

State Introduces Additional Requirements for Pesticide Applications Near Schools

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The California Department of Pesticide Regulation will require growers to notify public schools and licensed daycare centers annually of pesticides that may be used within one-quarter mile and prohibits some applications on weekdays between 6 a.m. and 6 p.m. The regulation is scheduled to go into effect on January 1, 2018. While notification costs in total are small on average, they are highly heterogeneous across growers. The economic impact of the prohibition on certain classes of applications is unclear. Insufficient information is available on the potential benefits of the regulation to determine whether it is socially desirable.

On January 1, 2018, the California Department of Pesticide Regulation (CDPR) will implement regulation regarding pesticide applications near public K–12 schools and licensed child daycare facilities, referred to collectively as schoolsites. The regulation prohibits some classes of pesticide applications within one-quarter mile of schoolsites between 6 a.m. and 6 p.m. on weekdays. There is also a requirement for agricultural property owners to prepare an annual plan stating which pesticides they may apply and notify schoolsites of that plan.

This article examines the potential economic effects of the notification requirement for growers. The analysis includes 13 counties, which accounted for over half of California’s total value of crop production in 2014 (Fresno, Imperial, Kern, Kings, Madera, Merced, Sacramento, San Joaquin, Santa Barbara, San Luis Obispo, Stanislaus, Ventura, and Yolo). These counties represent two-thirds of the value of production and two-thirds of the harvested acres in California in 2014 (Table 1).

Data

In order to evaluate the potential cost of the notification requirements, we utilized historical data regarding pesticide applications. The analysis required identifying sites with “pesticide applications made for the production of an agricultural commodity” located within one-quarter mile of schoolsites. CDPR requires reporting

of all commercial pesticide applications in the state. The data collected are aggregated into an annual Pesticide Use Report (PUR). PUR data provided information on pesticide product applications from July 1, 2013 to June 30, 2014. The PUR data supplied the crop treated, the pesticide used, application type (aerial or ground), as well as the date and time of day of the application and information identifying the grower and site location.

Attributes of pesticide applications incorporated into the data include federal and state restriction status, sprinkler chemigation label options, and whether the application occurred during the week or a weekend. Data regarding field boundaries, parcel maps, public school addresses, licensed child daycare addresses, and street and number geocoding data to map those addresses were obtained from a variety of sources.

Table 1. Value of Crop Production and Harvested Acres for the 13 Counties Studied, 2014

County	-----All Crops-----			
	Value of Production Value (\$1,000)	Percent of State	Acres Harvested Number of Acres	Percent of State
Fresno	\$4,910,871	10%	890,959	10%
Imperial	\$1,298,740	3%	482,281	6%
Kern	\$5,495,819	12%	804,285	9%
Kings	\$1,282,094	3%	416,746	5%
Madera	\$1,563,457	3%	284,810	3%
Merced	\$2,088,430	4%	597,173	7%
Sacramento	\$324,374	1%	130,551	2%
San Joaquin	\$2,520,519	5%	650,266	8%
San Luis Obispo	\$760,830	2%	97,348	1%
Santa Barbara	\$1,450,076	3%	122,695	1%
Stanislaus	\$2,533,735	5%	502,027	6%
Ventura	\$2,125,115	4%	98,830	1%
Yolo	\$767,018	2%	289,441	3%
Total (13 counties)	\$27,121,078	57%	5,367,113	62%
State Total	\$47,450,342	100%	8,617,708	100%

Source: California Department of Food and Agriculture (2015). California Agricultural Statistics Review 2014–2015. www.cdfa.ca.gov/Statistics/PDFs/2015Report.pdf

Table 2. Estimated Notification Costs

Activity	Total Annual Cost	Cost/ Grower	Cost/ Field
Preparation of Annual Notifications	\$1,594,843	\$1,108	\$620
Delivery of Annual Notifications	\$17,787	\$12	\$7
Understanding Requirements	\$37,198	\$26	\$14
Total	\$1,649,828	\$1,147	\$642

Source: California Department of Food and Agriculture (2015). California Agricultural Statistics Review 2014–2015. www.cdffa.ca.gov/Statistics/PDFs/2015Report.pdf.

The time required for each cost component for the notifications was estimated utilizing the federal government’s estimate of the time required for compliance with various provisions of the soil fumigant risk mitigation regulation promulgated by the U.S. Environmental Protection Agency (EPA). We paired these time estimates with federal wage data to estimate costs. The resulting costs were \$25.85 for each affected grower to understand the requirements, \$620.32 per field to prepare the annual notification, and \$2.58 for delivery of the annual notification for each affected field to each schoolsite and the County Agricultural Commissioner’s Office (CAC).

Schoolsites Subject to Regulation

The thirteen counties have 2,853 public K–12 schools, of which 795 are within one-quarter mile of fields. The draft regulation would affect 28% of all public K–12 schools in these counties. They have 2,972 licensed child daycare facilities, of which 896 are within one-quarter mile of fields. The draft regulation would affect 30% of all licensed child daycare facilities in these counties.

Growers and Fields Subject to Regulation

According to 2014 PUR data, there were 25,836 unique grower identification numbers in the thirteen counties. Of those, 1,439 (5.6%) have one or more fields within one-quarter mile of one or more schoolsites. Accordingly,

each of those growers would need to become familiar with the regulatory requirements. In total, there are 2,571 fields within one-quarter mile of one or more schoolsites—constituting 478,773 acres, of which 36,471 acres are within one-quarter mile of a schoolsite. Each field must have an annual notification of planned pesticide use delivered to each schoolsite and the County Agricultural Commissioner (CAC).

