

Santa Maria Strawberry Field Day May 6, 2015 – Pesticide Use Trends
Steve Blecker – Dept. of Pesticide Regulation

Purpose: Show pesticide use trends within and between the major strawberry growing regions in CA over the past several years. All pesticide use data and acres treated were taken from the Dept. of Pesticide Regulation’s Pesticide Use Report (PUR) database, which is available at: <http://calpip.cdpr.ca.gov/main.cfm>. If you have any questions about this handout, feel free to contact Steve Blecker, Environmental Scientist with DPR at sblecker@cdpr.ca.gov.

Fumigant use among the three main strawberry growing regions (2009-2013)

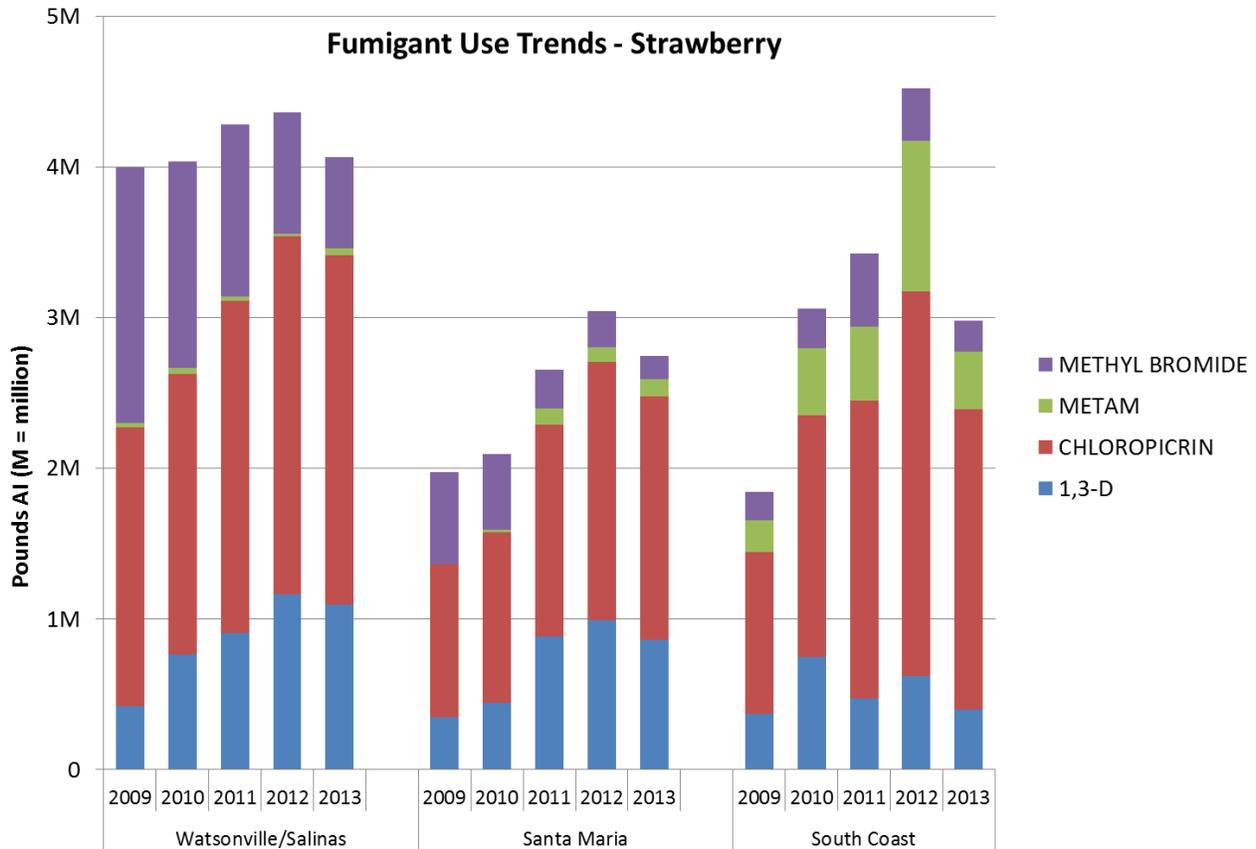


Figure 1.

