Metadata for Pesticides in Flooded Applications Model Scenarios for Simulating Pesticide Applications to Rice Paddies

Version 1.0

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1 Introduction

This document provides documentation for the scenarios developed to estimate pesticide concentrations in water resulting from applications of pesticides to rice when using the Pesticides in Flooded Applications Model (PFAM). Scenarios include information loaded on the crop, physical, watershed, and crop tabs in PFAM.

2 Crop, Physical, and Watershed Tabs

Table 1. Summary of model inputs for the crop tab

Parameter	Value	Source/Reference
Zero height reference	5/11 (AR) 5/23 (CA) 4/24 (LA) 5/12 (MS) 5/15 (MO) 4/19 (TX)	See Agronomic Practices Chapter (USEPA, 2016)
Days from zero height to full height	115 (AR) 125 (CA) 102 (LA) 111 (MS) 118 (MO) 103 (TX)	See Agronomic Practices Chapter (USEPA, 2016)
Days from Zero Height to Removal	136 (AR) 139 (CA) 123 (LA) 132 (MS) 139 (MO) 124 (TX)	See Agronomic Practices Chapter (USEPA, 2016)
Maximum Fractional Areal Coverage	1.0 (All)	See Agronomic Practices Chapter (USEPA, 2016)

Table 2. Summary of model inputs for the physical tab

Parameter	Value	Source/Reference
Meteorological files	AR (w13963) CA (w23232) LA (w03937) MS (w03940) TX (w13958) MO (w13994)	Meteorological data available at EPA models web site (SAMSON data). Stations correspond to Little Rock, AR (w13963), Sacramento, CA (w23232), Lake Charles, LA (w03937), Jackson, MS (w03940), and Austin, TX (w13958)
Latitude	AR 36.2^{o} CA 38.6^{o} LA 31^{o} MS 32^{o} TX 30^{o} MO 39^{o}	Corresponds to latitude of meteorological station.

Parameter	Value	Source/Reference
Area of application (m^2)	Drinking Water Assessment: 2071280629 (CA) 414175280(AR) Ecological Risk Assessment: 100,000 (Ecological Risk Assessment)	Determined from 2012 Rice Cropland Data Layer, 2007 National Agricultural Statistics Service census acres of rice, and the percent cropped area procedure (see conceptual model chapter). This input does not have an impact on the concentration estimated inside the rice paddy and for the ecological risk assessment.
Weir leakage (m/d)	0	PFAM default
Benthic leakage (m/d)	0	PFAM default
Mass transfer coefficient (m/s)	$1x10^{-8}$	PFAM default
Reference depth (m)	0.1016	Set to same depth as initial weir height, per PFAM guidance.
Benthic depth (m)	0.05	PFAM default
Benthic porosity	0.50	PFAM default
Dry bulk density (g/cm^3)	1.35	PFAM default
F_{OC} Water column on SS	0.04	PFAM default
F_{OC} benthic	0.01	PFAM default
SS (mg/L)	30	PFAM default
Water column DOC (mg/L)	5.0	PFAM default
Chlorophyll CHL (mg/L)	0.005	PFAM default
Dfac	1.19	PFAM default
Q10	2	PFAM default

Table 3. Summary of model inputs for the Watershed tab

Parameter	Value	Source/Reference
Calculate downstream waterbody concentrations	Drinking Water Assessment: Yes Ecological Risk Assessment: No	Yes for drinking water. No for ecological risk assessments.
Area of surrounding watershed (m^2)	56389517945 (CA) 12126415684 (AR)	See Conceptual Model (USEPA, 2016)
Curve number of surrounding watershed	70	See Conceptual Model (USEPA, 2016)
Base flow (m^3/s)	220 (CA) 48 (AR)	See Conceptual Model (USEPA, 2016)
Width of water body (m)	194 (CA) 98 (AR)	See Conceptual Model (USEPA, 2016)
Depth of water body (m)	5.1 (CA) 2.3 (AR)	See Conceptual Model (USEPA, 2016)
Length of water body (m)	40 (CA and AR)	See Conceptual Model (USEPA, 2016)

3 Drinking Water Assessments, Applications and Floods Tabs

For drinking water assessments, applications are simulated for several thousands of acres of rice. Therefore, applications are spread out over time. Because of the large area of rice simulated, it is not expected that all acres of rice would be treated with a single pesticide. Therefore, a percent crop treated (PCT) may be used to refine a drinking water estimate of exposure. The PCT would not be used for ecological risk assessments because the area of interest is the paddy itself, which is entirely treated with pesticide. The application timing recommended in the developed scenarios reflects applications that are expected to occur during the rice growing season when rice paddies are flooded. The timing of application should be adjusted to reflect the specific pesticide being simulated, but the applications should be spread out over time for drinking water assessments. If the number of days over which the pesticide applications is spread out is changed, justification should be provided as to why the change was made. This information is needed because the number of days over which applications are spread out can have a big impact on the estimated drinking water concentration.

For drinking water assessments, estimated drinking water concentrations (EDWC) are evaluated in a receiving water body outside of the rice paddy. Releases from the rice paddy are adjusted to maximize release from the rice paddy. Therefore, a release of a percentage of water in paddies either the day after or after a minimum holding period is simulated. This allows the risk assessment to capture benefits from implementing a holding period.

