

18 December 2017

Office of Pesticide Programs
Environmental Protection Agency
1200 Pennsylvania Ave NW.
Washington, DC 20460-0001

Re: Copper Cases Registration Review EPA-HQ-OPP-2010-0212

This comment is being provided by the Western Integrated Pest Management Center in response to the registration review proposed interim decisions for copper compounds: EPA-HQ-OPP-2010-0212.

About us

The Western Integrated Pest Management Center works alongside researchers and extension educators in the Western United States to promote the development, adoption, and evaluation of integrated pest management to solve pest problems. We gather comments from a network of sources throughout the West to provide federal agencies with expert-written reports that assist the agencies in decision-making. Our comment coordinators are associated with the University of California Statewide Integrated Pest Management Program, the Oregon State University Integrated Plant Protection Center, the University of Arizona Pest Management Center and the University of Hawaii Plant and Environmental Protection Sciences Department. The comments in this memo are primarily for California and draw on California's pesticide use reporting database. Comments reflect the principles of integrated pest management.

This comment is being made by the director of the Western IPM Center who is a plant pathologist. It reflects input from many stakeholders and outlines critical uses in several cropping systems, including organic uses. While a list of copper uses is included, the narrative focuses on walnut, cantaloupe, cucumber, pumpkin, squash, watermelon, onion, pepper, and strawberry. It is important to note that copper is important to both conventional and organic producers and that many of the diseases that copper controls are worse in wetter years. Overall, growers are making fewer applications than the maximum labeled number of applications. Of the commodities where the proposed interim decision indicates a reduction in maximum number of applications, walnuts will be the most impacted.

In 2015, copper was applied to 124 different commodities in California. The largest users by annual pounds of active ingredient are Walnut (1,255,291.45 lbs. AI); Rice (1,056,704.20 lbs. AI); Almond (827,943.73 lbs. AI); Orange (657,363.13 lbs. AI); Grape (488,724.59 lbs. AI); Rights Of Way (302,108.25 lbs. AI); Wine Grapes (248,100.80 lbs. AI); Water Areas (180,917.19 lbs. AI); Non-Agricultural Fumigation (180,179.05 lbs. AI); and Treated Lumber (165,589.42 lbs. AI). Many of these are also the largest crops in California.

Walnuts

Copper is primarily used to prevent bacterial walnut blight. Because copper is a contact pesticide, it must be reapplied throughout the dormant period, particular during wet years. It is conservatively estimated that bacterial walnut blight will destroy 30% of the walnut crop. At this point in time, walnut

*Table 1. Pounds of active ingredient of copper applied in 2014 and 2015 on selected commodities.
Source: California Department of Pesticide Regulation.*

growers
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onal and organic) do not have an alternative pesticide to control blight and there are no antibiotics on the horizon.

Vegetables

The proposed reductions in rates and applications in melons, cucumber, pumpkin, squash, pepper, and onion are reasonable and to the best of our knowledge, growers in California make fewer than the maximum allowed number of applications. The most usage of copper compounds is in onion and pepper for bacterial diseases. Pepper producers apply copper to control bacterial spot and do so fewer than 11 times each year to limit copper resistance. They are stewards of copper because it is the only thing they have to control bacterial spot of pepper and there have been some reports of copper-resistant bacterial spot pathogens. In onion, copper is the only chemical available to control bacterial soft rot of onion. This is an important disease but appears more frequently in wetter years. Of the cucurbits, copper is the only chemical available to control angular leaf spot. Again, the proposed limitations on copper use will be problematic in wetter years.

Strawberries

According to integrated pest management guidelines and grower comments, the proposed reduction in copper rates falls in line with current practices.

Snails and tadpole shrimp

One important use of copper that might be overlooked is the use of copper to control snails. While treatment of snails and tadpole shrimp might be more common in rice production, copper is also used to repel snails in fruit and nut crops, and is used also organically for that purpose.

Below my signature are summaries from 2014 and 2015 pesticide use data from California. Unfortunately, it is difficult to know which of these uses are from organic growers because growers are not required to report whether the application was made on an organic or conventional field. There is an option to indicate that but few growers or counties report those data.

Please contact me if further information is needed. The requests submitted by the Western IPM Center are archived at <http://westernipm.org/index.cfm/searchable-data-sources/information-request-replies/>.

Sincerely,

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References:

- California Pesticide Use Reporting database - <http://www.cdpr.ca.gov/docs/pur/purmain.htm>
- PURwebGIS portal - <http://purwebgis.ucdavis.edu/PURwebGIS.html>
- University of California Pest Management Guidelines: <http://ipm.ucanr.edu/>

Table 1. Pounds of active ingredient of copper applied in 2014 and 2015 on selected commodities.
Source: California Department of Pesticide Regulation.

