

2014 WTFRC CHERRY PESTICIDE RESIDUE STUDY

For the fourth consecutive year, the WA Tree Fruit Research Commission conducted a study of residues of commonly used pesticides on cherry at harvest. Digital versions of this report and similar studies from 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 www.nwhort.org.

TRIAL DETAILS

- Mature 'Bing'/Mazzard multiple leader open vase trees on 10' x 20' spacing near Orondo, WA
- 18 insecticides/acaricides & 10 fungicides applied at maximum rates and minimum pre-harvest and re-treatment intervals
- Ground applications made by Rears PakBlast PTO-driven airblast sprayer at **400 gal/acre** with Regulaid surfactant; malathion (Fyfanon ULV) applied by helicopter with no water or surfactant
- Measurable rain recorded on 2 days during study: 0.2" 6 days before harvest (DBH) and 0.1" 3 DBH
- Plot split into three equal sections: 1. Pesticides only 2. Pesticides + 408 oz/acre RainGard (Pace Intl.) at 14 and 7 DBH 3. Pesticides + 128 oz/acre Parka (Cultiva) at 21 and 14 DBH
- Samples submitted overnight to Pacific Agricultural Labs (Portland, OR) for chemical analysis



Cherries with dry residues at harvest

RESULTS & DISCUSSION

The strategy of this study was to simulate a *worst case scenario* for residues of legally applied pesticides with and without protective rain coatings, using very 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, we produced residues which complied comfortably with all domestic tolerances, but **exceeded foreign tolerances**, whether from published MRLs or default values, with application of the insecticides/acaricides: **Agri-Mek 0.15EC, Mustang MAX, Centaur, Entrust, Perm-Up 3.2EC, Danitol 2.4EC, Carbaryl 4L, and Envidor 2SC** and the fungicides: **TopGuard, Orbit, Topsin 4.5FL, Procure 480SC, and Abound**. While fruit from this study were not rinsed prior to analysis, similar studies in 2011 and 2012 found no evidence of clear, consistent reduction of residue levels from subjecting fruit to commercial hydrocooler cycles.

As these studies have routinely demonstrated since 2011, application of pesticides according to label directions consistently produce residues that are safely below tolerance levels set by the US Environmental Protection Agency. While 2014 residue levels in fruit treated with rain protectants RainGard or Parka were consistently higher than in control fruit, those differences were more subtle than in 2012 and 2013, possibly due to relatively less rinsing of the fruit from rainfall than in recent years. Across all chemistries, residues in RainGard- and Parka-treated fruit were roughly 20% and 40% higher than control fruit respectively, but only in the cases of zeta-cypermethrin and permethrin did those increases translate into a change of the compliance status for the foreign market with the lowest tolerance. The potential benefits of RainGard and Parka to reduce fruit cracking are significant, but cherry growers making multiple applications of rain protectants may want to be cautious with some pesticides to mitigate the risk of potential residue issues.

****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 their university extension staff, crop advisors, and warehouses to develop responsible pest control programs.**

Measured residue levels vs. MRLs for uniformly applied pesticides on cherries treated with no rain protectant (control), RainGard (408 oz/acre) at 14 and 7 days before harvest, or Parka (128 oz/acre) at 21 and 14 days before harvest. 'Bing'/Mazzard, Orondo, WA. WTFRC 2014.