While the dates of applications are important in determining the estimated drinking water concentrations, application dates are primarily chemical parameters and are not saved in the scenario file. Suggested application dates are provided for the different scenarios. The following application and flooding scenarios were developed for drinking water simulations: mixed, pre-flood, and post-flood. In pre-flood, all applications occur before the flooding of rice paddies begin. For post-flood, all applications occur after the flooding of rice paddies begin. In the mixed scenarios, applications may occur pre- or post-flood of the rice paddy.

Currently in California, winter flooding is very common (80% of rice fields; personal communication with rice farmers). Less information is available to characterize whether Arkansas and Missouri use winter floods; however, there is literature describing the use of rice paddies to provide habitat for birds and a place for hunting in the winter, indicating that the practice does occur to some degree. In 2009, 20% of rice paddies were managed with a winter flood (Norman and Moldenhauer, 2009). In California, winter floods were included in the developed scenarios. For Arkansas/Missouri, scenarios were created with and without a winter flood.

Rice growers in California have reported that turnover (at a low rate) is maintained in most rice paddies to prevent algae growth. Therefore, turnover at a low rate was applied in modeling. In the absence of data, a turnover rate of once in 60 days was chosen (0.017). For drinking water assessments, this practice has a low impact on the estimated drinking water concentrations.

3.1 California, Mixed, Winter Flood, with and without 14-day holding period (DW CA Mixed 14dHholding.PFS; DW CA Mixed noHold.PFS)

Table 4. Application Tab: California, Mixed, Winter Flood, with and without 14-day holding period

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	May 7	Based on CA PUR data, herbicides are commonly applied within a 30- to 60-day time window with a peak application period. Conceptual models for

Parameter	Value	Comment, Source
		drinking water were developed with applications spread over a 46-day period.
Last Day of Application	June 23	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label for the entire year.	This may be refined by multiplying by the maximum percent use area for the pesticide class (e.g., herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 5. Flood tab: California, Mixed, Winter Flood, with and without 14-day holding period

Parameter	Value	Comment, Source
Reference Date	May 23	This parameter is the day of the typical flood
Gradual or Sharp Transition	Gradual	This simulates the release of water from approximately 500,000 acres of rice, which occurs over time.
Number of Events	11	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 6. Flood Table: California, Mixed, Winter Flood, with and without 14-day holding period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	5/23	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 5 days	5/28	5	0.1016	5	0.1016	5	0.1016	5	0.017
Hold the water until after all applications and a 1-day default holding period*	**6/23**	**31**	**0.1016**	**44**	**0.1016**	**44**	**0.1016**	**44**	**0.017**
Release 50% of paddy water over 33 days*	**7/26**	**64**	**0.0508**	**72**	**0.0508**	**72**	**0.0508**	**72**	**0.017**
Bring water back up to full flood*	**7/27**	**65**	**0.1016**	**73**	**0.1016**	**73**	**0.1016**	**73**	**0.017**
Hold water until harvest	9/19	119	0.1016	119	0.1016	119	0.1016	119	0.017
Release water for harvest over 24 days	10/13	143	0	143	0	143	0	143	0
Winter flood	11/1	162	0.1016	162	0.1016	162	0.1016	162	0.017
Begin winter flood release	2/1	252	0.1016	252	0.1016	252	0.1016	252	0.017
Winter flood water released over 24 days	2/24	276	0	276	0	276	0	276	0
Flood in May	5/23	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.2 California, Pre-Flood, Winter Flood, No holding period (DW CA Preflood noHold.PFS)

Table 7. Applications Tab: California, Pre-Flood, Winter Flood, no holding period

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	April 6	Based on CA PUR data, herbicides are commonly applied within a 30- to 60-day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46-day period.
Last Day of Application	May 22	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (e.g., herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 8. Flood Tab: California, Pre-Flood, Winter Flood, No holding period

Parameter	Value	Comment, Source
Reference Date	May 23	This is the day of the typical flood
Gradual or Sharp Transition	Gradual	This simulates the release of water from approximately 500,000 acres of rice, which occurs over time.
Number of Events	11	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 9. Flood Table: California, Pre-Flood, Winter Flood, No holding period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	5/23	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 5 days	5/28	5	0.1016	5	0.1016	5	0.1016	5	0.017
Hold the water at least 1 day after the last application and after all paddies are flooded.*	**5/29**	**6**	**0.1016**	**6**	**0.1016**	**6**	**0.1016**	**6**	**0.017**
Release 50% of paddy water over 33 days*	**7/1**	**39**	**0.0508**	**39**	**0.0508**	**39**	**0.0508**	**39**	**0.017**
Bring water back up to full flood*	**7/2**	**40**	**0.1016**	**40**	**0.1016**	**40**	**0.1016**	**40**	**0.017**
Hold water until harvest	9/19	119	0.1016	119	0.1016	119	0.1016	119	0.017
Release water for harvest over 24 days	10/13	143	0	143	0	143	0	143	0
Winter flood	11/1	162	0.1016	162	0.1016	162	0.1016	162	0.017
Begin winter flood release	1/30	252	0.1016	252	0.1016	252	0.1016	252	0.017
Winter flood water released over 24 days	2/23	276	0	276	0	276	0	276	0
Flood in May	5/23	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.3 California, Post-flood, Winter Flood, with and without a 7-day Holding Period (CA Postflood noHold.PFS; CA Postflood 7dHold.PFS)

Table 10. Application Tab: California, Post-flood, Winter Flood, with and without a 7-day Holding Period