Percent change in fumigant use (pounds AI) between 2009-2013

	Methyl Bromide	1,3-D	Pic	Metam ¹	Total Fumigants
Watsonville/Salinas	-64%	+160%	+25%	+62%	+2%
Santa Maria	-75%	+150%	+60%	*	+40%
South Coast	+7%	+8%	+85%	+81%	+60%

*No reported use in 2009: 112,000 lbs. reported in 2013

Metam¹: Includes both Metam-Na and Metam-K

- Methyl bromide should continue to decline; as far as I know the Critical Use Exemptions for strawberry (at least on the production side, not sure about nurseries), won’t be renewed past 2017, but you may have heard differently.
- With this in mind and the tightening restrictions on other fumigants, DPR has funded a number of grants (through two competitive grant programs) in the past several years related to finding fumigant alternatives – many of those are related to strawberry production (see next page).

Fumigant Alternative Research Grants (related to strawberries) between DPR and UC

Lynn Epstein – UC Davis Plant Pathologist, (Funding period: 2013-2016)

- **Methyl bromide alternatives for strawberry nurseries**
 - Evaluate the efficacy of Pic-Clor 60, anaerobic soil disinfestation (ASD) and crop rotation to suppress soil pathogens in high elevation strawberry nurseries

Steve Fennimore – UC Extension Specialist, Salinas, (Funding period: 2014-2017)

- **Developing a mobile steam applicator to replace fumigants for strawberry**
 - Facilitate wide-scale use of steam for soil disinfestation in place of fumigants for strawberries and other high value crops

Mark Bolda – UC Farm Advisor, Watsonville, (Funding period: 2015-2018)

- **Integrating plant horticulture and soil borne disease control by methyl bromide alternatives strawberries**
 - Evaluate the efficacy of length of cold conditioning, plastic bed mulch color, nitrogen fertilizer levels in four different pre-plant treatments: chloropicrin, allyl isothiocyanate, steam, ASD

Krishna Subbarao – UC Davis Plant Pathologist, (Funding period: 2015-2018)

- **Integrated approaches to replace methyl bromide in strawberry production: strategies for soil borne disease management**
 - Evaluate the efficacy of a crop termination treatment using allyl isothiocyanate, broccoli residue treatments and a chitin-based soil amendment (RootGuard)

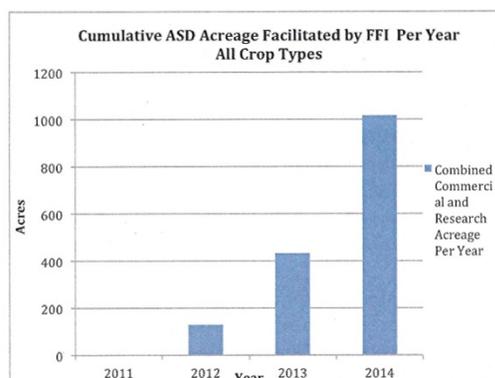
Strawberry related grants outside of UC

California Strawberry Commission – Watsonville, (Funding period, 2014-2017)

- Evaluate the efficacy of reduced rate fumigants (Pic, Vapam, allyl isothiocyanate) in combination with ASD

Farm Fuel Inc – Watsonville, (Funding period, 2013-2016)

- Facilitate ASD pre-plant soil treatment for strawberry and caneberry growers



This graph shows the increase in ASD acreage facilitated by Farm Fuel in the past several years (mainly strawberry but also some caneberry)

Insecticide use among the three main strawberry growing regions (2009-2013)

