

State of Hawai'i
Department of Agriculture
Plant Industry Division
Pesticide Branch

November 26, 2024

Board of Agriculture
Honolulu, Hawai'i

Subject: Proposed Amendment to the List of State Restricted Use Pesticides to Include
New Active Ingredient, Flupyradifurone

PROCEDURAL BACKGROUND:

In 2015, Bayer CropScience submitted two (2) product license applications to the Hawaii Department of Agriculture, Pesticides Branch for products containing the new active ingredient Flupyradifurone. This active ingredient was new to the State of Hawaii and subject to a full groundwater review which was conducted by Chittaranjan Ray and his team at the University of Hawaii Water Resources Research Center (“WRRC”). The results of the review and other environmental fate data indicated that this chemical would potentially leach into groundwater. Despite branch reservations, Sivanto 200 SL and Sivanto Prime were both licensed in 2015 as general use products under the condition that no other products containing the active ingredient Flupyradifurone would be licensed until an in-field study could be completed. A proposal for the in-field groundwater study was submitted in 2017 by UH-WRRC totaling \$403,199.00, but due to lack of funding, the study was never conducted.

Since 2015, several products with the active ingredient Flupyradifurone have been submitted by Bayer CropScience and other registrants. These registrants were notified that the Pesticides Branch will request to add Flupyradifurone to the State Department’s list of State restricted use pesticides and that current pending products will not be licensed unless the Pesticides Branch received their consent to register it as a State restricted use pesticide product. A groundwater review contract was issued in 2021 until 2026 to review new active ingredients, not including Flupyradifurone, and to evaluate existing groundwater modeling systems with the Pesticides Branch’s current model, CLERS. If the results of the contract conclude that CLERS is no longer a sufficient modeling tool, then the Pesticides Branch may re-review Flupyradifurone using the new model. In addition, when funds are available, an in-field study may be attempted to help determine if the State restricted status is warranted. If the in-field study is funded and the results of that study do not support the State restriction, or if a new groundwater model is established and the results of running Flupyradifurone through the new model suggest Flupyradifurone is not a potential leacher, then the Pesticides Branch will request removal of the active ingredient on the State restricted list.

ACTIVE INGREDIENT BACKGROUND:

Flupyradifurone is a systemic insecticide that is Federally registered for use on a variety of crops such as brassica, cucurbit, coffee, fruiting, leafy, bulb, tuberous and corn vegetables, citrus,

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pome and stone fruit trees, tree nuts, eggplants, peppers, taro, tomato, corn, bushberries, and ornamentals. It is also Federally registered for use as seed treatment on rapeseed/canola and soybean seeds. Application methods consist of foliar spray, soil drench, and chemigation.

The preliminary environmental fate data submitted by Bayer CropScience and the wide range of uses for this chemical triggered a full groundwater review to determine leachability in Hawaii's soils and a full groundwater data package was requested from the registrant. After review of the persistence and mobility characteristics of this chemical, it was determined that the likelihood of leaching to groundwater is high.

To date, there are nine Federally registered products containing Flupyradifurone registered under Environmental Science U.S., LLC, Bayer CropScience LP, and SBM Life Science Corp. There are two State registered products containing Flupyradifurone classified for general use registered under Bayer CropScience, two State products pending review under Environmental Science U.S., LLC, and three withdrawn applications, one under Bayer CropScience LP and two under SBM Life Science Corp., that may be rescinded if the active ingredient does not become State restricted.

On October 2, 2024, the proposed amendments were discussed with the Governor's Advisory Committee on Pesticides. A motion was made to recommend that flupyradifurone become a restricted use pesticide pending the completion of a groundwater study. If the groundwater study does not support the data that flupyradifurone is a groundwater leacher, then it will be withdrawn. The Advisory Committee on Pesticides voted, and the motion was passed. The minutes from the Advisory Committee are attached along with the proposed additional changes to the Rules.

AUTHORITY: Pursuant to Section 149A-19, *Hawaii Revised Statutes* ("HRS"): "(a) the board . . . shall adopt rules to: (1) Determine the pesticides that are highly toxic to humans, designate pesticides as restricted use or nonrestricted use, and establish a system of control over the distribution and use of certain pesticides and devices purchased by the consuming public. . . ." *Hawaii Administrative Rules* ("HAR") Section 4-66-32 outlines the procedures to designate a pesticide or its use as restricted use if its uses can be reasonably be anticipated to result in groundwater contamination.

RECOMMENDATION: Based on the environmental fate data provided, the broad range of uses of the products, and the full groundwater review, The Pesticides Branch recommends that Flupyradifurone be added to the State Department's list of State restricted use pesticides referenced in Section 4-66-32(g), HAR, on January 1, 2027. This will allow currently registered products to finish the rest of their licensing period classified as general use and

allow time for applicators and dealers to be educated on the restricted use status of any current products.

It is respectfully requested that the Board follow the recommendations set forth above.

Submitted by:



SCOTT NISHIMOTO
Acting Pesticides Branch Manager

CONCURRED:



GREG TAKESHIMA
Acting Administrator, Plant Industry

APPROVED FOR SUBMISSION:



SHARON HURD
Chairperson, Board of Agriculture

Attachments

List of HI Products in System as of 09/11/2024 with the active ingredient Flupyradifurone

product_name	epa_number	sub_registran t_number	company_n umber	hi_license_n umber	status	ai_name	Comp
Sivanto 200 SL	264-1141		9529	9529,257	ACTIVE	Flupyradifurone	Bayer
Sivanto Prime	264-1141		9529	9529,258	ACTIVE	Flupyradifurone	Bayer
Sivanto HL	264-1198		9529	N/A	WITHDRAWN	Flupyradifurone	Bayer
BioAdvanced Science-Based Solutions All-In-One Rose & Flower Care Granules	92564-77		10305	N/A	WITHDRAWN	Flupyradifurone; Azoxystrobin	SBM LI
BioAdvanced Science-Based Solutions Shrub Care Protect & Feed Granules	92564-77		10305	N/A	WITHDRAWN	Flupyradifurone; Azoxystrobin	SBM LI
Tempord Dust	101563-5		14988	N/A	INITIAL REVIEW	Flupyradifurone; beta- Cyfluthrin	Enviro
Attus	101563-186		14988	N/A	INITIAL REVIEW	Flupyradifurone	Enviro

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor



PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

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January 11, 2022

To whom it may concern,

Hawaii Department of Agriculture (HODA) is requesting to add flupyradifurone to Hawaii's list of Restricted Use Pesticide Active Ingredient list. Once the active ingredient is added to the list, you will be notified and all products currently licensed with the active ingredient flupyradifurone will not be renewed unless the registrant consents to products having the state restricted status. Also, any new products with this active ingredient will be licensed as a state restricted pesticide.

We have received several chemical product applications from you that contain the active ingredient flupyradifurone: Sivanto 200 SL (EPA Reg. No. 264-1141), Sivanto Prime (EPA Reg. No. 264-1141), Altus (EPA Reg. No. 432-1575), and Sivanto HL (EPA Reg. No. 264-1198). Sivanto 200 SL and Sivanto Prime will continue to be registered as a general use pesticide until 12/31/2023 when their registrations expire. Altus and Sivanto HL will not be registered unless we receive your consent to register them as a state restricted product. Since the initial application for Altus was misplaced by HDOA staff in 2017, the fee will be waived. A \$330.00 refund will be issued for Sivanto HL if the application is withdrawn.

Below is a brief summary for the historical record for the active ingredient flupyradifurone.

An internal groundwater review was conducted by pesticide staff in 2014 since flupyradifurone was a new active ingredient at the time of the Sivanto submissions. This review takes into account the soil adsorption coefficient (Kd), the total acreage of all uses on the EPA stamped "accepted" labels, the type of application method, whether the chemical is systemic or contact, and a possible preliminary run through the Comprehensive Leaching Risk Assessment System (CLERS). CLERS is a modeling system specifically designed for the Hawaiian islands in which the leachability of a new compound is compared against two reference chemicals: atrazine which is a known leacher and endosulfan, a known non-leacher in Hawaii.

Flupyradifurone scored greater than 45 on the internal review which triggered the requirement of conducting a full groundwater review. Full groundwater reviews compare and contrast information provided by the registrant and what is found in literature and considers the water quality and quantity information of the areas the pesticide is most likely to be used, any




drinking water level concerns established by EPA and/or Hawaii's Department of Health, and the pesticide application. This review was contracted out to University of Hawaii's Water Resource Center (UH-WRC) and completed in 2015. Based on this full groundwater review, flupyradifurone was considered a potential leacher in Hawaii.

