

Pre-Harvest Intervals to Comply with the Maximum Residue Limits (MRLs) of Selected Export Markets for Thirteen Insecticides Registered for Use in Blueberries for the 2018 Growing Season - March 1, 2018

Bifenthrin (Brigade) - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Green	Green	Green	Green	Green	Green	
Australia	Green	Green	Green	Green	Green	Green	
Canada	Red	Red	Red	Red	Red	Red	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Red	Red	Red	Red	Red	
Japan	Green	Green	Green	Green	Green	Green	
Korea	Red	Red	Red	Red	Red	Yellow	
Taiwan	Green	Green	Green	Green	Green	Green	

Carbaryl (Sevin)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Red	Red	Green	Green	Green	
Australia	Red	Red	Red	Red	Red	Red	
Canada	Red	Red	Red	Green	Green	Green	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Red	Red	Red	Red	Red	
Japan	Red	Red	Red	Green	Green	Green	
Korea	Red	Red	Red	Red	Yellow	Yellow	
Taiwan	Red	Red	Red	Red	Yellow	Yellow	

Cyantraniliprole (Exirel)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Green	Green	Green	Green	Green	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Green	Green	Green	Green	Green	
Hong Kong	Red	Red	Red	Red	Red	Red	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Green	Green	Green	Green	Green	
Taiwan	Red	Red	Red	Red	Red	Red	

Esfenvalerate (Asana)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Red	Red	Red	Green	Green	
Australia	Red	Red	Red	Red	Red	Red	
Canada	Red	Red	Red	Red	Red	Red	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Red	Red	Red	Green	Green	
Japan	Red	Red	Red	Red	Green	Green	
Korea	Red	Red	Red	Red	Red	Red	
Taiwan	Red	Red	Red	Red	Green	Green	

Fenpropathrin (Danitol)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Green	Green	Green	Green	Green	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Red	Red	Red	Yellow	Yellow	
Taiwan	Red	Green	Green	Green	Green	Green	

Imidacloprid (Provado) - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Red	Red	Red	Red	Red	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Green	Green	Green	Green	Green	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Green	Green	Green	Green	Green	
Taiwan	Red	Green	Green	Green	Green	Green	

Malathion - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Green	Green	Green	Green	Green	Green	
Australia	Green	Green	Green	Green	Green	Green	
Canada	Green	Green	Green	Green	Green	Green	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Green	Green	Green	Green	Green	Green	
Japan	Green	Green	Green	Green	Green	Green	
Korea	Green	Green	Green	Green	Green	Green	
Taiwan	Red	Red	Red	Red	Red	Red	

Methomyl (Lannate) - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Red	Red	Yellow	Green	Green	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Red	Red	Red	Yellow	Green	
Korea	Red	Red	Red	Red	Yellow	Green	
Taiwan	Red	Red	Red	Yellow	Green	Green	

Phosmet (Imidan)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Green	Green	Green	Green	Green	
Canada	Red	Yellow	Green	Green	Green	Green	
EU	Red	Green	Green	Green	Green	Green	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Green	Green	Green	Green	Green	
Taiwan	Red	Red	Red	Red	Red	Red	



Key to colors used in charts:
RED means that the product *should not be used during this time* either because of EPA label restrictions or due to a high risk of exceeding MRLs for a given market.
YELLOW means that the product *should be used with caution during this time* given all the variables (e.g. tank mixes, application method and calibration, use of adjuvants, environmental conditions, and post-harvest handling) that can impact the time it takes for a residue to degrade in order to meet the MRL for a given market.
GREEN means that the product is likely to be safe for use at this time with low risk of residue remaining at harvest that would exceed MRLs for a given market.

Pre-Harvest Intervals to Comply with the Maximum Residue Limits (MRLs) of Selected Export Markets for Thirteen Insecticides Registered for Use in Blueberries for the 2018 Growing Season - March 1, 2018

Spinetoram (Delegate)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Green	Green	Green	Green	Green	Green	
Australia	Green	Green	Green	Green	Green	Green	
Canada	Green	Green	Green	Green	Green	Green	
EU	Green	Green	Green	Green	Green	Green	
Hong Kong	Red	Red	Red	Red	Green	Green	
Japan	Green	Green	Green	Green	Green	Green	
Korea	Green	Green	Green	Green	Green	Green	
Taiwan	Green	Green	Green	Green	Green	Green	