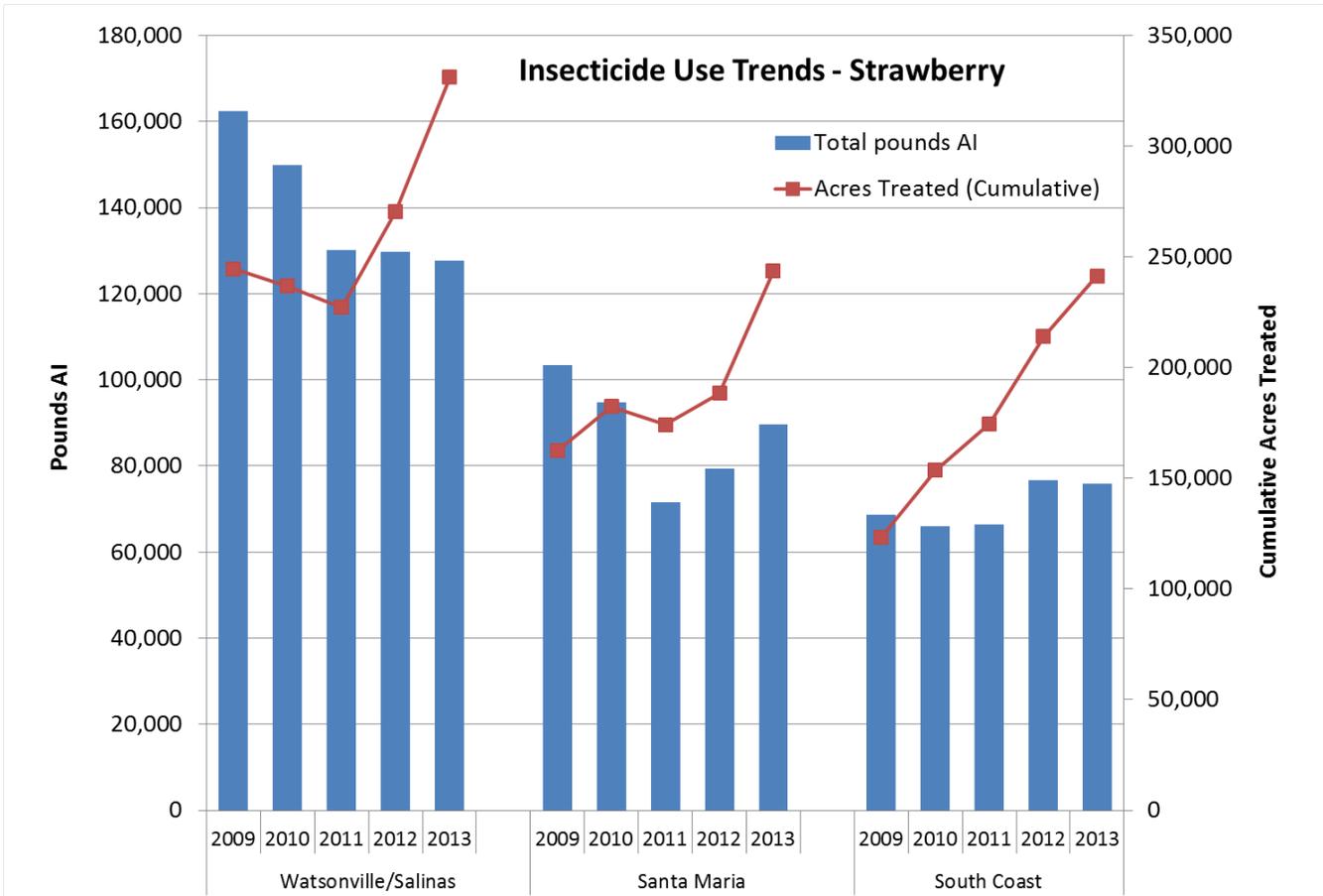


Figure 2.

Number of acres treated has increased in all three regions. The trend in total pounds of insecticide used varies by growing region.

