**APPENDIX 1-7: Malathion Scenario Development**

In selecting application dates for aquatic modeling, EPA considers a number of factors.  Label directions, such as whether a pesticide application is made during a dormant season, or if it is applied during preemergence or postemergence of the crop, are considered.  Consideration is also given to the timing of the pest pressure, utilizing resources such as the crop profile write-ups (<http://www.ipmcenters.org/cropprofiles/>), agricultural extension bulletins, and/or available state-specific use information. Malathion labels do not specify treatment based on crop development but only based on pest pressure.  For this reason, Integrated Pest Management (IPM) crop profiles and their characterization of the timing of pest pressures is an important line of evidence in the determination of application dates.  These profiles are considered only subsequent to an analysis of weather files to determine the time of year most likely to produce the greatest off-site transport.  The meteorological information is considered as pesticide loading to surface water may be directly affected by precipitation events. The wettest month (*e.g.*, the month with the highest cumulative precipitation) is identified and a random date (*e.g.*, the 15th of each month) is considered in an effort to maintain the probability of the distribution of environmental exposure concentrations generated. The 15th of the given application month was arbitrarily selected and consistently used as the random date selection. However, if pest pressure is considered very unlikely during application dates of greatest off-site transport, those application dates are not used.  Preharvest intervals specified on labels are also considered, so that applications are not modeled so that they occur within the pre-harvest window. All details on application date selections made aside from a wettest month selection are detailed in **Table B 1-7.2.**

Though malathion is applied foliarly in agricultural settings, there are no other determinants restricting the timing of application as insect pests are wide ranging in their seasonality.  In some instances, a known and predominant pest pressure with a well-identified window of treatment may define the application window for uses with lower application rates.  In the absence of definitive pest pressure information, the wettest month during the growing season for a particular crop group and in a particular region is selected (**Table B 1-7.1**).  In HUC2 regions with differing amounts of rainfall across the region, an additional location was selected with substantially different meteorological conditions to represent the range of conditions across the HUC2 region. These HUC2 regions with differing conditions are 10, 11, 12, 15, 16, 17, 18, and 20. Where pest pressure information has been considered and an alternative application date has been selected, an explanation of the reasoning behind the alternative application date is provided (**Table B 1-7.2**). If a HUC2 and crop combination is noted as ‘NA’ (not applicable) in **Table B 1-7.2**, the highest application month as specified in **Table B 1-7.1** is used.

**Table B 1-7.1.  Month with highest total precipitation in each 30-year weather file in each HUC2**

| **HUC2** | **City, State** | **Meteorological File** | **Average Wettest Month in 30 years of data** |
| --- | --- | --- | --- |
| 1 | Hartford, CT | w14740 | May |
| 2 | Lynchburg, VA | w13733 | July |
| 3 | Atlanta, GA | w13874 | March |
| 4 | Milwaukee, WI | w14839 | August |
| 5 | Covington, KY | w93814 | May |
| 6 | Knoxville, TN | w13891 | March |
| 7 | Des Moines, IA | w14933 | June |
| 8 | Fort Smith, AR | w13970 | July |
| 9 | Fargo, ND | w14914 | June |
| 10a | Grand Island, NE | w14935 | June |
| 10b | Sheridan, WY | w24029 | May |
| 11a | Fort Smith, AR | w13964 | May |
| 11b | Amarillo, TX | w23047 | June |
| 12a | Fort Worth, TX | w03927 | May |
| 12b | Abilene, TX | w13962 | September |
| 13 | El Paso, TX | w23044 | September |
| 14 | Rock Springs, WY | w24027 | May |
| 15a | Flagstaff, AZ | w03103 | July |
| 15b | Phoenix, AZ | w23183 | December |
| 16a | Salt Lake City, UT | w24127 | April |
| 16b | Winnemucca, NV | w24128 | November |
| 17a | Eugene, OR | w24221 | December |
| 17b | Pocatello, ID | w24156 | May |
| 18a | Sacramento, CA | w23232 | January |
| 18b | San Diego, CA | w23188 | January |
| 20a | Hilo, HI | w21504 | November |
| 20b | Honolulu, HI | w22521 | December |
| 21 | Puerto Rico | w11641 | May |

**Table B 17.2.  Application date exceptions with parenthetical reference to crop profile1**

| **HUC2** | **Corn** | **Cotton** | **Grassland** | **Orchard** |
| --- | --- | --- | --- | --- |
| 1 | September application due to corn earworm, fall armyworm, and aphid pressures from July to September and sap beetle pressure from silk to harvest (New England sweet corn) | **NA** | June application due to leafhopper control mid-June to August though weevil control can begin as early as  April (VT Alfalfa) | October application due to pear psylla control from dormancy to leaf drop (New England pear) |
| 3 | July application for low application rate due to aphid control on corn as early as 3 inches tall (MS corn) | July application for low application rate due to fall armyworm control from July 1 to Sept 1,  aphids after July 1, plant bug control can be from pre-squaring to post-bloom (NC cotton; MS Cotton) | **NA** | **NA** |
| 4 | **NA** | **NA** | **NA** | October application due to pear psylla treatments from dormancy to leaf fall (MI pears:) |
| 12b | **NA** | June applications allow use into September (wettest month) given BWEP application window | **NA** | **NA** |
| 13 | **NA** | June applications allow use into September (wettest month) given BWEP application window | **NA** | **NA** |
| 15b | **NA** | September application (2nd wettest month) due to  no pest pressure in wettest month of December (AZ Cotton) | **NA** | **NA** |
| 16b | June application due to wettest month occurring in non-growing season for corn | NA | **NA** | **NA** |
| 17a | October application due to wettest month occurring in non-growing season for corn | NA | **NA** | October application due to pear psylla and coddling moth occurring any time in growing season (OR pears) |
| 18a | March application (2nd wettest month) because wettest month is outside of growing season | March application (2nd wettest month) because wettest month is outside of growing season | **NA** | March application (2nd wettest month) because wettest month is outside of growing season |
| 18b | March application (2nd wettest month) because wettest month is outside of growing season | March application (2nd wettest month) because wettest month is outside of growing season | **NA** | May application due to pear psylla and coddling moth can occur any time in growing season (CA Pear) |
| **HUC2** | **Other Grain** | **Other Row** | **Other Tree** | **Vegetable** |
| 2 | **NA** | **NA** | **NA** | Low application done in June rather than July |
| 10a | **NA** | Low application done in May rather than June | **NA** |  |
| 17a | October application due to winter grain mite in spring and fall (OR ryegrass) | October application due to aphid being primary pest (Orhops:) | October application for aphid control (ORwachristmastrees) | May application for aphid control.  Applications occur late March-early June and late July .(Waspinachseed) |
| 18a | March application selected as 2nd wettest month for rye/flax use | **NA** | **NA** | **NA** |
| 18b | March application selected as 2nd wettest month for rye/flax use | May application is anticipated as aphid excretion on hop cone is problematic (ORhops) | **NA** | **NA** |

**1** [http://www.ipmcenters.org//index.cfm/center-products/crop-profiles/](http://www.ipmcenters.org/index.cfm/center-products/crop-profiles/)