UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON. D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

PC Code: 119011
DP Barcode: 467784
Date: December 12, 2023

MEMORANDUM

SUBJECT: Flazasulfuron - Environmental Fate and Ecological Risk Assessment for Proposed Section 3 New Use on Avocado.

FROM: Stephen Carey, Biologist
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Steve Carey Digitally signed by Steve Carey Date: 2023.12.12 11:06:39 -05'00'

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THRU: Mark Corbin, Branch Chief
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TO: Jennifer Drobish, Risk Manager Reviewer
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The Environmental Fate and Effects Division (EFED) has completed a review of the submission for proposed new use of the herbicide flazasulfuron (PC Code 119011) on avocado. The proposed use is to be added to the ISK Flazasulfuron Herbicide (EPA Reg. No. 71512-18) product label.

The proposed application rate for the avocado use is similar to other rates targeting soil and weed foliage-assessed previously (USEPA 2007, DP302482 and DP302484; USEPA 2011, DP372894). The proposed application rate for avocado use is 0.045 lbs. a.i./A (pounds of active ingredient per acre) per application and a maximum of 2 applications, totaling a maximum annual rate of 0.09 lbs. a.i./A per year. With the maximum single and annual application rates for the proposed avocado use, which is lower than or the same as the registered foliar uses in this petition, a new risk assessment for the previously assessed species is not needed and the risk conclusions from the 2007 and 2011 flazasulfuron assessments apply to the proposed

avocado uses. However, EFED was not previously aware of the submission of Tier I pollinator studies on adult reproduction and larval mortality and reproduction of honey bees (MRIDs 50833601, 50833602, and 52265801). As such, the pollinator studies have not yet been formally reviewed.

For registered foliar uses, there are no LOC exceedances for non-listed and listed terrestrial and aquatic wildlife. However, there are LOC exceedances for non-listed and listed terrestrial plants and both vascular and non-vascular aquatic plants. RQs for terrestrial plants were <160 when applying at a single maximum application rate of 0.047 lbs. a.i./A. Olives, a registered food use with two applications allowed instead of the maximum three applications to other registered food uses, the highest RQ for aquatic plants was 12 (USEPA 2016, DP431842).

A search of the incident database on September 26, 2023, indicates no incidents from flazasulfuron uses. However, incident data should be interpreted with caution, as no incidents reports should not be construed to indicate low risk, or that incidents are not occurring.

A brief description of flazasulfuron and its environmental fate and ecological effects is provided below. All required fate and effects studies has been submitted and included in the risk assessment except for the Tier I pollinator studies as the OECD studies of 237, 239, and 245 are currently being reviewed.

The United States Department of Agriculture (USDA) pollinator attractive data (see table below), indicate several crops, including avocado, that flazasulfuron is applied to are attractive to pollinators. Until the pollinator studies recently submitted are formally reviewed, a provisional assessment suggests flazasulfuron pose no risks to bees when applied to avocado at an application rate of 0.045 lb. ai/A. The toxicity effects observed in the Tier I pollinator studies was reduced larval survival and adult emergence in the chronic study with larval bees. Using the chronic endpoint of 10 ug ai/larva, BEE-REX produced a RQ of 0.06 that does not exceed the Level of Concern (LOC) of 1.0 for bees exposed to flazasulfuron (**Appendix I**).

Crop	**Honey Bee Attractive?[1,2]**	**Bumble Bee Attractive?[1,2]**	**Solitary Bee Attractive?[1,2]**	**Notes**
Citrus	++ (Both pollen and nectar)	+	+	--
Sugar cane	No	No	No	Wind pollinated.
Tree Nut Group[3]	Attractiveness varies. Most attracted to chinquapin; Not	Attractiveness varies. Most attracted to Brazil nut; attracted to	Attractiveness varies. Attracted to Brazil nut, chinquapin and	Managed pollinators are not required but cashew, coconut, and macadamia nut

