

National Water-Quality Assessment Program

# **Preliminary Estimates of Annual Agricultural Pesticide Use for Counties of the Conterminous United States, 2013**

Open-File Report 2015–1176

U.S. Department of the Interior  
U.S. Geological Survey





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**U.S. Geological Survey**  
Suzette M. Kimball, Acting Director

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## Conversion Factors

### International System of Units to Inch/Pound

	<b>Multiply</b>	<b>By</b>	<b>To obtain</b>
		Mass	
kilogram (kg)		2.205	pound avoirdupois (lb)

## Abbreviations

Ag Census	census of agriculture
CAPS	County Agricultural Production Survey
CRD	Crop Reporting District
DPR-PUR	Department of Pesticide Regulation-Pesticide Use Reporting
EPest	estimated pesticide use
EPest-high	high rate of estimated pesticide use
EPest-low	low rate of estimated pesticide use
FIPS	Federal Information Processing Standard
USDA	U.S. Department of Agriculture

# Preliminary Estimates of Annual Agricultural Pesticide Use for Counties of the Conterminous United States, 2013

By Nancy T. Baker

## Introduction

This report provides preliminary estimates of annual agricultural use of 387 pesticide compounds for counties in the conterminous United States in 2013. The files provided are a continuation of the 1992–2009 pesticide-use estimates reported by Stone (2013) and the 2008–2012 estimates reported by Baker and Stone (2015). Preliminary estimates are calculated annually as soon as results of proprietary surveys of farm operations are made available to the U.S. Geological Survey. These estimates are made by using projected crop acres by county from the 2012 Census of Agriculture (Ag Census) and are expected to be revised upon availability of updated crop acreages in the 2017 Ag Census, expected to be published by the U.S. Department of Agriculture (USDA) in 2019.

## Pesticide-Use Estimates

For all States except California, pesticide-use data compiled by proprietary surveys of farm operations located within USDA Crop Reporting Districts (CRDs)—a collection of contiguous counties within each State—were used to calculate pesticide per crop acre, or an “estimated pesticide use” (EPest) rate, for each pesticide compound used in a CRD. County-use estimates were then calculated by multiplying EPest rates by harvested-crop acres for each pesticide-by-crop combination in each county with annual harvested-crop acres reported by the USDA-National Agricultural Statistics 2012 Ag Census (U.S. Department of Agriculture, 2014) and 2013 county agricultural production survey (CAPS) for each crop harvested in the CRD for 2013. County-use estimates were then calculated by multiplying EPest rates by harvested-crop acres for each pesticide-by-crop combination in each county. The methods documented in this report summarize the more detailed methods developed and described by Thelin and Stone (2013) and updated by Baker and Stone (2015). Pesticide-use data for California were obtained from the online Department of Pesticide Regulation pesticide use reporting (DPR–PUR) database (California Department of Pesticide Regulation, 2015).

Two different estimates, EPest-low and EPest-high, provide a range of pesticide-use rates (Thelin and Stone, 2013 and Baker and Stone, 2015) where a pesticide-use rate is not available for a crop from a CRD. Both methods incorporated surveyed and extrapolated rates to estimate pesticide use for counties, but EPest-low and EPest-high estimation procedures differed in how they treated situations in which a CRD was surveyed and pesticide use was not reported for a particular pesticide-by-crop combination. The EPest-low estimate is zero in the CRD for pesticide-by-crop combinations not listed in responses from surveyed farmers. The EPest-high estimate, used for counties in nonsurveyed CRDs

and in surveyed CRDs with missing or incomplete responses, applies a more complex algorithm described in detail by Thelin and Stone (2013). The EPest-high estimate is based generally on the median of reported pesticide-by-crop use rates from surveyed farmers in neighboring CRDs and, in some cases, CRDs within the same USDA Farm Resource Region (Thelin and Stone, 2013). There is uncertainty in both the high and low estimates that is difficult to quantify. A user should become familiar with the two methods to decide which estimate is best for a specific application.