Despite branch reservations, Sivanto 200 SL and Sivanto Prime were both licensed in 2015 under the condition that no other products containing the active ingredient flupyradifurone will be licensed until an in-field study can be completed. A proposal for the in-field groundwater study was submitted in 2017 by UH-WRC totaling \$403,199.00, but due to lack of funding, the study was never conducted.

Currently, a groundwater contract is in place that will review new active ingredients, not including flupyradifurone, using two modeling systems: CLERS and HYDRUD-ID. If the results of the contract conclude that CLERS is no longer a sufficient modeling tool, then the branch may re-review flupyradifurone using the new model. In addition, when funds are available, an in-field study may be attempted to help determine if the state restricted status is warranted. If the in-field study is funded and the results of that study do not support the state restriction, or if a new groundwater model is established and the results of running flupyradifurone through the new model suggests flupyradifurone is not a potential leacher, then we will request the removal of the active ingredient on the list and will notify any registrants.

If you had any questions, please reach out to Esther Riechert at (808) 973-9403 or at esther.riechert@hawaii.gov.



Helmut Rogg
Plant Industry Division Administrator

1/12/22
Date

Cc: Greg Takeshima (HDOA)
Tann Schafer (Bayer)

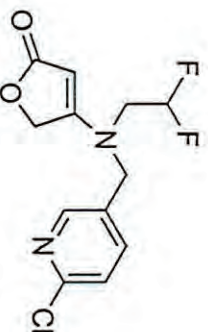
Ground Water Leaching Potential of Flupyradifurone

Introduction:

Flupyradifurone, 4-((6-chloro-3-pyridyl)methyl)(2,2-difluoroethyl)amino)furan-2(5H)-one, is a systemic insecticide that is newly proposed to protect various crops (e.g., vegetables, fruits, and grapes) from piercing and sucking insects (e.g., aphids, whiteflies, and thrips). The compound belongs to the chemical class of butenolide, and its putative mode of insecticidal action is to inhibit the nicotinic acetylcholine receptor that results in a disorder of the nervous system of insects, followed by death. It is labeled for agricultural applications of foliar spray, chemigation, and soil drench to many crops including a seed treatment for soybeans, but not for residential uses. The compound was found to be less toxic to humans and non-target organisms, when compared to other insecticides such as pyrethroids, neonicotinoids, and organophosphates. The trade name of this compound is Sivanto (developed by Bayer CropScience) and is currently under registration process by the US EPA (CAS number: 951659-40-8).

Selected Physical/Chemical Properties of Flupyradifurone:

Chemical structure:



Literature data

Chemical formula:	$C_{12}H_{11}ClF_2N_2O_2$
Molecular mass:	288.68 g/mole
Physical state:	Solid powder (white to beige colors)
Water solubility (at 20°C):	3,200 mg/L
Log P_{ow} (at pH 7, 20°C):	1.2
(at pH 4, 7, and 9, 25°C):	1.2 (registrant)
Vapor pressure (at 25°C):	9.1×10^{-04} mPa
Henry law constant (at 25°C):	8.2×10^{-08} Pa·m ³ /mol
(at 20°C):	3.37×10^{-11} dimensionless
K_{oc} :	85.2–333 (typical 162.2) mL/g
Soil degradation half-life (lab & field):	74.9–132.2 (registrant) mL/g
	8.3–371 (typical 138.4) days
	10.1–228 (registrant) days
Freundlich coefficients (K_d):	0.60–3.82 (typical 2.26) mL/g
Freundlich coefficient (1/n):	0.845–0.902 (typical 0.866)
GUS index:	3.53 (high leachability)
SCI-GROW index (ppb) for 1 kg/ha dose:	6.15×10^{-01} µg/L
Potential for particle bound transport index:	Medium

Environmental Fate Data:

Hydrolysis

Sterile aqueous buffer solutions of different pH values were treated with 1.0 mg a.i./L [Furanone-4-¹⁴C] BY1 02960 to investigate its hydrolytic stability. The test matrices included acetate (for pH 4), tris (for pH 7), and borate buffers (for pH 9). Samples were incubated in the dark at 50°C and analyzed at selected time intervals for 5 days. From the experiments, the registrant confirmed that the compound was stable in sterile aqueous solutions because none accounted for more than 5% of applied radioactivity at all pH values. Thus, the half-life of the compound could not be estimated in this study. Also, no significant volatiles were detected during hydrolysis.

Photodegradation in Sterile Buffer and Natural Water

The photodegradation of [¹⁴C]-labeled compound (BY1 02960) was studied by the registrant in sterile potassium phosphate buffer (10 mM, pH 7) under artificial sunlight. Duplicate samples were continuously irradiated at 25°C for 35 hours using a xenon lamp with a UV cutoff filter ($\lambda < 290$ nm). Dark controls were also included in the experiment. The concentration of the compound was 1.0 mg a.i./L. Two major degradates (i.e., BY1 02960-succinamide and BY1 02960-azabicyclosuccinamide) that explained more than 10% of applied radioactivity were identified from the irradiated samples. However, one minor metabolite (i.e., BY1 02960-deschlorohydroxy-succinamide) and polar mixture accounted for less than 5% of applied radioactivity during the experimental period. The experimental half-life value estimated was 13.8 hours and its corresponding value under field condition (at Phoenix, AZ, USA) was expected to be 1.75 days. The compound was found to be stable in the dark control samples.

The same applies to the experiments using sterile natural water at pH 8. The only difference was that the samples were irradiated and analyzed for 28 hours which corresponded to 7.5 environmental days at Tokyo, Japan. Identical metabolites such as major and minor transformation products as described above were also detected from the experiments. The estimated half-life values under laboratory and field conditions were 14.0 hours and 3.8 days, respectively, with a half-life of over 45 days for dark controls. All these results indicated that the compound was rapidly degraded through aqueous photolysis.

Photodegradation in Soil

The registrant investigated a photodegradation of [pyridinylmethyl-¹⁴C]- and [furanone-4-¹⁴C]-labeled compounds on a loam soil (with a pH of 6.5 and a carbon content of 0.6%) under artificial sunlight, as described above. Stock solutions were applied to the soil surface at the single maximum field use rate of 400 g a.i./ha (or at a concentration of 40.8 µg/3g soil). The soil moisture content was adjusted at 75% of field capacity (at 1/3 bar) during the experiment. Duplicate samples were continuously irradiated at 20°C for 8 days. Dark controls as well as air dried samples were prepared in parallel. The soil samples taken at selected time intervals were extracted in two steps, first with ambient organic extracts (i.e., 8 mL acetonitrile/water (1/1, v/v), 5 mL acetonitrile/water (1/1, v/v), 5 mL acetonitrile/water (8/2, v/v), and 5 mL acetonitrile in series) and second with aggressive organic extracts (i.e., 8 mL of acetonitrile/water (8/2, v/v) at 70°C). CO₂ and organic volatiles were collected through traps connected to test vessels. Results showed that phototransformation in soil had a minimal impact on the degradation of the parent compounds. The parent compound treated with two labels accounted for around 94% of

applied activity at test termination in the irradiated samples, whereas over 97% of applied activity was observed at the end of the study for both labels in the dark samples. Some minor degradates were also detected for both labels in the irradiated samples, but did not explain more than 2% of applied activity during the study period. Negligible amounts of CO₂ and organic volatiles were detected for two labels in both irradiated and dark samples. There was no significant difference in the degradation of the parent compound (treated with both labels) between humid and dry soil samples. The experimental half-life values estimated using a simple first order kinetic were 99.6 (for label P) and 109.3 days (for label F). Their corresponding values under environmental conditions were expected to be 358 and 405 days (at Los Angeles, CA, USA), 466 and 527 days (at Athens, Greece), and 638 and 722 days (at Tokyo, Japan).

Photodegradation in Air

The photodegradation of the parent compound BY102960 in air was estimated using the Atmospheric Oxidation Program (i.e., AOPWIN™), one of models provided by the software Estimation Programs Interface (EPI Suite™ version 1.92) released by the US EPA. The EPI Suite™ indicates a screening-level tool to estimate characteristics and environmental fate of the chemical when measured values are not available. The AOPWIN™ refers to a model that calculates rate constants for the gas-phase reactions between a chemical of interest and photochemically generated active species such as hydroxyl radical and ozone concentrations, as examined in this study. The half-life values of the parent compound were estimated to be 4.37 (for short-term scenario) and 13.12 hours (for long-term scenario), when default values for hydroxyl radical concentrations averaged over 12 (during daylight) and 24 hours (during day and night-time) were used, respectively. Here, hydroxyl radical was selected as the main reaction partner, which was responsible for degradation of the parent compound. In contrast, the compound was considered to react with ozone more slowly by a factor 2 to 10. The compound was neither accumulated nor likely to enter in the atmosphere due to its short half-life and low vapor pressure.