[1] a single "+" attractiveness rating indicates a use pattern is opportunistically attractive to bees.
[2] a double "++" attractiveness rating indicates a use pattern is attractive in all cases.
[3] Based on beechnut, Brazil nut, bur oak, butternut, cashew, candlenut, chinquapin, coconut, ginkgo, Guiana chestnut, heartnut, hickory, macadamia nut, peachia, peach palm nut, pecan, pine nut, and tropical almond.

	attracted to ginkgo, beechnut, peach palm nut, and pecan; attracted to rest of group.	chinquapin and coconut; not available for cashew, macadamia nut and tropical almond; not attracted to rest of group.	coconut; not available for cashew, macadamia nut and tropical almond; not attracted to rest of group.	require bee pollination. Beechnut, bur oak, and pecan are wind pollinated while peach palm nut are pollinated by beetles.
Grass/turf	+ (pollen only)	No	No	Wind-pollinated. Only when no other forage sources are available.
Olive	+ (pollen only)	N/A	N/A	--
Avocado	+ (both pollen and nectar)	N/A	+	Use managed pollinators as pollination is required.
Grapes	+ (pollen only)	No	No	Wind pollinated.
Conifers	Potentially attractive depending on the specific plant			

Overview

Flazasulfuron is a selective herbicide belonging to the pyrimidinyl family of the sulfonylurea chemical class. Flazasulfuron is a currently registered herbicide for use on non-residential areas (e.g., golf courses), on non-residential turf areas (e.g., industrial parks, sports fields, commercial lawns, Christmas tree farms), and on agricultural fields where citrus fruits, grapes, olives, tree nuts, and sugarcane are grown.

Regarding exposure, flazasulfuron does not sorb strongly to soils and has the potential to leach to ground water and/or reach surface water during runoff events. Flazasulfuron is a weak acid. Hydrolysis is the major route of degradation of flazasulfuron. Flazasulfuron degrades through photolysis and metabolism with degradation driven by hydrolytic processes. Based on new data reviewed since the previous assessment, flazasulfuron is slightly to moderately persistent to aerobic soil metabolism (MRID 49747501). In addition, flazasulfuron is mobile and expected to be more mobile with increasing pH.

Major bridge-contraction transformation products N-(4,6-dimethoxy-2-pyrimidinyl-N-[3-(trifluoromethyl)-2-pyridinyl urea (DPTU) and 4,6-dimethoxy-N-[3-(trifluoromethyl)-2-pyridinyl]-2-pyrinidinylamine (DTPP) persist in hydrolysis and metabolism studies but readily degrade via photolysis. The photolysis half-life is 34 days.

Aquatic modeling is conducted with new scenarios appropriate for avocado - deciduous orchard 3S (Florida) and 18 (California) - and resulting EECs are substantially similar to prior EECs with acute values ranging from 0.1 to 0.4 ppb and chronic values ranging from 0.03 to 0.2 ppb.

Application dates are 45 days pre-emergence and 45 days post emergence to account for pre- and post-emergence applications and a 90-day retreatment interval. Modeling also incorporates a 25 ft ground buffer with medium droplet size distribution resulting in 0.7% of the application rate depositing to the pond via spray drift. Input parameters are consistent with those presented in the last flazasulfuron assessment (USEPA 2015, DP427429) aside from an update to the aerobic soil metabolism based on newly reviewed data (MRID 49747501) resulting in 70.5 day input. A Pesticide Water Calculator (PWC Version 2.001) input file supporting this assessment is attached below.

Survival and growth effects are impacted for terrestrial and aquatic (both vascular and non-vascular) plants exposed to flazasulfuron as a result of a combination of surface runoff and spray drift. For terrestrial wildlife and aquatic animals, flazasulfuron is practically non-toxic to birds, terrestrial-phase amphibians, reptiles, mammals, honey bees (adults), earthworms, fish, aquatic-phase amphibians, and aquatic invertebrates on an acute exposure basis. Reduced survival and reproduction were observed in fish and aquatic invertebrates and reduced survival, reproduction and growth were observed in birds. No chronic reproduction effects were observed with mammals.