Use estimates for California were compiled without extrapolation; therefore, EPest-low and EPest-high rates are the same for counties in California. The California county data were appended by crop after the estimation process was completed for the rest of the Nation.

County annual harvested-crop acres reported in the 2012 Ag Census (U.S. Department of Agriculture, 2014) and 2013 CAPS (U.S. Department of Agriculture-National Agricultural Statistics Service, 2015) were used in this compilation. The Ag Census is the most uniform and complete source of crop-acre estimates for all counties in the United States. The Ag Census is published every 5th year, with CAPS reporting crop-acre estimates for selected crops and counties for interim Ag Census years. For the 1992–2009 estimates (Stone, 2013) and 2008–2012 estimates (Baker and Stone, 2015), acreages for crops not surveyed by CAPS were interpolated linearly between census years. By convention, estimates of county acreages made for years before an Ag Census is available and where CAPS data are unavailable carry forward acreages from the most recent published Ag Census (Stone, 2013; Baker and Stone, 2013). Thus, the 2013 estimates published herein use 2012 Ag Census acreages in counties where CAPS acreages are not available for 2013. When the 2017 Ag Census data are published in 2019, estimates for 2013 and subsequent preliminary publications prior to 2017 are expected to be revised by using linear interpolation between 2012 and 2017 for crop acreages not reported by CAPS.

Estimates of 2013 annual agricultural pesticide use are provided via this report as downloadable, tab-delimited files, which are organized by compound, year, state Federal Information Processing Standard (FIPS) code, county FIPS code, and amount in kilograms (kg). Pesticide use reported for each county is the sum of pesticide use for all harvested crops in the county. High estimates (EPest-high) of county pesticide use are arranged alphabetically in tables 1 through 7 by pesticide name. Low estimates (EPest-low) of county pesticide use are arranged alphabetically in tables 8 through 14 by pesticide name. All tables are available to download separately at <http://dx.doi.org/10.3133/ofr20151176>.

## Acknowledgments

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## References Cited

- Baker, N.T., and Stone, W.W., 2013, Preliminary estimates of annual agricultural pesticide use for counties of the conterminous United States, 2010–11: U.S. Geological Survey Open-File Report 2013–1295, 2 p., 14 tables, accessed July 12, 2015, at <http://pubs.usgs.gov/of/2013/1295/>.
- Baker, N.T., and Stone, W.W., 2015, Estimated annual agricultural pesticide use for counties of the conterminous United States, 2008–12: U.S. Geological Survey Data Series 907, 9 p., accessed July 12, 2015, at <http://dx.doi.org/10.3133/ds907>.



- California Department of Pesticide Regulation, 2015, Pesticide use reporting—2013 summary data: California Department of Pesticide Regulation pesticide use reporting (PUR) database, accessed May 26, 2015, at <http://www.cdpr.ca.gov/docs/pur/purmain.htm>.
- Stone, W.W., 2013, Estimated annual agricultural pesticide use for counties of the conterminous United States, 1992–2009: U.S. Geological Survey Data Series 752, 1 p., 14 tables, accessed July 12, 2015, at <http://pubs.usgs.gov/ds/752/>.
- Thelin, G.P., and Stone, W.W., 2013, Estimation of annual agricultural pesticide use for counties of the conterminous United States, 1992–2009: U.S. Geological Survey Scientific Investigations Report 2013–5009, 54 p., accessed July 12, 2015, at <http://pubs.usgs.gov/sir/2013/5009/>.
- U.S. Department of Agriculture, 2014, State and county data, Geographic area series parts 1–50, AC–12–A–1—AC–12–A–50: U.S. Department of Agriculture 2012 Census of Agriculture, v. 1, accessed May 19, 2014, at <http://www.agcensus.usda.gov/Publications/2012/>.
- U.S. Department of Agriculture, National Agricultural Statistics Service, 2015, Field crops, 2013: U.S. Department of Agriculture Quick Stats database, accessed March 18, 2015, at [http://www.nass.usda.gov/Quick\\_Stats/](http://www.nass.usda.gov/Quick_Stats/).

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