California Environmental Protection Agency
Department of Pesticide Regulation

Chlorpyrifos Update

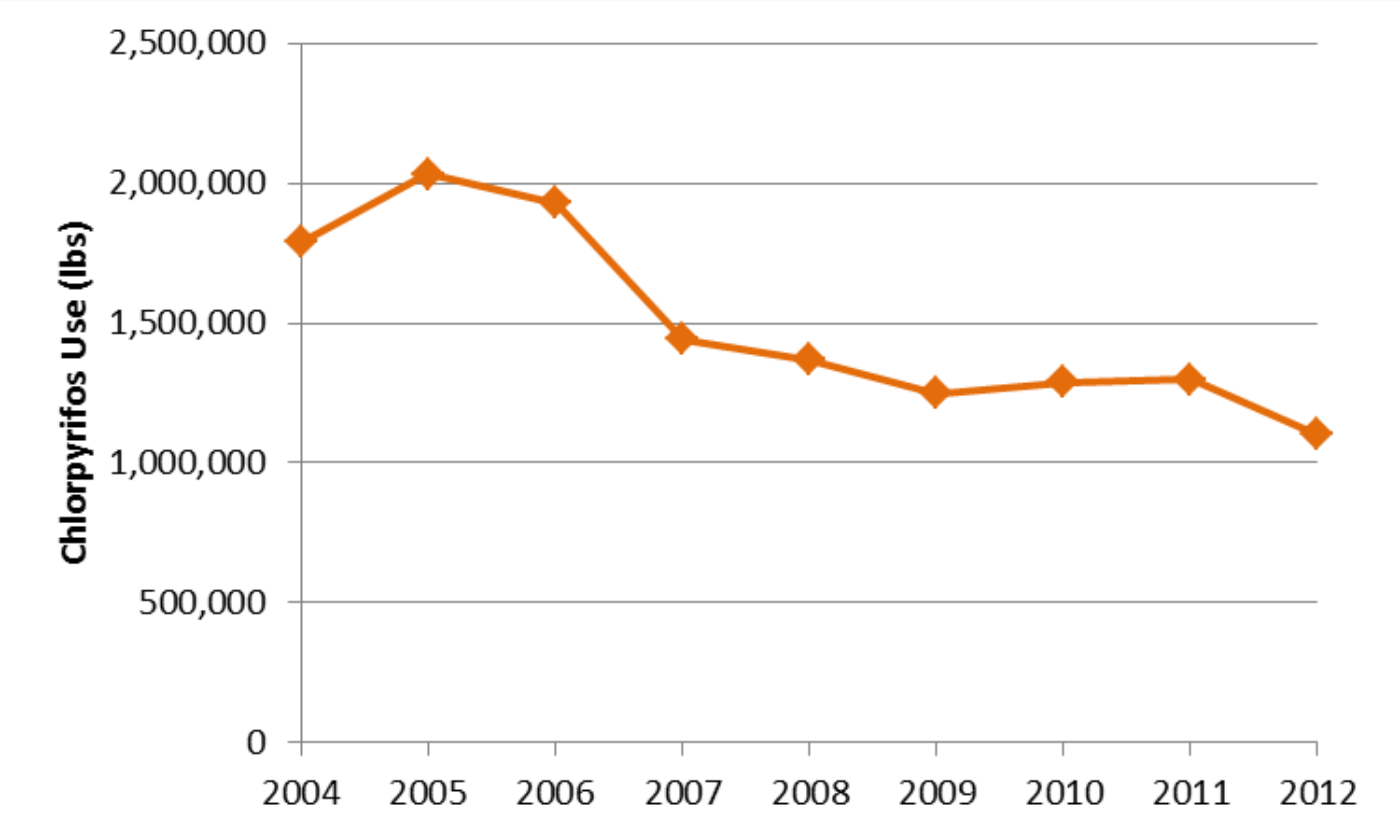
July 2014
revised

Agenda

- Introductions
- Background and current use requirements
- Key environmental issues
- Key health issues
- Future proposed regulations
- Related activities
- Timeline and next steps