Aerobic Degradation Studies in Water

Two aerobic aquatic metabolism studies were carried out separately using natural water/sediment systems at two locations in Germany, one for [Pyridine-2,6-¹⁴C]-labeled compound and the other with [Furanone-4-¹⁴C]-, and [Ehtyl-1-¹⁴C]-labeled compounds. The two water/sediment systems used for each parent compound treated with different labels were characterized differently in terms of pH and organic carbon values in waters and sediments as well as sediment textures. Their major characteristics treated with [Pyridine-2,6-¹⁴C]-labeled compound were explained as follows: natural waters with pH values of 7.4 and 7.7 and total organic carbons of < 2 mg/L and < 2 mg/L as well as sediments with textual classes of sandy loam and loamy sand, pH values of 5.2 and 6.7 in calcium chloride, and carbon contents of 3.6% and 1.2%. Also, those with [Furanone-4-¹⁴C]-, and [Ehtyl-1-¹⁴C]-labeled compounds were explained as follows: natural waters with pH values of 6.5 and 6.9 and total organic carbons of 5 mg/L and < 2 mg/L as well as sediments with textual classes of loam and sand, pH values of 4.8 and 6.8 in calcium chloride, and carbon contents of 5.1% and 0.4%. Based on the maximum field application rate of 400 g a.i./ha, each compound was applied to the water/sediment systems and then incubated at 20°C in the dark on a horizontal shaker at 65 rounds per minute. Duplicate test systems were analyzed at selected time intervals for 119-120 days for all radiolabeled compounds. The water samples were centrifuged with or without filtration to measure radioactivity, whereas the sediment samples were extracted in two steps, first with ambient organic extracts (i.e., 3 × acetonitrile/water (8/2,

v/v), followed by 1 × acetonitrile at room temperature) and second with aggressive organic extract (i.e., 1 × acetonitrile/water (8/2, v/v) at 70°C) for all radiolabeled compounds. CO₂ and organic volatiles were collected through traps connected to test vessels. Note that supplemental tests sterilized by gamma radiation or steam pressure were performed only for the systems treated with [Pyridine-2,6-¹⁴C]-labeled compound.

From the experiments, the registrant confirmed that the compounds treated with different labels were degraded slowly under aerobic aquatic conditions. While the parent compounds treated with different labels showed large decreases in applied radioactivity in the water phases, the amounts of the parent compounds increased considerably in the sediment phases during the study period. In fact, [Pyridine-2,6-¹⁴C]-labeled compound accounted for less than 23 % of applied radioactivity in the water phases of the two systems at study termination, whereas [Furanone-4-¹⁴C]-, and [Ehtyl-1-¹⁴C]-labeled compound accounted for less than 15 and 37% of applied radioactivity, respectively. In contrast, [Pyridine-2,6-¹⁴C]-labeled compound explained around 50% of applied radioactivity in the sediment phases of the two systems at study termination, whereas [Furanone-4-¹⁴C]-, and [Ehtyl-1-¹⁴C]-labeled compounds showed more than 50 and 37% of applied radioactivity, respectively. Up to three minor metabolites were identified for the water phases in the systems treated with [Pyridine-2,6-¹⁴C]-labeled compound, but not for the sediment phases. However, various minor degradation products were detected for both water and sediment phases in the systems treated with [Furanone-4-¹⁴C]-, and [Ehtyl-1-¹⁴C]-labeled compounds, including one major or minor metabolite difluoroacetic acid in the systems of [Ehtyl-1-¹⁴C]-labeled compound. CO₂ accounted for less than 10% applied radioactivity during the entire study period for all radiolabeled compounds, and no significant amounts of volatile organics were detected. Non-extractable residues explained 13.6-26.6% of applied radioactivity during the study period depending on each compound, which were partially attributed to microbial processes (from the supplemental test results). The half-life values estimated using a simple first-order kinetic were 193.1 and 246.9 days for [Pyridine-2,6-¹⁴C]-labeled compound, 208.2 and 246.1 days for [Furanone-4-¹⁴C]-labeled compound, and 202.4 and 285.0 days for [Ehtyl-1-¹⁴C]-labeled compounds.

Aerobic Degradation Studies in Soil

The registrant reported six aerobic soil metabolism studies of the parent compound treated with different labels using various soils in Europe and the USA (see Tables 1 and 2). Table 1 presents the characteristics of test soils examined for each compound. Table 2 also shows the main experimental conditions and their corresponding outcomes of individual studies. Soils used in the studies differed in terms of pH and the percentage of organic matter (see Table 1). In duplicate samples, each compound except for [Pyridinylmethyl-¹⁴C] BY102960 was applied at similar rates, which corresponded to the maximum single field usage rate of 400-410 g a.i./ha (see Table 2). Soil samples maintained at different moisture conditions were incubated at 20°C in the dark condition and analyzed at selected time intervals for each period of the study. The soil samples were extracted using two different sequential extraction procedures (see Table 2). Ethylene glycol and potassium hydroxide solutions were used to collect organic volatiles and CO₂ passed through traps for all studies, respectively. Note that non-sterile experiments were only performed at the soils collected in the USA (see Table 1).

It was found that all parent compounds treated with different labels underwent extensive mineralization to CO₂ under aerobic soil conditions (see Table 2). Depending on test soils and compounds, some major degradates such as 6-chlororonicotic acid (17.1 % of applied

radioactivity for A soil using [Pyridine-2,6-¹⁴C] BY102960) and difluoroacetic acid (30.2, 22.0, and 33.8% of applied radioactivity for A, B, and C soils using [Ehtyl-1-¹⁴C] BY102960, respectively) were found during the study period (see Tables 1 and 2). Non-extractable (bound) residues which accounted for more than 10% of applied radioactivity increased considerably at the end of all non-sterile studies, whereas very negligible amounts of volatile organics were detected. Biologically-mediate processes were found to be responsible for dissipation of the parent compound, to a lesser extent, when sterile and non-sterile soils were compared to each other: 6-chloronicotinic acid, BY1 02960-chloro, and BY1 02960-des-difluoroethyl were identified as minor transformation products in some studies (see Table 2). The two kinetic models, i.e., simple first-order and double first order in parallel, were found to provide the best fit to the observed data in different studies. The half-life values estimated based on these two models ranged 33.0 to 228 days for all tested soils (see Table 2). Note that a rigorous evaluation of degradation rates was additionally done for the parent compounds treated with different labels and their metabolites (see Table 3), which slightly showed different values compared to those of the original studies (compare the half life values of the parent compounds in Tables 2 and 3). The metabolite 6-chloronicotinic acid had very short half life (less than 6 days), whereas difluoroacetic acid exhibited a relatively long half-life (ranging from 44.9 to 73.6 days) than 6-chloronicotinic acid.

Table 1. The test soils used for each substance in aerobic soil metabolism studies.

Test items	Test soils	Geographic locations
[Furanone-4- ¹⁴ C] BY102960	A. Silt loam (pH ¹ 6.5; OC ² 2.3%)	A. Springfield, NE, USA
	B. Sandy loam (pH 7.0; OC 0.6%)	B. Sanger, CA, USA
[Pyridine-2,6- ¹⁴ C] BY102960	A. Silt loam (pH 6.5; OC 2.3 %)	A. Springfield, NE, USA
	B. Sandy loam (pH 7.0; OC 0.6%)	B. Sanger, CA, USA
[Ehtyl-1- ¹⁴ C] BY102960	A. Clay loam (pH 7.1; OC 5.1%)	A. Blankenheim, Germany
	B. Loamy sand (pH 6.2; OC 1.9%)	B. Monheim, Germany
	C. Silt loam (pH 6.5; OC 2.4%)	C. Burscheid, Germany
[Pyridine-2,6- ¹⁴ C] BY102960	A. Silt loam (pH 6.5; OC 2.4%)	A. Burscheid, Germany
[Furanone-4- ¹⁴ C] BY102960	A. Sandy loam (pH 6.1; OC 2%)	A. Monheim, Germany
	B. Silt loam (pH 6.5; OC 2.5%)	B. Burscheid, Germany
	C. Silt loam (pH 4.8; OC 3.3%)	C. Burscheid, Germany
	D. Silt clay (pH 7.1; OC 4.1%)	D. Blankenheim, Germany
[Pyridinylmethyl- ¹⁴ C] BY102960	A. Sandy loam (pH 6.4; OC 1.2%)	A. Monheim, Germany
	B. Silt loam (pH 6.5; OC 1.8%)	B. Burscheid, Germany
	C. Loam (pH 5.4; OC 2.3%)	C. Burscheid, Germany
	D. Clay loam (pH 7.4; OC 4.6%)	D. Blankenheim, Germany

¹ Soil pH presents a value measured in calcium chloride (CaCl₂).