Spinosad (Entrust) - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Green	Green	Green	Green	Green	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Green	Green	Green	Green	Green	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Green	Green	Green	Green	Green	
Taiwan	Red	Green	Green	Green	Green	Green	

Thiamethoxam (Actara)							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Red	Green	Green	Green	Green	Green	
Australia	Red	Green	Green	Green	Green	Green	
Canada	Red	Green	Green	Green	Green	Green	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Green	Green	Green	Green	Green	
Japan	Red	Green	Green	Green	Green	Green	
Korea	Red	Green	Green	Green	Green	Green	
Taiwan	Red	Green	Green	Green	Green	Green	

zeta-Cypermethrin (Mustang) - single or double applications							
Intended Market	Time before harvest						
	1 day	3 days	5 days	7 days	14 days	21 days	
USA	Green	Green	Green	Green	Green	Green	
Australia	Red	Yellow	Yellow	Green	Green	Green	
Canada	Red	Red	Red	Red	Red	Red	
EU	Red	Red	Red	Red	Red	Red	
Hong Kong	Red	Red	Red	Red	Red	Red	
Japan	Red	Yellow	Yellow	Green	Green	Green	
Korea	Green	Green	Green	Green	Green	Green	
Taiwan	Green	Green	Green	Green	Green	Green	

Purpose & Methods: This tool was developed to aid blueberry growers in selecting materials to manage key pests close to harvest with a particular export market in mind. Selected markets have been included, some of which have more restricted maximum residue limits (MRLs) or tolerances than required by the US for particular materials. The MRLs used to develop this tool come from those published by www.globalmrl.com as of February 14, 2018. Please check the database as MRLs are dynamic. The data used to determine whether a longer pre-harvest interval would be necessary for a given market and its published MRL, are based on a single application, unless noted otherwise, made near the legal U.S. PHI for each material tested, in replicated trials conducted at one location in Michigan over two years, one location in Oregon over three years, and three locations in Washington over three years. For those treatments that received two applications ("one or two applications"), the second application was made 7 days after the initial application. All samples were extracted by the QuEChERS method and analyzed by GC/MS/MS and LC/MS/MS.

Acknowledgements: This work was made possible in part through grants funded by Michigan Department of Agriculture and Rural Development through the Strategic Growth Initiative and MBG Marketing, Oregon Blueberry Commission, Washington Blueberry Commission, Washington State Commission on Pesticide Registration, USDA, WSDA Specialty Crop Grant from 2013 through 2015, and a donation from two Oregon blueberry growers. Field collaborators include: Rufus Isaacs and Steve VanTimmeren (Michigan State University); Dave Trinka (Michigan Blueberry Growers Association); Joe DeFrancesco and Peter Sturman (Oregon State University); Alan Schreiber and Tom Balotte (Agriculture Development Group); Lynell Tanigoshi, Hollis Spitler, and Bev Gerdeman (Washington State University); and Steve Midboe (CHS, Whatcom County). Sample analysis and generation of these charts was done by Camille Holladay and Keith Crosby (Synergistic Pesticide Lab).

Disclaimer: These charts are just a guide. The authors of this tool cannot guarantee that any of these MRLs have not changed since February 14, 2018, therefore, the user assumes all responsibility for its use subsequently. We also cannot guarantee that a material listed for use in Michigan, Oregon, or Washington is registered for use outside those states (pesticide registration status is determined by the USEPA and State Governments where 'special uses' are concerned). Users outside these states are cautioned to consult with their local extension service to determine what is allowable. We also make no guarantees that any of the products listed will be effective against a particular pest. Finally, given all of the variables that can affect degradation rates - in particular the use of adjuvants and tank mixes, environmental post-application conditions, and post-harvest handling - we cannot guarantee that if a product is used according to this tool it will not leave residues that exceed MRLs for the selected market.



Key to colors used in charts:

RED means that the product *should not be used during this time* either because of EPA label restrictions or due to a high risk of exceeding MRLs for a given market.

YELLOW means that the product *should be used with caution during this time* given all the variables (e.g. tank mixes, application method and calibration, use of adjuvants, environmental conditions, and post-harvest handling) that can impact the time it takes for a residue to degrade in order to meet the MRL for a given market.

GREEN means that the product is likely to be safe for use at this time with low risk of residue remaining at harvest that would exceed MRLs for a given market.