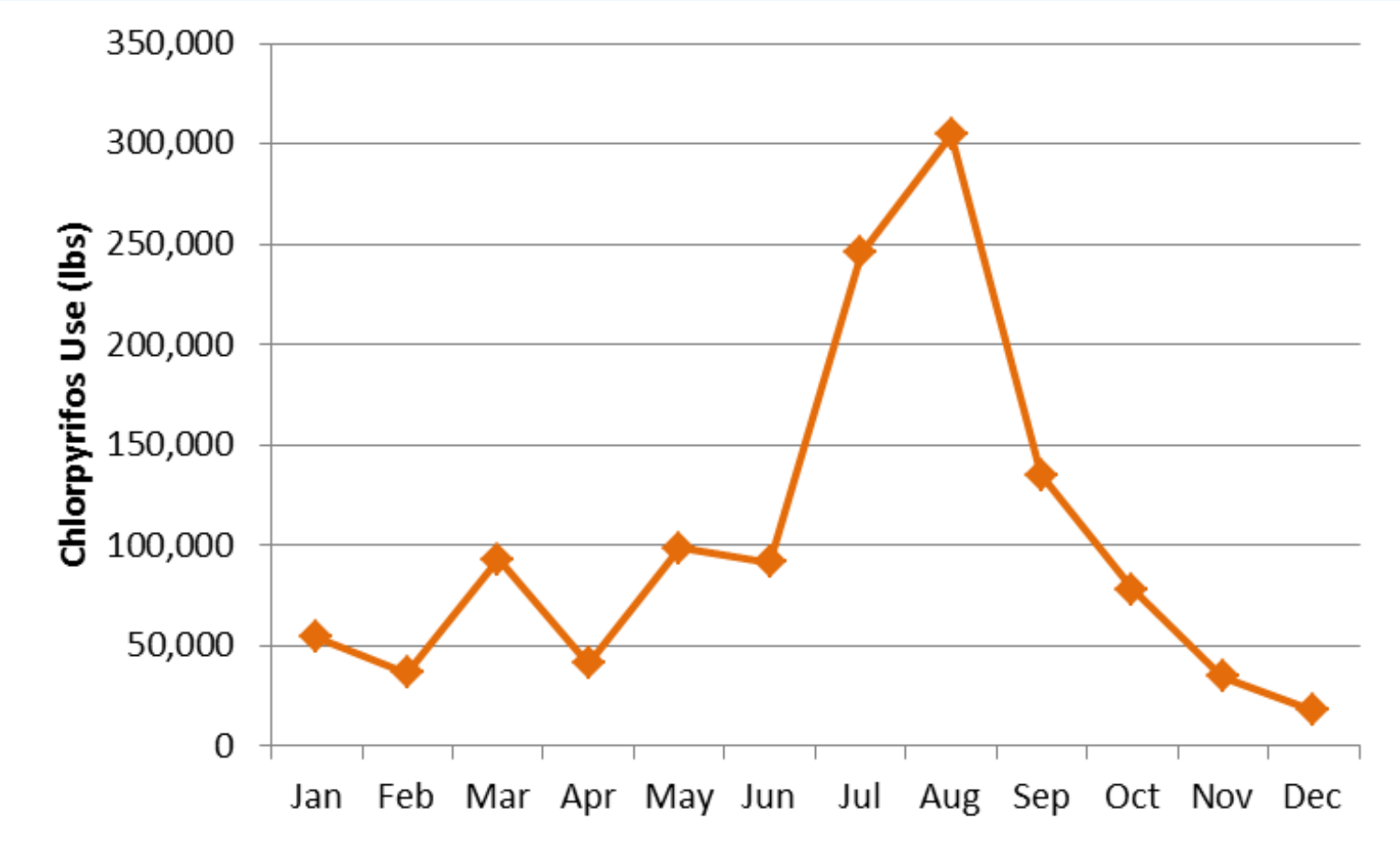
Background – use by year

- Chlorpyrifos is a widely used agricultural insecticide
- Use has been decreasing, but more than a million pounds are applied each year