² OC indicates the percentage of organic matter.

Anaerobic Degradation Studies in Water

The registrant studied anaerobic aquatic metabolism of the parent compound treated with [Pyridine-2,6-¹⁴C]-label using two natural water/sediment systems of Lawrence, KS and Pikeville, NC in USA. Their major characteristics in the KS and NC systems were explained as

Table 2. Summary of six different aerobic soil metabolism studies.

Test items	[Furanone-4- ¹⁴ C] BY102960	[Pyridine-2,6- ¹⁴ C] BY102960	[Ethy-1- ¹⁴ C] BY102960	[Pyridine-2,6- ¹⁴ C] BY102960	[Furanone-4- ¹⁴ C] BY102960
Test concentrations	1.1 µg a.i./g soil (410 g a.i./ha)	1.1 µg a.i./g soil (410 g a.i./ha)	106.7 µg a.i./100 g soil (400 g a.i./ha)	106.7 µg a.i./100 g soil (400 g a.i./ha)	106.7 µg a.i./100 g soil (410 g a.i./ha)
Duration of study	120 days	120 days	118 (for A soil) and 117 days (for B and C soils)	117 days	120 days
Soil moisture contents	pF 2.0 to 2.5	pF 2.0 to 2.5	55% of max water holding capacity	55% of max water holding capacity	55% of max water holding capacity
Extraction of soil samples ¹	1. 3 × ACN: water (70:30) 2. ACN (100%) 3. ACN: water (70:30) at 70°C	1. 3 × ACN: water (70:30) 2. ACN (100%) 3. ACN: water (70:30) at 70°C	1. 2 × ACN: water (50:50) 2. ACN: water (80:20) 3. ACN (100%) 4. ACN: water (80:20) at 70°C	1. 2 × ACN: water (50:50) 2. ACN: water (80:20) 3. ACN (100%) 4. ACN: water (80:20) at 70°C	1. 2 × ACN: water (50:50) 2. ACN: water (80:20) 3. ACN (100%) 4. ACN: water (80:20) at 70°C
The estimated T _{1/2} values ²	A. 228 days B. 65.7 days	A. 211 days B. 62.1 days	A. 33.9 days B. 62.0 days C. 34.1 days	A. 33.0 days	A. 62.2 days B. 33.2 days C. 98.3 days D. 49.3 days
Kinetic models ³	SFO	SFO	DFOP	DFOP	DFOP
Major degradates	CO ₂	CO ₂ and 6-chloronicotinic acid (for A soil)	CO ₂ and Difluoroacetic acid	CO ₂	CO ₂
Minor degradates ⁴	-	-	1	3 (6-chloronicotinic acid)	5 (BY1 02960-chloro and BY1 02960-des-difluoroethyl)
Report numbers ⁵	MERVP037-2	MERVP038-1	MEF-10/858	MEF-10/880	MEF-10/804

¹ ACN indicates acetonitrile; no temperature is shown for the experiments conducted at ambient temperature.

² The upper-case letters signify the test soils examined with each parent compound (see Table 1).

³ SFO and DFOP represent the simple first-order and double first order in parallel, respectively

⁴ The compounds in parenthesis indicate the identified metabolites among them.

⁵ Refer to the reports submitted by the registrant directly below the reference list.

Table 3. In-depth kinetic evaluation of the parent compounds treated with different labels and their metabolites for modeling (endpoint).

Test items	[Ehyl-1- ¹⁴ C] BY102960	[Pyridine-2,6- ¹⁴ C] BY102960	[Furanone-4- ¹⁴ C] BY102960	[Pyridinylmethyl- ¹⁴ C] BY102960
The estimated T _{1/2} values ¹	A. 34.0 days B. 62.0 days C. 34.1 days a. 44.9 days b. 73.6 days c. 67.4 days	A. 33.1 days a. 3.1 days	A. 141.5 days B. 40.5 days C. 157.5 days D. 55.1 days	A. 169.1 days B. 54.4 days C. 157.5 days D. 60.1 days
Kinetic models ²	A. DFOP B. DFOP C. FOMC a. SFO b. SFO c. SFO	A. FOMC a. SFO	A. DFOP B. SFO C. DFOP D. SFO	A. DFOP B. SFO C. DFOP D. SFO
Major degradates	CO ₂ and Difluoroacetic acid	CO ₂	CO ₂	CO ₂
Minor degradates	1	3 (6-chloronicotinic acid ³)	5 (BY1 02960-chloro and BY1 02960-des-difluoroethyl)	3
Report numbers ⁴	MEF-11/855	MEF-11/838	MEF-11/620	MEF-11/619
Supplements	MEF-10/858	MEF-10/880	MEF-10/804	MEF-07/334

¹ The upper-case letters signify the half-life values for each parent compound tested in different soils (see Table 1), whereas the lower-case letters indicate those with their degradates.

² SFO, FOMC, and DFOP represent the simple first-order, first-order multiple-compartment, and double first order in parallel, respectively.

³ The half-life values estimated from the degradation study of 6-chloronicotinic acid only using SFO model were 2.2, 2.9, and 5.3 days in three European soils (see the report MEF-11/837).

⁴ Refer to the reports submitted by the registrant directly below the reference list.

follows: natural waters with pH values of 8.3 and 7.4 and total organic carbons of 7.8 mg/L and 11.9 mg/L as well as sediments with textural classes of silty clay and loamy sand, pH values of 7.6 and 4.7 in calcium chloride, and carbon contents of 1.1% and 1.5%. All experimental conditions were identical to those described above in the section of “Aerobic Degradation Studies in Water”, except for the duration of study, extraction solutions and procedures, and attached traps used for the volatile and CO₂ analysis. The experiments treated with the maximum field application rate of 410 g a.i./ha were conducted for 102 days. Acetonitrile/water (8/2, v/v) used in the European soil as the ambient and aggressive organic solvent extracts was replaced with acetonitrile/water (7/3, v/v) for ambient temperature and acetonitrile/water (7/3, v/v) with 1:1 methanol: water for high temperature (at 70°C), respectively. Also, a series of volatile traps that contained ethylene glycol, potassium hydroxide, and sulfuric acid solutions were used in the anaerobic phase for both soils.

From the results, it was found that the parent compound in the water phases was rapidly translocated into sediments and then remained stable under anaerobic conditions. The compound accounted for 25.1 and 18.5 % of applied radioactivity in the water phases of the two systems at study termination, whereas 68.9 and 64.8% of applied radioactivity were observed in the sediment phases. CO₂ and volatile organics remained very low during the study period and bound residues explained 4.9-12.0% of applied radioactivity. The half-life values estimated using double first-order in parallel were >1,000 for KS system and 415 days for NC system under anaerobic conditions.

Anaerobic Degradation Studies in Soil

Anaerobic soil metabolism study of [Furanone-4-¹⁴C]-, [Ethyl-1-¹⁴C]-, and [Pyridine-2,6-¹⁴C]-labeled compounds was conducted in one European soil, a silt loam (with a pH of 6.4 in calcium chloride and a carbon content of 2.7%). The parent compounds treated with different labels were applied to the soil at the field use rate of 400 g a.i./ha which corresponded to actual rates between 104.6 and 110.1 µg/100 g soil depending on individual compounds. In the aerobic phase, the soil samples maintained at 55% max water holding capacity were incubated at 20°C in the dark and analyzed at selected time intervals for 30 days. Then, the experimental condition changed from aerobic to anaerobic by flooding the soil samples with oxygen-depleted deionized water (with a water layer of around 3 cm above soil level). The anaerobic soil samples were incubated at 20°C in the dark under a nitrogen gas atmosphere and analyzed at selected time intervals for additional 123 days. Duplicate soil samples were extracted in two steps, ambient and aggressive organic extract, as described above in the section of "Aerobic Degradation Studies in Water". CO₂ and organic volatiles were collected not only through air-permeable traps in the aerobic phase, but also by plastic gas sampling bags (that protected the system from the outer atmosphere) in the anaerobic phase.

