CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION
PUBLIC REPORT 2005-01

Fluroxypyr

Tracking ID 197141 N

DESCRIPTION OF ACTION

Dow AgroSciences LLC submitted an application seeking a California registration of Vista®, EPA Reg. No. 62719-308 for selective postemergence control of annual and perennial broadleaf weeds in non-cropland areas including industrial sites, non-irrigation ditch banks and rights-of-way such as electrical power lines, communication lines, pipelines, roadsides and railroads. Vista® contains the new active ingredient fluroxypyr. Vista® was registered by the U.S. Environmental Protection Agency (U.S. EPA) on October 5, 1998.

The Department of Pesticide Regulation (DPR) evaluated the product label and scientific data supporting registration of the product and found them to be acceptable to support registration. The precautionary and first aid statements on the product label, as well as label directions requiring personal protective equipment (PPE) and other protective measures adequately mitigate potential health risks to persons who may come in contact with the pesticide. DPR does not expect significant adverse environmental impacts to result from registration of this product.

BACKGROUND

Registrant:	Dow AgroSciences LLC
Common name:	Fluroxypyr
Chemical name:	1-methylheptyl (4-amino-3,5-dichloro-6-fluro-2-pyridyloxyl)acetate
Brand name:	Vista®
Uses:	For selective postemergence control of annual and perennial broadleaf weeds.
Pests controlled:	Bedstraw (cleavers), chickweed, cocklebur, coffeeweed, common ragweed, common purslane, grape species, hemp dogbane, kochia, morninglory, sunflower, velvetleaf, Venice mallow
Type of registration:	Unconditional

Vista® is a liquid formulation containing 26.2% fluroxypyr. Fluroxypyr is a member of the pyridine class of herbicides. Fluroxypyr induces auxin-like responses (auxin is a plant growth hormone), similar to indolacetic acid, resulting in disruption of plant cell growth. Fluroxypyr is systemic and rapidly absorbed by foliage of growing plants.

Vista® can be applied in non-cropland areas including industrial sites, non-irrigation ditch banks, and rights-of-way such as electrical power lines, communication lines, pipelines, roadsides and railroads. Application rates range from ⅔ – 1⅓pints per acre when weeds are small and/or actively growing, to a maximum of 2⅔ pints per acre per annual growing season. The product can be applied as a single broadcast treatment with ground or aerial equipment (helicopter only). Spot treatments may be applied with a calibrated boom or with hand sprayers.

SCIENTIFIC REVIEW

A. Chemistry

1. Product Chemistry: DPR evaluated the submitted chemistry studies for the formulated product Vista® and summarized the results in the following table.

Table I. Physical and Chemical Properties of Vista®

Properties	Values
Physical state	Liquid
Density	0.989 g/ml
Nominal concentration	26.2%
Certified limits	24.9 – 26.5%
Analytical technique	HPLC with UV detector
Vapor pressure (25°C)*	2.0×10^{-5} Pa
Water solubility (pH=7)*	136 µg/L
Octanol/water partition coefficient*	Log Kow ≥ 5.04 at pH 7
Storage stability	N/A

* These properties were derived using technical fluroxypyr as the test substance.

2. Environmental Fate: The fluroxypyr environmental fate studies which included: soil adsorption/desorption, hydrolysis, photolysis (aqueous and soil), aerobic and anaerobic soil metabolism, and terrestrial field dissipation were found to be satisfactory. Leaching and soil adsorption/desorption studies for fluroxypyr were conducted on four soil types. The submitted adsorption/desorption studies indicate that fluroxypyr is mobile. The tendency of a pesticide to leach to groundwater depends on its persistence in the environment, its solubility and how strongly it adsorbs to soil. Both U.S. EPA and DPR have developed sets of physicochemical criteria based on certain test types to estimate the potential of a chemical to leach to groundwater. The comparison indicates that fluroxypyr has a low potential for movement into groundwater.

The submitted product chemistry data and environmental fate data support registration of Vista®. The use of the product is expected to have minimal impact on the environment and it is not expected to leach into groundwater.

B. Toxicology

Dow AgroSciences LLC submitted adequate toxicology studies to conduct a complete toxicological evaluation of Vista®. DPR evaluated the submitted data to ascertain the potential for adverse health effects from exposure to the pesticide. The acute toxicity parameters for Vista® are summarized in Table II

Table II. Acute Toxicity of Vista®

Type of Study	Acute Toxicity Values	Acute Toxicity Category
Acute oral	LD_{50} =3162 mg/kg	III
Acute dermal	LD_{50} >2000 mg/kg	III
Acute inhalation	LC_{50} >6.2 mg/l	IV
Primary eye irritation	N/A	II
Primary dermal irritation	N/A	IV
Dermal sensitization	N/A	Not a dermal sensitizer
Signal word	N/A	WARNING

* N/A = Not Applicable

The precautionary language on the product label adequately identifies the acute toxicity hazards noted in the studies.

DPR found the submitted toxicology studies sufficient to satisfy the data requirements of the Birth Defects Prevention Act (Food and Agricultural Code section 13121 et at). Possible adverse effects were observed in a rat chronic toxicity study.