<i>site</i>	<i>chemical</i>	2014	2015	Totals
Apple	Copper Ammonium Complex	1.93	6.83	8.76
	Copper Hydroxide	3,339.63	2,820.12	6,159.75
	Copper Octanoate	5.55	223.04	228.59
	Copper Oxide (Ous)	263.59	686.4	949.99
	Copper Oxychloride	234.65	1,018.81	1,253.45
	Copper Sulfate (Basic)	41.27	84.92	126.19
Asian Pear	Copper Hydroxide		443.52	443.52
Cantaloupe	Copper Hydroxide	0.12		0.12
	Copper Oxychloride	0.13		0.13
Cucumber	Copper Hydroxide	15.47	127.72	143.19
	Copper Octanoate	0.06	17.11	17.17
	Copper Oxide (Ous)		4.2	4.2
	Copper Oxychloride	0.11	0.06	0.17
	Copper Sulfate (Pentahydrate)	4.35		4.35
Nuts	Copper Hydroxide	0.26		0.26
Onion, Dry	Copper Hydroxide	16,852.97	23,546.74	40,399.71
	Copper Octanoate	4.17	143.24	147.41
	Copper Oxide (Ous)	271.94	2,270.38	2,542.31
	Copper Oxychloride	43.47	1,233.58	1,277.05
	Copper Sulfate (Basic)	33,748.51	50,595.76	84,344.27
Onion, Green	Copper Hydroxide	315.18	402.8	717.98
	Copper Octanoate	1.28	0.44	1.71
	Copper Oxide (Ous)	29.45	10.4	39.85
	Copper Sulfate (Basic)	216.14		216.14
Pear	Copper Ammonium Complex	0.96	0.84	1.8
	Copper Hydroxide	6,970.20	8,314.51	15,284.71
	Copper Octanoate		101.61	101.61
	Copper Oxide (Ous)	999.81	1,110.11	2,109.92
	Copper Oxychloride	3,005.95	5,013.23	8,019.19
	Copper Sulfate (Basic)		3.77	3.77
Pepper, Fruiting	Copper Hydroxide	3,701.91	4,692.52	8,394.44
	Copper Octanoate	70.44	431.15	501.59
	Copper Oxide (Ous)	1,010.66	428.33	1,438.99
	Copper Oxychloride	1.96	521.84	523.79
	Copper Sulfate (Basic)	99.21	237.82	337.03
Pepper, Spice	Copper Hydroxide	185.8	242.5	428.29
	Copper Oxide (Ous)		88.93	88.93
	Copper Oxychloride		6.19	6.19
Pumpkin	Copper Hydroxide	99.69		99.69
Rice	Copper Hydroxide	43.12	59.1	102.22

	Copper Oxychloride		65.5	65.5
	Copper Sulfate (Pentahydrate)	1,377,207.26	1,056,579.59	2,433,786.86
<i>Rice, Wild</i>	Copper Sulfate (Basic)		446.53	446.53
	Copper Sulfate (Pentahydrate)	24,774.35	49,493.66	74,268.02
<i>Squash</i>	Copper Hydroxide	11.14	4.65	15.79
	Copper Octanoate	2.08		2.08
	Copper Oxychloride	0.11		0.11
<i>Squash, Summer</i>	Copper Hydroxide	0.13	6.93	7.06
	Copper Octanoate	0.7		0.7
	Copper Oxide (Ous)		8.39	8.39
	Copper Oxychloride	0.15		0.15
<i>Squash, Winter</i>	Copper Octanoate	0.63		0.63
<i>Squash, Zucchini</i>	Copper Hydroxide	0.05	0.05	0.1
	Copper Oxychloride	0.05	0.06	0.11
<i>Strawberry</i>	Copper Hydroxide	6,698.86	4,309.52	11,008.38
	Copper Octanoate	3,906.47	2,161.47	6,067.94
	Copper Oxide (Ous)		21.81	21.81
	Copper Oxychloride		2	2
	Copper Sulfate (Basic)	1,871.24	6,728.73	8,599.97
	Copper Sulfate (Pentahydrate)	9.64		9.64
<i>Walnut</i>	Copper	241.15	7.35	248.5
	Copper Diammonium Diacetate Complex	10.51		10.51
	Copper Hydroxide	924,861.38	1,099,860.64	2,024,722.03
	Copper Oxide (Ous)	57,433.28	46,512.50	103,945.78
	Copper Oxychloride	46,428.33	51,111.93	97,540.27
	Copper Sulfate (Basic)	63,462.85	53,344.02	116,806.87
	Copper Sulfate (Pentahydrate)	6,870.60	4,455.00	11,325.60
<i>Watercress</i>	Copper Hydroxide	0.58	0.12	0.69
<i>Watermelon</i>	Copper Hydroxide	315.61	451.05	766.65
	Copper Oxychloride	0.2		0.2
Totals		2,585,729.46	2,480,460.00	5,066,189.46

Table 2. Acres treated with copper in 2014 and 2015 on selected commodities. Source: California Department of Pesticide Regulation .

