California Department of Pesticide Regulation
Environmental Monitoring Branch

EVALUATION REPORT - PESTICIDE Date: February 7, 2013

Tracking ID No.	:	248748
Product Name	:	Belay Insecticide
Study No.	:	
Applicant	:	Valent U.S.A Corporation
EPA Reg. No.	:	59639-150
Document No.	:	
Active Ingredient	:	Clothianidin
Use	:	
Registration Action	:	Add Use for Rice
Area of Review	:	Water Quality, Aquatic Toxicity
Registration Specialist	:	Susan Sutherland

[✓] Data/Information Support Registration

[ ] Data/Information Support Conditional Registration

[ ]Data/Information Do Not Support Registration

[ ] No Registration Action Required

Introduction

Valent U.S.A. has requested an additional use for clothianidin to control rice pests in California. Targeted pests listed on the proposed label for Belay insecticide include billbugs, chinch bug, green bug, rice seed midge, and rice water weevil. Pre and post flood rice applications can be applied by air. The use proposed would result in probable widespread application in years with heavy infestations of target pests. The maximum use rate for the rice growing season is 0.075 lbs a.i./A and was used in surface water modeling for this evaluation.

Summary

Environmental Monitoring utilizes a surface water model (Luo and Deng, 2011a/b) and after analysis by the model registration of clothianidin was supported. However, environmental concerns still exist due to accumulation, carry-over, persistence of clothianidin in soil and sediment (Table 1). The model does not consider these conditions when the KOC of an active ingredient is <1000. Concerns for runoff and toxicity exist for clothianidin use on rice in California due not only to the "continual flood" method of irrigation but also due to timing of application early in the growing season for targeted pests when late rains can still occur and growers can be forced to release water before holding times have expired due to flooding conditions.

Clothianidin is registered for other uses in California including cotton, cucumber, grapes, landscape maintenance, greenhouse container plants, tomatoes, and structural uses. The highest use in 2010 was on grapes (3,107 lbs product). All other use was minimal with less than 10 lbs reported on most sites.

Half-lives from field dissipation ranged from 282 to stable (Alspach, J. 2003). DPR staff concluded that "seven half-lives would have to occur for more than 99% of clothianidin to degrade and would take 5.4 to an indeterminate number of years for clothianidin to disappear from a treated field" (Alspach, 2003). Aqueous photolysis half-life is fast at 5 days (Alspach, 2003). Valent U.S.A. conducted a California field trial study (Greenland, 2010) and found after 7 days post treatment clothianidin residue were 0.00231-0.00294ppm. At 14-days post application levels had decreased to <0.001ppm in water. Clothianidin is persistent with an aerobic soil metabolism half-life 533 days, and accumulates in soil after repeated use due to slow degradation (USEPA, 2010).

Clothianidin has high potential to move off-site and also can re-suspend from sediment into surface water (USEPA, 2010). Clothianidin is very highly toxic (Table 2) to sediment dwelling organisms. The acute LC50 for Mysid shrimp is 0.053 ppm and is the most sensitive species based on registrant submitted studies (Shelgren, 2002) (Table 2).

Table 1. Chemistry data used in model from registrant studies, 2010.

Test	Value	Unit	Source
KOC	345	L/kg[OC]	Alspach, 2003
Water solubility (SOL)	327	ppm	Alspach, 2003
Hydrolytic half-life	stable	day	Alspach, 2003
Aerobic soil metabolism	533 (stable)	day	Alspach, 2003
Field dissipation (FD)	282 (stable)	day	Alspach, 2003
Water phase only	2.62	DT50	Greenland, 2010
Anaerobic aquatic metabolism	2.67	day	Alspach, 2003

Table 2. Aquatic toxicity values used in model (USEPA, 2010) from registrant supplied studies and model recommendation.

Test (96-h LC50)	Value (ppm)	Data Source	Model Results
Mysidopsis bahia	.053	Shelgren, 2002	**Support**

The modeling results concluded that for the high use pattern for rice that runoff is high, persistence is intermediate, toxicity is very high, and risk is high (Table 3). In pore-water tests submitted to USEPA it was concluded that clothianidin is very highly toxic to sediment dwelling organisms Clothianidin repartions to water from sediment and can accumulate from year-to-year (USEPA, 2010).

The 14-day water hold suggested on the clothianidin label was used as was the recommended label rate of 0.075 lbs a.i./acre (Table 3). CDPR Surface Water Modeling (Table 4) was used with *Mysidopsis bahia.*

Table 3. Clothianidin use information based on label information for rice application.

Use	Application Rate	Post Application Water-Hold
Rice	0.075 lbs a.i./acre	14-days

The surface water model (Luo 2011a and Luo 2011b) was used to determine risks to surface water and use of clothianidin on California rice paddies. *Mysidopsis bahia* and *Chironomus riparius*

Table 4. Rice Use Modeling and summary results for clothianidin.

Indicator	Dissolved phase (water)
Runoff potential	High
Aquatic persistence	Intermediate
Toxicity	Very High
Use pattern	High exposure potential
Risk quotient	High
Model-based decisions	**Support**

Conclusion:

Clothianidin is of high risk to runoff, is persistent in soil and sediment, accumulates from successive applications, and can repartition into surface water from sediment. Registration is supported by the surface water model (Luo and Deng,2011a/b) based on water column conclusions alone. However, the DPR surface water model does not determine risks to sediment in this case because the clothianidin KOC<1000. Nonetheless, concerns of toxicity exist to sediment dwelling aquatic organisms. The registrant study is small in scale (Greenland, 2010) and doesn't represent concentrations that could occur when clothianidin is aerially applied to a wide-spread regional geographical area where rice is grown in California. Clothianidin will be used to treat common wide-spread pests that attack rice and use could be very high in years with extreme pest pressure. Also, due to application timing to the early stage of rice growth, threat exists to adjacent waterways that could receive large amounts of water during emergency releases in years when late rains and flooding occurs.

Original Signed by

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References

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