

National Verticillium Wilt Trial

Shelley Jansky and Andy Hamernik
USDA-ARS and UW-Madison Department of Horticulture

This trial is carried out annually at the Hancock Agricultural Experiment Station on a field that has been inoculated with *Verticillium dahliae*. Breeders are asked to submit selections from their breeding programs. Typically, these are advanced lines that may be released as cultivars. Information about Verticillium wilt (VW) resistance is useful when considering the merits of a line as a potential cultivar.

Three plots were planted on May 5, 2015. Each consisted of three replications of five-hill units of 50 cultivars and advanced selections from the U.S. potato breeding programs. Plot A was planted on a fumigated field and was used to score for vine maturity of all clones and evaluate yield of eight cultivars standards. Plot B was planted on a field that was inoculated with *V. dahliae* in 2006 and has been maintained as a VW screening plot. This field was used to evaluate disease symptom expression, yield in the presence of *V. dahliae*, and colonization of dying stems. Plot C was also planted on the inoculated field and was destructively sampled during the summer to evaluate colonization of green stems.

On July 21 and August 10 and 25, plots in Plot B were scored for percent foliage expressing Verticillium wilt symptoms (symp). Data were combined to generate an area under the disease progress curve (AUDPC). On August 10, stems from all clones in Plot C were collected, surface disinfested, and squeezed in a vice to collect sap for plating. For each plot, 100 ul of sap was plated on selective medium and the plates were incubated in the dark for two weeks. After that, they were microscopically examined to determine the number of colony forming units per 100 ul of sap. Data are provided in Table 1.

Table 1. Performance of clones in the Verticillium wilt trial.

Clone	Yr in trial	Rep	Symp 1	Symp 2	Symp 3	AUDPC	Sap
Atlantic	11	1	0	20	95	1062.5	288
Atlantic	11	2	5	60	100	1850	850
Atlantic	11	3	0	25	100	1187.5	335
Red Norland	11	1	0	100	100	2500	15
Red Norland	11	2	25	100	100	2750	345
Red Norland	11	3	40	100	100	2900	60
Ranger Russet	11	1	0	15	80	862.5	630
Ranger Russet	11	2	5	10	75	787.5	539
Ranger Russet	11	3	5	10	85	862.5	625
Russet Burbank	11	1	0	25	100	1187.5	775
Russet Burbank	11	2	5	40	100	1500	925
Russet Burbank	11	3	5	60	100	1850	450
Russet Norkotah	11	1	10	100	100	2600	268
Russet Norkotah	11	2	15	100	100	2650	600
Russet Norkotah	11	3	25	100	100	2750	304
Superior	11	1	10	90	100	2425	650
Superior	11	2	10	100	100	2600	453

Superior	11	3	30	100	100	2800	700
White Pearl	11	1	0	20	95	1062.5	575
White Pearl	11	2	5	25	95	1200	585
White Pearl	11	3	5	55	100	1762.5	650
Yukon Gold	2	1	0	75	100	2062.5	1000
Yukon Gold	2	2	10	95	100	2512.5	725
Yukon Gold	2	3	15	100	100	2650	750
1154 B2947-5	1	1	5	90	100	2375	300
1154 B2947-5	1	2	5	90	100	2375	500
1154 B2947-5	1	3	10	95	100	2512.5	600
1205 BNC177-5	1	1	0	5	80	687.5	400
1205 BNC177-5	1	2	5	35	75	1225	500
1205 BNC177-5	1	3	10	20	90	1125	1000
1222 B2869-29	1	1	5	30	100	1325	700
1222 B2869-29	1	2	10	75	100	2162.5	100
1222 B2869-29	1	3	5	75	100	2112.5	700
1231 B2904-2	1	1	0	40	100	1450	0
1231 B2904-2	1	2	0	50	100	1625	0
1231 B2904-2	1	3	15	70	100	2125	1000
1233A BNC201-1	1	1	10	75	100	2162.5	220
1233A BNC201-1	1	2	0	60	100	1800	210
1233A BNC201-1	1	3	5	70	100	2025	300
MSQ131-A	1	1	5	70	100	2025	88
MSQ131-A	1	2	10	30	95	1337.5	27
MSQ131-A	1	3	5	25	100	1237.5	92
MSR127-2	1	1	5	25	50	862.5	500
MSR127-2	1	2	5	15	75	875	700
MSR127-2	1	3	5	25	80	1087.5	1000
MSS176-1	3	1	0	15	85	900	138
MSS176-1	3	2	0	30	90	1200	130
MSS176-1	3	3	0	20	90	1025	1000
MSS487-2	3	1	5	20	85	1037.5	400
MSS487-2	3	2	0	15	75	825	400
MSS487-2	3	3	0	10	80	775	400
MSS576-05SPL	3	1	0	50	100	1625	135
MSS576-05SPL	3	2	5	40	100	1500	350
MSS576-05SPL	3	3	5	75	100	2112.5	280
AF4296-3 (3015)	4	1	5	25	85	1125	500
AF4296-3 (3015)	4	2	0	35	100	1362.5	700
AF4296-3 (3015)	4	3	0	30	100	1275	300
AF5225-1 (3076)	1	1	0	20	95	1062.5	1000
AF5225-1 (3076)	1	2	5	45	95	1550	600
AF5225-1 (3076)	1	3	10	50	100	1725	500
AF5060-27 (3083)	1	1	10	80	100	2250	300