site	chemical	2014	2015	Totals
<i>Apple</i>	Copper Ammonium Complex	0.5	3.5	4
	Copper Hydroxide	1,043.68	1,656.41	2,700.09
	Copper Octanoate	9.5	522.5	532
	Copper Oxide (Ous)	78.7	180.97	259.67
	Copper Oxychloride	425.9	1,113.40	1,539.30
	Copper Sulfate (Basic)	3.25	6.25	9.5

<i>Asian Pear</i>	Copper Hydroxide		72	72
<i>Cantaloupe</i>	Copper Hydroxide	0.6		0.6
	Copper Oxychloride	0.6		0.6
<i>Cucumber</i>	Copper Hydroxide	39.65	102.11	141.76
	Copper Octanoate	0.07	38	38.07
	Copper Oxide (Ous)		2	2
	Copper Oxychloride	0.4	0.11	0.51
	Copper Hydroxide	0.1		0.1
<i>Nuts</i>	Copper Hydroxide	22,848.93	31,553.16	54,402.09
	Copper Octanoate	45	277.2	322.2
	Copper Oxide (Ous)	241.2	1,455.65	1,696.85
	Copper Oxychloride	200.85	4,616.48	4,817.33
	Copper Sulfate (Basic)	19,435.21	29,018.10	48,453.31
<i>Onion, Dry</i>	Copper Hydroxide	292.75	341.55	634.3
	Copper Octanoate	1.35	0.7	2.05
	Copper Oxide (Ous)	17.51	8.8	26.31
	Copper Sulfate (Basic)	152		152
<i>Onion, Green</i>	Copper Hydroxide	14,831.41	17,290.55	32,121.96
	Copper Octanoate		224.57	224.57
	Copper Oxide (Ous)	469.03	530.39	999.42
	Copper Oxychloride	4,547.62	7,051.33	11,598.95
	Copper Sulfate (Basic)		0.25	0.25
<i>Pear</i>	Copper Hydroxide	7,231.53	10,449.99	17,681.52
	Copper Octanoate	210.83	828.16	1,038.99
	Copper Oxide (Ous)	828.75	348.7	1,177.45
	Copper Oxychloride	38.35	2,179.65	2,218.00
	Copper Sulfate (Basic)	87.6	223.96	311.56
<i>Pepper, Fruiting</i>	Copper Hydroxide	328.1	458	786.1
	Copper Oxide (Ous)		106	106
	Copper Oxychloride		26	26
<i>Pepper, Spice</i>	Copper Hydroxide	172.5		172.5
	Copper Hydroxide	14	55	69
	Copper Oxychloride		55	55
<i>Pumpkin</i>	Copper Sulfate (Pentahydrate)	101,733.01	80,923.15	182,656.16
	Copper Sulfate (Basic)		37.97	37.97
	Copper Sulfate (Pentahydrate)	1,955.30	3,439.10	5,394.40
<i>Rice</i>	Copper Hydroxide	19.6	8	27.6
	Copper Octanoate	5		5
	Copper Oxychloride	0.6		0.6
<i>Rice, Wild</i>	Copper Hydroxide	0.5	45	45.5
	Copper Octanoate	1.08		1.08
	Copper Oxide (Ous)		4	4
<i>Squash</i>	Copper Hydroxide			
	Copper Octanoate			
	Copper Oxychloride			
<i>Squash, Summer</i>	Copper Hydroxide			
	Copper Octanoate			
	Copper Oxide (Ous)			

	Copper Oxychloride	0.5		0.5
<i>Squash, Winter</i>	Copper Octanoate	0.5		0.5
<i>Squash, Zucchini</i>	Copper Hydroxide	0.4	0.25	0.65
	Copper Oxychloride	0.4	0.25	0.65
<i>Strawberry</i>	Copper Hydroxide	3,044.40	2,183.79	5,228.19
	Copper Octanoate	4,066.02	3,543.37	7,609.39
	Copper Oxide (Ous)		11	11
	Copper Oxychloride		4.12	4.12
	Copper Sulfate (Basic)	964.08	639.22	1,603.30
	Copper Sulfate (Pentahydrate)	30		30
<i>Walnut</i>	Copper	38	35	73
	Copper Diammonium Diacetate Complex	16		16
	Copper Hydroxide	294,145.75	325,904.39	620,050.14
	Copper Oxide (Ous)	12,392.52	10,992.51	23,385.03
	Copper Oxychloride	41,732.59	48,189.99	89,922.58
	Copper Sulfate (Basic)	14,526.83	11,794.45	26,321.28
	Copper Sulfate (Pentahydrate)	378	234	612
<i>Watercress</i>	Copper Hydroxide	3.5	1	4.5
<i>Watermelon</i>	Copper Hydroxide	704.92	1,047.60	1,752.52
	Copper Oxychloride	0.8		0.8
	Totals	549,379.52	599,834.60	1,149,214.12