

PMTP Newsletter – Maximum Residue Levels (MRLs)

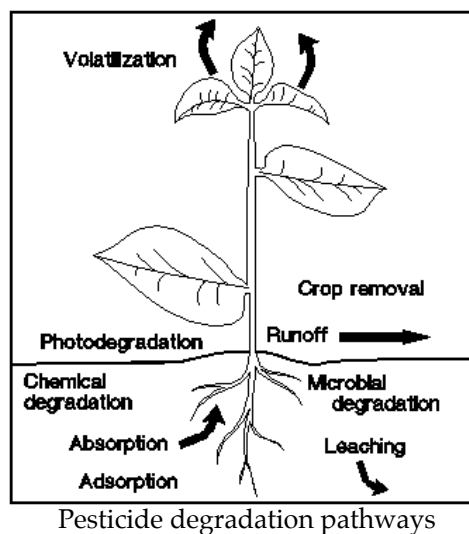


Maximum Residue Levels (MRLs) represent the legal tolerances for the amount of pesticides that may remain in or on foods. MRLs are not a health-based exposure limit, but rather are used to verify that the pesticide is being used correctly according to label directions. MRLs for each pesticide-crop combination are set at levels well below the amount that could pose a health concern.

The maximum residue likely to result in or on food crops is generally determined from field trial residue studies that reflect the maximum use rates, maximum number of applications, and minimum duration after application that the crop may be harvested. The Environmental Protection Agency (EPA) is responsible for regulating the pesticides that are used by growers to protect crops and for setting limits on the amount of pesticides that may remain in or on foods marketed in the US (www.epa.gov/pesticides). Fruit that is exported from the US to other markets are subject to MRLs set by the country receiving that fruit. The list of pesticides and country-specific MRLs continues to grow and change and can make exporting fruit outside of the US more difficult. The most current list of MRLs for pesticides used on apples to export markets can be found on the Northwest Horticultural Council website: <http://www.nwhort.org/AppleMRLs.html>

Pesticide Degradation

After pesticides are applied in the orchard they undergo a process of breakdown. Pesticides can be broken down by microbes, chemical reactions, and light or photo-degradation. This process can take hours, months, or even years depending on the environmental conditions and the characteristics of the pesticide. Pesticides that break down quickly do not persist in the environment or on the crop; however, the rate at which the pesticide breaks down can also effect the length of time that the product will control pests. Products with long lasting residues may provide extended periods of pest control but also pose a greater risk to the environment and consumers while products that break down too quickly may only provide pest control for a short period of time.



Apple Pesticide Residue Study

The Washington Tree Fruit Research Commission (WTFRC) recently conducted a pesticide residue trial at the WSU Sunrise Research Orchard. Ten insecticides and six fungicides were applied according to either an “aggressive” (maximum label rates at minimum re-treatment and pre-harvest intervals) or “standard” (typical industry rates and timings) protocol. Apples from each protocol were sampled at harvest with half of the fruit being subjected to a simulated commercial packing process. Fruit samples were processed then sent for chemical analysis by a lab specializing in pesticide residue screening. Washing fruit in a simulated packing process generally reduced residue levels for most products tested; diazinon and endosulfan residues were relatively more persistent.



Soapy fruit during simulated packing



Spray application 1d pre- harvest

OP-alternative Insecticides

Four OP-alternative insecticides used for codling moth and leafroller control were included in the WTFRC trial: Intrepid (methoxyfenozide), Delegate (spinetoram), Assail (Acetamiprid), and Altacor (chlorantraniliprol). When apples were treated with maximum label rates and minimum pre-harvest and re-treatment intervals, residues of all four op-alternative insecticides included in this trial tested below the lowest export market MRLs – Intrepid 150 times below, Altacor 30X below, Assail 10X below, and Delegate 5X below.

Measured residues vs. MRLs for pesticide programs utilizing maximum label rates and minimum pre-harvest (PHI) and re-treatment intervals (REI) on apples.

Trade Name	Application Rate ¹	Application Timings	Field Run Fruit	US MRL ²	Lowest export MRL ³
	oz per acre	days before harvest	ppm	ppm	ppm
Intrepid 2F	16	28 & 14	<0.01	1.5	1.5 (many)
Assail 70WP	3.4	21 & 7	<0.01	1	0.1 (EU)
Delegate 25WG	7	14 & 7	<0.01	0.2	0.05 (many)
Altacor 35WG	4.5	14 & 5	<0.01	1.2	0.3 (CAN)

¹ Applied with Airblast sprayer at 100 gpa

² US MRLs; 30 Sep, 2011 – <http://www.nwhort.org/AppleMRLs.html>

³ Major export markets for WA apples; 30 Sep, 2011 – <http://www.nwhort.org/AppleMRLs.html>

Pesticides that Exceeded MRLs

Of all the pesticides and fungicides tested, only three exceeded either US or foreign MRLs. Two applications of Diazinon 50W (35 & 21d pre-harvest) produced residues very near the European Union (EU) MRL, which has essentially been set at the current limit of quantification. Ziram 76DF (28 & 14d pre-harvest) residue levels also exceeded EU tolerances. Ziram also produced a residue (2.8 ppm) very near MRLs for Taiwan (2.5 ppm) and India (3 ppm) in unwashed fruit. All applications of Carbaryl 4L tested produced residues far in excess of the EU MRL, which is also set at the current limit of quantification. For a full report on the WTFRC trial visit: http://www.treefruitresearch.com/images/stories/2011_WTFRC_Apple_MRL_Report.pdf. **This study reflects one set of results from one site in one season. Results are shared for informational purposes only.*



For more information about US and Foreign MRLs, visit the Northwest Horticulture Council website: <http://www.nwhort.org/>