



Identifying Current Use Pesticides Through Retail Surveys

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Introduction

Pesticides found in consumer pest control products can enter the waste stream through various washing activities or runoff directly to surface waters (Teerlink, 2017, Ensminger, 2013). An understanding of the environmental pathway of pesticides is necessary for the California Department of Pesticide Regulation (CDPR) to develop effective monitoring and mitigation strategies. Professional applications of pesticides in California are reported and tracked within the CDPR Pesticide Use Reporting system (PUR); however, non-professional applications are not. Since the market is continually shifting, it is imperative to understand the current availability of pesticides for homeowner use. Previous store surveys conducted by CDPR Surface Water Protection Program (SWPP) focused on either outdoor or indoor use products (Osienski, 2010, Vander Werf, 2015). For this study, CDPR surveyed seven large retail outlets in the Sacramento, California region for all pesticide products labelled for indoor, outdoor, and personal care products. The information gained from this survey will assist CDPR to identify pesticides that have the potential to be transported through various environmental pathways (Figure 1).

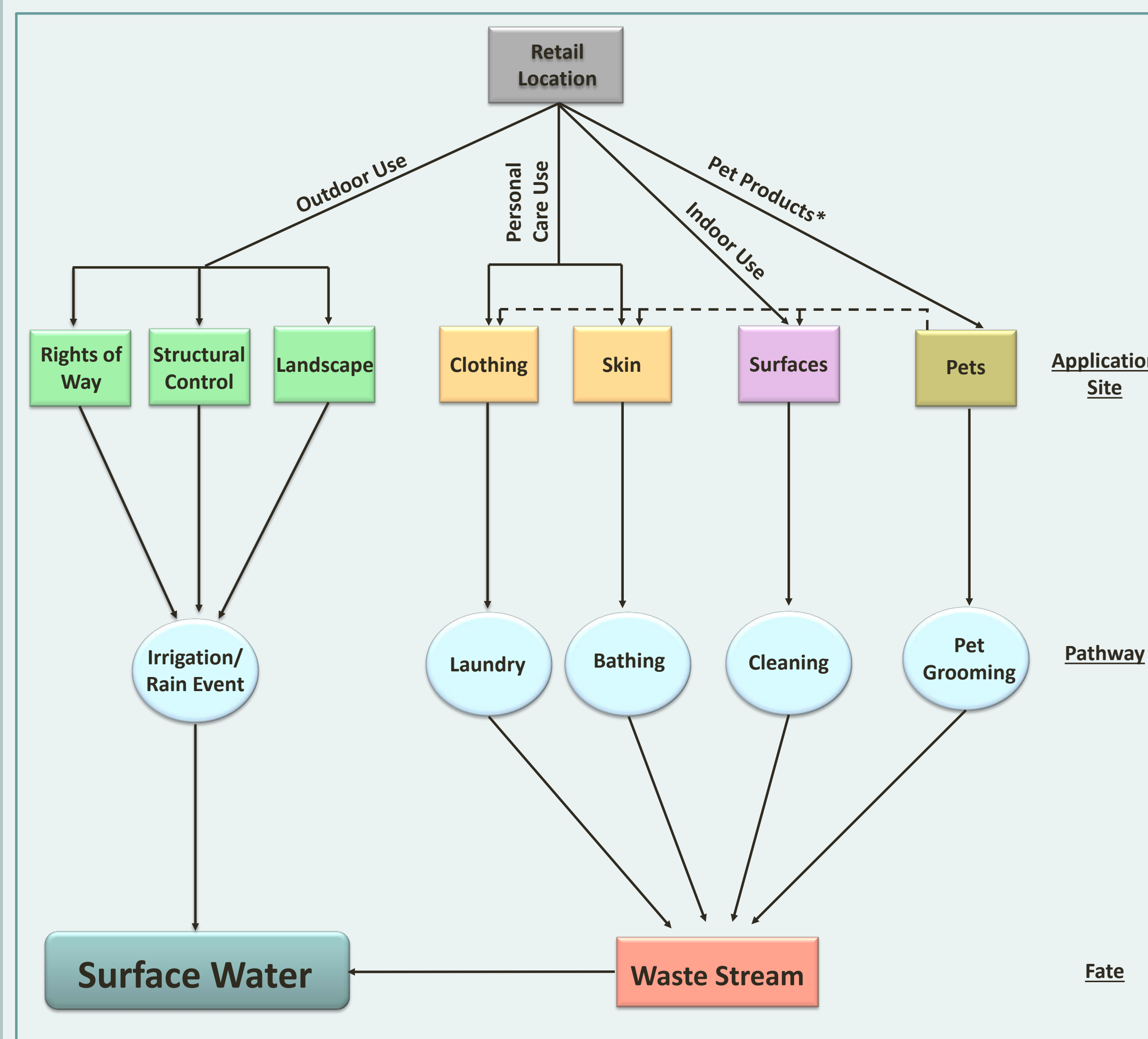


Figure 1. Conceptual environmental fate pathways for pesticides in consumer products. *Not evaluated in this study

Objectives

- Identify currently available pesticide products for consumer use.
- Identify products labelled for outdoor, indoor, and personal care use.
- Determine primary chemical classes by use patterns.

Methods

- Survey conducted in Northern California between March and May, 2017 at seven stores including those characterized as: home goods, hardware, garden supply, and big box
- All pesticide products containing active ingredients were recorded, excluding pet care products
- Recorded manufacturer, product name, volume, formulation, application site (indoor, outdoor, or both), active ingredients (a.i.) and a.i. percent
- Products defined by unique name, formulation, application site, active ingredient, and percent a.i
- For pathway analysis, products labeled for indoor and outdoor use were counted in both categories (Figures 2C and 2D)
- Personal care products were designated as a unique pathway category (Figure 2B)

Results

- There were 663 unique products and 180 active ingredients identified.
- 2,4-D, dimethylamine salt was found in the most products (46), followed by imidacloprid (34) and MCPP-P, dimethylamine salt (34) (Figure 2A).
- 53% of active ingredients are insecticides or herbicides and 52% are formulated as ready-to-use, concentrate, or granule (Figures 3 and 4).