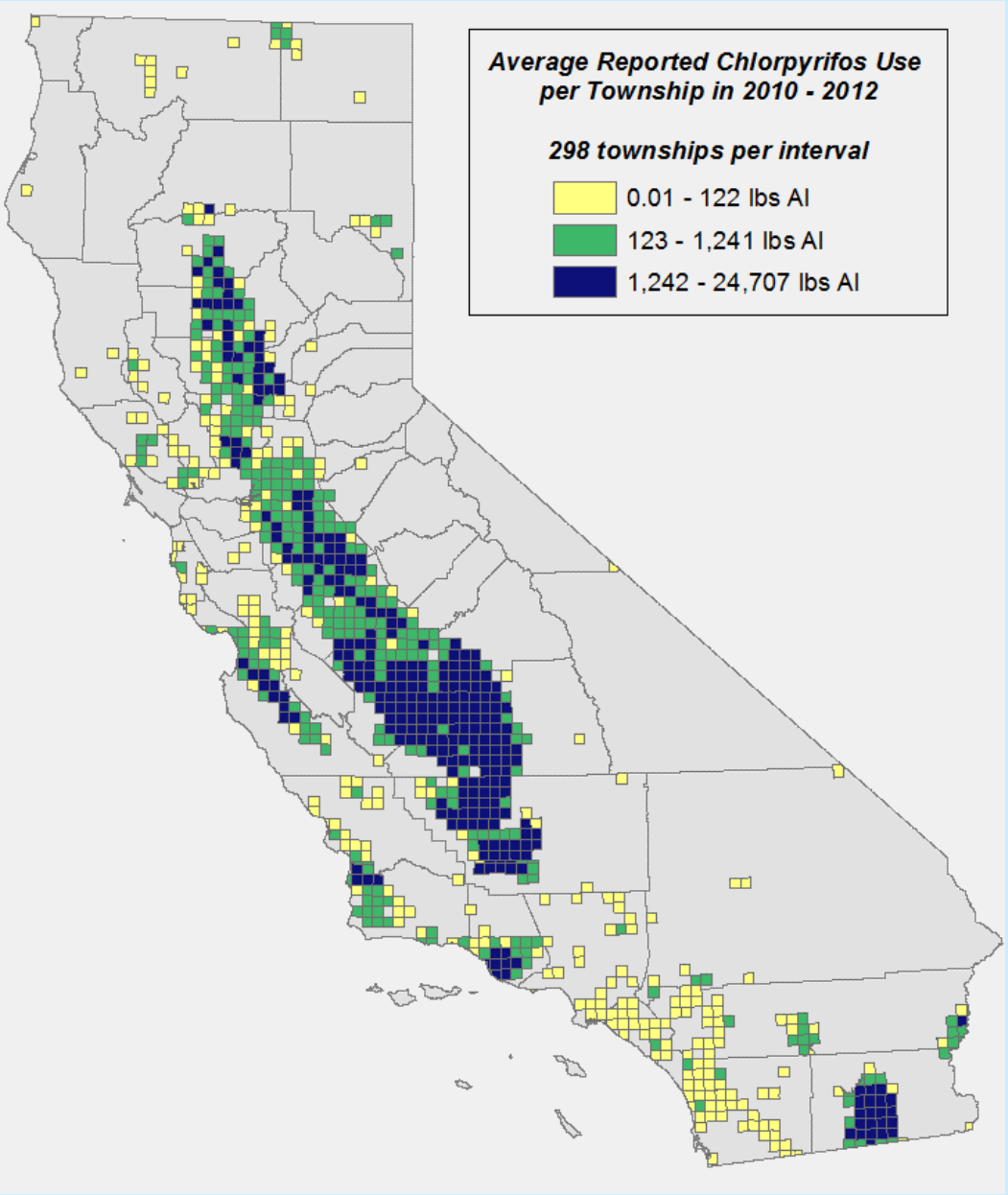
Background – 2010-2012 annual use (pounds) by month

- Most use occurs during the summer



Background – 2010-2012 annual use (pounds) by location

- Most use occurs in the Central Valley, Central Coast, and Imperial County regions
- The top 5 counties were
  - Fresno
  - Kern
  - Tulare
  - Kings
  - Imperial



Background – 2010-2012 annual use (pounds) by crop and method

- Chlorpyrifos is applied to more than 60 crops, but the top 5 crops account for more than 70% of the use
- 2/3 of the applications are by ground rig, 1/3 by air

Crop	Aerial	Ground	Total
Almond	49,721	179,093	229,246
Alfalfa	142,593	35,169	178,925
Walnut	19,209	150,722	170,194
Orange	47	168,787	169,736
Cotton	122,370	13,273	135,702
Grape	19	96,711	97,624
Corn	24,124	15,761	40,048
Broccoli	174	33,213	33,408
Sugarbeet	23,780	7,114	33,138
Lemon	259	27,445	27,731
All other crops	15,684	95,647	115,368
Total	397,981	822,934	1,231,121

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Background – 2010-2012 annual use (pounds) by formulation and site type

- Chlorpyrifos has about a dozen different formulation types, but liquid concentrates and ECs account for more than 90% of the use
- More than 99% of the use is for agricultural commodities

Formulation	Ag Commodity Sites	Other Sites	Total
Liquid concentrate	617,608	695	618,303
Emulsifiable concentrate	546,939	830	547,769
Granular/flake	52,776	150	52,926
All other formulations	9,635	2,488	12,123
Total	1,226,957	4,164	1,231,121

