Late Water: The Massachusetts Experience

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"Late Water"

- Historic practice – holding of winter flood until after frost danger
- Current practice – remove winter flood in early spring then reflood for 30 days starting mid-April
- Deep flood – 30+ cm above the upright tips; if it is allowed to seep away to a shallow flood, the uncovered vines will start their seasonal growth
- Begin when leaves turning green but buds tight and red

Late Water Effects

- Loss of frost tolerance after flood

  Bloom synchronized, maturity delayed

- Ways Late Water can save $$

  Suppresses fruit rot for at least 2 years

  Suppresses SRM for up to 2 years

  Suppresses CFW and cutworms

  Depresses dewberry populations

  Growth stimulation (need less N – use 20-30% less)

Late Water Effects

- Ways Late Water might cost $$

Frost protection

After flood

>1 week 27F >2 wk 30F

Flood must be kept at 1 foot deep

Temp and clarity must be monitored

65°F, might need to treat for algae

Crop may be reduced (5-15%)

1993 data - cranberry fruitworm data from eight paired sites

	Early water	Late water
Berries w/CFW eggs (%)		
All fruit sampled	1.66 a	0.32 b
At peak CFW flight	4.92 a	0.52 b
CFW damage at harvest (%)	0.48 a	0.49 a
Insecticide aplications for CFW	2.70 a	0.88 b
Yield (t/ha)	12.7 a	16.6 a

Effect of LW on fruit rot incidence

- Year of LW - below threshold of 3% at harvest with no fungicides used
  (little or no storage rot)
- Year after LW – again no fungicide needed
- 2 years after LW – mid-rate fungicide again required
- 3 years after LW – can hold LW again or resume full fungicide regime

Year after Late Water - 1995

TRT	RATE	FROT	SROT	TOTAL
Check		5.5 a	1.4 b	6.8 b
Bravo	4 pt - 1X	6.8 a	2.0 a	8.6 ab
Bravo	4 pt - 2X	7.3 a	1.7 ab	8.9 ab
Bravo	4 pt - 3X	7.1 a	1.5 ab	8.5 ab
Bravo	7 pt - 1X	6.3 a	1.7 ab	7.8 ab
Bravo	7 pt - 2X	6.8 a	1.8 ab	8.5 ab
Bravo	7 pt - 3X	8.7 a	1.9 ab	10.4 a

Means with same letter are not different (P= 0.05).

2 Years after Late Water - 1996

TRT	RATE	FROT	SROT	TOTAL
Check		7.6 a	8.9 a	15.9 a
Bravo	5.5 pt - 1X	4.0 b	5.8 b	9.6 b
Bravo	5.5 pt - 2X	3.8 b	3.9 bc	7.5 b
Bravo	5.5 pt - 3X	3.8 b	3.5 c	7.1 b

Means with same letter are not different (P= 0.05).

LW effects on dewberries

- Crown mortality

  EW = 30%

  LW = 50%

- New runner production

  EW = 2.0/crown

  LW = 1.4/crown

Yield with Late Water

	Compare to Early Water	Compare to prev. 5 yrs.
1993	+21%	+8%
1994	+30%	+5%
1995	-38%	-19%
1996	-9%	-25%

Possible reasons for LW failure in 1995

- Inadequate dormancy going into flood, warm winter
  - **Low carbohydrate reserves**

- Anything that leads to low carbohydrates is a negative
  - **oxygen deficiency**
  - **low sunshine prev. year**
  - **heavy crop**

Post – LW management

- Protect for temperatures below 30ºF
  - 27ºF if up to ~10 days only
- Modify weed, disease, and insect control and monitoring
- Remember that bloom is synchronized
- Reduce N applications but not too much
- Harvest is delayed

N management summary

- Do not reduce more than 40% or crop may be down year after LW

- Skip spring application
  Time bloom application carefully
  Apply bud set fertilizer (early Aug.)

Prospectives from John Decas – January 17, 1992

- In 12 years, only saw crop reduction in 1989 (90 acres held)
- Not as many blossoms but better fruit set
- Usually holds LW on 60-90 acres per year
- Good quality fresh fruit
- 30 day flood – no more, no less
- Hold LW on newly-planted beds – reduces fruit rot inoculum buildup, helps vining in

Prospectives from John Decas – January 17, 1992

- No pre-bloom insecticide applications necessary – no cutworms
- Can reduced insecticide applications by 60%
- Fruitworm sprays may not be necessary
- Mite control during the year of LW; vines may be more susceptible to mites in the following growing season

Prospectives from John Decas – January 17, 1992

- Apply 50 # Casoron 10 days prior to the LW flood (35# will work) for dodder control
- Controls narrow-leaf goldenrod
- Can spot treat 75-100# Casoron for bramble control

Prospectives from John Decas – January 17, 1992

- Vines will be stronger; can rectify the lack of sanding to a certain degree
- Can result in odd-shaped berries
- No significant effect on berry size
- Costs more to hold LW – need to repump to retain a deep flood (sometimes daily)
- Water quality makes a big difference; should flush the bed during the middle of the flood

Don’t hold Late Water if…

- The vines are stressed at the end of the winter
- The bed had a very good crop the previous fall (depletion of plant reserves)
- The fall was especially mild (preventing the normal hardening off process)
- The winter was particularly mild
- The bed had been sanded during the winter

More comments on Late Water

- Organic growers will tend to use it at least 2 of every 3 years
- Mobilization of nutrients and their release into waterways at the conclusion of the flood is a concern
- Not used as often – concerns about crop reduction, good efficacy of fungicides for fruit rot control, good efficacy of insecticides for fruitworm control

Questions???