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	May 23	Based on CA PUR data, herbicides are commonly applied within a 30 to 60 day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46 day period.
Last Day of Application	Jul 8	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (e.g., herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 11. Flood Tab: California, Post-flood, Winter Flood, with and without a 7-day Holding Period

Parameter	Value	Comment, Source
Reference Date	May 23	This parameter is the day of the typical flood
Gradual or Sharp Transition	Gradual	This simulates the release of water from the simulated acres of rice, which occurs over time.
Number of Events	11	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 12: Flood Table without Holding Period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	5/23	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 5 days	5/28	5	0.1016	5	0.1016	5	0.1016	5	0.017
Hold the water at least 1 day after the last application and after all paddies are flooded.*	**7/9**	**48**	**0.1016**	**47**	**0.1016**	**47**	**0.1016**	**47**	**0.017**
Release 50% of paddy water over 33 days*	**8/12**	**81**	**0.0508**	**81**	**0.0508**	**81**	**0.0508**	**81**	**0.017**
Bring water back up to full flood*	**8/13**	**82**	**0.1016**	**82**	**0.1016**	**82**	**0.1016**	**82**	**0.017**
Hold water until harvest	9/19	119	0.1016	119	0.1016	119	0.1016	119	0.017
Release water for harvest over 24 days	10/13	143	0	143	0	143	0	143	0
Winter flood	11/1	162	0.1016	162	0.1016	162	0.1016	162	0.017
Begin winter flood release	1/30	252	0.1016	252	0.1016	252	0.1016	252	0.017
Winter flood water released over 24 days	2/23	276	0	276	0	276	0	276	0
Flood in May	5/23	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

Table 13: Flood Table with 7-day Holding Period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	5/23	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 5 days	5/28	5	0.1016	5	0.1016	5	0.1016	5	0.017
Hold the water at least 1 day after the last application and after all paddies are flooded.*	**7/9**	**55**	**0.1016**	**55**	**0.1016**	**55**	**0.1016**	**55**	**0.017**
Release 50% of paddy water over 33 days*	**8/12**	**88**	**0.0508**	**88**	**0.0508**	**88**	**0.0508**	**88**	**0.017**
Bring water back up to full flood*	**8/13**	**89**	**0.1016**	**89**	**0.1016**	**89**	**0.1016**	**89**	**0.017**
Hold water until harvest	9/19	119	0.1016	119	0.1016	119	0.1016	119	0.017
Release water for harvest over 24 days	10/13	143	0	143	0	143	0	143	0
Winter flood	11/1	162	0.1016	162	0.1016	162	0.1016	162	0.017
Begin winter flood release	1/30	252	0.1016	252	0.1016	252	0.1016	252	0.017
Winter flood water released over 24 days	2/23	276	0	276	0	276	0	276	0
Flood in May	5/23	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.4 Missouri/Arkansas, Mixed, No Holding Period, Winter Flood (DW MO Mixed Winter noHold.PFS)

Table 14. Application Tab: Missouri/Arkansas, Mixed, No Holding Period, Winter Flood

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	April 25	Based on CA PUR data, herbicides are commonly applied within a 30 to 60-day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46-day period.
Last Day of Application	June 10	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (*e.g.*, herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 15. Flood Tab: Missouri/Arkansas, Mixed, No Holding Period, Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 30	This is the day of the typical flood
Gradual or Sharp Transition	Gradual	This simulates the release of water from approximately 100,000 acres of rice, which occurs over time.
Number of Events	14	Number of events needed to capture flooding and releases over an entire year and simulate the holding period. After seeding in Arkansas, there are typically a couple of flushes of water out of the rice paddy.

Table 16. Flood Table: Missouri/Arkansas, Mixed, No Holding Period, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	4/30	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 4 days	5/4	5	0.1016	5	0.1016	5	0.1016	5	0.017
In Arkansas, rice is often dry seeded and flushed after seeding. In Missouri, rice is most commonly water seeded. This practice simulates a small percentage of flushing of the rice after seeding.	5/17	17	0.0914	17	0.0914	17	0.0914	17	0.017
Bring water back up to full flood after flushing	5/18	18	0.1016	18	0.1016	18	0.1016	18	0.017

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Hold the water until after all applications and a 1-day holding period	**6/11**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.017**
Release 50% of paddy water over 33 days	**7/14**	**75**	**0.0508**	**75**	**0.0508**	**75**	**0.0508**	**72**	**0.017**
Bring water back up to full flood	**7/15**	**76**	**0.1016**	**76**	**0.1016**	**76**	**0.1016**	**73**	**0.017**
Hold water until 14 days before typical harvest dates	8/26	118	0.1016	118	0.1016	118	0.1016	119	0.017
Release water over typical harvest dates minus 14 days	9/26	149	0	149	0	149	0	143	0
Winter flood	11/1	185	0.1016	185	0.1016	185	0.1016	162	0.017
Begin winter flood release	1/30	275	0.1016	275	0.1016	275	0.1016	252	0.017
Winter flood water released over 24 days	2/23	299	0	299	0	299	0	276	0
Flood in April	4/29	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.5 Missouri/Arkansas, Mixed, No Holding Period, No Winter Flood (DW MO Mixed noWinter noHold.PFS)

Table 17. Application Tab: Missouri/Arkansas, Mixed, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	April 25	Based on CA PUR data, herbicides are commonly applied within a 30 to 60 day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46 day period.
Last Day of Application	June 10	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (*e.g.*, herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 18. Flood Tab: Missouri/Arkansas, Mixed, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 30	This parameter is the day of the typical flood
Gradual or Sharp Transition	Gradual	This parameter simulates the release of water from approximately 100,000 acres of rice, which occurs over time.
Number of Events	14	Number of events needed to capture flooding and releases over an entire year and simulate the holding period. After seeding in Arkansas, there are typically a couple of flushes of water out of the rice paddy.

