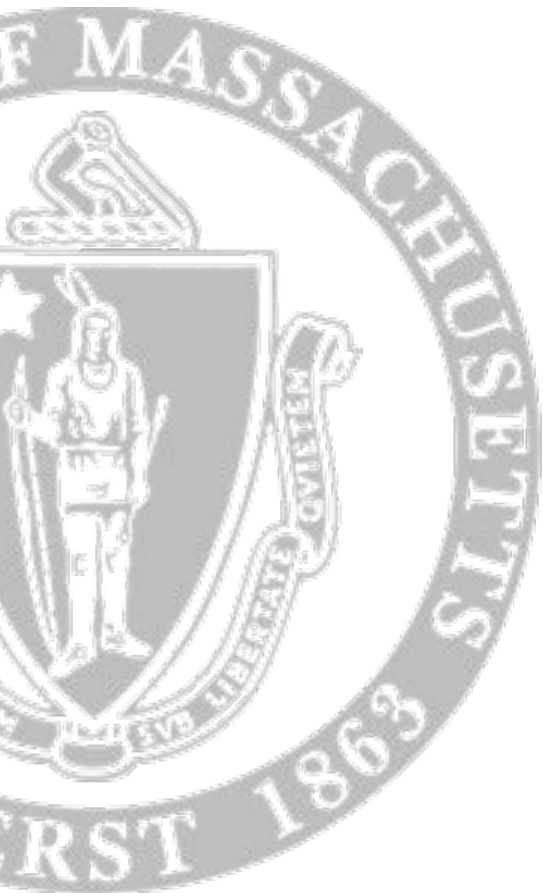


Delaying the First Scab Fungicide Using PAD

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Part of NE Regional IPM Project

- *Development of Advanced Integrated Pest Management for Northeastern Apples*
- Testing and developing advanced IPM methods on key pests in test blocks of commercial orchards
- UMass, Cornell, ARS-Kearneysville
- First year 2010
- 6 orchards in New England, 5 in NY
 - advanced IPM block, 3-5 acres
 - grower control block



Pest Targets and Protocols: Scab

- PAD
- Inoculum destruction
- Delayed 1st spray
- Degree-day model to track end of primary season



Pest Targets and Protocols: Plum Curculio

- Trap-trees around perimeter at PF
- Baited with olfactory attractant and aggregation pheromone prior to petal fall
- Full block spray at PF; later sprays to trap tree only (using degree day/oviposition model)
- Damage assessments at 2 week intervals



Pest Targets and Protocols: OBLR & Internal Leps.

- Seasonal fruit monitoring programs for optimizing insecticide treatments
- Start weekly fruit inspections at 550 degree day (50°F) after biofix
- Pheromone trap catch patterns used to determine choice of materials and timing



Pest Targets and Protocols: Sooty Blotch/Flyspeck

- Develop model-directed applications of reduced-risk fungicides
- Eliminate early post-scab cover sprays
- Determine need for later sprays based on rain- and time-based fungicide degradation



Pest Targets and Protocols: Apple Maggot

- Perimeter placement of Pesticide-treated spheres (PTS) for trap-out
- Odor bait with PTS
- Unbaited sticky spheres in interior checked bi-weekly



Pest Targets and Protocols: Thinning

- Eliminate carbaryl
- Use alternative materials
- Couple with model to predict thinning efficacy



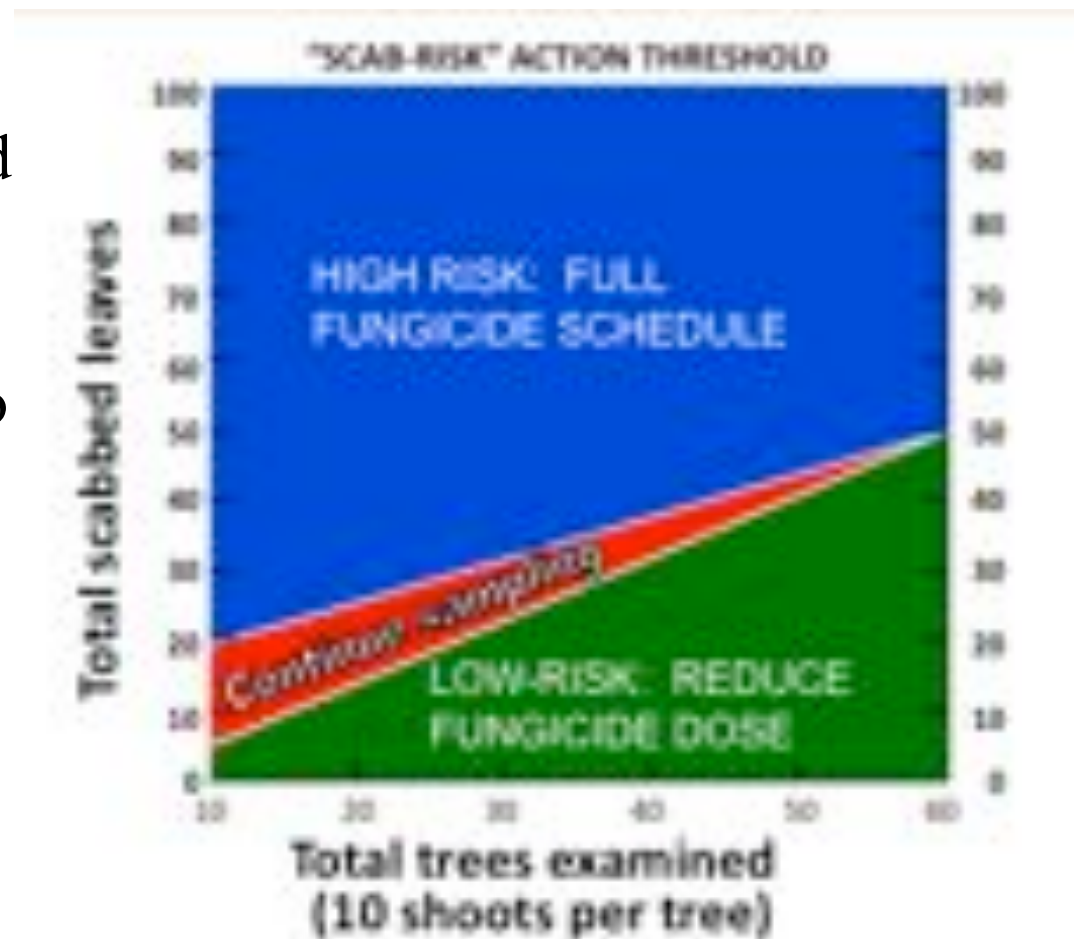
Pest Targets and Protocols: Pesticide Selection