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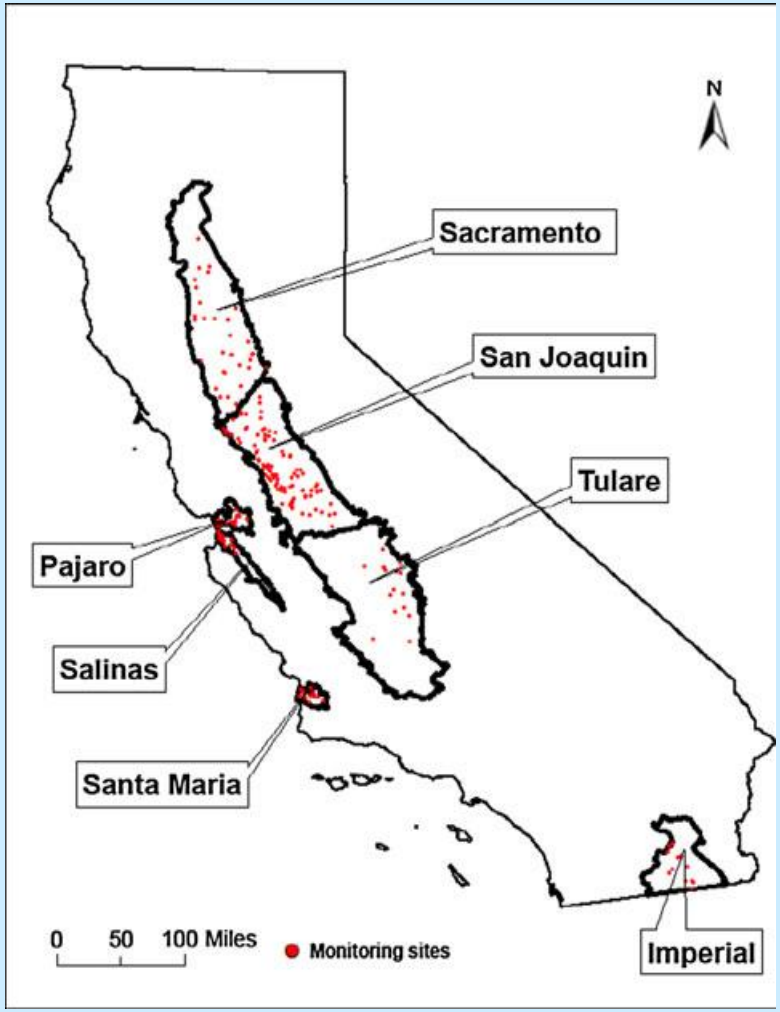
Current label requirements for bystander and environmental impacts

- Certain products are federally restricted use pesticides that require a certified applicator, but not a permit
- Setbacks from aquatic areas: 25-150 feet
- Setbacks from sensitive areas: 10-100 feet
- Application method restrictions and spray drift management

Current DPR regulations for environmental impacts from dormant sprays (3 CCR section 6960)

- Option 1: Apply to a hydrologically isolated site
- Option 2: Hold runoff for 72 hours
- Option 3:
  - Obtain pest control adviser (PCA) recommendation
  - No application within 100 feet of sensitive aquatic site
  - Wind speed 3-10 mph
  - Most aerial applications prohibited
- Plus: no dormant application if soil moisture at field capacity or storm runoff forecasted within 48 hours

Key environmental issues – surface water detections



Region	Sites	samples	Detect %	Exceed %
Santa Maria	19	94	79.8	59.6
Salinas	22	279	44.8	26.5
Imperial	24	114	46.5	26.3
Pajaro	22	78	16.7	11.5
Tulare	37	337	12.5	9.8
San Joaquin	115	2591	12.2	6.2
Sacramento	42	601	9.5	1.8
All Regions	281	4094	16.7	9.1

U.S.EPA benchmark of 0.04 µg/L used to determine number of exceedances.

Credit: Xuyang Zhang, SWPP

Key environmental issues – surface water mitigation

- Initial focus Central Coast (Salinas & Santa Maria valleys)
  - Based on detections & USEPA benchmark exceedances
  - Technical Advisory Committee (TAC) meetings in 2013
  - TAC identified significant use of chlorpyrifos on broccoli seed/transplant to control cabbage maggot & subsequent runoff from sprinkler irrigation as area of initial focus
  - Currently evaluating possible mitigation methods
- Focus next on Central Valley and Imperial Valley

Key health issues – potential health effects

- Acute, high-dose exposures
  - Effects include tremors, vomiting, convulsions and possibly death
- Some studies suggest that lower-dose exposures can cause neurodevelopmental effects in infants and children
  - More susceptible because of their developing nervous systems
- Exposures of residents in rural areas where chlorpyrifos is applied are potentially of concern
  - Exposure data are lacking for those who are downwind of applications
  - Calculating exposure estimates requires many assumptions