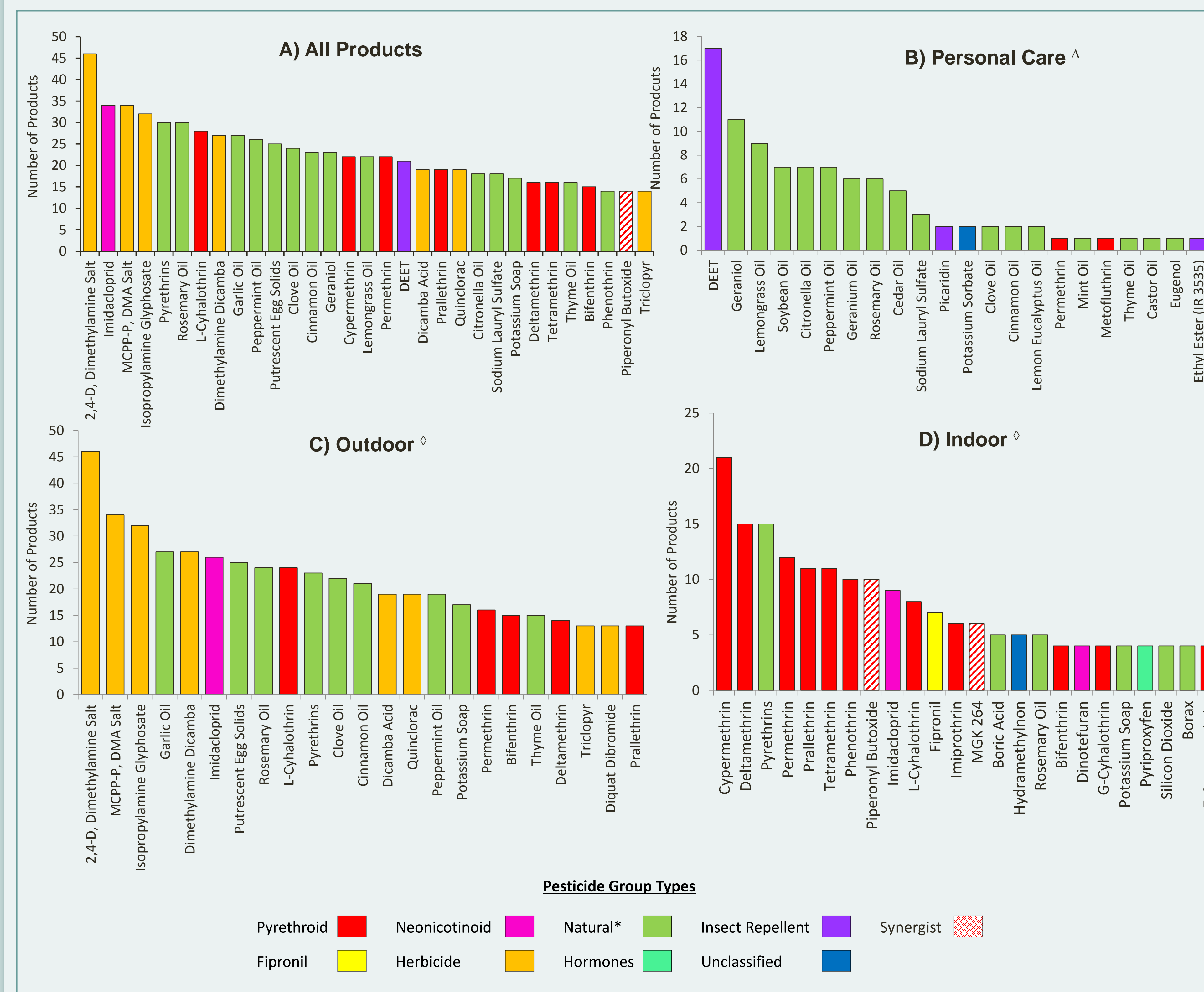


Figure 2. Number of products containing each active ingredient by group or use type. Not all products shown, graphs truncated for viewing purposes. ^Δ Personal care products are body sprays and lotions. [◊] Includes products identified as both indoor and outdoor use. *Natural includes Oils, Soaps, Botanicals, Animal Derivatives, and Inorganic group types.

Results (cont.)

- Pyrethroids were present in 248 products (37%) and all application site categories with the majority formulated as aerosols (35%), ready-to-use (18%), and foggers (12%) (Figures 2A-2D).
- The neonicotinoids imidacloprid, dinotefuran, and thiamethoxam were found in 49 products (7%) for both indoor and outdoor use and came in multiple formulations including granules, sprays, aerosols, and gels (Figures 2C and 2D).
- All Fipronil products were for indoor use only and formulated as baits and gels (Figure 2D).
- Two personal care products contained pyrethroids. All others contained natural ingredients and repellents. (Figure 2B)