**Insecticide use among the three main strawberry growing regions (2009-2013)
by chemical class**

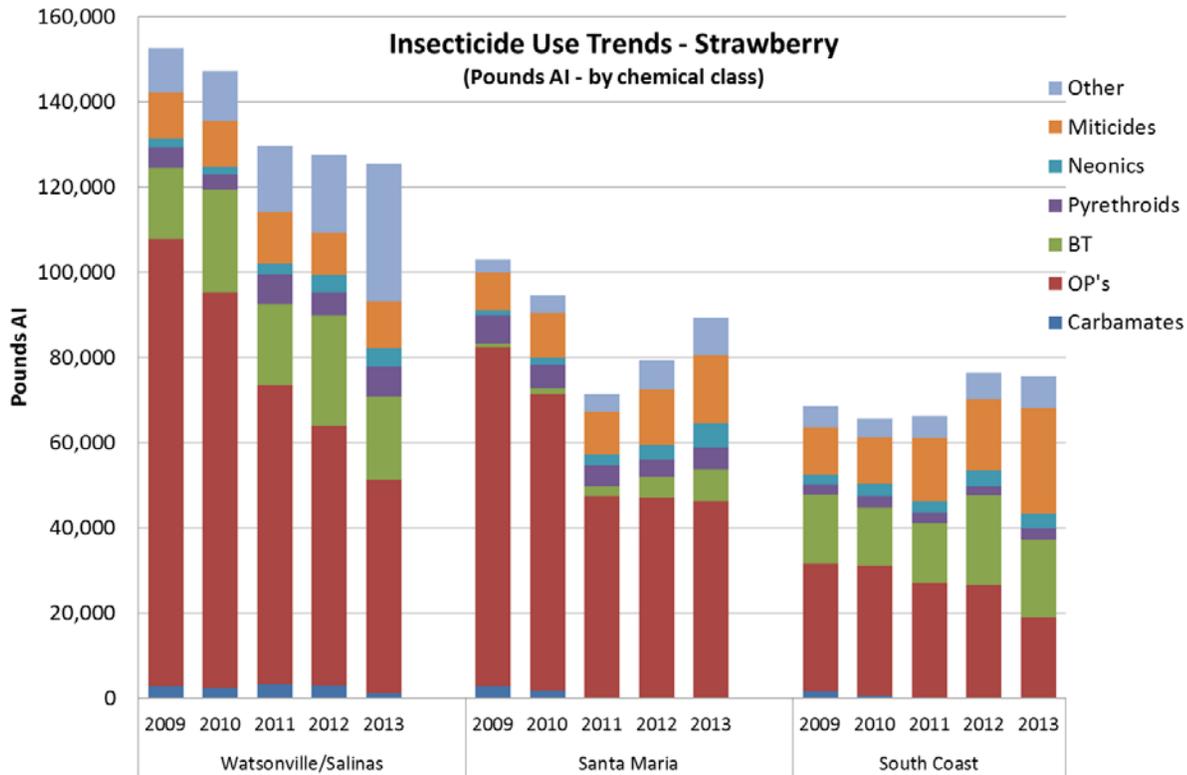


Figure 3.

Percent change in insecticide use (pounds AI) between 2009-2013

	Carbamates	OP's	BT	Pyrethroids	Neonics	Miticides	Other	Total
Watsonville/Salinas	-52%	-52%	+18%	+43%	+100%	+2%	+200%	-18%
Santa Maria	*	-42%	+700%	-22%	+350%	+82%	+190%	-13%
South Coast	*	-37%	+13%	+17%	+50%	+125%	+50%	+11%

*No reported use in 2013

Insecticides (AI's comprising each chemical class)

