



Department of Pesticide Regulation



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MEMORANDUM

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916-324-3547

DATE: January 30, 2019

SUBJECT: Addendum to the July 2018 California Neonicotinoid Risk Determination

Background

After issuance of the *California Neonicotinoid Risk Determination* (https://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/neonicotinoid_risk_determination.pdf), the Department of Pesticide Regulation (DPR) received information from Syngenta Crop Protection, LLC identifying items in the risk determination report that were appropriate to change based on the newly available information. In an effort to report the most accurate information possible, DPR prepared an *Addendum to the July 2018 California Neonicotinoid Risk Determination*.

DPR's risk determination report meets the requirements of Food and Agricultural Code (FAC) section 12838 which states, "On or before July 1, 2018, the department shall issue a determination with respect to its reevaluation of neonicotinoids." FAC section 12838 also requires DPR to "adopt any control measures necessary to protect pollinator health" within two years after issuing the determination or to provide a report to the Legislature setting forth the reasons for the delay. The risk determination report begins with U.S. EPA's preliminary pollinator assessments and includes new data submitted to DPR for all four active ingredients (imidacloprid, thiamethoxam, clothianidin, and dinotefuran) since the issuance of the preliminary pollinator assessments. It is important to note that the risk determination report includes only California registered use sites and permitted application methods and rates.

Below is a summary of DPR's changes to the *California Neonicotinoid Risk Determination*. Additionally, Tables 1 through 10 have been updated to clarify the scope of the analysis.

Submitted Comments and Responses

1. Colony Feeding Study – CDPH Identified NOEC Value Differs From Value Used in Crop Assessment

Two different thiamethoxam colony feeding studies (CFSs) were submitted to DPR for evaluation. DPR classified the first CFS as scientifically valid with limitations. The study authors set the nectar No Observed Effects Concentration (NOEC) at 37.5 µg/kg, based on nominal concentrations. DPR determined the nectar NOEC to be 30 µg/kg, based on mean measured concentrations.

In the second CFS, the study authors set the nectar NOEC at 37.5 µg/kg, based on nominal concentrations. DPR determined the nectar NOEC to be 34 µg/kg, based on mean measured concentrations. As described in the risk determination report, DPR determined the second CFS to be scientifically sound and acceptable to quantitatively assess risks to honey bee colonies. Comparing the two thiamethoxam CFSs side by side, the first study indicates no effects at 30 µg/kg and the second study, which tested a slightly higher concentration, refines this result indicating that there are also no effects at 34 µg/kg. This does not conflict with the established Lowest Observed Effects Concentration (LOEC) of 40 µg/kg (based on measured concentrations) since it narrows the gap between the NOEC and the LOEC. DPR views this as a refinement and as such, DPR agrees that 34 µg/kg is the appropriate nectar NOEC to use in the risk determination report since available data indicates no colony-level effects at this higher concentration.

As a result of the revised nectar NOEC, the thiamethoxam summer squash crop will be classified as low risk to honey bees. The thiamethoxam cucurbit crop group will remain classified as posing risk to honey bees with crop-specific or application-specific exceptions.

2. Crop Group 12 Stone Fruit – 90th Percentile Residue Values for Pollen and Nectar

After reviewing the thiamethoxam stone fruits field residue study, DPR determined that it inadvertently switched the pollen and nectar values in Table 3 of the risk determination report between the two residue matrices. DPR has corrected the thiamethoxam stone fruits crop group in the corresponding tables to reflect low risk to honey bees.

Due to DPR's residue bridging strategy with the thiamethoxam stone fruits crop group and stone fruits being taxonomically related to tree nuts, DPR is now designating the clothianidin stone fruits crop group, thiamethoxam tree nuts crop group, clothianidin tree nuts crop group, and imidacloprid tree nuts crop group as low risk to honey bees. DPR inadvertently omitted the thiamethoxam tree nuts crop group from the risk determination report.

