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Review of Representative Currently Registered Fipronil Product Labels in California

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Currently, there are 94 active registered fipronil products in California, as listed in CDPR's California Product/Label database (Registration Branch: <http://cdpr.ca.gov/docs/label/labelque.htm#regprods>). The Registration Branch provided Surface Water with eight fipronil labels to review based on these products. These eight labels represent six different formulation types of fipronil products (Figure 1). Five of these formulation types are not likely to cause state-wide environmental exposure of fipronil to surface waters due to application method, site of application, or geographical restrictions. These include:

1. Liquid ready to use (RTU) "squeeze" products that are applied topically to the back of cats and dogs for flea and tick control (also registered for chewing lice; 54 registered products). The label for Parastar® Plus was reviewed as a representative product in this group. Like the products in this group, Parastar® Plus has a moderately high concentration (9.8% ai), is packaged in individual use containers, and is applied by squeezing the contents of one package onto the back of a dog or cat. Often these products are packaged with other chemicals, mostly different pyrethroids or the insect growth regulator methoprene (Parastar® Plus contains the pyrethroid cyphenothrin). Application can be repeated monthly. The label does not have environmental hazard warnings but does give disposal information (Table 1).
2. Bait stations/gels/pellets/tablets/cakes labeled for indoor or outdoor use to control various species of ants (but not Imported Fire Ants; 28 registered products). The label for Combat® Outdoor Ant Stakes was reviewed as a representative product in this category. It is labeled for outdoor use and contains a low percentage of fipronil (0.01%; a cursory look at other products in the category contained $\leq 0.01\%$ fipronil) enclosed in a bait station. Ant stakes can be replaced after six week; multiple ant stakes are to be placed around a homeowner's property at one time. The label does not have environmental hazard warnings but does give disposal information (Table 1).
3. Pressurized spray products used to apply fipronil topically to a cat's or dog's hair/fur to control fleas and ticks (five registered products). The Sentry® Fiproguard® label was

reviewed as a representative product in this category. These products are housed in a pressurized sprayer and all contain a low percentage (0.29%) of fipronil. The applicator sprays the product onto the hair/fur of a cat or dog. Application can be repeated monthly. No application is permitted to bedding or other animal areas. There is no restriction to the site of application, i.e., these products could be applied to a pet outdoors and spray drift could occur. The label does not have environmental hazard warnings but does give disposal information (Table 1).

4. Granular products used to control Imported Fire Ants in Coachella Valley (four products). The labels of two granular products (Chipco® Choice™ Insecticide and Senture™ Insecticide) were evaluated as representative products in this category. Granular products contain a low percentage of fipronil (these two products contain 0.1% and 0.0143% fipronil, respectively), and can only be applied in turf (cemeteries, sports fields, parks, lawns, school grounds, etc.), landscape beds, and outdoor nursery sites (but not to bareground) in Coachella Valley between April and September (these areas of California can get some rain in the summer months). The label for these products informs the applicator of fipronil's environmental toxicity potential and instructs the applicator to take care in preventing fipronil runoff (Table 2). The labels also instruct proper disposal of empty containers (either by burning or disposing of containers into sanitary landfills). For turf applications, the label instructs the applicator to irrigate the turf after application. Although the granular products may runoff with irrigation or rainfall, the runoff would strictly be limited to Coachella Valley.
5. The label of one dust formulated product to control termites (Termidor® Dry California) was evaluated. Termidor® Dry California is applied as a spot treatment with a special applicator that allows direct injection of the product to the site where termites are causing damage, as into termite nests, voids, fencing, decking materials, railroad trestles, structural and landscape timbers, and other inaccessible areas of buildings where termite activity is expected. The label has an environmental hazards section, instructing the applicator not to apply this product to surface waters but has little other instruction for preventing surface water contamination (Table 2). However, the application method of injecting the product directly to the site of insect activity limits the potential of surface water runoff.

Of the 94 registered fipronil products, two products have the potential to contaminate surface waters: Termidor® SC Termiticide/Insecticide and Taurus® SC Termiticide/Insecticide. Both of these products are liquid soluble concentrate (SC) formulations containing 9.1% fipronil. Both of these product labels were reviewed; however, the labels are similar for both products. These products have two different specific uses:

1. Pre/post-construction for termite prevention or control;

2. Outdoor residual control of ants and non-residual control of nuisance arthropods (beetles, cockroaches, millipedes, centipedes, silverfish, earwigs, spiders, ticks, and fleas, etc.).

