

## ARB's 2012 Adoption of a Revised Harvesting Emission Factor for Almonds

From 2003 - 2012, the statewide harvesting emission factor for almonds was 40.77 lbs PM10/acre, based on testing conducted by the University of California, Davis, under contract to USDA (1). From 2002-2009, the Almond Board of California supported extensive emissions testing to develop an updated almond harvesting emission factor (2). The San Joaquin Valley Ag Tech Subcommittee received regular updates and provided comments throughout the emission factor development process.

In February 2012, the San Joaquin Valley Air Pollution Control District recommended that ARB adopt a revised almond harvest EF of 31.2 lbs PM10/acre (3). The recommendation was based on review of the 2010 white paper summarizing the testing supported by the Almond Board of California and on testing conducted for a Master's Thesis (4). The table below shows the prior and revised emission factors, and the sources for the respective values.

Revised Almond Harvesting Emission Factor and Sources

Harvest Operation	Emission Factor Lb PM10/acre		Source, Revised Emission Factor
	Previous (2001 UCD Study)	Revised	
Shaking	0.37	3.47	Jones, avg of ISCST3 and AERMOD Inverse Modeling Results
Sweeping	3.70	4.15	Faulkner et al., avg of 3 highest results
Pickup	36.70	23.60	Faulkner et al., avg of 3 highest results
<b>Total</b>	<b>40.77</b>	<b>31.20</b>	

ARB adopted the revised almond harvesting emission factor of 31.2 lbs PM10/acre for the 2012 inventory and 2008 SJV PM2.5 SIP. The revised emission factor reduces almond harvesting emissions by 23.5% compared to the previous emission factor. The emission factor is also applied to walnut harvesting. The revised almond harvesting emission factor is addressed in the 2016 update to Area Source Methodology Section 7.5, Agricultural Harvest Operations.

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### References

1. Flocchini, R.G., James, T.A., et al. Sources and Sinks of PM10 in the San Joaquin Valley (Interim Report), a study for United State Department of Agriculture Special Research Grants Program. Contract Nos. 94-33825-0383 and 98-38825-6063. Air Quality Group, Crocker Nuclear Laboratory, University of California, Davis. August 10, 2001. <https://www.arb.ca.gov/research/apr/reports/l2022.pdf>
2. Faulkner, William B., Goodrich, Barry, Capareda, Sergio and Flocchini, Robert. White Paper for the San Joaquin Valley Unified Pollution Control District (SJVAPUCD), Recommended PM10 Emission Factors for Almond Harvesting. Texas A&M University. 2010. <http://www.almondboard.com/PR/A.2009.09-AIR7-Faulkner.Faulkner.Summary%20of%20PM%20Emission%20Studies%20from%20Almond%20Harvest.pdf>
3. Gill, S. Proposed Almond PM10 EF (Email message with Word docx attachment). San Joaquin Valley Air Pollution Control District. Feb. 29, 2012.
4. Jones, Derek, "Evaluation of Arrayed-Field Concentration Measurements and U. S. EPA-Regulatory Models for the Determination of Mixed-source Particulate Matter Emissions" (2008). *All Graduate Theses and Dissertations*. Paper 156. Utah State University. December 2008. <http://digitalcommons.usu.edu/etd/156>.