3. Crop Group 15 Cereal Grains – 90th Percentile Residue Data and Study Suitability for Registered Uses

DPR reviewed currently registered neonicotinoid products for sale and use in California and found that barley and rice are the only agricultural crops within the cereal grains crop group that bears foliar or soil applications as a permitted application method. The United States Department of Agriculture (USDA, 2017) classifies barley and rice as “non-attractive as a food source of pollen or nectar for bees.” As there is a lack of registered crops in the cereal grains crop group, DPR has included barely and rice as individual crops and has removed the cereal grains crop group designation. Based on the USDA classification, DPR finds that barley, registered for thiamethoxam, and rice, registered for clothianidin, should be identified as posing low risk to honey bees in the risk determination report as these crops do not produce an attractive food source for honey bees.

Updated Tables

Table 1. Pollen and Nectar NOECs used in the Risk Determinations for Imidacloprid, Thiamethoxam, Clothianidin, and Dinotefuran.


Active Ingredient	NOEC (µg/Kg)
<i>Nectar – Colony Feeding Studies</i>	
Imidacloprid ^a	23
Thiamethoxam ^b	34
Clothianidin ^c	19
Dinotefuran ^d	71
<i>Pollen – Colony Feeding Studies</i>	
Imidacloprid ^e	97.5
Thiamethoxam ^f	372
Clothianidin ^g	372
Dinotefuran ^f	372
All toxicity values derived from the following colony feeding studies: ^a Bocksch, 2014. ^b Bocksch, 2017. ^c Louque, 2016. ^d Bocksch, 2016. ^e Dively et al., 2015. ^f Bridged from the registrant-submitted colony feeding study with clothianidin. ^g Bocksch and Werner, 2018.	

Table 2. Imidacloprid 90th percentile residue values and NOEC exceedances.

Imidacloprid								
Crop Group	Crop	Residue Study Lab ID	Application	Residue Matrix	Residue (µg/Kg)	NOEC (µg/Kg)	Exceedance (Y/N)	Risk
Crop Group 8. Fruiting Vegetables Group	Tomato	EBNTN012	1 Soil + 2 Foliar	Pollen	476.9	97.5	Y	
Crop Group 10. Citrus Fruit Group	Orange	EBNTY007	2 Foliar (Pre-Bloom)	Pollen	3257.9	97.5	Y	
	Citrus ^a	EBNTL056-7	1 Soil	Nectar	267.1	23	Y	
Crop Group 11. Pome Fruits Group	Apple	EBNTN014	1 Soil + 2 Foliar	Pollen	58.5	97.5	N	
				Nectar	3.5	23	N	
Crop Group 12. Stone Fruits Group	Stone Fruit ^b	EBNTN013	1 Soil + 2 Foliar	Pollen	136.2	97.5	Y	
	Cherry	EBNTY008	5 Foliar	Nectar	9.5	23	N	
Crop Group 13. Berries Group	Blueberry	EBNTY006	1 Soil	Pollen	17.5	97.5	N	
				Nectar	4.6	23	N	
	Strawberry	EBNTL056-04	1 Soil	Pollen	247.0	97.5	Y	
Crop Group 20. Oilseed Group	Cotton	EBNTN011	1 Soil + 3 Foliar (At Bloom)	Pollen	182.2	97.5	Y	
				Floral Nectar	107.0	23	Y	
				Extrafloral Nectar	578.6	23	Y	
		EBNTY010	5 Foliar (Pre-Bloom)	Pollen	6.6	97.5	N	
				Floral Nectar	18.4	23	N	
				Extrafloral Nectar	13.3	23	N	

Notes:

 Red shading indicates soil or foliar applications on California registered crops that result in pollen or nectar residues that exceed the NOEC.

 Green shading indicates soil or foliar applications on California registered crops that do not result in pollen or nectar residues that exceed the NOEC.


^a Residue study was conducted on multiple crops within the crop group, including orange, tangerine, grapefruit, tangelo, and lemon. However, data was not analyzed by individual crop due to limited replication.


^b Residue study was conducted on multiple crops within the crop group, including cherry, plum, apricot, and peach. However, data was not analyzed by individual crop due to limited replication.

Table 3. Thiamethoxam 90th percentile residue values and NOEC exceedances.

