4-25-2019

2019 Pesticide Safety - Floods for Pest Management

Hilary A. Sandler

Follow this and additional works at: https://scholarworks.umass.edu/cranberry_extension
Part of the Agriculture Commons
Flooding Options for Pest Management

Hilary Sandler
UMass Cranberry Station
Pesticide Safety Meeting
April 25, 2019
Why are we interested

- Cost savings?
  
  ✓ Much depends on cost to manage the flood
  ✓ Elimination of some pesticide applications
  ✓ Biggest potential is with Late Water
  ✓ Concern about carbohydrate ‘cost’ to the cranberry

- Organic Production
Types of Floods

Late Water
  CFW
  Fruit rot
  Mites
  Weeds?

Short Spring Floods
  Black-headed fireworm
  Dodder

Summer Floods
  Grubs
  Perennial weeds

Fall Floods
  Girdler
  CFW
  Perennial weeds
Late Water Method

- 30 day re-flood starting about April 15
  
  *Weather and plant stage determines this*

- Buds must still be dormant
  
  *ok if leaves are a bit green*

- Flood must cover vines

- Ideal is warm water but less than 65F

- Plants lose carbohydrate but recover within 2 weeks after flood
Late Water - Pros

- Suppresses fruit rot
  - *No fungicide needed that year*
  - *Reduced rates or no fungicide in following year*

- Suppresses cranberry fruitworm (CFW)
  - *Many sites needed no sprays*

- Suppresses cutworms
  - *But watch for re-invasion after*
Late Water - Pros

- Suppresses Southern Red Mite
  *Controlled in LW year and most of next*

- Suppresses dewberry
  *Prevents spread*

- Need less fertilizer; 30% less N

- New plantings

- Maybe less frost protection for the season
Late Water - Cons

- Loss of frost tolerance
  After 2 weeks some; after 3 weeks all

- Temperature of the flood
  Warm kills pests but can affect cranberry – the carbohydrate hit
  Algae growth

- Early release less effective
  4 weeks killed 98% CFW
  2.5-3 weeks killed 40-50% CFW

- COST?
Short May Floods

- **24 hours**
  - Un-webbed worms (false army, blossom, gypsy moth)

- **48 (up to 72 hours)**
  - Webbed worms: BHF, YHF (must have hatched)
  - Dodder
  - NOT Spag

- Must be able to move water fast, cover vines completely
Spring Flash Flood - When?

- Early to mid May – BEFORE roughneck
- Cloudy, cool – not above 75-80F air T (less carbohydrate impact)
- But warm water kills pests better (less oxygen)
- Timing for pest development
  BHF: eggs must be hatched but worms small
- Dodder – must be germinated but not attached to cranberry
Spring flood

Black-headed Fireworm (BHF)

- Timing critical – must be hatched

- Kills most larvae but if not all hatched may still have a problem after

- If water too cool – not effective
Spring floods

Dodder

- May match up with BHF timing
- 24-48 hrs
- Variable impacts
- Suppresses dodder growth NOT seed germination
- Timing critical: 3-4 weeks after first emergence
Attachment to initial host, produce haustoria

Elongation and searching

Flooding

Hook

Germination and emergence

Overwintering seed

* May occur in some species

May

Proliferation of stems, additional host attachments

May-June

May

Overwintering haustoria *

July-August

Flowering

Seeds form

September

Seed set and stem senescence
Summer Flood

- Mid May to mid July
- Eliminates crop
- Grubs, briars controlled
- Preparation for renovation?
Fall floods

- **Cranberry Girdler**
  
  September 25\textsuperscript{th} for 1 week
  
  May coincide with harvest for early cultivars

- **Holding the harvest flood**
  
  Up to 4 weeks, best if start by late September
  
  Suppresses dewberry and CFW
Fall floods - harvest

Holding the harvest flood

✓ Up to 4 weeks, best if start by late September

✓ Suppresses dewberry and CFW

✓ No apparent impact on yield but carbohydrates take a big hit

✓ Water quality?

![Graph showing Phosphorus (PO₄) levels over days after flood applied]
Fall Flood

Only affects running bramble (not upright)

1/3 fewer crowns after 4-week flood

3-week flood results mixed

Running Bramble (*R. hispidus*)

Upright Bramble (*R. allegheniensis*)
Fall Flood

Killed CFW in hibernacula (did not emerge in spring)

100% mortality after 3 or 4 weeks
The Bottom Line

✓ Potential exists to reduce pesticide and fertilizer requirements

✓ Cost/benefit and cost comparison

✓ Manage to limit crop impact and provide effective pest management

✓ How much does the flood cost?
This is not a pest management flood – it has to cover the vines or pests just move out of the water.