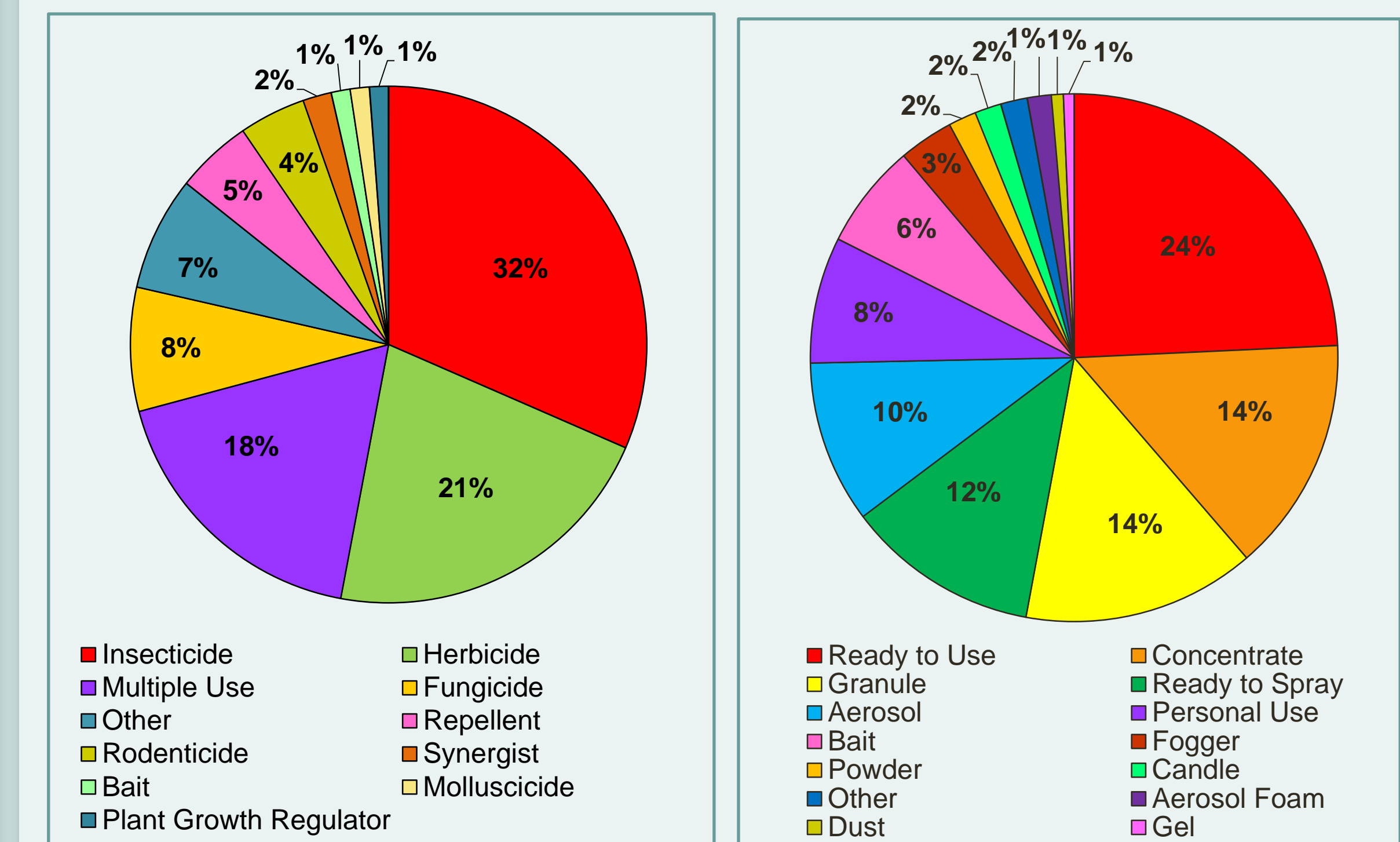


Figure 3. Pesticide products by use type. Figure 4. Pesticide products by formulation type. Ready to Use = Already mixed with spray nozzle. Ready to Spray = concentrate with attachment for dilution. Other includes everything else

Discussion

- These results show that pyrethroids and neonicotinoids are the primary classes of pesticides that should be evaluated for their potential to enter both wastewater and surface water via environmental pathways.
- Future work will include assessing ecological risk of available pesticides on the market.

References

Ensminger, M. P., R. Budd, K. C. Kelley, and K.S. Goh. 2013. Pesticide Occurrence and Aquatic Benchmark Exceedances in Urban Surface Waters and Sediments in Three Urban Areas of California, USA, 2008-2011. Environ. Monit. Assess. 185: 3697-3710

Teerlink, J., J Hernandez, R Budd. 2017. Fipronil washoff to municipal wastewater from dogs treated with spot-on products. Sci Total Environ 599-600: 960-966

Osienski, K., E. Lisker, R. Budd. 2010. Surveys of Pesticide Products Sold in Retail Stores in Northern and Southern California, 2010 http://www.cdpr.ca.gov/docs/emon/surfwttr/swanalysismemo/retail_memo_final.pdf

Vander Werf, R., A. Aldana, J. Teerlink, R. Budd. 2015. Retail Store Survey of Consumer-Use Indoor Pesticide Products, 2014 http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/analysis_memos/retail_memo_cons_umer_survey.pdf