Thiamethoxam								
Crop Group	Crop	Residue Study Lab ID	Application	Residue Matrix	Residue (µg/Kg)	NOEC (µg/Kg)	Exceedance (Y/N)	Risk
Crop Group 6. Legume Vegetables (Succulent or Dried) Group	Soybean	TK0250070	2 Foliar	Anthers	41.2	372	N	Green
				Nectar	4.7	34	N	
Crop Group 8. Fruiting Vegetables Group	Tomato	TK0222531	2 Foliar	Pollen	6519.7	372	Y	Red
		TK0242072	1 Soil	Pollen	157.2	372	N	Green
	Pepper	TK0236306	1 Soil	Pollen	259.9	372	N	Red
				Nectar	180.9	34	Y	
Crop Group 9. Cucurbit Vegetables Group	Cucumber	TK0024668	1 Soil	Pollen	10.8	372	N	Green
				Nectar	13.2	34	N	
		TK0222532	2 Foliar	Pollen	1079.9	372	Y	Red
				Nectar	288.6	34	Y	
	Muskmelon	TK0222530	1 Soil	Pollen	119.7	372	N	Green
				Nectar	27.9	34	N	
	Pumpkin	TK0222530	1 Soil	Pollen	8.1	372	N	Green
				Nectar	12.2	34	N	
		TK0242074	2 Foliar	Pollen	18.0	372	N	Green
				Nectar	15.0	34	N	
Summer Squash	TK0222530	1 Soil	Pollen	16.1	372	N	Green	
			Nectar	31.7	34	N		
Crop Group 10. Citrus Fruit Group	Citrus ^a	TK0177221	1 Soil	Pollen	62.3	372	N	Green
				Nectar	10.2	34	N	
	Sweet Orange	TK0250069	2 Foliar	Pollen	126.7	372	N	Green
				Nectar	2.1	34	N	
Crop Group 11. Pome Fruits Group	Apple ^b	TK0250071	1 Foliar	Pollen	1954.7	372	Y	Red
				Nectar	225.4	34	Y	
Crop Group 12. Stone Fruits Group	Stone Fruit ^c	TK0177222	2 Foliar	Pollen	133.2	372	N	Green
				Nectar	1.6	34	N	
Crop Group 13. Berries Group	Blueberry	TK0250072	3 Foliar	Pollen	836.4	372	Y	Red
				Nectar	613.0	34	Y	
	Strawberry	TK0177224	3 Foliar	Pollen	7411.0	372	Y	Red
				Nectar	301.0	34	Y	
	TK0250068	1 Soil	Pollen	541.0	372	Y	Red	
			Nectar	52.3	34	Y		
Cranberry	TK0236307	3 Foliar	Pollen	1226.4	372	Y	Red	
			Nectar	921.9	34	Y		
Crop Group 20. Oilseed Group	Cotton	TK0177223	2 Foliar	Pollen	102.5	372	N	Red
				Nectar	5.8	34	N	
				Extrafloral Nectar	125.9	34	Y	

Notes:

 Red shading indicates soil or foliar applications on California registered crops that result in pollen or nectar residues that exceed the NOEC.

 Green shading indicates soil or foliar applications on California registered crops that do not result in pollen or nectar residues that exceed the NOEC.

^a Residue study was conducted on multiple crops within the crop group, including orange and lemon. However, data was not analyzed by individual crop due to limited replication.


^b The residue study for this crop was not conducted at the maximum application rate allowed by the product label, therefore worst-case residues are expected to be higher than reported in this table.


^c Residue study was conducted on multiple crops within the crop group, including peach, plum, cherry, and prune. However, data was not analyzed by individual crop due to limited replication.

Table 4. Clothianidin 90th percentile residue values and NOEC exceedances.