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Key health issues – potential bystander exposures from drift

- Air monitoring and inhalation exposure
  - Max concentration from ambient monitoring ~1 ug/m^3
  - Max concentration from application-site monitoring ~50 ug/m^3
- Computer modeling with AgDrift and AgDisp to estimate off-site deposition and dermal exposure is in progress
- Other exposures are possible, such as ingestion by infants due to hand-to-mouth activities
- During 2001-2011, 35 applications might have or definitely caused illnesses to 136 people due to drift

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Future proposed regulations

- DPR will propose regulations for chlorpyrifos due to health and environmental concerns, particularly from drift
- Proposed regulations will make chlorpyrifos a state restricted material when used for production of an agricultural commodity
  - Applications must be made or supervised by a certified applicator
  - Purchase, possession, or use requires the property operator to obtain a permit from the county agricultural commissioner
  - Applications for hire require a pest control adviser recommendation

Certified applicator requirements – no changes

- 3 types of certification
  - DPR-issued qualified applicator license (QAL)
  - DPR-issued qualified applicator certificate (QAC)
  - Agricultural commissioner-issued private applicator certificate (PAC)
- Certified applicator requirements
  - Must pass examinations
  - QAL/QAC valid for 2 years; PAC valid for 3 years
  - Continuing education required to renew

Restricted materials permit requirements – no changes

- PCAs and growers must consider and adopt feasible mitigation measures and alternatives which substantially lessen environmental impact
- Agricultural commissioners must evaluate permit applications and notices of intent, including
  - If substantial environmental impact will occur
  - Local conditions
  - Information from DPR and other specified sources
- Agricultural commissioners may approve, condition, or deny a permit

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Chlorpyrifos products affected

- 38 total end use products with active registrations
  - 30 products used for the production of agricultural commodities will be affected
    - 24 products are federally restricted use pesticides that require a certified applicator, but not a permit
  - 8 products used solely for non-production agriculture or non-agriculture uses will not be affected
    - Examples: golf courses, rights of way, landscape maintenance, seed treatments, non-residential structures, livestock housing, cattle tags
- 10 Section 24(c) Special Local Need (SLN) active registrations
  - 8 SLNs used for the production of agricultural commodities will be affected
  - 2 SLNs for seed treatment will not be affected

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Related activities – research and analyses in progress

- **DPR air monitoring network** – ambient air monitoring in Ripon, Salinas, and Shafter

- **Air Resources Board monitoring** – monitoring during and after an application

- **CA Dept of Food and Agriculture-Coalition for Urban Rural Environmental Stewardship project** – improving efficiency of pesticide applications by minimizing offsite movement from orchards; outreach on good spraying practices

Related activities – reevaluation

- Reevaluation requires registrants to
  - Identify processes that contribute to chlorpyrifos detection in surface water
  - Identify mitigation strategies

Related activities – DPR grants and contracts in progress

- Reduced risk approaches to manage maggot pests in cole crops in the Central Coast (Joseph)
- Integrated pesticide reduction strategies for insect and disease management in cole crops (Shennan)
- Identify and manage critical uses of chlorpyrifos in alfalfa, almond, citrus, and cotton (Goodell)
- Ecoinformatics approaches to reduce use of high-risk insecticide on San Joaquin Valley citrus (Rosenheim)
- California pesticide efficacy and selectivity trials archive (Grieneisen)

Timeline for rulemaking

- Jul-Aug 2014: stakeholder meetings
- Sep 2014: begin 45-day public comment period
- Nov 2014: end public comment period
- Summer 2015: earliest possible effective date

Next steps – concurrent with rulemaking – evaluate and mitigate bystander exposures

- Resolve toxicity uncertainties and set risk management goals
- Identify exposure scenarios and estimate exposures
  - Characterize crops and application settings (e.g., foliage density)
  - Characterize application methods (e.g., air, ground boom, orchard sprayer)
  - Characterize application amounts (application rates, field acreage)
- Consider permit conditions
  - Estimate drift and air concentrations with monitoring data and computer modeling
  - Consider application method restrictions
  - Consider revised setbacks for sensitive sites

Next steps – concurrent with rulemaking – evaluate and mitigate bystander exposures

- Consider the information developed from the grants and other research in progress listed above

- The work conducted by Goodell to identify and manage critical uses of chlorpyrifos in alfalfa, almonds, citrus, and cotton will be particularly useful as DPR considers permit condition options