

Evaluation of Disease Susceptibility of Cultivars in the 1999 NE-183 Apple Cultivar Trial

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As part of the NE-183 Apple Cultivar Evaluation Project (<http://www.ne183.org>), an ongoing study that is evaluating the disease susceptibility of new cultivars is being conducted in conjunction with the horticultural evaluation of these apples. Trees were planted at the UMass Cold Spring Orchard Research & Education Center in 1999.

Table 1. Foliar disease incidence of apples in the 1999 NE-183 disease planting in 2004.

Cultivar	Leaves with scab (%)	Leaves with rust (%)	Leaves with frog-eye leaf spot (%)	Terminals with mildew (%)
Ambrosia	<1	2	1	0
BC-8S-26-50	<1	2	1	0
Co-op 25	0	<1	<1	43
Co-op 29	0	<1	3	23
Co-op 39	1	<1	2	17
CQR 10-T-17	0	<1	1	0
CQR 12-T-50	<1	1	13	10
Delblush	1	<1	<1	37
Golden Delicious	0	<1	2	12
Hampshire	<1	<1	2	10
Jubilee Fuji	<1	5	3	0
NJ 109	<1	<1	0	0
NJ 90	0	<1	3	7
NY 65707-19	0	<1	3	0
NY 75907-49	0	<1	2	17
NY 79507-72	0	<1	<1	7
Pinova	0	<1	1	20
Rogers McIntosh	5	<1	2	0
Runkel	0	0	6	0
Silken	2	1	2	0
Zestar!	3	<1	6	0

For the disease planting, five replicates of twenty-one apple cultivars were evaluated on June 29, 2004 for disease symptoms on leaves. Six terminals on each tree were examined for the presence or absence of symptoms of four diseases: scab, cedar apple rust, frog-eye leaf spot, and powdery mildew. For scab, rust, and leaf spot, the numbers of leaves containing lesions were determined. The percentage of leaves infected in each terminal was then calculated. Mildew was counted as either present or absent for the entire terminal. Trees received one pre-bloom fungicide (Thiram) and one post-bloom fungicide (Flint and Manzate) only.

Table 2. Disease incidence of apples in the 1999 NE-183 disease planting in 2004. A dash denotes no fruit.

Cultivar	Fruit with scab (%)	Fruit with fly speck (%)	Fruit with sooty blotch (%)	Fruit with fly speck and sooty blotch (%)	Fruit with rot (%)	Clean fruit (%)
Ambrosia	0	24	12	0	0	64
BC-8S-26-50	-	-	-	-	-	-
Co-op 25	0	31	0	0	2	67
Co-op 29	0	36	1	1	1	61
Co-op 39	0	11	0	0	<1	87
CQR 10-T-17	<1	33	0	0	0	67
CQR 12-T-50	0	52	0	0	0	44
Delblush	1	27	5	11	0	56
Golden Delicious	-	-	-	-	-	-
Hampshire	0	50	0	0	0	50
Jubilee Fuji	2	4	4	2	2	86
NJ 109	0	7	0	0	0	93
NJ 90	0	29	0	0	0	51
NY 65707-19	-	-	-	-	-	-
NY 75907-49	0	39	0	0	1	60
NY 79507-72	0	14	<1	0	0	85
Pinova	0	13	<1	<1	3	83
Rogers McIntosh	7	38	0	<1	0	54
Runkel	-	-	-	-	-	-
Silken	0	10	0	0	0	90
Zestar!	0	3	0	0	<1	96

Disease incidence on foliage is presented in Table 1. Leaf scab symptoms were generally negligible. Rogers McIntosh leaves had the most scab (5%), followed by Zestar! and Silken (3% and 2%, respectively). All other cultivars had less than 1% leaf scab. Rust lesions were also minimal, with Jubilee Fuji having the most rust (5%). Frog-eye leaf spot was more prevalent than either scab or rust. CQR 12-T-50 had the most (13%) leaf spot, followed by Zestar!, Runkel, NY 65707-19, Co-op 29, and Jubilee Fuji with from 3–6% leaf spot. Mildew symptoms on terminals were prevalent, with Co-op 25 having the most terminals infected (43%). Golden Delicious, NY 75907-49, Co-op 39, Pinova, and Delblush all had from 10 to 37% mildew-infested terminals.

Twenty-five fruit (harvested over three weeks on four dates (September 2, 9, 16, and 23) from each cultivar were evaluated for disease incidence (scab, rust, flyspeck, sooty blotch, and rots). Results are presented in Table 2. Of most interest is fruit susceptibility or resistance to scab. Only Rogers McIntosh had significant fruit scab (6%). Jubilee Fuji had 2%, Delblush and CQR 10-T-17 had 1% or less fruit scab, while all other cultivars had no fruit scab. Flyspeck incidence ranged from 3 to 52% of fruit infected. Cultivars with the highest amount of flyspeck included CQR 12-T-50, Hampshire, NY 79507-49, Rogers McIntosh, Co-op 29, CQR 10-T-17, and Co-op 25 (> 30%), followed by NJ 90, Delblush, Ambrosia, NY 79507-72, Pinova, Co-op 39, and Silken (10–30%).

Fruit with sooty blotch or flyspeck and sooty blotch were less common, however, Ambrosia and Delblush had the most (12% sooty blotch and 11% flyspeck and sooty blotch respectively). Fruit rots were uncommon and unclassified, and there were no differences in incidence among cultivars. Finally, the earlier harvested cultivars Zestar, NJ-109, and Silken had the highest percentage of clean fruit (Table 2), which can be attributed to their earlier harvest date and low incidence

of flyspeck and sooty blotch.

As a result of these disease evaluations, and combined with disease incidence data from other states, a chart will be developed that rates relative susceptibility or resistance of these cultivars to the most common diseases. Growers can use the information to choose cultivars that are more resistant to diseases, hence likely reducing their fungicide use and reducing their risk of crop quality loss because of disease.