Clothianidin								
Crop Group	Crop	Residue Study Lab ID	Application	Residue Matrix	Residue (µg/Kg)	NOEC (µg/Kg)	Exceedance (Y/N)	Risk
Crop Group 1. Root and Tuber Vegetables Group	Potato	VP-38985	1 Soil	Pollen	113.9	372	N	
Crop Group 9. Cucurbit Vegetables Group	Cucumber	VP-38938	1 Soil	Anthers	32	372	N	
				Nectar	39.6	19	Y	
	Melon	VP-38938	1 Soil	Anthers	18.7	372	N	
				Nectar	14.6	19	N	
	Squash	VP-38938	1 Soil	Pollen	10.7	372	N	
				Nectar	4.4	19	N	
	Pumpkin	VP-38938	1 Soil	Pollen	21	372	N	
				Nectar	6.6	19	N	
		VP-38263	1 Soil (At Planting)	Pollen	17	372	N	
				Nectar	6.3	19	N	
		VP-38313	2 Foliar	Pollen	71	372	N	
				Nectar	5	19	N	
VP-38971	1 Soil (Post-Emergence)	Pollen	20.3	372	N			
		Nectar	9.9	19	N			
Crop Group 11. Pome Fruits Group	Apple ^a	VP-38552	1 Foliar (Post-Bloom)	Pollen	57.4	372	N	
				Nectar	0.71	19	N	
Crop Group 12. Stone Fruits Group	Peach ^a	VP-38563	2 Foliar (Post-Bloom)	Pollen	10	372	N	
				Nectar	0.3	19	N	
Crop Group 13. Berries Group	Grape	VP-38992	1 Soil	Pollen	157.3	372	N	
			1 Foliar (Pre-Bloom)	Pollen	1229.8	372	Y	
Crop Group 14. Tree Nuts Group	Almond ^a	VP-38473	2 Foliar (Post-Bloom)	Pollen	12.7	372	N	
				Nectar	0.8	19	N	
Crop Group 20. Oilseed Group	Cotton	VP-38259	2 Foliar	Pollen	246	372	N	
				Nectar	79.4	19	Y	
				Extrafloral Nectar	647	19	Y	

Notes:

 Red shading indicates soil or foliar applications on California registered crops that result in pollen or nectar residues that exceed the NOEC.


 Green shading indicates soil or foliar applications on California registered crops that do not result in pollen or nectar residues that exceed the NOEC.

^a Data indicate that post-bloom applications on these crops are not associated with a determination of risk to honey bees; however, these studies do not represent the worst-case scenario for the crop group.

Table 5. Dinotefuran 90th percentile residue values and NOEC exceedances.

Dinotefuran								
Crop Group	Crop	Residue Study Lab ID	Application	Residue Matrix	Residue (µg/Kg)	NOEC (µg/Kg)	Exceedance (Y/N)	Risk
Crop Group 1. Root and Tuber Vegetables Group	Potato	10934.4100	1 Soil	Anthers	56.9	372	N	Green
Crop Group 8. Fruiting Vegetables Group	Bell Pepper	S16-01167	2 Soil	Pollen Nectar	183 4.46	372 71	N N	Green
	Tomato	10934.4103	2 Foliar 2 Soil	Pollen Pollen	10438.6 5532.4	372 372	Y Y	Red
Crop Group 9. Cucurbit Vegetables Group	Pumpkin	10934.4104	2 Soil	Pollen	88.3	372	N	Green
				Nectar	39.0	71	N	
Crop Group 12. Stone Fruits Group	Cherry	10934.4105	2 Foliar	Pollen Nectar	130.5 12.5	372 71	N N	Green
Crop Group 13. Berries Group	Blueberry	10934.4107	2 Foliar	Pollen Nectar	468.9 470.8	372 71	Y Y	Red
	Cranberry	10934.4101	2 Foliar	Pollen	763.5	372	Y	
Nectar				780.9	71	Y		
Crop Group 20. Oilseed Group	Cotton	43411B104	2 Foliar	Pollen	6968	372	Y	Red
				Floral Nectar	81.6	71	Y	
				Extrafloral Nectar	1660	71	Y	

Notes:

 Red shading indicates soil or foliar applications on California registered crops that result in pollen or nectar residues that exceed the NOEC.






 Green shading indicates soil or foliar applications on California registered crops that do not result in pollen or nectar residues that exceed the NOEC.

Table 6. Risk determinations for California registered foliar or soil applications of imidacloprid, thiamethoxam, clothianidin, and dinotefuran at the maximum allowed annual application rate based on 90th percentile residue values.

