

Potential Designated Pesticide: Pendimethalin

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*Presentation to Scientific Guidance Panel
February 9, 2010*

Criteria for recommending additional designated chemicals

- ▶ Exposure or potential exposure
 - ▶ Known or suspected health effects
 - ▶ Need to assess the efficacy of public health actions
 - ▶ Availability of a biomonitoring analytical method
 - ▶ Availability of adequate biospecimen samples
 - ▶ Incremental analytical cost
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Pendimethalin

Top 100 Pesticides: >1 million lbs applied

Use and exposure

- ▶ Agricultural crops, golf courses, landscape maintenance, residential lawn care
- ▶ 1.4 million lbs applied in 2008 in California
 - Use has nearly tripled within the last five years
 - 29% increase in 2008
- ▶ Found in rainfall samples in four agricultural watersheds across the country
 - Found in 78% of California samples

Increase in use

Pounds pendimethalin applied in California (CDPR, 2002–2008)

Year	2002	2004	2006	2008
Total pounds applied	447,032	542,634	714,755	1,448,554
Alfalfa	11,130	10,329	18,191	369,121
Almond	16,314	33,133	162,560	311,234
Cotton	154,781	158,450	114,583	72,159
Oranges	4,853	4,985	42,249	73,470
Pistachio	23,156	10,855	69,606	146,166
Landscape Maintenance + Rights of way	105,345	215,894	136,241	110,114

Known or suspected health effects

- ▶ U.S. EPA possible human carcinogen (Group C)
 - Thyroid tumors in rat cancer studies
 - Considered to be high dose effect by U.S. EPA
- ▶ Recent studies
 - Potential genotoxicity
 - Suspected endocrine disruption
 - Estrogenic and anti-androgenic
- ▶ Agricultural Health Study Cohort
 - Studies of pesticide applicators suggest associations between pendimethalin exposures and certain cancers

Potential to biomonitor

▶ Physical and chemical properties:

Molecular weight:	281.31
Vapor pressure:	3×10^{-5} mm Hg
Water solubility:	0.3 mg/L at 20°C
Log K_{ow} :	5.18

▶ Persistence and bioaccumulation

- Identified as Persistent, Bioaccumulative and Toxic (PBT) under the U.S. EPA Emergency Planning and Community Right to Know Act of 1986 [EPCRA]

Potential to biomonitor

- ▶ Past biomonitoring studies
 - None identified
- ▶ Analytical methods
 - CECBP would need to develop methods
 - Biological medium: Urine
 - Analysis can be bundled with other dinitroanilines (e.g., trifluralin)

Need to assess efficacy of public health actions

- ▶ Widely used agricultural pesticide
- ▶ Recent findings highlight the need for further study
- ▶ Biomonitoring would help assess extent of exposure in California