- **Carbamates** (Carbaryl, Methomyl)
- **OP's** (Malathion, Naled, Chlorpyrifos, Diazinon)
- **Pyrethroids** (Fenopropathrin, Bifenthrin)
- **Neonicotinoids** (Imidacloprid, Acetamiprid, Thiamethoxam)
- **BT**
- **Miticides** (Spiromesifen, Bifenazate, Acequinocyl, Hexythiazox, Fenbutatin-oxide, Etoxazole, Abamectin, Fenpyroximate)
- **Other insect growth regulators, etc.** (Spinosad, Spinetoram, Pyriproxyfen, Potash soap, Piperonyl butoxide, Oils, Novaluron, Methoxyfenozide, Flubendiamide, Flonicamid, Chlorantniliprole, Buprofezin, Azadirachtin)

Note: Figure 3 totals are slightly lower than the Figure 2 totals, as not every AI was included in the 'Other' category, though overall the totals from figure 3 account for 98.8% of the Figure 2 totals

Fungicide use among the three main strawberry growing regions (2009-2013)

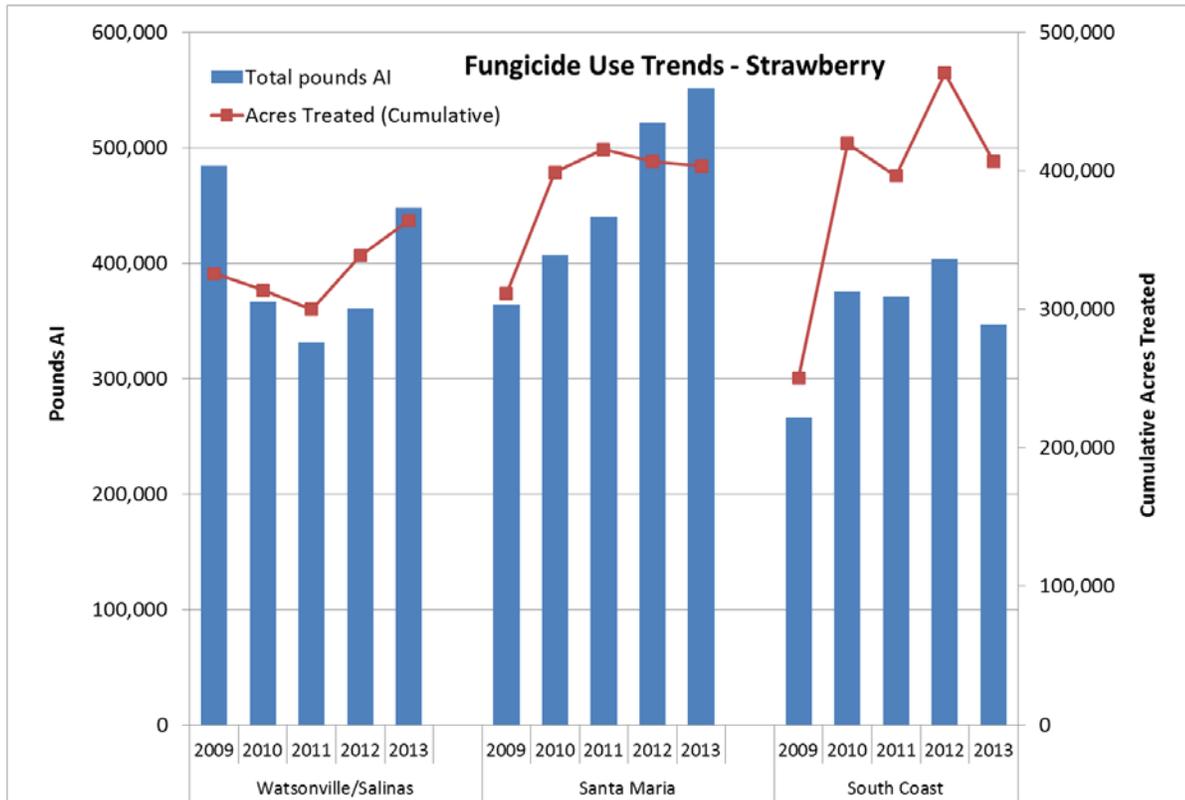


Figure 4. Fungicides continue to be the most used pesticide by acres treated

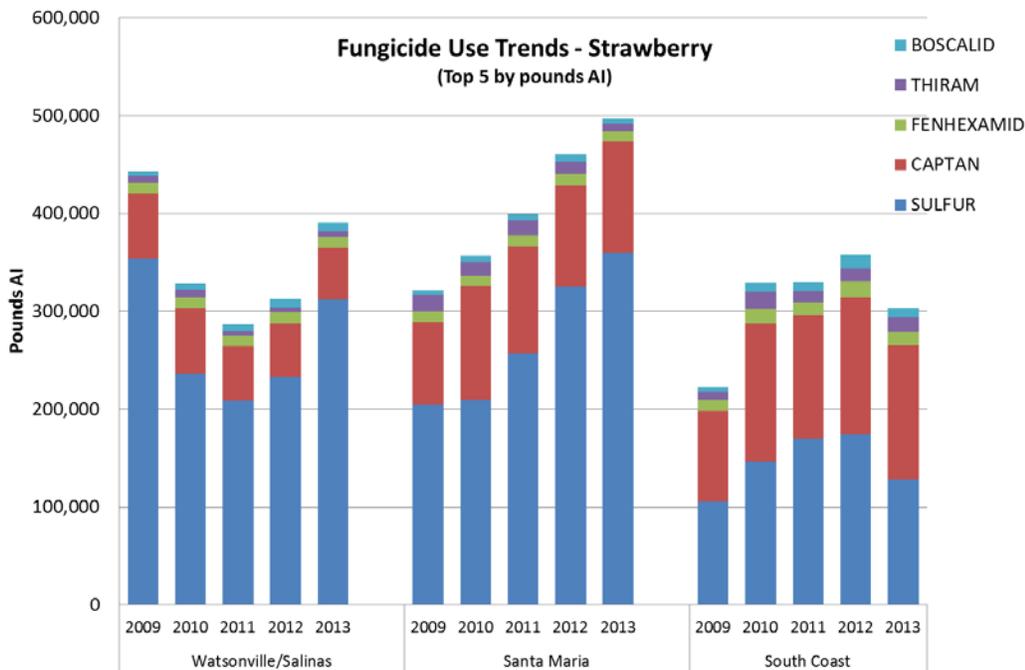


Figure 5. Shows a steady increase in fungicide use (primarily in sulfur) in Santa Maria since 2009

Herbicide use among the three main strawberry growing regions (2009-2013)