Crop Group	Imidacloprid		Thiamethoxam		Clothianidin		Dinotefuran	
	Risk	Notes	Risk	Notes	Risk	Notes	Risk	Notes
Crop Group 1. Root and Tuber Vegetables Group	Green	d	Green	d	Green		Green	
Crop Group 3. Bulb Vegetables Group	Green	c	Green	c	Gray		Green	c
Crop Group 4. Leafy Vegetables (Except <i>Brassica</i> Vegetables) Group	Green	c	Green	c	Green	c	Green	c
Crop Group 5. <i>Brassica</i> (Cole) Leafy Vegetables	Green	c	Green	c	Green	c	Green	c
Crop Group 6. Legume Vegetables (Succulent or Dried) Group	Green	b	Green		Green	b	Gray	
Crop Group 8. Fruiting Vegetables Group	Red		Yellow		Gray		Yellow	k
Crop Group 9. Cucurbit Vegetables Group	Red	b	Yellow	h	Yellow	j	Green	
Crop Group 10. Citrus Fruit Group	Red		Green		Gray		Gray	
Crop Group 11. Pome Fruits Group	Green		Red		Yellow	b, e	Gray	
Crop Group 12. Stone Fruits Group	Red		Green		Green	b	Green	
Crop Group 13. Berries Group	Yellow	i	Red		Yellow		Red	
Crop Group 14. Tree Nuts Group	Green	g	Green	g	Green	g	Gray	
Crop Group 19. Herbs and Spices	Green	c	Gray		Gray		Gray	
Crop Group 20. Oilseed Group	Yellow		Red		Red		Red	
Crop Group 24. Tropical and Subtropical Fruit, Inedible Peel Group	Red	f	Red	f	Red	f	Gray	
Barley	Gray		Green	l	Gray		Gray	
Rice	Gray		Gray		Green	l	Gray	
Globe Artichoke ^a	Green	c	Green	c	Gray		Gray	
Hops ^a	Red	f	Red	f	Gray		Gray	
Mint ^a	Gray		Green	c	Gray		Gray	
Tobacco ^a	Red	f	Red	f	Red	f	Gray	
Coffee ^a	Red	f	Gray		Gray		Gray	

Notes:

-  Gray indicates that the active ingredient is not currently registered in California for foliar or soil applications on the entire crop group.
-  Red shading indicates a determination of risk for all California registered crops in the crop group based on evaluated data.
-  Yellow shading indicates a determination of risk for California registered crops in the crop group; however, there were crop-specific or application-specific exceptions indicating low risk.
-  Green shading indicates a determination of low risk for all California registered crops within the crop group based on evaluated data.

For additional detail on residue values, please see tables 3, 4, 5, and 6.

^a Not categorized into a general crop group, according to 40 CFR 180.41 crop group tables.

^b Risk determination category bridged from thiamethoxam.

^c No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.

^d Risk determination category bridged from clothianidin.

^e Risk except for post-bloom, pre-harvest applications.

^f In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.

^g Risk determination category bridged from thiamethoxam stone fruit, as tree nuts and stone fruits are taxonomically related.

^h Risk except certain applications to pumpkin, muskmelon, cucumber, and summer squash.

ⁱ Risk except certain applications to blueberry.

^j Risk except certain applications to melon, pumpkin, and squash.

^k Risk except certain applications to bell pepper.

^l Determined by USDA to be unattractive to honey bees as a food source

Table 7. Evaluating risk categories for registered California crop groups and application scenarios of imidacloprid based on NOEC exceedances of maximum and 50th, 75th, and 90th percentile values from acceptable data or based on assumptions of risk.