Table 19. Flood Table Missouri/Arkansas, Mixed, No Holding Period, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	4/30	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 4 days	5/4	5	0.1016	5	0.1016	5	0.1016	5	0.017
In Arkansas, rice is often dry-seeded and flushed after seeding. In Missouri, rice is most commonly water seeded. This simulates a small percentage of flushing of the rice after seeding.	5/17	17	0.0914	17	0.0914	17	0.0914	17	0.017
Bring water back up to full flood after flushing	5/18	18	0.1016	18	0.1016	18	0.1016	18	0.017
Hold the water until after all applications and a 1-day holding period	**6/11**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.017**
Release 50% of paddy water over 33 days	**7/14**	**75**	**0.0508**	**75**	**0.0508**	**75**	**0.0508**	**72**	**0.017**
Bring water back up to full flood	**7/15**	**76**	**0.1016**	**76**	**0.1016**	**76**	**0.1016**	**73**	**0.017**
Hold water until 14 days before typical harvest dates	8/26	118	0.1016	118	0.1016	118	0.1016	119	0.017
Release water over typical harvest dates minus 14 days	9/26	149	0	149	0	149	0	143	0
Winter flood	11/1	185	0	185	0	185	0	162	0
Begin winter flood release	1/30	275	0	275	0	275	0	252	0
Winter flood water released over 24 days	2/23	299	0	299	0	299	0	276	0
Flood in April	4/29	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.6 Missouri/Arkansas, Pre-flood, No Holding Period, No Winter Flood (DW MO Preflood noWinter noHold.PFS)

Table 20. Application Tab: Missouri/Arkansas, Pre-flood, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	March 15	Based on CA PUR data, herbicides are commonly applied within a 30- to 60-day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46-day period.
Last Day of Application	April 30	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (*e.g.*, herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 21. Flood Tab: Missouri/Arkansas, Pre-flood, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 30	This parameter is the day of the typical flood
Gradual or Sharp Transition	Gradual	This parameter simulates the release of water from approximately 100,000 acres of rice, which occurs over time.
Number of Events	14	Number of events needed to capture flooding and releases over an entire year and simulate the holding period. After seeding in Arkansas, there are typically a couple of flushes of water out of the rice paddy.

Table 22. Flood Tab: Schedule for Missouri/Arkansas, Pre-flood, No Holding Period, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	4/30	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 4 days	5/4	5	0.1016	5	0.1016	5	0.1016	5	0.017
In Arkansas, rice is often dry seeded and flushed after seeding. In Missouri, rice is most commonly water seeded. This simulates a small percentage of flushing of the rice after seeding.	5/17	17	0.0914	17	0.0914	17	0.0914	17	0.017
Bring water back up to full flood after flushing	5/18	18	0.1016	18	0.1016	18	0.1016	18	0.017
Hold the water until after all applications and a 1-day holding period	**6/11**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.017**
Release 50% of paddy water over 33 days	**7/14**	**75**	**0.0508**	**75**	**0.0508**	**75**	**0.0508**	**72**	**0.017**
Bring water back up to full flood	**7/15**	**76**	**0.1016**	**76**	**0.1016**	**76**	**0.1016**	**73**	**0.017**
Hold water until 14-days before typical harvest dates	8/26	118	0.1016	118	0.1016	118	0.1016	119	0.017
Release water over typical harvest dates minus 14-days	9/26	149	0	149	0	149	0	143	0
Winter flood	11/1	185	0	185	0	185	0	162	0
Begin winter flood release	1/30	275	0	275	0	275	0	252	0
Winter flood water released over 24 days	2/23	299	0	299	0	299	0	276	0
Flood in April	4/29	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14 day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

3.7 Missouri/Arkansas, Post-flood, No Holding Period, No Winter Flood (DW MO Postflood noWinter noHold.PFS)

Table 23. Application Tab: Missouri/Arkansas, Post-flood, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Apply Pesticide Over a Distribution of Days	Yes	Choose for a drinking water assessment
First Day of Application	April 30	Based on CA PUR data, herbicides are commonly applied within a 30- to 60-day time window with a peak application period. Conceptual models for drinking water were developed with applications spread over a 46-day period.
Last Day of Application	June 15	See above
Total Mass Applied in kg/ha	Enter the total kg/ha allowed on the label over the entire year.	This parameter may be refined by multiplying by the maximum percent use area for the pesticide class (*e.g.*, herbicide, fungicide, insecticide).
Drift Factor	Enter the spray drift factor based on label recommendations	Determined by label recommendations and corresponding spray drift factor
Distribution	^	Based on CA PUR data.

Table 24. Flood Tab: Missouri/Arkansas, Post-flood, No Holding Period, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 30	This parameter is the day of the typical flood
Gradual or Sharp Transition	Gradual	This parameter simulates the release of water from approximately 100,000 acres of rice, which occurs over time.
Number of Events	14	Number of events needed to capture flooding and releases over an entire year and simulate the holding period. In Arkansas, when seeding there are typically a couple of flushes of water out of the rice paddy.