Common name	Trade name	Application rate ¹	Application timing(s)	Control fruit	RainGard-treated fruit	Parka-treated fruit	US tolerance ²	Lowest export tolerance ³
		per acre	days before harvest	ppm	ppm	ppm	ppm	ppm
Diazinon	Diazinon 50W	64 oz	21	<0.01	<0.01	<0.01	0.2	0.01 (EU)
Abamectin	Agri-Mek 0.15EC	20 oz	21	0.013	0.015	0.014	0.09	0.01 (EU)
Zeta-cypermethrin	Mustang MAX	4 oz	21, 14	0.072	0.11	0.12	1	0.1 (Can)
Lambda-cyhalothrin	Warrior II	2.56 oz	21, 14	<0.05	<0.05	<0.05	0.5	0.3 (many)
Imidacloprid	Nuprid 2SC	6.4 oz	21, 7	0.14	0.19	0.22	3	0.5 (many)
Acetamiprid	Assail 70WP	3.4 oz	21, 7	0.44	0.56	0.69	1.2	1 (Aus, Tai)
Beta-cyfluthrin	Baythroid XL	2.8 oz	21, 7	<0.05	<0.05	<0.05	0.3	0.01 (Tai)
Metconazole	Quash	4 oz	14	0.011	0.020	0.018	0.2	0.2 (many)
Buprofezin	Centaur	34.5 oz	14	0.27	0.46	0.52	1.9	0.1 (Can)
Spinosad	Entrust	2.5 oz	14, 7	0.052	0.067	0.058	0.2	0.05 (Kor)
Spinetoram	Delegate WG	7 oz	14, 7	<0.01	<0.01	<0.01	0.2	0.1 (Kor)
Quinoxifen	Quintec	7 oz	14, 7	0.023	0.034	0.029	0.7	0.3 (EU)
Flutriafol	TopGuard	14 oz	14, 7	0.11	0.16	0.18	1.5	0.01 (Jap)
Penthiopyrad	Fontelis	20 oz	14, 7	0.046	0.082	0.081	4	1 (Kor)
Flubendiamide	Belt	4 oz	14, 7	0.059	0.059	0.057	1.6	0.1 (Can)
Fenpropathrin	Danitol 2.4EC	21.3 oz	14, 3	0.18	0.31	0.37	5	0.01 (EU)
Permethrin	Perm-Up 3.2EC	8 oz	14, 3	<0.05	0.061	0.064	4	0.05 (EU)
Carbaryl	Carbaryl 4L	96 oz	10, 3	1.3	1.1	1.8	10	0.01 (EU)
Propiconazole	Orbit	4 oz	10, 1	0.06	0.11	0.19	4	0.05 (EU)
Thiophanate-methyl*	Topsin 4.5FL	30 oz	10, 1	0.72	0.52	0.91	20	0.3 (EU)
Etoazole	Zeal	3 oz	7	0.035	0.039	0.038	1	0.1 (Can)
Spirodiclofen	Envidor 2SC	18 oz	7	0.066	0.064	0.071	1	0.02 (Tai)
Azoxystrobin	Abound	15.5 oz	7, 1	0.26	0.24	0.44	1.5	0.1 (Can)
Triflumizole	Procure 480SC	16 oz	7, 1	0.23	0.28	0.31	1.5	0.2 (Kor)
Trifloxystrobin	Luna Sensation	5.6 oz	7, 1	0.042	0.046	0.071	2	1 (EU)
Fluopyram	Luna Sensation	5.6 oz	7, 1	0.11	0.11	0.19	0.6	0.7 (many)
Pyraclostrobin	Pristine	14.5 oz	7, 1	0.20	0.21	0.32	2.5	0.7 (Can)
Boscalid	Pristine	14.5 oz	7, 1	0.42	0.36	0.54	3.5	1 (Kor)
Bifenazate	Acramite 50WS	16 oz	3	0.022	0.015	0.016	2.5	0.3 (Kor)
Malathion**	Fyfanon ULV AG	16 oz	1	0.01	<0.01	<0.01	8	0.2 (EU)

¹ All materials except Fyfanon ULV AG were applied by Rears PakBlast sprayer at 400 gal water/acre; pesticides (excluding RainGard & Parka) were applied with 32 oz Regulaid/acre

² 9 July 2014. <http://www.nwhort.org/CherryMRLs.html>

³ Major export markets for Pacific Northwest cherries; 9 July 2014; tolerances may be based on published MRLs or default values. <http://www.nwhort.org/CherryMRLs.html>

* Reported thiophanate-methyl values reflect sum total of thiophanate-methyl and carbenzadim residue levels

** Malathion (Fyfanon ULV AG) applied by helicopter as formulated with no water or surfactant

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