Imidacloprid						
Crop Group	Crop	Application Type	Exceedance Category			
			50%	75%	90%	Max
Crop Group 8. Fruiting Vegetables Group	Tomato	1 Soil + 2 Foliar				
Crop Group 10. Citrus Fruit Group	Orange	2 Foliar (Pre-Bloom)				
	Citrus ^a	1 Soil				
Crop Group 11. Pome Fruits Group	Apple	1 Soil + 2 Foliar				
Crop Group 12. Stone Fruits Group	Stone Fruit ^b	1 Soil + 2 Foliar				
	Cherry	5 Foliar				
Crop Group 13. Berries Group	Blueberry	1 Soil				
	Strawberry	1 Soil				
Crop Group 20. Oilseed Group	Cotton	1 Soil + 3 Foliar (At Bloom)				
		5 Foliar (Pre-Bloom)				
Crop Groups With Data Gaps						
Crop Group	Bridged Crop Group Data	Exceedance Category				
		50%	75%	90%	Max	
Crop Group 1. Root and Tuber Vegetables Group	Clothianidin: Crop Group 1. Root and Tuber Vegetables Group					
Crop Group 6. Legume Vegetables (Succulent or Dried) Group	Thiamethoxam: Crop Group 6. Legume Vegetables (Succulent or Dried) Group					
Crop Group 9. Cucurbit Vegetables Group	Thiamethoxam: Crop Group 9. Cucurbit Vegetables Group					
Crop Group 14. Tree Nuts Group	Thiamethoxam: Crop Group 12. Stone Fruits Group					
Imidacloprid Assumed Risk						
Crop Group/Crop	Rationale					Risk Category
Crop Group 3. Bulb Vegetables Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 4. Leafy Vegetables (Except <i>Brassica</i> Vegetables) Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 5. <i>Brassica</i> (Cole) Leafy Vegetables	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 19. Herbs and Spices	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 24. Tropical and Subtropical Fruit, Inedible Peel Group	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Globe Artichoke	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Hops	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Tobacco	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Coffee	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Notes:						
	Red shading indicates either there is assumed risk or there was data resulting in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					
	Green shading indicates either there is assumed low risk or there is data that do not result in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					
^a Residue study was conducted on multiple crops within the crop group, including orange, tangerine, grapefruit, tangelos, and lemon. However, data was not analyzed by individual crop due to limited replication.						
^b Residue study was conducted on multiple crops within the crop group, including cherry, plum, apricot, and peach. However, data was not analyzed by individual crop due to limited replication.						

Table 8. Evaluating risk categories for registered California crop groups and application scenarios of thiamethoxam based on NOEC exceedances of maximum and 50th, 75th, and 90th percentile values from acceptable data or based on assumptions of risk.

Thiamethoxam						
Crop Group	Crop	Application Type	Exceedance Category			
			50%	75%	90%	Max
Crop Group 6. Legume Vegetables (Succulent or Dried) Group	Soybean	2 Foliar				
Crop Group 8. Fruiting Vegetables Group	Tomato	2 Foliar				
		1 Soil				
	Pepper	1 Soil				
Crop Group 9. Cucurbit Vegetables Group	Cucumber	1 Soil				
		2 Foliar				
	Muskmelon	1 Soil				
	Pumpkin	1 Soil				
		2 Foliar				
Summer Squash	1 Soil					
Crop Group 10. Citrus Fruit Group	Citrus ^a	1 Soil				
	Sweet Orange	2 Foliar				
Crop Group 11. Pome Fruits Group	Apple	1 Foliar				
Crop Group 12. Stone Fruits Group	Stone Fruit ^b	2 Foliar				
Crop Group 13. Berries Group	Blueberry	3 Foliar				
		3 Foliar				
	Strawberry	1 Soil				
		3 Foliar				
Cranberry	3 Foliar					
Crop Group 20. Oilseed Group	Cotton	2 Foliar				
Crop Groups With Data Gaps						
Crop Group	Bridged Crop Group Data	Exceedance Category				
		50%	75%	90%	Max	
Crop Group 1. Root and Tuber Vegetables Group	Clothianidin: Crop Group 1. Root and Tuber Vegetables Group					
Crop Group 14. Tree Nuts Group	Thiamethoxam: Crop Group 12. Stone Fruits Group					
Thiamethoxam Assumed Risk						
Crop Group/Crop	Rationale					Risk Category
Crop Group 3. Bulb Vegetables Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 4. Leafy Vegetables (Except <i>Brassica</i> Vegetables) Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 5. <i>Brassica</i> (Cole) Leafy Vegetables	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 24. Tropical and Subtropical Fruit, Inedible Peel Group	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Barley	USDA determined barley is unattractive as a nectar or pollen food source for honey bees.					
Globe Artichoke	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Hops	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Mint	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Tobacco	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Notes:						
	Red shading indicates either there is assumed risk or there was data resulting in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					
	Green shading indicates either there is assumed low risk or there is data that do not result in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					
^a Residue study was conducted on multiple crops within the crop group, including orange and lemon. However, data was not analyzed by individual crop due to limited replication.						
^b Residue study was conducted on multiple crops within the crop group, including peach, plum, cherry, and prune. However, data was not analyzed by individual crop due to limited replication.						

Table 9. Evaluating risk categories for registered California crop groups and application scenarios of clothianidin based on NOEC exceedances of maximum and 50th, 75th, and 90th percentile values from acceptable data or based on assumptions of risk.