It was shown that three radiolabeled compounds were degraded much more rapidly during the aerobic phase than under the anaerobic condition. The parent compounds showed 53.7 (for [Furanone-4-¹⁴C]-labeled compound), 52.6 (for [Ethyl-1-¹⁴C]-labeled compound), and 54.7% of applied radioactivity (for [Pyridine-2,6-¹⁴C]-labeled compound) at the end of the aerobic phase, which decreased further to 47.8, 47.2, and 47.7% of applied radioactivity under the anaerobic condition. Difluoroacetic acid (BYI 02960-DFA) was identified as the major degradate that exceeded 5% of applied radioactivity during the study period, which accounted for 25.1% of applied radioactivity in the aerobic phase and then almost remained stable in the anaerobic phase. Up to five, four, and one minor transformation products which were not identified due to their low amounts were observed for [Pyridine-2,6-¹⁴C]-, [Furanone-4-¹⁴C]-, and [Ethyl-1-¹⁴C]-labeled compounds, respectively. Very negligible amounts of CO₂ and organic volatiles were detected for all radiolabeled compounds in the anaerobic phase. Non-extractable residues increased slightly for the radiolabeled compounds in the anaerobic phase compared to those under the aerobic condition. Based on a simple first-order kinetic model, the estimated half-life values were 581.8, 693.2, and 693.2 days for [Pyridine-2,6-¹⁴C]-, [Furanone-4-¹⁴C]-, and [Ethyl-1-¹⁴C]-labeled compounds, respectively. A metabolic pathway for degradation of the parent compounds in one European soil during the entire study period suggested by the registrant is illustrated in Figure 1a.

Similar studies were also conducted by the registrant using [Pyridine-2,6-¹⁴C]-labeled compound on two US soils, one from Springfield, NE and the other from Sanger, CA. Soils from

NE and CA were characterized by sandy clay loam (with a pH of 6.5 in calcium chloride and a carbon content of 1.9%) and loamy sand (with a pH of 6.7 in calcium chloride and a carbon content of 0.5%), respectively. All experimental conditions were identical to those described above, except for the duration of study, wet soil condition, extraction solutions and procedures, and attached traps used for the volatile and CO₂ analysis. The experiments were conducted for 29 (under the aerobic condition) and 60 days (under the anaerobic condition) in NE soil as well as 32 (under the aerobic condition) and 121 days (under the anaerobic condition) in CA soil. Both soil samples were flooded with a water layer of around 2 cm above soil level. The extraction solutions and procedures as well as attached traps are described in detail in the section of “Anaerobic Degradation Studies in Water”.

Results showed that the parent compound was fairly stable during the anaerobic phase in NE soil. While three minor metabolites were identified during the anaerobic phase of the study, no significant organic volatiles were detected. CO₂ and non-extractable residues reached a max of 18.4 and 14.8% of applied radioactivity during the entire study period, respectively. As a result, no half-life was estimated for the parent compound in NE soil. In contrast, the parent compound was degraded further in CA soil, exhibiting 51.1 and 26.2% of applied radioactivity at the beginning and end of the anaerobic phase, respectively. However, any significant amounts of CO₂ and organic volatiles were not produced under the anaerobic condition. 6-chloronicotonic acid and chloro-BY1 02960 were designated as the major and minor metabolites, respectively, which remained, after reaching their maximum amounts in the aerobic phase, fairly stable under the anaerobic condition. The half-life values estimated using a simple first-order kinetic, first-order multiple-compartment, and double first-order in parallel were 152, 164, and 584 days, respectively. A proposed metabolic pathway for degradation of the parent compound in CA soil during the entire study period is illustrated in Figure 1b.

Adsorption and Desorption to Soil

The adsorption and desorption characteristics of [Pyridinylmethyl-¹⁴C] BY102960 were studied using batch equilibrium experiments. Experiments were conducted separately with soils from two different geographic areas, four soils in Europe and two soils in USA. Table 4 shows the key characteristics of six soils used in this study. As shown in the table, the test soils differed significantly in terms of the textural class, pH, bulk density (BD), moisture content (FC), organic carbon content (OC), and cation exchange capacity (CEC). 0.01 M CaCl₂ was used as background solution in the batch experiments, to which five different concentrations of the compound (i.e., 0.01, 0.03, 0.1, 0.3, and 1 mg/L) were applied at a soil to solution ratios of 1:4 for four European soils and 1:1 for two US soils. The soil samples were allowed to shake for 24 hours in the dark at 20°C during the adsorption/desorption cycle. In the desorption study, the supernatant liquid removed in the adsorption step was replaced by an equal volume of CaCl₂ solution without test item, and then agitated for 24 hours. The supernatant at each adsorption and desorption step was centrifuged at 8500 rpm for 15 min for European soils and at 3000 rpm for 10 min for US soils. Note that two additional desorption cycles were done only for the highest concentration in US soils.

The Freundlich isotherm model was used to fit the experimental data (see Table 5). In the adsorption study, the estimated K_d values varied between 0.60 and 3.82 mL/g for six different soils. Based on the organic carbon content for each soil, the K_{oc} values estimated varied between 74.9 and 132.2 mL/g. The Freundlich exponent ($1/n$) ranged from 0.84 to 0.90, indicating that the adsorption behavior was affected by the test soils in addition to the concentrations of the test

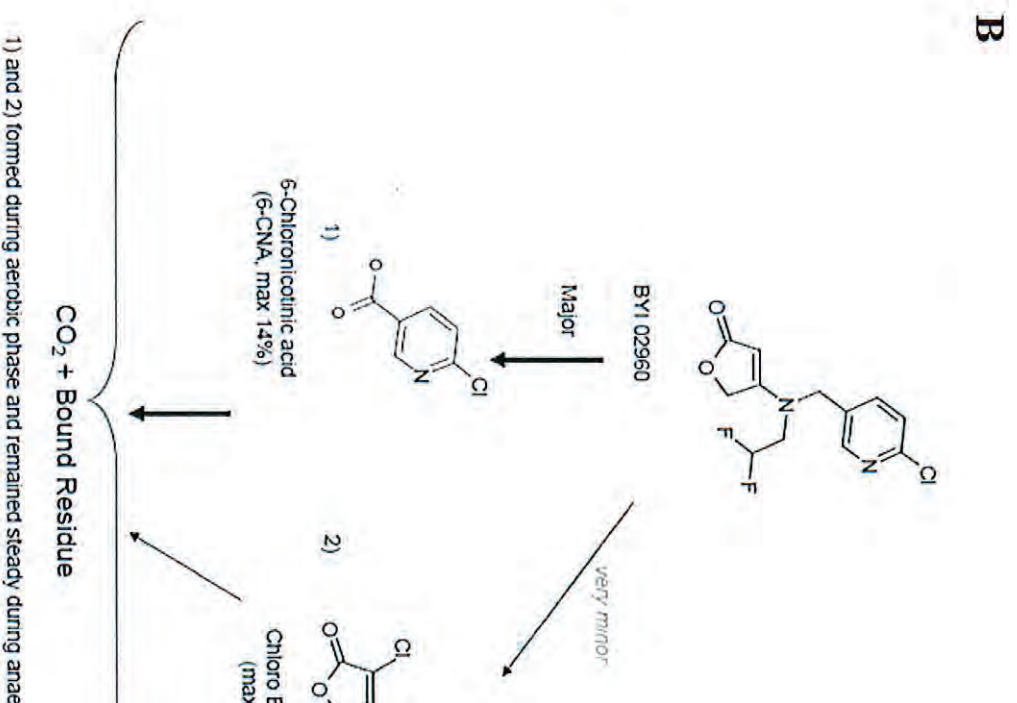
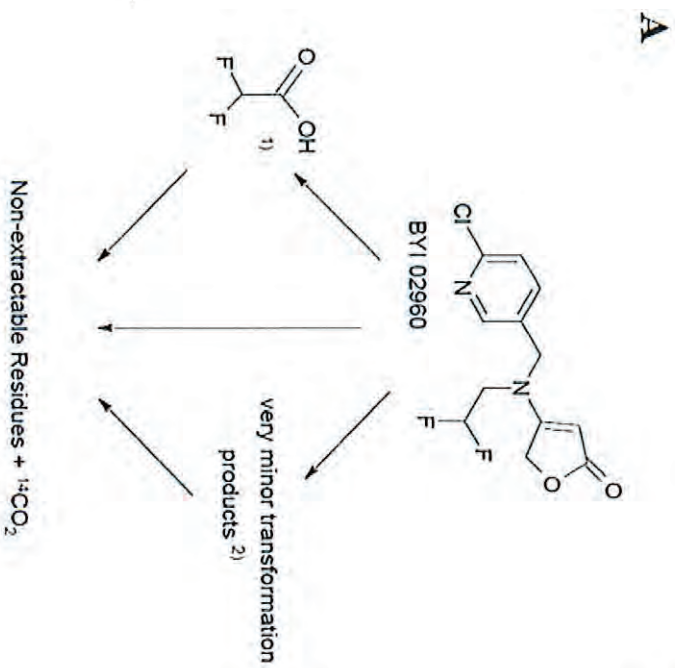


Figure 1. Proposed pathway for the parent compounds under aerobic and anaerobic conditions on (a) a silt loam soil and (b) a loamy sand soil (at CA) in USA.