Table 25. Flood Tab: Schedule for Missouri/Arkansas, Post-flood, No Holding Period, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First day of flood	4/30	0	0.0508	0	0.0508	0	0.0508	0	0.017
All fields flooded after 4 days	5/4	5	0.1016	5	0.1016	5	0.1016	5	0.017
In Arkansas, rice is often dry-seeded and flushed after seeding. In Missouri, rice is most commonly water seeded. This simulates a small percentage of flushing of the rice after seeding.	5/17	17	0.0914	17	0.0914	17	0.0914	17	0.017
Bring water back up to full flood after flushing	5/18	18	0.1016	18	0.1016	18	0.1016	18	0.017
Hold the water until after all applications and a 1-day holding period	**6/11**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.1016**	**42**	**0.017**
Release 50% of paddy water over 33 days	**7/14**	**75**	**0.0508**	**75**	**0.0508**	**75**	**0.0508**	**72**	**0.017**
Bring water back up to full flood	**7/15**	**76**	**0.1016**	**76**	**0.1016**	**76**	**0.1016**	**73**	**0.017**
Hold water until 14 days before typical harvest dates	8/26	118	0.1016	118	0.1016	118	0.1016	119	0.017
Release water over typical harvest dates minus 14 days	9/26	149	0	149	0	149	0	143	0
Winter flood	11/1	185	0	185	0	185	0	162	0
Begin winter flood release	1/30	275	0	275	0	275	0	252	0
Winter flood water released over 24 days	2/23	299	0	299	0	299	0	276	0
Flood in April	4/29	364	0	364	0	364	0	364	0

* Bolded items should be adjusted so that the first release occurs after the minimum holding period for the chemical. So for a 14-day holding period, the 3 bolded data items would be shifted by adding 13 to the number of days as the water is held 1 day already by default.

4 Ecological Risk Assessment, Applications and Floods Tabs

For the ecological risk assessment, exposure is evaluated in the rice paddy for organisms that may move (*e.g.*, animals) by comparing toxicity endpoints to estimated exposure in the rice paddy. Exposure estimates are also characterized with concentrations in water that may be released after a specified holding period. The released water estimated environmental concentrations (EECs) may be used to help to characterize risk outside of the rice paddy. Unlike the drinking water assessment where many fields are simulated, in the ecological risk assessment one rice paddy is simulated. Therefore, maximum application rates on the label are simulated, and applications are not spread out over time, unless multiple applications are allowed on the label. Example application inputs for a pesticide applied at 4.5 kg/ha, 2 times, with a five day minimum retreatment interval are provided below.

Table 26. Applications Tabs: Ecological Assessment

Parameter	Value	Comment, Source
Apply Pesticide Over Specific Days or a Distribution of Days	Specific Days	Choose for ecological risk assessment
Month, Day	5/4 5/9	Dependent on pesticide, pre-emergence vs post-emergence, pre-flood or post-flood
Mass Applied in kg/ha	4.5 4.5	--
Slow Release (1/day)	0	This parameter is used if the formulation slowly releases the pesticide over time.
Drift Factor	0	--

As exposure is estimated in the rice paddy for ecological risk assessment, releases of water after an application could reduce estimated exposure in the paddy, leading the risk assessor to erroneously conclude that risk could be reduced by early paddy releases. The risk, however, would move with the residues in the water after they left the paddy, and it is uncertain to what extent residues in the water would be diluted after the water left the rice paddy. Some canals that receive water may not have much water in them or the water may be coming from releases from rice paddies upstream. Therefore, to follow the residues in the water and to fully capture the potential for risk for ecological organisms, water should be held on the rice paddy after the application and until harvest. Reports of individuals using the canals right next to rice paddies for fishing are common and the canals are often promoted to be a resource for wildlife.

Rice growers in California have reported that a low level of turnover is maintained in most rice paddies to prevent algae growth. Therefore, a low level of turnover was applied in the modeling. In the absence of data, a turnover rate of once in 60 days was chosen (0.017). For ecological risk assessments, this input does reduce estimated 21-day and 60-day average concentrations in the rice paddy.

4.1 Arkansas, Winter Flood (ECO AR Winter.PFS)

Table 27. Flood Tab: Arkansas, Winter Flood

Parameter	Value	Comment, Source
Reference Date		Midpoint of typical plant date is 5/1. First flush occurs Plant + 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 28. Flood Tab: Schedule for Ecological Assessment Arkansas, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/4	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 14 days prior to harvest	9/3	122	0	122	0	122	0	122	0
Flood field for winter flood	11/1	181	0.1016	181	0.1016	181	0.1016	181	0.017
Drain field after winter flood	1/30	271	0	271	0	271	0	271	0

4.2 Arkansas, No Winter Flood (ECO AR noWinter.PFS)

Table 29. Flood Tab: Arkansas, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 4	Midpoint of typical plant date is 5/1. First flush occurs Plant + 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	2	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 30. Flood Tab: Schedule for Arkansas, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/4	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 14 days prior to harvest	9/3	122	0	122	0	122	0	122	0

4.3 California, Winter Flood (ECO CA Winter.PFS)

Table 31. Flood Tab: California Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 3	Midpoint of typical plant date is 5/13. Flooding occurs at Plant -10 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year.