As a result of these findings, DPR has placed fluroxypyr in "low" priority for conducting a risk assessment. DPR prioritizes pesticide active ingredients for risk assessment based on the nature of the potential adverse health effects, number of potential adverse health effects, number of species affected, NOELs, potential for human exposure, use patterns, and similar factors. Based on these criteria, pesticides with the greatest potential for health problems are placed in high priority, with other chemicals being place in moderate or low priority. The purpose of the risk assessment will be to appraise the potential for fluroxypyr to cause adverse health effects in humans if exposed to the pesticide as the result of a legal use. Further toxicity information is available in DPR's Summary of Toxicology Data for fluroxypyr, available on DPR public website at http://www.cdpr.ca.gov/docs/toxsums/pdfs/5768.pdf

C. Health & Safety

An evaluation of the medical management information on the Vista® label and the acute toxicity study results indicate the product label bears all of the required statements and warnings regarding safety to handlers and other persons who may be exposed to the pesticide. The product label bears an adequate first aid statement. In addition, the product label requires persons handling and applying Vista® to wear long-sleeved shirt and long pants, chemical resistant gloves, shoes plus socks, and protective eyewear. Workers wearing only work clothing are not allowed to enter a treated field until 12 hours after an application for all crops. Persons entering a treated area before the 12-hour reentry interval has elapsed must wear coveralls, chemical-resistant gloves and shoes plus socks if they are going to contact treated plants, soil or water.

D. Fish & Wildlife

The registrant submitted fish and wildlife toxicity studies, including studies on bobwhite quail, mallard duck, bluegill sunfish, rainbow trout, sheepshead minnow, Daphnia magna (water fleas), mysid shrimp, and oysters. The submitted data are adequate to characterize the toxicity to wildlife and aquatic animals from environmental exposure. Table III summarizes the results of these studies.

Table III. Summary of Toxicity Studies for Wildlife

Test Animal	Type of Study	Acute Toxicity Value**	Relative Toxicity
Bobwhite quail	Single acute oral dose	>2000 mg/kg (LD_{50})	Relatively non-toxic
Mallard duck	Feeding study (5 days)	>5620 ppm (LC_{50})	Relatively non-toxic
Bobwhite quail	Feeding study (5 days)	>5000 ppm (LC_{50})	Relatively non-toxic
Bluegill sunfish	Water exposure (96 hrs.)	>100 mg/l (LC_{50})	Relatively non-toxic
Mallard duck	Single acute oral dose	>2000 mg/kg (LD_{50})	Relatively non-toxic
Sheepshead minnow	Water exposure (96 hrs.)	>0.0866 mg a.i./l (LC_{50})	Extremely toxic
Grass shrimp	Water exposure (96 hrs.)	>0.135 ppm (LC_{50})	Highly toxic
Pink shrimp	Water exposure (96 hrs.)	>0.128 mg/l (LC_{50})	Highly toxic
Oystershell	Water exposure (96 hrs.)	0.0963 ppm (EC_{50})	Extremely toxic
Silverslide	Water exposure (96 hrs.)	40 ppm (LC_{50})	Slightly toxic

* The test substance used for the studies was technical fluroxypyr.
** Values expressed as : a. LD_{50}= lethal dose that will kill 50% of test population; b. LC_{50} = lethal environmental concentration that will kill 50% of test population; and c. EC_{50} = Concentration that causes a specific effect in 50% of test population.

The data indicate fluroxypyr is relatively non-toxic to terrestrial wildlife, but highly toxic to freshwater fish and aquatic invertebrates. Label directions bear a warning indicating that the product is toxic to fish and prohibit application of the product directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.

Based on the submitted data, registered uses, label rates, and use restrictions for Vista®, DPR does not expect toxic concentrations to occur in aquatic environments from use of the product in accordance with label directions.

E. Efficacy & Phytoxicity

Submitted data indicate that Vista® provides selective postemergence control of annual and perennial broadleaf weeds in non-cropland areas. Applications of the product at the labeled rate resulted in adequate or excellent control of numerous weeds, including kochia, lambsquarter, redroot pigweed, wild buckwheat, prickly lettuce and filaree. Since the proposed label does not include applications at crop sites, phytotoxicity on crops was not reported.

ALTERNATIVES

Fluroxypyr is an extremely effective post emergence herbicide that controls economically important broadleaf weeds such as dicamba, ALS, and immazadolinone resistant kochia. It can be used alone or in combination with reduced rates of other herbicides to achieve similar or greater results than existing products. The chemical and physical properties of fluroxypyr, combined with the relatively low use rates results in reduction in the risk from alternative products in regards to environmental burden, potential groundwater contamination and run-off potential.

CONCLUSION

DPR evaluated the product label and scientific data submitted to support the registration of Vista® and found them acceptable to support registration. The precautionary and first aid statements on the product label, as well as the required PPE and other protective measures mitigate potential health risks to persons who may be exposed to the pesticide. If, after the risk assessment, DPR determines that exposure to fluroxypyr may result in unacceptable margins of exposure, further restrictions will be placed on the use of fluroxypyr at that time. Submitted data also indicate that no significant adverse environmental impacts are expected to occur from the use of Vista® and that when used in accordance with label directions, the product will be effective for its intended use.