- Eliminate OP use
- Increase use of pesticides with fewer non-target impacts based on Eco-Apple Protocol ratings



Potential Ascospore Dose (PAD) and delay

- MacHardy developed PAD based on inoculum in orchard
- Has been modified to use sequential sampling
- In low inoculum orchards, the initial scab spray can be significantly delayed



Inoculum Reduction

- Reduce initial inoculum
- Apply urea, 40 lb/A to orchard floor
- Can be applied with boom or airblast
- Also can chop
- Can use inoculum reduction and PAD independently or together



Previous Years: 2007-2008

- 16 blocks in commercial orchards evaluated in fall
- 10 blocks had low enough levels to delay
- Conservative recommendation: delay to tight cluster or first two infection periods rather than pink or first three infections
- Harvest data - fruit scab incidence



2007-2008 Results

Orchard	Blocks surveyed	Blocks qualified for delay	Blocks delayed	Mean scab incidence %, harvest 2008	
				Delayed	Check*
C	7	4	4	0.1	0.0
E	2	1	1	0.5	6.5
F	4	2	2	0.0	0.0
Mean			7	0.1	2.2

*One check block per orchard

2008-2009 – 10 blocks surveyed, 9 delayed blocks

Orch.	Block Type	Fall 08 PAD ¹	No. of blks	Orchard floor trt. ²	First fungicide application				Scab, %		
					Date	Bud stage ³	Prior infection periods	Fungicide ⁴	Terms.	Clst.	Harvest fruit
NHA	no chk.	-	-	-	-	-	-	-	-	-	-
	delay	0	1	LC	4/30	TC +	1	Syllit	0	0	0.1
CTL	chk.	72	2	no	4/13	¼ in. gr.	0	Pzb+Cptn	23.0	17.5	12.6
	delay	0.3	6	LC & U	4/23	TC	2	Pzb+Cptn	1.2	1.5	5.4
VTS	chk.	-	1	no	4/22	½ in. gr	0	Vgrd	7	3	16
	delay	2	2	LC	4/27	TC	1	Pzb	1	1	0
VTH	chk.	0	1	no	4/19	gr. tip	0	Mzb+Cptn	0	2	0
	delay	0	1	no	5/1	TC	2	Cptn	0.5	0.5	0
Mean*	chk		4						13.3	10.0	10.3
	delay		9		9 day	TC	1.7		1.1	1.3	3.6

*Last three orchards only

2009-2010, 7 blocks surveyed, 5 delayed blocks

Orch.	Block Type	Fall 09 PAD ¹	Orchard floor trt. ²	First fungicide application				Scab, %		
				Date	Bud stage ³	Prior infection periods	Fungicide ⁴	Term.	Clst.	Harvest fruit
NHA	chk.	0	LC	4/8	1/4 in. gr.	0	Pzb.	0	0	0
	delay	0	LC	4/15	TC	1	Syllit	0	0	0
VTH	chk.	0	no	4/8	1/4 in. gr.	0	Poly	0	0	0
	delay	0	no	4/14	TC	1	Poly+C	0	0	0
VTS	chk.	3	LC	4/9	1/4 in. gr.	0	Vgd + Pzb	0	0	2
	delay	2	LC	4/24	TC +	2	Vgd + Pzb	0	0	1.2
MAC	chk.	3	LC	4/8	1/4 in. gr.	0	Cptn	0	0	0
	delay	3	LC	4/14	TC	1	Pzb	0	0	2.6
NYK	chk.	0	LC	4/4	GT	0	Pzb.	0	0	0
	delay	0	LC	4/8	1/2 in. gr.	1	Pzb.	0	0	0
Mean*	chk.				1/4 in. gr.			0	0	0.4
	delay			8 day	TC	1.2		0	0	0.8

*All 5 orchards, total of 5 blocks

Summary, 2008-2010

- 14 delayed blocks
- 13 delayed blocks had fruit scab \leq check blocks
- Overall scab incidence 2.6% in delay blocks vs. 5.0% in check blocks
- Mean delay of 8.4 days @ tight cluster
- Mean evaluation time of 33 min.



Thanks

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Thanks also to the growers who took on the challenge and risk of trying this approach.