Florida soil, and 3) loam, loam, loam, loam, sandy loam, and sandy loam for Idaho soil. The soil samples were analyzed for the parent compound (for BY102960) and its metabolites (for 6-chloronicotinic acid and 2,2-difluoroacetic acid) using a mixture of acetonitrile/water (7/3, v/v) for 535 (in California soil), 363 (in Florida soil), and 364 days (in Idaho soil).

Results showed that the residues of the parent compound BY102960 and its metabolites 6-chloronicotinic acid and 2,2-difluoroacetic acid were not detected below 12, 24, and 24 inch depths in California soil, respectively, with respect to the limit of quantification. However, all three residues, except for some samples, were not generally observed below 6 inch depths in Florida soil in terms of the method detection limit. In the case of Idaho soil, BY102960, 6-chloronicotinic acid, and 2,2-difluoroacetic acid were not detected below 12, 24, and 36 inch depths, respectively, with respect to the method detection limit. The degrades 6-chloronicotinic acid and 2,2-difluoroacetic acid accounted for a maximum 6.3 and 21.9% of applied amount for California soil, 4.9 and 5.1% for Florida soil, and 5.9 and 7.8% for Idaho soil. The double first order in parallel kinetic model provided the best-fit to the observed data in terms of χ^2 and R^2 . The half-life values estimated based on this model were 57.3, 10.1, and 49 days for California, Florida, and Idaho soils, respectively. Tables 6, 7, and 8 describe the degradation pathway of the parent compound in three US soils suggested by the registrant.

Table 6. Dissipation routes for BY102960 in California soil.

Routes of dissipation	Percent of applied amount
Accumulation of BY102960 in soil at 366 days	27% - Average soil residue of BY102960
Max transformation products during the study	6% - 6-chloronicotinic acid 22% - 2,2-difluoroacetic acid
Max mineralization to CO ₂ at 120 days	40.5% - Radiolabeled soil metabolism studies ¹
Max non-extractable residue at 120 days	26.4% - Radiolabeled soil metabolism studies ¹
Leaching, if measured	0.0% - No leaching below the sampling zone.
Volatilization, if measured	0.0% - Non-volatile product
Run off, if measured	0.0% - Not expected

¹ Shepherd, J.J.; [Pyridine-2,6-14C]BY102960: Aerobic Soil Metabolism in Two US Soils; Bayer CropScience LP, Stilwell, KS, USA; Report No. MER VP038; September 6, 2011.

Table 7. Dissipation routes for BY102960 in Florida soil.

Routes of dissipation	Percent of applied amount
Accumulation of BY102960 in soil at 364 days	18% - Average soil residue of BY102960
Max transformation products during the study	4.9% - 6-chloronicotinic acid 5.1% - 2,2-difluoroacetic acid
Max mineralization to CO ₂ at 120 days	40.5% - Radiolabeled soil metabolism studies ¹
Max non-extractable residue at 120 days	26.4% - Radiolabeled soil metabolism studies ¹
Leaching, if measured	0.0% - No leaching below the sampling zone.
Volatilization, if measured	0.0% - Non-volatile product
Run off, if measured	0.0% - Not expected

¹ Shepherd, J.J.; [Pyridine-2,6-14C]BY102960: Aerobic Soil Metabolism in Two US Soils; Bayer CropScience LP, Stilwell, KS, USA; Report No. MER VP038; September 6, 2011.

Table 8. Dissipation routes for BY102960 in Idaho soil.

Routes of dissipation	Percent of applied amount
Accumulation of BY102960 in soil at 364 days	21.9% - Average soil residue of BY102960
Max transformation products during the study	5.9% - 6-chloronicotinic acid 7.8% - 2,2-difluoroacetic acid
Max mineralization to CO ₂ at 120 days	40.5% - Radiolabeled soil metabolism studies ¹
Max non-extractable residue at 120 days	26.4% - Radiolabeled soil metabolism studies ¹
Leaching, if measured	0.0% - No leaching below the sampling zone.
Volatilization, if measured	0.0% - Non-volatile product
Run off, if measured	0.0% - Not expected

¹ Shepherd, J.J.; [Pyridine-2,6-14C]BY102960: Aerobic Soil Metabolism in Two US Soils; Bayer CropScience LP, Stilwell, KS, USA; Report No. MERVVP038; September 6, 2011.

Evaluation of Leaching Potential to Ground Water for Flupyradifurone

Leaching potential of the parent compound was examined in soils ($n=2,789$) on Oahu, Hawaii. Since there is difference between literature and registrant's recommended values for K_{oc} and half-life, we have run the CLERS model twice to assess leaching potential of the parent compound. The mean and standard deviation in literature were 0.162 and 0.116 m³/kg for K_{oc} and 138.4 and 139.4 days for half-life. And those of registrant values were determined as 0.098 and 0.020 m³/kg for K_{oc} and 76.8 and 55.7 days for half-life. Note that all available values in relevant laboratory and field studies were used to calculate the mean and standard deviation.



Figure 2. Leaching potential of the parent compound (on Oahu Island, Hawaii) using (a) literature and (b) registrant' recommended values in the CLERS model.

Figure 3 shows the leaching potential of the parent compound on Oahu Island, Hawaii, determined by literature and registrant' recommended values in the CLERS model. As shown in the figure, no difference is observed in the leaching potential of the parent compound using literature and registrant' recommended values, although they show some differences in K_{oc} and half-life values. Most areas are classified as likely according to classification scheme. Table 9

also shows a descriptive statistics of the main evaluation criteria in the CLERS model. From the table, it is determined that there is a slight difference in the revised attenuation factor (AFR) using both literature and registrant¹ recommended values in the CLERS model. As AFR decreases, the leaching potential of the chemical is high. The retardation factor (RF) using literature values is higher than that of registrant values, indicating that the parent compound may be bound onto the soils slightly more. Volatilization of the compound also does not likely occur in the soils due to its very low Henry's law constant. Based on these results, it can be suggested that the compound is considered as a potential leacher in Hawaii. Thus, the compound should be used carefully in appropriate plan.

Table 9. Summary statistics of main evaluation criteria in CLERS model ($n=2,789$)¹.

	Literature			Registrant				
	AFR	CVAFR	RF	CVRF	AFR	CVAFR	RF	CVRF
Mean	4.14	0.30	12.50	0.29	4.28	0.30	7.96	0.27
SD	1.26	0.05	4.92	0.13	1.26	0.05	2.98	0.13

¹ Abbreviation: AFR = the revised attenuation factor; CV = the coefficient of variance, i.e., uncertainty band, RF = the retardation factor; SD = the standard deviation, and n = the number of soil polygons.

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Appendix A. Additional runs of the CLERS model for remaining islands in Hawaii.

A1. Maui Island, Hawaii



Figure A1. Leaching potential of the parent compound (on Maui Island, Hawaii) using (a) literature and (b) registrant¹ recommended values in the CLERS model.

Table A1. Summary statistics of the main evaluation criteria in the CLERS model for Maui Island, Hawaii ($n=1,095$)¹.

	Literature				Registrant			
	AFR	CVAFR	RF	CVRF	AFR	CVAFR	RF	CVRF
Mean	4.24	0.29	16.26	0.25	4.38	0.29	10.23	0.24
SD	0.80	0.03	7.68	0.13	0.80	0.03	4.64	0.12

¹ Abbreviation: AFR = the revised attenuation factor; CV = the coefficient of variance, i.e., uncertainty band; RF = the retardation factor; SD = the standard deviation, and n = the number of soil polygons.

A2. Molokai Island, Hawaii

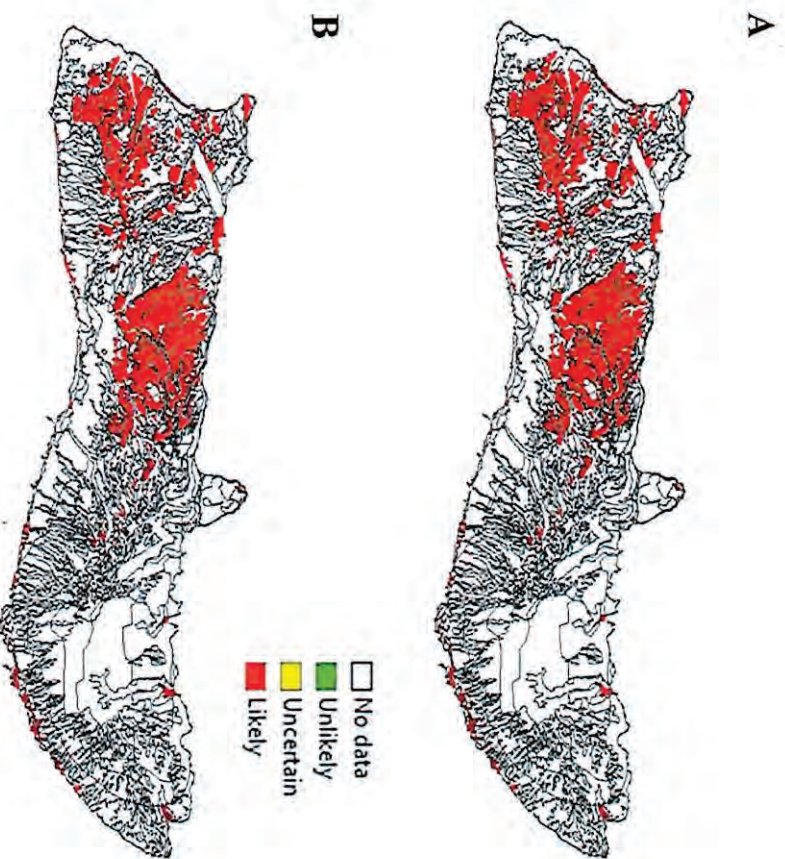


Figure A2. Leaching potential of the parent compound (on Molokai Island, Hawaii) using (a) literature and (b) registrant¹ recommended values in the CLERS model.