For termite control, applications are made pre/post-construction. Pre-construction applications consist of spraying the product onto bare soil and then pouring a concrete slab over the sprayed area on the same day. If the concrete slab cannot be laid the same day, the label requires that the sprayed area be covered with a waterproof barrier. Also for pre/post-construction termite control, the fipronil products can be applied by rod and/or trenching. This consists of digging a trench “at least” six inches wide by “at least” six inches deep (it can be wider/deeper) and hammering rods into the trench at specific distances. The fipronil products are applied as a soil drench; the rods help the solution to more deeply penetrate the soil. The soil that was removed from the trench is sprayed with the fipronil product (in a wheelbarrow or on a heavy plastic sheet), mixed, and used to back fill in the trench. Fipronil product can also be applied to masonry voids, hollow block foundations, under or alongside concrete slabs, alongside basement foundations, and in crawl spaces.

The above stated application methods for termite control limit exposure of fipronil in the environment. The outdoor use of fipronil for ant and other arthropod control may be a larger contributor to surface water contamination. For outdoor ant control, applications can consist of:

1. A low-pressure coarse banded surface spray up to 18 inches in width around doors, windows, vents, pipes, foundation cracks, or any exterior openings etc. with a general surface spray, crack and crevice spray, or into voids;
2. A low-pressure general surface spray to perimeter foundations (where the foundation meets the ground) “one foot up and one foot out”.

Thus, fipronil is being applied to impervious surfaces that are prone to runoff. Although there are numerous precautions and limits to these outdoor applications in an attempt to reduce or eliminate runoff from the site of application (Table 2; restrictions are for general Taurus®/Termidor® SC application), applications to impervious surfaces are allowed.

