

APPLE (*Malus × domestica*, ‘Cortland’)
 Apple scab; *Venturia inaequalis*
 Powdery mildew; *Podosphaera leucotricha*

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Evaluation of reduced risk spray programs for management of apple scab and powdery mildew, 2001.

The experiment was conducted in a 26-year-old ‘Cortland’ orchard planted on MM.106 rootstock in Geneva, NY. The presence of DMI-resistant isolates of *Venturia inaequalis* in this orchard provided a proper setting for evaluation of alternative control programs for orchards where DMI resistance has developed. Single-tree plots were arranged in a randomized complete block design with four replications. Treatments were applied to runoff with a handgun at 350 psi and additional cover sprays were applied with an airblast sprayer at 3X concentration. Apple scab incidence (presence/absence) was evaluated by examining all leaves on 25 clusters per tree on 21-22 Jun; on the first 10 fully expanded leaves (i.e., oldest leaves) on each of 10 terminal branches on 8 Aug; and 100 fruit per tree on 21 Jun and 8 Aug. Powdery mildew incidence was evaluated by examining the first 10 fully expanded leaves on each of 10 terminal branches on 8 Aug. Data was transformed with an arcsine transformation and were analyzed in an ANOVA. Treatment means were separated using Fisher’s protected LSD.

Early season apple scab pressure (i.e., primary scab) was low because precipitation was minimal before petal fall. Powdery mildew pressure was moderate. All spray programs gave significant levels of control of scab on cluster leaves and fruit early in the season (21 Jun) relative to the untreated check because disease pressure was light. Two applications of Nova 40W plus Dithane 75WG at ¼-inch green and pink formed the base of all programs tested except for program 6 (considered the “growers’ standard”). Alone, these two applications gave little control of late season apple scab, but provided 45% control of powdery mildew relative to the untreated check. Alternating with Microthiol 80WP (#2e,f) provided significantly better control of late season fruit scab than the Nova/Dithane base treatment but not better than the “growers’ standard”. There were inconsistent results among the QRD treatments (#2a-d,f). In general, however, the QRD formulations provided better (and sometimes significantly better) control of powdery mildew than apple scab. Alternating Messenger with the base treatment (#2g) did not provide significant control of late season fruit scab or terminal scab. Adding a third application of Nova/Dithane at petal fall (#3-5) did not provide significantly better control of either apple scab or powdery mildew than the base treatment.

Material, rate/100 gal	Timing**	Apple Scab*				Powdery Mildew*
		% Fruit scab [% control]		% Foliar Scab [% control]		% Mildew [% control]
		21 Jun	8 Aug	Cluster	Terminal	Terminal
1. Nova 40WP, 1.67 oz + Dithane 75WG, 1 lb	1,3	44 bc [54]	83 ab [6]	5 bcd [78]	79 bc [15]	19 ab [45]
2. Nova 40WP, 1.67 oz + Dithane 75WG, 1 lb	1,3					
a. <u>alternating with</u> QRD 137WP, 2 lb	2,4-6	54 b [43]	68 bc [23]	2 d [90]	85 abc [9]	20 ab [41]
b. <u>alternating with</u> QRD 137WP, 2.67 lb	2,4-6	42 bc [56]	85 ab [3]	10 b [57]	84 abc [10]	11 bc [67]
c. <u>alternating with</u> QRD 132WP, 2.67 lb	2, 4-6	32 cd [66]	85 ab [3]	6 bcd [74]	81 bc [12]	20 ab [42]
d. <u>alternating with</u> QRD 131AS, 0.67 gal	2,4-6	44 bc [53]	86 ab [2]	5 bcd [78]	88 ab [6]	13 bc [63]
e. <u>alternating with</u> Microthiol 80WP, 3.33 lb	2,4-6	12 ef [87]	57 c [35]	5 bcd [78]	63 ef [32]	10 bc [70]
f. <u>alternating with</u> QRD 137WP, 1.33 lb + Microthiol 80WP, 3.33 lb	2,4-6	20 def [79]	57 c [35]	7 bc [69]	80 bcd [13]	8 bc [78]
g. <u>alternating with</u> Messenger, 9 oz	2,4,6	27 cde [72]	69 bc [21]	8 bc [65]	87 ab [6]	12 bc [66]
3. Nova 40WP, 1.67 oz + Dithane 75WG, 1 lb	1,3,5	28 cde [70]	63 bc [31]	8 bc [65]	71 cde [24]	13 bc [63]
4. Nova 40WP, 1.67 oz + Dithane 75WG, 1 lb	1,3,5					
<u>then</u> Messenger, 9 oz	2,4,6	16 def [84]	50 c [44]	5 bcd [78]	62 ef [33]	11 bc [67]
5. Nova 40WP, 1.67 oz + Dithane 75WG 1 lb + Messenger, 9 oz	1,3,5	20 def [79]	58 c [34]	6 bcd [74]	65 def [30]	15 ab [54]
6. Dithane 75WG, 1 lb	1,2,4,5					
<u>then</u> Flint 50WG, 0.67 oz	3,6	10 f [89]	20 d [77]	3 cd [87]	49 f [47]	2 c [93]
Untreated check.....		94 a	97 a	23 a	93 a	34 a

* Mean disease incidence values from four replicate plots per treatment are shown. Means within a column not followed by a common letter are significantly different from each other according to Fishers protected LSD (P<0.05). Bracketed values denote percent control relative to the untreated check.

** Timing and corresponding phenological stages: #1= 23 Apr (1/4-inch green); #2 = 30 Apr (tight cluster); #3 = 7 May (pink); #4 = 14 May (bloom); #5 = 23 May (petal fall); and #6 = 31 May (first cover). Unless otherwise noted, four (#8-#11) or five (#7-#11) additional cover sprays of Topsin M 70W (3 oz./100gal) plus Captan 50W (1 lb/100gal) were applied on 4, 14, 29 Jun and 12, 27 Jul.