Table 32. Flood Tab: Schedule for California Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/3	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field 14 days prior to harvest	9/25	145	0	145	0	145	0	145	0
Winter flood	11/1	182	0.1016	182	0.1016	182	0.1016	182	0
Drain	1/30	272	0	272	0	272	0	272	0

4.4 Louisiana, Winter Flood (ECO LA Winter.PFS)

Table 33. Flood Tab: Louisiana, Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 11	Midpoint of typical plant date is 4/14. First flush occurs Plant – 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 34. Flood Tab: Schedule for Louisiana, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	4/11	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field	8/11	122	0	122	0	122	0	122	0
Winter flood	11/1	204	0.1016	204	0.1016	204	0.1016	204	0.017
Drain	1/30	294	0	294	0	294	0	294	0

4.5 Louisiana, No Winter Flood (ECO LA noWinter.PFS)

Table 35. Flood Tab: Louisiana, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 11	Midpoint of typical plant date is 4/14. First flush occurs Plant – 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	2	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 36. Flood Tab: Schedule for Louisiana, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	4/11	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field	8/11	122	0	122	0	122	0	122	0

4.6 Mississippi, Winter Flood (ECO MS Winter.PFS)

Table 37. Flood Tab: Mississippi, Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 10	Midpoint of typical plant date is 5/2. First flush occurs Plant + 8 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 38. Flood Tab: Schedule for Mississippi, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/10	0	0.1524	0	0.1524	0	0.1524	0	0.017
Drain field 9 days prior to harvest	9/12	125	0	125	0	125	0	125	0
Winter flood	11/1	175	0.1524	175	0.1524	175	0.1524	175	0.017
Drain	1/30	265	0	265	0	265	0	265	0

4.7 Mississippi, No Winter Flood (ECO MS noWinter.PFS)

Table 39. Flood Tab: Mississippi, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 10	Midpoint of typical plant date is 5/2. First flush occurs Plant + 8 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	2	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 40. Flood Tab: Schedule for Mississippi, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/10	0	0.1524	0	0.1524	0	0.1524	0	0.017
Drain field 9 days prior to harvest	9/12	125	0	125	0	125	0	125	0

4.8 Missouri, Winter Flood (ECO MO Winter.PFS)

Table 41. Flood Tab: Missouri, Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 6	Midpoint of typical plant date is 5/5. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 42. Flood Tab: Schedule for Missouri, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field	5/6	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 9 days prior to harvest	9/10	127	0	127	0	127	0	127	0
Winter flood	11/1	179	0.1016	179	0.1016	179	0.1016	179	0.017
Drain	1/30	269	0	269	0	269	0	269	0

4.9 Missouri, No Winter Flood (ECO MO noWinter.PFS)

Table 43. Flood Tab: Missouri, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	May 6	Midpoint of typical plant date is 5/5. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	2	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 44. Flood Tab: Schedule for Missouri, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field at 4”	5/6	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 21 days prior to harvest	9/10	127	0	127	0	127	0	127	0

4.10 Texas, Winter Flood (ECO TX Winter.PFS)

Table 45. Flood Tab: Texas, Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 10	Midpoint of typical plant date is 4/9. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 46. Flood Tab: Schedule for Texas, Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field at 4 inches	4/10	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 14 days prior to harvest	8/7	119	0	119	0	119	0	119	0
Winter flood	11/1	205	0.1016	205	0.1016	205	0.1016	205	0.017
Drain	1/30	295	0	295	0	295	0	295	0

4.11 Texas, No Winter Flood (ECO TX noWinter.PFS)

Table 47. Flood Tab: Texas, No Winter Flood

Parameter	Value	Comment, Source
Reference Date	April 10	Midpoint of typical plant date is 4/9. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	2	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 48. Flood Tab: Schedule for Texas, No Winter Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Flood field at 4 inches	4/10	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 14 days prior to harvest	8/7	119	0	119	0	119	0	119	0

5 PFAM Flood Scenarios for a Single Field Reflecting Typical Agronomic Practices

5.1 Arkansas Scenario – Dry Seeded Rice (ar_dryseed.PFS)

Table 49. Flood Tab: Arkansas– Dry Seeded Rice

Parameter	Value	Comment, Source
Reference Date	May 4	Midpoint of typical plant date is 5/1. First flush occurs Plant + 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	6	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 50. Flood Tab: Schedule for Arkansas– Dry Seeded Rice

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 4”	5/4	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field	5/6	2	0	2	0	2	0	2	0
2nd flush at 4”	5/21	17	0.1016	17	0.1016	17	0.1016	17	0
Drain field	5/23	19	0	19	0	19	0	19	0
Permanent flood at 4”	5/31	27	0.1016	27	0.1016	27	0.1016	27	0
Drain field 14 days prior to harvest	9/3	122	0	122	0	122	0	122	0

5.2 California Scenario – Water Seed, No Hold, Post-flood Application (ca_waterseed_postflood_nohold.PFS)

Table 51. Post-flood Application of Pesticide (application made after permanent flood, 5/22), no holding time

Parameter	Value	Comment, Source
Reference Date	May 3	Midpoint of typical plant date is 5/13. Flooding occurs at Plant -10 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	6	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 52. Schedule for Post-flood Application of Pesticide (application made after permanent flood, 5/22), no holding time

