on soybeans, vegetables, cereal grains, berries, alfalfa, etc. It is the first member of butenolide class of insecticides with mode of action similar to neonicotinoid insecticides which act on the central nervous system of target insect pests. However, its chemical structure differs from neonicotinoids and thus, it is a separate sub-class of IRAC (Insecticide Resistance Action Committee) Group 4D insecticides. Flupyradifurone has activity on sucking insects such as aphids, leafhoppers, and whiteflies.

On soybeans, flupyradifurone is registered as three end-use products*, Sivanto 200SL, Sivanto Prime and Sivanto Prime200 SL. All products comprise 17.09% active ingredient (a.i.) and can be applied foliarly through ground or aerial application. The labelled rate for controlling soybean aphids and leaf hoppers on soybeans is 0.091 lb a.i./A to 0.137 lb a.i./A (7.0 to 10.5 fl oz of formulated product). Regardless of product or formulation, the maximum annual application rate on soybeans must not exceed 0.365 lb a.i./A (28.0 fl oz of formulated product). A minimum interval of 10 days must be maintained between two applications. Flupyradifurone products cannot be tank-mixed with azole fungicides (Fungicide Resistance Action Committee, Group 3) during bloom period.

Always read and follow the label directions before using the pesticide. It is a violation of Minnesota state law to use a pesticide without following the label directions.

Important Environmental Protection Advisories/Requirements for Flupyradifurone

- When compared to other commonly used systemic insecticides (clothianidin, imidacloprid, thiamethoxam), flupyradifurone exhibits a relatively lower toxicity to honeybees. Flupyradifurone is not toxic to adult and larval honeybees via acute contact exposure, however, it is toxic to adult bees through acute oral exposure. Field studies have shown that flupyradifurone is unlikely to pose long term effects on honeybee colony development.
- Flupyradifurone has properties and characteristics associated with other chemicals detected in groundwater and may leach into groundwater if used in areas where soils are permeable, particularly where the water table is shallow.
- Flupyradifurone and its degradate product (difluoroacetic acid) may reach surface water via run off for several months or more after application, especially for poorly drained soils and soils with shallow ground water. A level, well maintained vegetative buffer strip between surface water sources and the application field will reduce the potential loading of flupyradifurone and its degradates products into the surface water.
- Flupyradifurone is toxic to aquatic invertebrates and drift and runoff may be hazardous to aquatic organisms in water adjacent to treated areas. Follow spray drift management directions to minimize the off-target movement.
- Flupyradifurone may impact endangered species. The product label requires that County specific measures contained in the Endangered Species Protection Bulletin must be followed while using flupyradifurone products. Call 1-844-447-3813 or visit <https://www.epa.gov/endangered-species> to obtain bulletins.

Important Insecticide Resistance Management Recommendations for Flupyradifurone

In 2015 and 2016 growing seasons, many Minnesota growers observed that foliar applications of some synthetic pyrethroid insecticides (bifenthrin and lambda cyhalothrin) failed to provide adequate control of soybean aphids. Resistance to these synthetic pyrethroids was later confirmed by the University of Minnesota through laboratory bioassays. With soybean aphids showing resistance to some synthetic pyrethroids, flupyradifurone can be a potential tool for managing insecticide resistance to soybean aphids. Take the following steps to manage insecticide resistance to soybean aphids:

- Correctly identify the pest and ensure that appropriate economic thresholds are met before application.
- Rotate the use of flupyradiurone with other insecticide groups with different mode of action to reduce selection for insect resistance.
- Follow an Integrated Pest Management (IPM) program that includes scouting and economic thresholds and considers alternate control options.
- Monitor treated pest populations for resistance development and consult your crop advisor for more information on resistance management.
- Report suspected resistance to the University of Minnesota Extension or the registrant.

To learn more about flupyradifurone and other new active ingredients visit:

<http://www.mda.state.mn.us/chemicals/pesticides/regs/newreviews.aspx>

*List of flupyradifurone products can change with introduction of new products: always check the label, or consult pesticide product registration database at <http://state.ceris.purdue.edu/>, select Minnesota, and search for active ingredient. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement is implied.