Clothianidin						
Crop Group	Crop	Application Type	Exceedance Category			
			50%	75%	90%	Max
Crop Group 1. Root and Tuber Vegetables Group	Potato	1 Soil				
Crop Group 9. Cucurbit Vegetables Group	Cucumber	1 Soil				
	Melon	1 Soil				
	Squash	1 Soil				
	Pumpkin	1 Soil				
		1 Soil (At Planting)				
		2 Foliar				
Crop Group 13. Berries Group	Grape	1 Soil				
		1 Foliar (Pre-Bloom)				
Crop Group 20. Oilseed Group	Cotton	2 Foliar				
Crop Groups With Data Gaps						
Crop Group	Bridged Crop Group Data	Exceedance Category				
		50%	75%	90%	Max	
Crop Group 6. Legume Vegetables (Succulent or Dried) Group	Thiamethoxam: Crop Group 6. Legume Vegetables (Succulent or Dried) Group					
Crop Group 11. Pome Fruits Group ^a	Thiamethoxam: Crop Group 11. Pome Fruits Group					
Crop Group 12. Stone Fruits Group	Thiamethoxam: Crop Group 12. Stone Fruits					
Crop Group 14. Tree Nuts Group	Thiamethoxam: Crop Group 12. Stone Fruits					
Clothianidin Assumed Risk						
Crop Group/Crop	Rationale					Risk Category
Crop Group 4. Leafy Vegetables (Except <i>Brassica</i> Vegetables) Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 5. <i>Brassica</i> (Cole) Leafy Vegetables	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 24. Tropical and Subtropical Fruit, Inedible Peel Group	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Rice	USDA determined rice is unattractive as a nectar or pollen food source for honey bees.					
Tobacco	In absence of tier II data and no similar crop groups from which to bridge, the crop group determination defaults to risk to honey bees.					
Notes:						
<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: red; margin-right: 5px;"></div> <div>Red shading indicates either there is assumed risk or there was data resulting in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.</div> </div>						
<div style="display: flex; align-items: flex-start;"> <div style="width: 20px; height: 15px; background-color: green; margin-right: 5px;"></div> <div>Green shading indicates either there is assumed low risk or there is data that do not result in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.</div> </div>						
^a Risk except post-bloom foliar applications to apple.						

Table 10. Evaluating risk categories for registered California crop groups and application scenarios of dinotefuran based on NOEC exceedances of maximum and 50th, 75th, and 90th percentile values from acceptable data or based on assumptions of risk.

Dinotefuran						
Crop Group	Crop	Application Type	Exceedance Category			
			50%	75%	90%	Max
Crop Group 1. Root and Tuber Vegetables Group	Potato	1 Soil				
Crop Group 8. Fruiting Vegetables Group	Bell Pepper	2 Soil				
	Tomato	2 Soil				
		2 Foliar				
Crop Group 9. Cucurbit Vegetables Group	Pumpkin	2 Soil				
Crop Group 12. Stone Fruits Group	Cherry	2 Foliar				
Crop Group 13. Berries Group	Blueberry	2 Foliar				
	Cranberry	2 Foliar				
Crop Group 20. Oilseed Group	Cotton	2 Foliar				
Dinotefuran Assumed Risk						
Crop Group	Rationale					Risk Category
Crop Group 3. Bulb Vegetables Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 4. Leafy Vegetables (Except <i>Brassica</i> Vegetables) Group	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Crop Group 5. <i>Brassica</i> (Cole) Leafy Vegetables	No on-field exposure to honey bees expected as crops are harvested before bloom unless grown for seed.					
Notes:						
	Red shading indicates either there is assumed risk or there was data resulting in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					
	Green shading indicates either there is assumed low risk or there is data that do not result in pollen or nectar residues exceeding the NOEC after soil or foliar applications on California registered crops.					

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New Citations

1. Bocksch, S. (2017). Thiamethoxam Technical – Honey Bee Brood and Colony Level Effects Following Thiamethoxam Intake via Treated Sucrose Solution in a Field Study in North Carolina – USA 2016: Final Report. Unpublished study prepared by Eurofins Agroscience Services EcoChem GmbH, & Eurofins Agroscience Services Ecotox GmbH. 481p., Laboratory Report Number S16-02808. MRID 50432101. CDPR Study ID 304522.
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