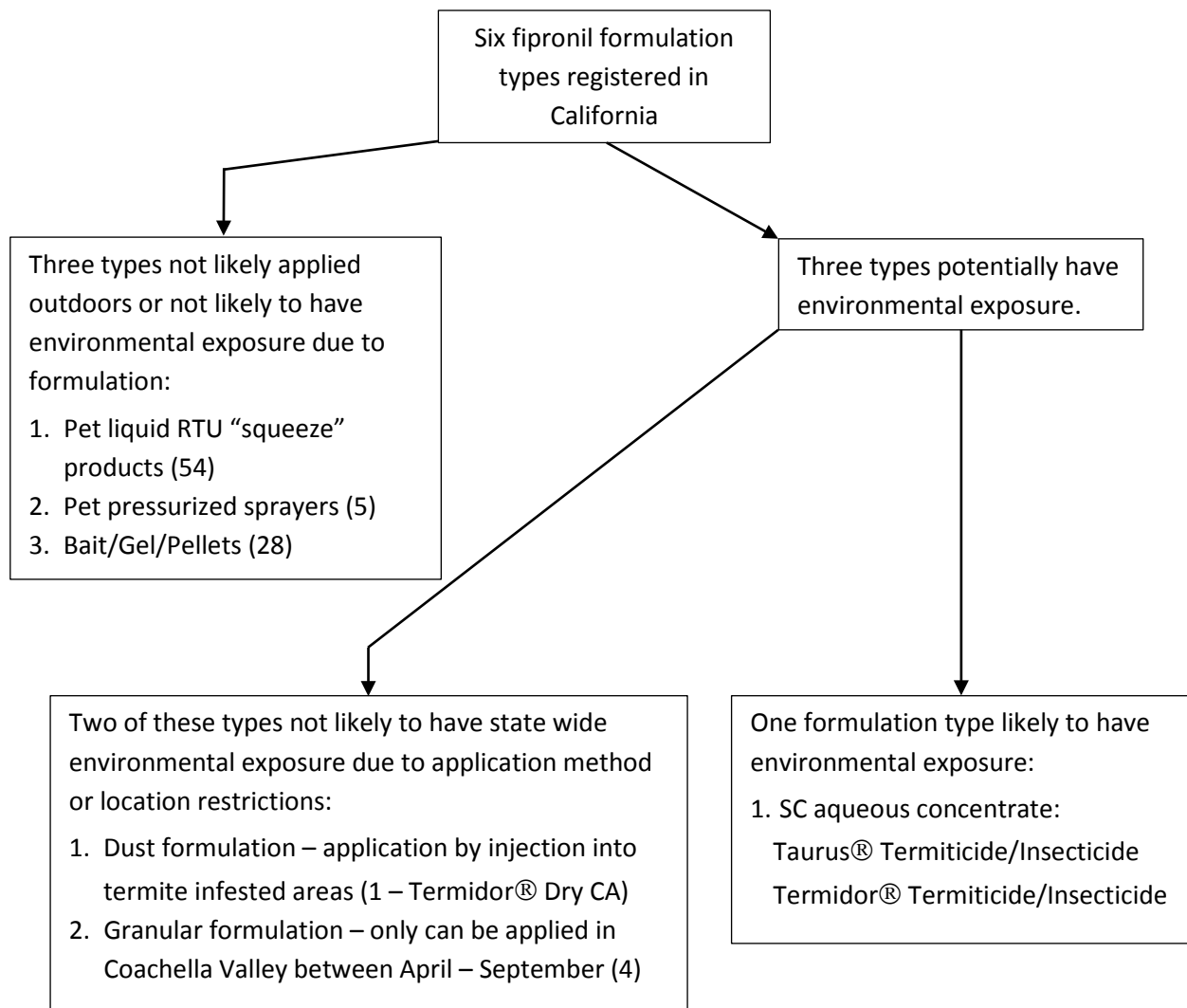


Figure 1. Summary of the six different fipronil formulation types. Numbers of product of each type are indicated in parenthesis.

Table 1. Label environmental information of three formulation types with low environmental exposure.

Label Information	Parastar® Plus (liquid RTU formulation)	Combat® Outdoor Ant Stakes (bait/gels/pellet formulation)	Sentry® Fiproguard® (pressurized sprayer)
Environmental hazard warning	No	No	No
Mentions that fipronil is toxic to aquatic invertebrates	No	No	No
Restricted use during precipitation	No	No	No
Product is waterproof*	Yes	Does not mention on label	Yes
Disposal of product listed in label	Yes, empty product disposed in household trash. Partially filled container disposed at a local waste agency.	Yes but difficult for consumer to determine if bait station is partially filled upon disposal which would warrant disposal at a local waste agency rather than in household trash.	Yes, empty product and gloves disposed in household trash. Partially filled container disposed at a local waste agency.

*manufacturer implies that product is “waterproof” or continues to work after bathing the pet or if the pet is exposed to water. However, overexposure to pet is mitigated by bathing with soap and rinsing with copious amounts of water.

Table 2. Environmental hazard statement and runoff protection language for dust, granular (GR), and soluble concentrate (SC) products.

Label Information	Formulation and Type Granular - Chipco® Choice™ and Senture™ (GR)	Termidor® Dry California Dust	Aqueous Concentrate - Termidor®/Taurus® (SC)
Label states toxic to fish/invertebrates	Yes	Yes	Yes
Prohibits applications directly to water	Yes	Yes	Yes
Prohibits application to impervious surfaces	Yes	No	No*
Prohibits application to storm drains	Yes	No	No
Prohibits application during precipitation	No	No	Yes
Cautions against causing runoff	No	Yes	Yes
Label requires applicator to clean/sweep up spills	Yes	No	Yes
Prohibits contaminating water when disposing of equipment rinsate	Yes	Yes	Yes
Freshwater buffer zone (distance)	15 ft	No	15 ft
Vegetation required in freshwater buffer zone	Yes	No	Yes
Estuarine water buffer zone (distance)	60 ft	No	60 ft
Vegetation required in estuarine buffer zone	No	No	No
Limits on applications around French drains	No	No	Yes
Buffer for wells or cisterns	No	No	5 – 10 ft
Prohibits applications to frozen soil	Implies “Yes” by season restrictions	No	Yes
Prohibits applications to saturated soil	No	No	Yes
Restricts application to soil or surfaces where runoff, drip, or movement from the treatment area (site) is likely to occur	No	No	Yes
Number of applications per year	1**	12***	2
Certified applicator notice on label	Yes	Yes	Yes
<p>*Label restricts application to perimeter foundations (where the foundation meets the ground) to one foot up and one foot out. Applications can be made in an 18 inch width pattern around doors and windows with a coarse banded spray.</p> <p>**Sod farms in imported fire ant quarantined areas can make two applications a year</p> <p>***Applications can be made every 30 days if termite infestation reappears or is not controlled.</p>			