

2018 WTFRC CHERRY PESTICIDE RESIDUE STUDY

For the eighth consecutive year, the WA Tree Fruit Research Commission conducted a study of residues of commonly used pesticides on cherry fruit at harvest. Digital versions of this report and similar studies on apple and cherry are available at www.treefruitresearch.com. For current information on maximum residues levels (MRLs) and other regulatory issues, please consult the Northwest Horticultural Council at <http://nwhort.org/export-manual>.

TRIAL DETAILS

- Mature 'Bing'/Mazzard multiple leader open vase trees on 10' x 20' spacing near Orondo, WA (a different block than was used in previous WTFRC studies)
- 10 insecticides/acaricides & 3 fungicides applied at or near maximum rates and minimum pre-harvest and re-treatment intervals; a foliar fertilizer containing potash and phosphite applied early in season at rates & timings consistent with industry use patterns
- Most applications made by Rears PakBlast PTO-driven airblast sprayer with 8 oz Regulaid per 100 gal water/acre; applications of 16 oz/acre Fyfanon ULV-A (malathion) made by helicopter
- Roughly 1.6" cumulative total rainfall recorded on 8 separate days during study: heaviest rain events were approximately 1.2" which fell May 17-20 (42 to 39 days before harvest), 0.2" on June 8 (20 dbh), 0.16" on June 15 (13 dbh), and 0.08" on June 25 (3 dbh)
- Samples submitted overnight to Pacific Agricultural Labs (Sherwood, OR) for chemical analysis



Airblast application @ 400 gal/acre

RESULTS & DISCUSSION

As before, this study generally simulates a *worst case scenario* for residues of legally applied pesticides using aggressive rates, timings, and spray intervals. Most materials were applied twice as allowed by product labels, whether or not commercial use patterns would do the same. With that approach, all residues complied with domestic tolerances but **most exceeded some key foreign tolerances**, whether from published MRLs or national default values:

Insecticides/acaricides: Bexar, Agri-Mek 0.15SEC, Mustang MAX, Baythroid XL, Danitol 2.4EC, Perm-Up 3.2EC, Carbaryl 4L, Onager

Fungicides: TopGuard, Orbit

Fertilizer: 19% potash + 33% phosphite foliar fertilizer



Moderate drip from blast zone cherries after 200 gal/acre spray

Application dates for this study are typically set by estimating the commercial harvest date and then setting the spray schedule based on label preharvest and retreatment intervals. Due to rapidly advancing fruit maturity, the grower had to pick the trial block earlier than anticipated, forcing a compression of the spray schedule for the week prior to harvest; as a result, some materials may have been applied within standard timing intervals, resulting in slightly elevated residue levels.

Concentrate applications (200 gal water/acre) produced a moderate drip in the sprayer blast zone with very little drip in the tree tops; in contrast, dilute applications (400 gal water/acre) produced a heavy drip in the blast zone and light drip in tree tops. **Pesticide residues were consistently 10-80% higher on fruit sprayed concentrate vs. dilute**; this trend corroborates the results of a 2017 apple study comparing residues from spraying at 100 vs. 200 gal/acre, but contradicts the findings of a similar cherry study in 2016, where 400 gal/acre applications generally produced higher residues than 200 gal/acre. However, that earlier cherry study was conducted in a block of larger trees where higher carrier volumes were likely needed for thorough wetting of the entire canopy. This suggests that growers seeking to optimize the efficacy of their pesticide applications would be well served

to customize their sprayer calibration to the specific needs of individual blocks rather than rely on generic assumptions regarding effective carrier volumes. We plan to repeat this study in the same trees to develop a more robust data set.

For the first time in three years of testing, helicopter applications of Fyfanon ULV-A produced a measurable malathion residue in one of four samples, but was only marginally higher than the limit of quantitation and still less than Europe's stringent MRL of 0.02 ppm. For the third consecutive year, application of a potash & phosphite fertilizer produced residues exceeding the EU's MRL for fosetyl-Al; cherry growers should avoid these products if they hope to export fruit to Europe.

Measured residue levels vs. MRLs for pesticides applied in 200 vs. 400 gal water/acre with 8 oz/100 gal water of Regulaid. 'Bing'/Mazzard, Orondo, WA. WTFRC 2018.

Common name	Trade name	Application rate <i>per acre</i>	Application timing(s) <i>days before harvest</i>	Measured residue at	Measured residue at	US tolerance ¹ <i>ppm</i>	Lowest export tolerance ² <i>ppm</i>
				200 gal/acre <i>ppm</i>	400 gal/acre <i>ppm</i>		
phosphite	33% phosphite fertilizer	64 oz	40, 26, 12	19	11	na	2 (EU)*
tolfenpyrad	Bexar	27 oz	26, 12	0.76	0.49	2	0.01 (many)
abamectin	Agri-Mek 0.15SEC	20 oz	19	0.024	0.018	0.09	0.01 (EU)
zeta-cypermethrin	Mustang MAX	4 oz	19, 12	0.16	0.14	1	0.1 (Can)
beta-cyfluthrin	Baythroid XL	2.8 oz	19, 5	0.064	0.052	0.3	0.01 (Tai)
spirotetramat	Ultor	14 oz	19, 5	0.020	0.014	4.5	3 (many)
flutriafol	TopGuard	14 oz	12, 5	0.64	0.39	1.5	0.01 (Jap)
metrafenone	Vivando	15.4 oz	12, 5	0.075	0.041	2	1 (Tai)
myclobutanil	Rally 40WSP	6 oz	12, 5	0.79	0.46	5	1 (Can, Tai)
fenpropathrin	Danitol 2.4EC	21.3 oz	12, 3	1.7	1.4	5	0.01 (EU)
permethrin	Perm-Up 3.2EC	8 oz	12, 3	0.70	0.42	4	0.05 (EU)
carbaryl	Carbaryl 4L	96 oz	8, 3	7.8	3.8	10	0.01 (EU)
propiconazole	Orbit	4 oz	8, 1	0.42	0.27	4	0.01 (EU)
hexythiazox	Onager	24 oz	5	0.37	0.21	1	0.1 (Kor)
malathion**	Fyfanon ULV-A	16 oz	8, 1	0.012		8	0.02 (EU)

¹ 16 July 2018. <http://nwhort.org/export-manual/comparisonmrls/cherry-mrls>, <https://www.globalmrl.com>

² Major export markets for Pacific Northwest cherries; 16 July 2018; tolerances may be based on published MRLs or default values.

<http://nwhort.org/export-manual/comparisonmrls/cherry-mrls>, <https://www.globalmrl.com>

* EU tolerance for fosetyl-Al defined as the sum total of residue levels of fosetyl-Al, phosphonic acid and all of its salts (including phosphite)

** Fyfanon ULV-A applied as formulated (16 oz/acre) by helicopter

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Results of this lone unreplicated trial are shared for informational purposes only and should not be construed as endorsements of any product, reflections of their efficacy against any arthropod or fungal pest, or a guarantee of similar results regarding residues for any user. Cherry growers should consult with extension team members, crop advisors, and warehouses to develop responsible pest control programs.