Table A2. Summary statistics of the main evaluation criteria in the CLERS model for Molokai Island, Hawaii ($n=515$)¹.

	Literature				Registrant			
	AFR	CVAFR	RF	CVRF	AFR	CVAFR	RF	CVRF
Mean	4.47	0.85	12.05	0.27	4.62	0.85	7.68	0.25
SD	0.46	8.15	7.78	0.11	0.46	8.15	4.70	0.10

¹ Abbreviation: AFR = the revised attenuation factor, CV = the coefficient of variance, i.e., uncertainty band, RF = the retardation factor, SD = the standard deviation, and n = the number of soil polygons.

A3. Kauai Island, Hawaii

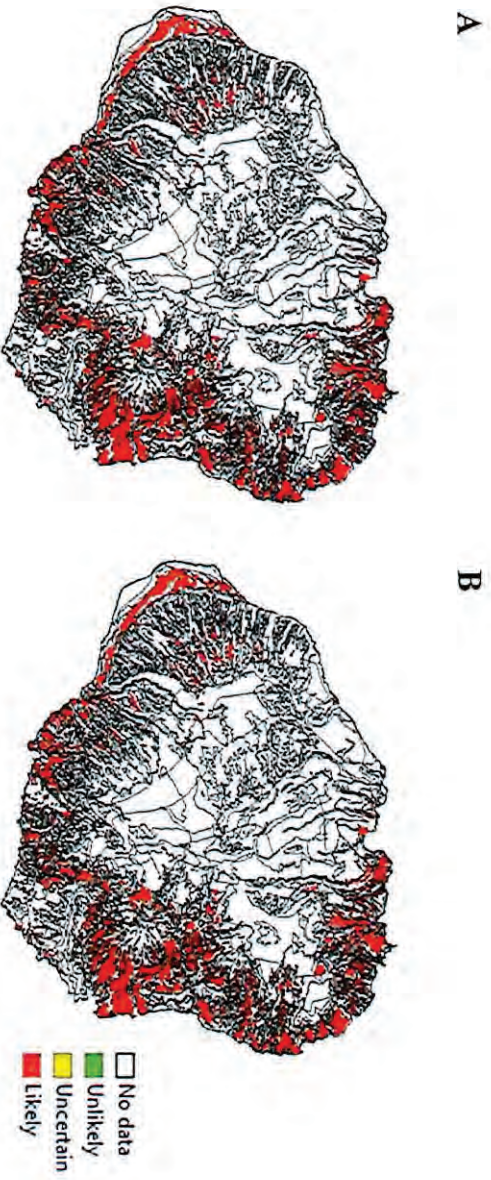


Figure A3. Leaching potential of the parent compound (on Kauai Island, Hawaii) using (a) literature and (b) registrant¹ recommended values in the CLERS model.

Table A3. Summary statistics of the main evaluation criteria in the CLERS model for Kauai Island, Hawaii ($n=1,236$)¹.

	Literature				Registrant			
	AFR	CV/AFR	RF	CVRF	AFR	CV/AFR	RF	CVRF
Mean	4.86	1.04	16.42	0.22	5.00	1.04	10.33	0.21
SD	0.91	1.70	6.31	0.10	0.90	1.70	3.82	0.10

¹ Abbreviation: AFR = the revised attenuation factor, CV = the coefficient of variance, i.e., uncertainty band, RF = the retardation factor, SD = the standard deviation, and n = the number of soil polygons.

A4. Hawaii Island, Hawaii

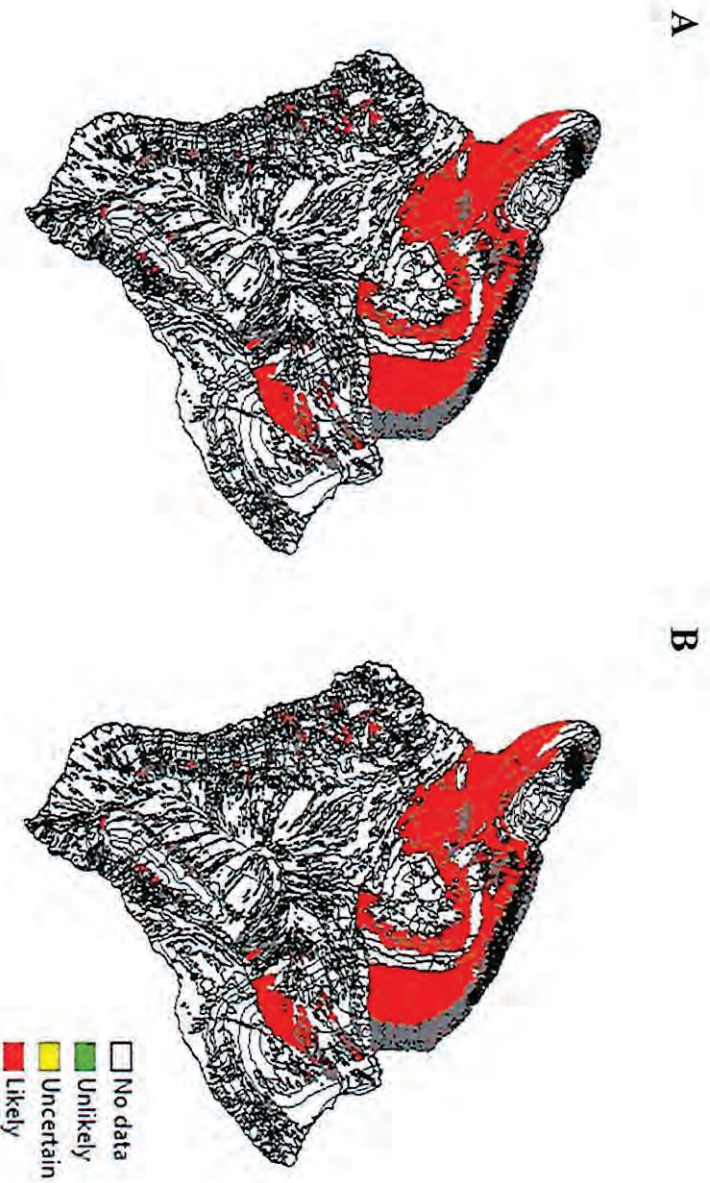


Figure A4. Leaching potential of the parent compound (on Hawaii Island, Hawaii) using (a) literature and (b) registrant¹ recommended values in the CLERS model.

Table A4. Summary statistics of the main evaluation criteria in the CLERS model for Hawaii Island, Hawaii ($n=2,101$)¹.

	Literature				Registrant			
	AFR	CVAFR	RF	CVRF	AFR	CVAFR	RF	CVRF
Mean	3.29	0.07	17.29	0.38	3.42	0.07	10.85	0.37
SD	1.53	0.09	6.56	0.14	1.53	0.09	3.97	0.14

¹ Abbreviation: AFR = the revised attenuation factor, CV = the coefficient of variance, i.e., uncertainty band, RF = the retardation factor, SD = the standard deviation, and n = the number of soil polygons.

DRAFT Minutes of the Advisory Committee on Pesticides

I. Call to order

Upon determining that there was a quorum of members, the meeting of the Advisory Committee on Pesticides was called to order on October 2, 2024, at 10:08 am by Hawaii Department of Agriculture (HDOA) Deputy to the Chairperson, Dexter Kishida, at the HDOA Boardroom located at 1428 S. King Street, Honolulu, Hawaii.