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 4”	5/3	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field	5/15	12	0	12	0	12	0	12	0
Permanent flood at 4”	5/22	19	0.1016	19	0.1016	19	0.1016	19	0
Drain field 14 days prior to harvest	9/25	145	0	145	0	145	0	145	0
Winter flood	10/16	166	0.1016	166	0.1016	166	0.1016	166	0
Drain field	1/31	273	0	273	0	273	0	273	0

5.3 California Scenario – Water Seed, No Hold, Pre-flood (CA_waterseed_preflood_nohold.PFS)

Table 53. CA Pre-flood Application of Pesticide (application made prior to flooding on 5/3), No Holding Time

Parameter	Value	Comment, Source
Reference Date	May 3	Midpoint of typical plant date is 5/13. Flooding occurs at Plant -10 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 54. Schedule for CA Pre-flood Application of Pesticide (application made prior to flooding on 5/3), No Holding Time

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Permanent flood at 4”	5/3	0	0.1016	0	0.1016	0	0.1016	0	0.017
Drain field 14 days prior to harvest	09/25	145	0	145	0	145	0	145	0
Winter flood (10/16)	10/16	166	0.1016	166	0.1016	166	0.1016	166	0.017
Drain (01/31)	1/31	273	0	273	0	273	0	273	0

5.4 California Scenario – Water-seeded, Post-flood, Holding Period (ca_waterseed_postflood_hold.PFS)

Post-flood Application of Pesticide (application made after permanent flood, 5/22), Holding Time Specified.

The user should set the first application to occur on the day after a permanent flood (5/22), with subsequent applications occurring at the label-prescribed retreatment interval (RTI.) The user should modify the "Days after" for Event 4 to reflect the difference in the date of last application plus the holding period and the date of Event 1. The "Days after" for Event 58 should equal the "Days after" for Event 47 plus 1, indicating a re-flooding of the paddy until the rice is ready for harvest.

Below is an example of a pesticide with a 14-day holding period, where the final application occurred on 6/30. For Event 4, the "Days after" reflect the difference in the date of the last application plus the holding period (6/30 + 14 days = 7/14) and the date for Event 1 (5/3), or 72 days.

Table 55. California Scenario – Water-seeded, Post-flood, Holding Period

Parameter	Value	Comment, Source
Reference Date	May 3	Midpoint of typical plant date is 5/13. Flooding occurs at Plant -10 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	8	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 56. Schedule for California Scenario – Water-seeded, Post-flood, Holding Period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 4"	5/3	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field	5/15	12	0	12	0	12	0	12	0
Permanent flood at 4"	5/22	19	0.1016	19	0.1016	19	0.1016	19	0
Assume release of paddy water occurs after holding period (14 days after last application	7/14	72	0	72	0	72	0	72	0
Flood field	7/15	73	0.1016	73	0.1016	73	0.1016	73	0
Drain field 14 days prior to harvest	9/25	145	0	145	0	145	0	145	0
Winter flood	10/16	166	0.1016	166	0.1016	166	0.1016	166	0
Drain	1/31	273	0	273	0	273	0	273	0

5.5 California Scenario – Water-seeded, Pre-flood, Holding Period (ca_waterseed_preflood_hold.PFS)

Pre-flood Application of Pesticide (application made prior to flooding on 5/3), Holding Time Specified.

The user should modify the “Days after” for Event 2 to reflect the holding period. The “Days after” for Event 3 should equal the “Days after” for Event 2 plus 1, indicating a re-flooding of the paddy until the rice is ready for harvest.

Below is an example of a pesticide with a 14-day holding period, where the final application occurred before flooding on 5/3. For Event 2, the “Days after” reflect the holding period (14 days).

Table 57. California Scenario – Water-seeded, Pre-flood, Holding Period

Parameter	Value	Comment, Source
Reference Date	May 3	Midpoint of typical plant date is 5/13. Flooding occurs at Plant -10 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	6	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 58. Schedule for California Scenario – Water-seeded, Pre-flood, Holding Period

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
Permanent flood at 4”	5/3	0	0.1016	0	0.1016	0	0.1016	0	0
Assume release of paddy water occurs after holding period (14 days)	5/17	14	0	14	0	14	0	14	0
Flood field	5/18	15	0.1016	15	0.1016	15	0.1016	15	0
Drain field 14 days prior to harvest	9/25	145	0	145	0	145	0	145	0
Winter flood	10/16	166	0.1016	166	0.1016	166	0.1016	166	0
Drain	1/31	273	0	273	0	273	0	273	0

5.6 Louisiana Scenario – Water-seeded, Pinpoint Flood (la_pinpointflood.PFS)

Table 59. Louisiana Scenario – Water-seeded, Pinpoint Flood

Parameter	Value	Comment, Source
Reference Date	April 11	Midpoint of typical plant date is 4/14. First flush occurs Plant – 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 60. Schedule for Louisiana Scenario – Water-seeded, Pinpoint Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/11	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/15	4	0	4	0	4	0	4	0
Permanent flood at 4”	4/18	7	0.1016	7	0.1016	7	0.1016	7	0
Drain field 14 days prior to harvest	8/11	122	0	122	0	122	0	122	0

5.7 Louisiana Scenario – Water-seeded, Delayed Flood (la_waterseed_pinpointflood.PFS)

Table 61. Louisiana Scenario – Water-seeded, Delayed Flood

Parameter	Value	Comment, Source
Reference Date	April 11	Midpoint of typical plant date is 4/14. First flush occurs Plant – 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 62. Schedule for Louisiana Scenario – Water-seeded, Delayed Flood