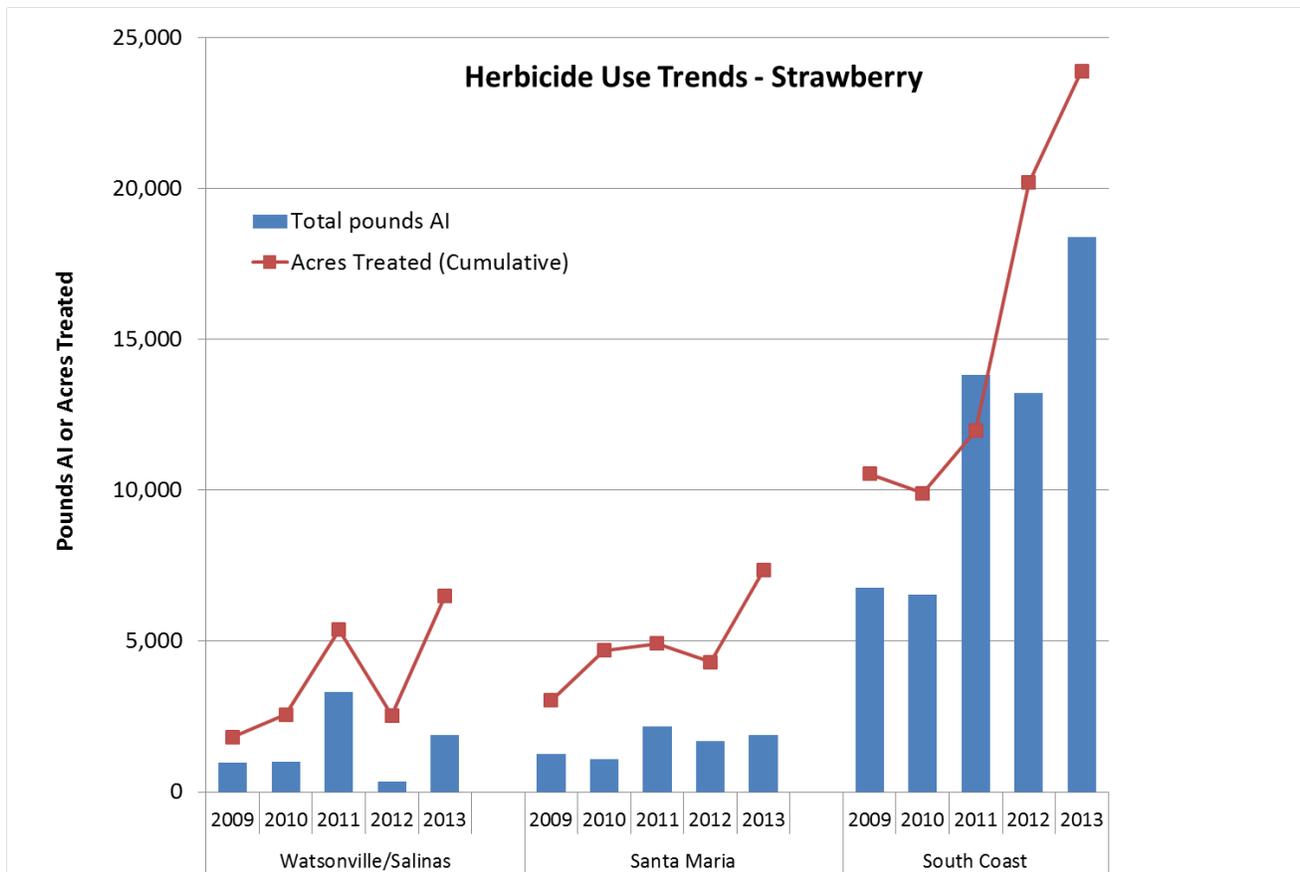


Figure 6. Shows the differences in amount of active ingredient (AI) used and acres treated among the growing regions

Top 5 Herbicide AI's by region (2009-2013)

Watsonville/Salinas (Limonene, Napropamide, Flumioxazin, Oxyfluorfen, Paraquat dichloride)

Santa Maria (Glyphosate, Oxyfluorfen, Napropamide, Pendimethalin, Paraquat dichloride)

South Coast (Pendimethalin, Napropamide, Oxyfluorfen, Glyphosate, MSMA)

Additional Notes:

- Why 2009-2013? The latest available PUR data is from 2013; 2009 was not selected for any particular reason other than to provide a look at recent trends, without presenting too much data. (Note: The 2013 data is preliminary and subject to change).
- Growing regions: This represents most, but not all strawberry production in CA (i.e. areas such as the Central Valley were not included).
 - Watsonville/Salinas: Monterey, Santa Cruz, Santa Clara, San Benito and San Mateo counties
 - Santa Maria: San Luis Obispo and Santa Barbara counties
 - South Coast: Ventura, Orange, Riverside, Los Angeles, and San Diego counties
- Cumulative acres treated: does not necessarily equal total crop acreage, because the acreage is counted every time that field is treated with the same active ingredient within the same year.

Acres harvested among the three growing regions (2009-2013)
(data source: annual county ag commissioner crop reports)