Schoolsites may be sufficiently close to each other for some fields to be within one-quarter mile of more than one schoolsite. Each schoolsite must be provided with an annual notification, so notification costs are higher for a field if more schoolsites are near it.

Estimated Notification Costs

Table 2 reports notification costs in total, per grower, and per field. Total estimated annual notification costs are \$1,649,828, or \$1,147 per affected grower, and \$642 per affected field. The vast majority of these costs, \$1,594,843, are for preparation of the annual notification of pesticides, which could be applied in the following July 1 to June 30 period.

Prohibited Applications

It is difficult to create a counterfactual that would enable us to estimate the cost of prohibiting certain pesticide applications between 6 a.m. and 6 p.m., Monday through Friday. We instead simply provide an evaluation of the extent to which applications would have been impacted by the

draft regulation from July 1, 2013–June 30, 2014. The regulation defines prohibited applications in the school-site buffer zone as the use of sprinkler chemigation, aerial, and air blast (including air assist) applications.

We examine two classes of applications: aerial and air blast. A total of 6,907 applications would have been impacted out of a total of 12,005 aerial and air blast applications. Aerial applications accounted for 1,089 (16%) of the two types of prohibited applications, while 84% (5,818 applications) of prohibited applications were air blast.

Importantly, just over half of aerial and air blast applications (58%) occurred during the prohibited weekday time period between 6 a.m. and 6 p.m. Thus, evenings and weekends are already standard time windows for aerial and air blast applications. Weekday evening applications accounted for 18% of the total. Most striking, one-fourth of all applications took place on weekends.

Air blast applications are made primarily to perennial crops, while both annual and perennial crops utilize aerial applications. The commodities with the largest numbers of applications impacted were almonds and grapes—with 1,757 applications to almonds, 979 applications to grapes, and 580 applications to wine grapes. These three crops comprised 48% of all prohibited applications in this 2013–2014 period. Slightly over half of the almond and grape applications were prohibited, about one-fourth were on the weekends and one-fifth on weekdays after 6 p.m. Of all weekend aerial and air blast applications, 27% were on almonds and 24% were on grapes or wine grapes.

Of the field crops, alfalfa would have had the largest number of impacted applications followed by corn, wheat, cotton, and processing tomato. All of these were aerial applications. Well over half of the applications to these

crops were prohibited. Over a fourth of the applications to these crops were weekend aerial applications.

Conclusion

The estimated notification costs for 2013–14 would have been small on a per grower basis. However, it is important to keep in mind that averages do not provide a complete picture of the impact of notification costs on growers. Notification costs are heterogeneous across growers. Differences in the number of fields and the number of schoolsites that must be notified cause differences in notification costs across growers.

The most obvious way growers can mitigate the impact of the prohibition of certain types of applications at certain times is to move pesticide applications outside the prohibited window. However, weather and field conditions are not always suitable for applying pesticides. Forecasted rain events can in themselves prohibit certain pesticide applications. Thus, growers may sustain losses due to the regulation because they lose the option of treating during the weekday 6 a.m.–6 p.m. window.

More broadly, we do not consider the costs of possible strategies for adaptation to the prohibition of certain types of applications on certain times, including change in crops or pest management practices. Changes in crop choices or varieties would change costs of production, revenue, and profit at the farm level. Growers may choose pesticides that have longer residuals and/or are more toxic, may replace applications of targeted pesticides with applications of broad-spectrum pesticides, may replace monitoring and applications of pesticides only as needed with a schedule of preventative applications, or may apply at maximum label rates instead of lower ones.

Such responses will have economic implications, although the direct effect on per-acre costs may be an increase or decrease. Similarly, if the efficacy of pest control changes with a change in materials, application method or timing, the income to the grower could decrease, impacting profit. There also may be implications for environmental quality and human health. All such considerations affect the net social benefit of the regulation.

Additionally, evaluating the social benefit that offsets these costs requires additional information regarding the nature of the benefit and its quantification. The benefit of the regulation must be incremental; existing regulations, labels, and permit requirements all address mitigating risks of exposure to pesticides. In its Initial Statement of Reasons for the regulation, CDPR states that “... concerns about the risks associated with pesticide use at or near schools and child daycare facilities have persisted through the years due to children’s potentially increased sensitivity and exposure.”

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For additional information, the authors recommend:

“Pesticide Use Near Schoolsites.” Proposed Text. California Department of Pesticide Regulation. www.cdpr.ca.gov/docs/legbills/rulepkgs/16-004/16-004_text.pdf

“Initial Statement of Reasons and Public Report.” California Department of Pesticide Regulation. www.cdpr.ca.gov/docs/legbills/rulepkgs/16-004/16-004_initial_statement.pdf

Goodhue, R., K. Klonsky, C. DeMars, R.V. Steenwyck. 2016. “Draft Regulation Regarding Pesticide Applications Near Schoolsites: Potential Economic Effects for Agriculture.” UC Davis. Prepared for California Dept. of Food and Agriculture, Office of Pesticide Consultation and Analysis. www.cdpr.ca.gov/docs/legbills/rulepkgs/16-004/economic_effects.pdf.