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/11	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/15	4	0	4	0	4	0	4	0
Permanent flood at 4”	5/6	25	0.1016	25	0.1016	25	0.1016	25	0
Drain field 14 days prior to harvest	8/11	122	0	122	0	122	0	122	0

5.8 Louisiana Scenario – Dry-seeded (la_dryseed.PFS)

Table 63. Louisiana Scenario – Dry-seeded

Parameter	Value	Comment, Source
Reference Date	April 15	Midpoint of typical plant date is 4/14. First flush occurs Plant+1 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 64. Schedule for Louisiana Scenario – Dry-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/15	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/17	2	0	2	0	2	0	2	0
Permanent flood at 4”	5/12	27	0.1016	27	0.1016	27	0.1016	27	0
Drain field 14 days prior to harvest	8/11	118	0	118	0	118	0	118	0

5.9 Mississippi Scenario – Dry-seeded (ms_dryseed.PFS)

Table 65. Mississippi Scenario – Dry-seeded

Parameter	Value	Comment, Source
Reference Date	May 10	Midpoint of typical plant date is 5/2. First flush occurs Plant + 8 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 66. Schedule for Mississippi Scenario – Dry-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 6"	5/10	0	0.1524	0	0.1524	0	0.1524	0	0
Drain field	5/12	2	0	2	0	2	0	2	0
Permanent flood at 6"	5/29	19	0.1524	19	0.1524	19	0.1524	19	0
Drain field 9 days prior to harvest	9/12	125	0	125	0	125	0	125	0

5.10 Missouri Scenario – Dry-seeded (mo_dryseed.PFS)

Table 67. Missouri Scenario – Dry-seeded

Parameter	Value	Comment, Source
Reference Date	May 6	Midpoint of typical plant date is 5/5. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 68. Schedule for Missouri Scenario – Dry-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 4"	5/6	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field	5/8	2	0	2	0	2	0	2	0
Permanent flood at 4"	7/4	59	0.1016	59	0.1016	59	0.1016	59	0
Drain field 21 days prior to harvest	9/10	127	0	127	0	127	0	127	0

5.11 Missouri Scenario – Water-seeded (mo_waterseed.PFS)

Table 69. Missouri Scenario – Water-seeded

Parameter	Value	Comment, Source
Reference Date	May 2	Midpoint of typical plant date is 5/5. First flush occurs Plant - 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 70. Schedule for Missouri Scenario – Water-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 4”	5/2	0	0.1016	0	0.1016	0	0.1016	0	0
Drain field	5/6	4	0	4	0	4	0	4	0
Permanent flood at 4”	5/9	7	0.1016	7	0.1016	7	0.1016	7	0
Drain field 14 days prior to harvest	9/17	138	0	138	0	138	0	138	0

5.12 Texas Scenario – Dry-seeded (tx_dryseed.PFS)

Table 71. Texas Scenario – Dry-seeded

Parameter	Value	Comment, Source
Reference Date	April 10	Midpoint of typical plant date is 4/9. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 72. Schedule for Texas Scenario – Dry-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/10	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/11	1	0	1	0	1	0	1	0
Permanent flood at 4”	4/14	4	0.1016	4	0.1016	4	0.1016	4	0
Drain field 14 days prior to harvest	8/7	119	0	119	0	119	0	119	0

5.13 Texas Scenario – Water-seeded (tx_waterseed.PFS)

Table 73. Texas Scenario – Water-seeded

Parameter	Value	Comment, Source
Reference Date	April 6	Midpoint of typical plant date is 4/9. First flush occurs Plant – 3 days.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	4	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 74. Schedule for Texas Scenario – Water-seeded

Comment	Month, Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/6	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/10	4	0	4	0	4	0	4	0
Permanent flood at 4”	4/13	7	0.1016	7	0.1016	7	0.1016	7	0
Drain field 14 days prior to harvest	8/7	123	0	123	0	123	0	123	0

5.14 Texas Scenario – Ratoon Crop (tx_ratoon.PFS)

In a ratoon crop, the crop is harvested twice. However, the crop tab and PFAM assume one long crop. This scenario was only developed for dry seeded rice.

Table 75. Texas Scenario – Ratoon Crop

Parameter	Value	Comment, Source
Reference Date	April 10	Midpoint of typical plant date is 4/9. First flush occurs Plant + 1 day.
Gradual or Sharp Transition	Sharp	This parameter simulates the release of water from the rice paddy.
Number of Events	7	Number of events needed to capture flooding and releases over an entire year and simulate the holding period.

Table 76. Schedule for Texas Scenario – Ratoon Crop

Comment	Month , Day	Fill Level Days	Fill Level (m)	Wier Days	Wier (m)	Min Level Days	Min Level (m)	Turn Over Days	Turn Over (d^{-1})
First flush at 3”	4/10	0	0.0762	0	0.0762	0	0.0762	0	0
Drain field	4/11	1	0	1	0	1	0	1	0
Permanent flood at 4”	4/14	4	0.1016	4	0.1016	4	0.1016	4	0
Drain field 14 days prior to 1st harvest	8/7	119	0	119	0	119	0	119	0
Shallow flood of 2”	8/25	137	0.0508	137	0.0508	137	0.0508	137	0
Permanent flood at 4”	9/3	148	0.1016	148	0.1016	148	0.1016	148	0
Drain field prior to 2nd harvest	11/16	222	0	222	0	222	0	222	0

6 Literature Cited

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