For full details on the environmental fate and ecological effects of flazasulfuron, please refer to the flazasulfuron new chemical risk assessment document (USEPA 2007, DP302482,302484) and the registration review assessment of 22 Sulfonylureas (SUs) (USEPA 2015, DP427429).

With the maximum single and annual application rates for the proposed avocado use, which is lower than or the same as the registered foliar uses in this petition, a new risk assessment for the previously assessed species is not needed and the risk conclusions from the 2007 and 2011 flazasulfuron assessments apply to the proposed avocado uses.

PWC INPUT FILE

avocado.PWC

REFERENCES

USEPA 2007. Ecological Risk Assessment: New Chemical: Flazasulfuron (SL-160). DPs 302482 and 302484.

USEPA 2011. Flazasulfuron: Ecological Risk Assessment for First Food Uses on Cirtus, Grapes and Sugarcane and New Outdoor Non-food uses on Christmas Trees and Industrial Vegetation Management. DP 372894.

USEPA 2015. Preliminary Ecological Risk Assessment for Registration Review of 22 Sulfonylurea Herbicides. DP 427429.

Appendix I. BEE-REX Inputs and Outputs

Table 1. User inputs (related to exposure)

Description	Value
Application rate	0.045
Units of app rate	lb a.i./A
Application method	foliar spray
Are empirical residue data available?	no

Table 2. Toxicity data

Description	Value (µg a.i./bee)
Adult contact LD50	100
Adult oral LD50	100
Adult oral NOAEL	10
Larval LD50	89
Larval NOAEL	10

Table 3. Estimated concentrations in pollen and nectar

Application method	EECs (mg a.i./kg)	EECs (µg a.i./mg)
foliar spray	4.95	0.00495
soil application	NA	NA
seed treatment	NA	NA
tree trunk	NA	NA

Table 5. Results (highest RQs)

Exposure	Adults	Larvae
Acute contact	0.001215	NA
Acute dietary	0.01	0.01
Chronic dietary	0.14	0.06

Table 4. Daily consumption of food, pesticide dose and resulting dietary RQs for all bees

Life stage	Caste or task in hive	Average age (in days)	Jelly (mg/day)	Nectar (mg/day)	Pollen (mg/day)	Total dose (µg a.i./bee)	Acute RQ	Chronic RQ
Larval	Worker	1	1.9	0	0	0.00009405	1.0567E-06	9.41E-06
		2	9.4	0	0	0.0004653	5.2281E-06	4.65E-05
		3	19	0	0	0.0009405	1.0567E-05	9.41E-05
		4	0	60	1.8	0.30591	0.00343719	0.030591
		5	0	120	3.6	0.61182	0.00687438	0.061182
	Drone	6+	0	130	3.6	0.66132	0.00743056	0.066132
	Queen	1	1.9	0	0	0.00009405	1.0567E-06	9.41E-06
		2	9.4	0	0	0.0004653	5.2281E-06	4.65E-05
		3	23	0	0	0.0011385	1.2792E-05	0.000114
		4+	141	0	0	0.0069795	7.8421E-05	0.000698
Adult	Worker (cell cleaning and capping)	0-10	0	60	6.65	0.3299175	0.00329918	0.032992
	Worker (brood and queen tending, nurse bees)	6 to 17	0	140	9.6	0.74052	0.0074052	0.074052
	Worker (comb building, cleaning and food handling)	11 to 18	0	60	1.7	0.305415	0.00305415	0.030542
	Worker (foraging for pollen)	>18	0	43.5	0.041	0.21552795	0.00215528	0.021553
	Worker (foraging for nectar)	>18	0	292	0.041	1.44560295	0.01445603	0.14456
	Worker (maintenance of hive in winter)	0-90	0	29	2	0.15345	0.0015345	0.015345
	Drone	>10	0	235	0.0002	1.16325099	0.01163251	0.116325
	Queen (laying 1500 eggs/day)	Entire lifestage	525	0	0	0.0259875	0.00025988	0.002599