Members Present:

- Dexter Kishida, Deputy to the Chairperson, HDOA for Chairperson, Sharon Hurd
- Melvin Tokuda, Department of Health Representative
- Troy Sakihara, Department of Land and Natural Resources Representative
- Dr. Qing Li, University of Hawaii, College of Tropical Agriculture and Human Resources Representative
- Nicholas Testa, Structural Pest Control Industry Representative
- Judson Laird, Diversified Ag Industry Representative
- Janet Ashman, Hawaii Farm Bureau Federation Representative
- Steve Russo, Pesticide Industry Representative
- Matt Lyum, Landscape Professional Representative

Members Absent:

- Coffee Industry Representative
- Environmental Organization Representative
- Citizen's Group Representative

Others Present:

- Jennifer Waihee-Polk, Deputy Attorney General for HDOA
- Greg Takeshima, Acting Plant Industry Administrator, HDOA
- Scott Nishimoto, Acting Pesticides Branch Manager, HDOA
- Esther Riechert, Environmental Health Specialist/Registration, HDOA/Pesticides Branch
- Adam Yamamoto, Environmental Health Specialist/Education, HDOA/Pesticides Branch
- Klayton Kubo, Member of the Public

II. Approval of minutes from last meeting

Minutes of the Advisory Committee on Pesticides convened on October 11, 2019. After reviewing the minutes for the meeting held on October 11, 2019, a motion was made by committee member Dexter Kishida to accept the minutes as submitted. The motion did not pass, no second. Minutes remain as draft.

III. Comments from the General Public on Agenda Items

Member of the public, Klayton Kubo, requested to move the agenda item number 6 up. Committee member Janet Ashman made the motion, seconded by committee member, Dexter Kishida.

IV. Requests for Review by the Advisory Committee on Pesticides

1. Item 5 submittal was retracted and removed from the agenda.
2. Request to adopt amendments under Hawaii Administrative Rules, Chapter 4-66, pursuant to section 91-3(a), Hawaii Revised Statutes, to address increased civil penalties pursuant to Act 220, SLH 2023, and conformance to the approved Hawaii State Certification Plan.
 - a. Proposed Amendments to Section 4-66, Hawaii Administrative Rules (HAR), provisions in the Code of Federal Regulations (1) be amended and updated to the current revised versions and (2) be updated in Appendices B and C; (3) adoption of updated appendices A and B, and a new appendix C.

Acting Plant Industry Administrator, Greg Takeshima gave a background. In 2018, the U.S. EPA initiated an update of State certification plans for certified applicators. All State lead agencies which include the Department and is implemented by the Pesticides branch who is designated primacy over the Federal insecticides, Fungicide, and Rodenticide Act were required to receive approval of their state certification plans via U.S. EPA. The Pesticides branch drafted and received approval of the Hawaii State Certification Plan by the U.S. EPA in the 4th quarter of 2022. Changes and updates to HAR, Chapter 4-66 are required to ensure Hawaii's pesticide laws match Federal law. The changes, amendments, additions, and deletions are reflected in the Ramseyer attachment, and are summarized in the submission to the committee. Act 220, SLH 2023 provided updates to several penalties related to pesticide law violations. Those changes are reflected in the Appendix A.

Klayton Kubo testified that he's been involved in this matter for about 24 years now and has been trying to get some meaningful regulations on repeat offenders of pesticides violations for the last 5 years. He is hopeful that the Governor will sign it into law.

No other testimony from the public.

Committee member Steve Russo is not in favor of raising fines. He is concerned that raising penalties with a fine of \$10,000 per violation on small businesses for a single occurrence could be crippling and small businesses would be impacted by this and put out of business. Scott Nishimoto, Acting Pesticides Branch Manager, HDOA clarified that these would be the maximum penalty amounts, and not initial penalty amounts.

After discussion to ensure clarity on penalties, raising the amount of fines, and how monies are being used on pesticide violations, the motion was made to vote and failed. Four (4) voted yes, three (3) voted no, one (1) objected, and one (1) abstained.

3. Proposed amendment to the list of state restricted use pesticides to include new active ingredient, Flupyradifurone.

Pesticides Branch Environmental Health Specialist employee, Esther Riechert, explained to the committee why flupyradifurone is proposed to be added to the list of State Restricted Use Pesticides. Flupyradifurone is a systemic insecticide that is federally registered for use on a variety of crops such as brassica, cucurbit, coffee, fruiting, leafy, bulb, tuberous and

corn, citrus, pome and stone fruit trees, tree nuts, eggplants, peppers, taro, tomato, bushberries, and ornamentals. In 2015 Bayer CropScience submitted a product that contained a new active ingredient. At the time, flupyradifurone was a new active ingredient and subject to a full groundwater review which was conducted by the University of Hawaii. The results of the review and other environmental fate data indicated that this chemical would potentially leach into groundwater. Despite branch reservations, two (2) were licensed in 2015 as general use products under the condition that no other products containing the active ingredient flupyradifurone will be licensed until an in-field study can be completed. A proposal for the infield groundwater study was submitted in 2017 by UH-WRRRC totaling \$403,199.00, but due to lack of funding, the study was never conducted.

Committee member Melvin Tokuda made the motion, seconded by committee member, Steve Russo. A motion was made to recommend flupyradifurone to become a restricted use product pending completion of groundwater study. If the study does not support the data of it being a ground water leacher, then the restricted use status will be withdrawn. The motion was made to vote and passed. Five (5) voted yes and four (4) voted no.

4. Proposed amendment to list of state restricted use pesticides to include new active ingredient, Quinclorac.

Pesticides Branch Environmental Health Specialist employee, Esther Riechert, explained to the committee why quinclorac is proposed to be added to the list of State Restricted Use Pesticides. Quinclorac is a systemic herbicide that is federally registered for use on ornamental turf, conservation land, pastures, rice, sorghum, bushberries, institutional premises, rights of ways, and airport. Sometime in 1998-1999, quinclorac was introduced to the state. The initial groundwater review and full groundwater review was conducted, and the results of the review and other environmental fate data indicated that this chemical would potentially leach into groundwater and the Branch would designate the active ingredient as a restricted use in Hawaii. Since then, various registrants submitted product license applications, but they were all withdrawn once they were informed that this active ingredient will be requested to be put on the list of restricted use pesticides. Currently, the Branch does not have any products with this active ingredient in the market.

Committee member Melvin Tokuda approved the motion, seconded by committee member, Judson Laird. A motion was made to vote and passed. Eight (8) voted yes and one (1) abstained.

5. Proposed amendment to list of state restricted use pesticides to include new active ingredient, Thiamethoxam.

Pesticides Branch Environmental Health Specialist employee, Esther Riechert, explained to the committee why thiamethoxam is proposed to be added to the list of State Restricted Use Pesticides. Thiamethoxam is a neonicotinoid insecticide that is federally registered for use on brassica, cucurbits, ginger, bushberries, citrus, peppers, tomatoes, watermelon, nuts, soybeans, stone fruits, tuberous vegetables, corn, ornamentals, turf, structures, and more. It was introduced or requested to be licensed in the State back in 2012. The full groundwater review was finished in 2013 and it suggested it was a potential leacher. There are currently several active products in the State. Mainly for indoor use or seed treatment.

There were a couple of other products for outdoor use as well. They were registered under the assumption that staff on the branch did not know that this product was a potential leacher at the time. In 2022, a letter or email was sent out to all of the registrants with active products, stating that the Branch would request to add this active ingredient to the list of restricted use products. Registrants either responded, did not respond, or withdrew their application.

Committee member Melvin Tokuda made the motion, seconded by committee member, Steve Russo. The motion was moved to vote and failed. Three (3) voted yes, two (2) voted no, and three (3) abstained.

6. Proposed amendment to list of state restricted use pesticides to include new active ingredient, Penflufen.

Pesticides Branch Environmental Health Specialist employee, Esther Riechert, explained to the committee why penflufen is proposed to be added to the list of State Restricted Use Pesticides. Penflufen is a systemic fungicide that is federally registered for use on artichoke, chayote, cassava, ginger, sweet potato, and yams. In 2012, penflufen was introduced in the State. A full groundwater review was completed in 2013 and it concluded that the active ingredient might be a potential groundwater leacher. In 2014, the product was registered because at the time, the only uses were for seed treatment. Seed treatment has a low possible impact for groundwater usage. Currently, there are three (3) registered products in the State and six (6) Federally. It is currently in the market for seed treatment.

Committee member Melvin Tokuda made the motion, seconded by committee member, Judson Laird. The motion was made to vote and passed. Six (6) voted yes and two (2) voted no.

V. Old business

No old business was presented or discussed.

VI. New business

No new business was presented or discussed.

VII. Adjournment

A motion for adjournment was made by committee member Dexter Kishida and Seconded by committee member Steve Russo. The meeting was adjourned at 12:35 pm.