AF5060-27 (3083)	1	2	10	80	100	2250	500
AF5060-27 (3083)	1	3	5	75	100	2112.5	200
AF5164-19 (3093)	1	1	5	75	100	2112.5	700
AF5164-19 (3093)	1	2	10	60	100	1900	280
AF5164-19 (3093)	1	3	5	20	90	1075	700
AF5179-4 (3095)	1	1	5	20	90	1075	100
AF5179-4 (3095)	1	2	0	5	65	575	700
AF5179-4 (3095)	1	3	5	25	100	1237.5	236
TXA549-5Ru	1	1	0	35	100	1362.5	700
TXA549-5Ru	1	2	5	45	100	1587.5	700
TXA549-5Ru	1	3	10	70	100	2075	500
TX08352-5Ru	1	1	30	100	100	2800	1
TX08352-5Ru	1	2	20	100	100	2700	1000
TX08352-5Ru	1	3	20	100	100	2700	13
COTX03134-1W	1	1	10	95	100	2512.5	1000
COTX03134-1W	1	2	10	95	100	2512.5	1000
COTX03134-1W	1	3	5	90	100	2375	300
COTX09022-3RuRE/Y	2	1	20	100	100	2700	dead
COTX09022-3RuRE/Y	2	2	30	100	100	2800	500
COTX09022-3RuRE/Y	2	3	20	100	100	2700	1000
NDTX059759-3RY/YPinto	1	1	15	40	100	1600	0
NDTX059759-3RY/YPinto	1	2	10	90	100	2425	300
NDTX059759-3RY/YPinto	1	3	20	80	100	2350	1000
AO03123-2	2	1	10	30	100	1375	500
AO03123-2	2	2	10	30	100	1375	400
AO03123-2	2	3	10	20	80	1050	400
AO06070-1KF	2	1	0	10	90	850	300
AO06070-1KF	2	2	5	5	80	737.5	1000
AO06070-1KF	2	3	5	15	90	987.5	120
POR06V12-3	2	1	5	30	95	1287.5	1000
POR06V12-3	2	2	0	50	100	1625	500
POR06V12-3	2	3	5	50	100	1675	500
OR05039-4	2	1	10	40	80	1400	200
OR05039-4	2	2	10	20	75	1012.5	89
OR05039-4	2	3	15	25	90	1262.5	330
AO96141-3	1	1	0	60	100	1800	700
AO96141-3	1	2	10	40	100	1550	300
AO96141-3	1	3	5	55	100	1762.5	700
W9133-1rus	2	1	5	100	100	2550	120
W9133-1rus	2	2	5	90	100	2375	13
W9133-1rus	2	3	10	100	100	2600	200
W8886-3R	1	1	20	100	100	2700	dead
W8886-3R	1	2	10	100	100	2600	dead
W8886-3R	1	3	20	100	100	2700	dead

W8893-1R	1	1	45	100	100	2950	dead
W8893-1R	1	2	30	100	100	2800	dead
W8893-1R	1	3	40	100	100	2900	dead
W9576-11Y	1	1	15	100	100	2650	700
W9576-11Y	1	2	10	80	100	2250	500
W9576-11Y	1	3	40	100	100	2900	180
W9576-13Y	1	1	5	95	100	2462.5	1000
W9576-13Y	1	2	10	80	100	2250	54
W9576-13Y	1	3	10	100	100	2600	7000
AC03452-2W	1	1	5	70	100	2025	50
AC03452-2W	1	2	5	30	100	1325	160
AC03452-2W	1	3	15	55	100	1862.5	1000
CO04099-3W/Y	2	1	5	75	100	2112.5	500
CO04099-3W/Y	2	2	5	75	100	2112.5	20
CO04099-3W/Y	2	3	15	80	100	2300	500
CO05068-1 Ru	1	1	5	15	80	912.5	1000
CO05068-1 Ru	1	2	5	25	90	1162.5	214
CO05068-1 Ru	1	3	15	20	80	1100	700
CO05110-6 Ru	1	1	0	30	100	1275	700
CO05110-6 Ru	1	2	5	85	100	2287.5	700
CO05110-6 Ru	1	3	10	90	100	2425	400
CO05175-1Ru	1	1	0	60	90	1725	15
CO05175-1Ru	1	2	5	60	95	1812.5	117
CO05175-1Ru	1	3	10	45	95	1600	500
Vert10	1	1	0	30	100	1275	6
Vert10	1	2	5	20	95	1112.5	0
Vert10	1	3	0	30	100	1275	500
Vert11	1	1	0	15	75	825	118
Vert11	1	2	5	20	90	1075	500
Vert11	1	3	5	20	100	1150	25
Vert12	1	1	5	15	80	912.5	22
Vert12	1	2
Vert12	1	3	0	0	100	750	1
AO2424-83LB (6109)	3	1	5	20	70	925	18
AO2424-83LB (6109)	3	2	0	5	65	575	83
AO2424-83LB (6109)	3	3	5	10	80	825	140
AO2507-2LB (6111)	4	1	0	10	80	775	0
AO2507-2LB (6111)	4	2	0	5	70	612.5	500
AO2507-2LB (6111)	4	3	0	20	90	1025	1000