

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 trials were planted on May 3, 2017. Each consisted of three replications of five-hill units of eight cultivar standards and 29 selections from the U.S. potato breeding programs. Trial A was planted on a fumigated field and was used to score for vine maturity of all clones and evaluate yield of the cultivar standards. Trial B was planted on a field that was inoculated with *V. dahliae* in 2016 and will be maintained as our new VW screening plot. This field was used to evaluate disease symptom expression, yield of standards in the presence of *V. dahliae*, and colonization of dying stems. Trial C was also planted in the inoculated field and was destructively sampled during the summer to evaluate colonization of green stems.

On July 18 and August 7, plots in Trial B were scored for percent foliage expressing Verticillium wilt symptoms. On August 7, stems from all clones in Trial 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. On September 7, stems were collected from clones in the Trial B field and allowed to air dry at room temperature. Stems were not collected from clones that had high levels of *V. dahliae* in stem sap. All main stems from a plot were ground in a Wiley mill and 50 mg per plot was plated on selective medium. Colonies were counted two weeks later.

Clone	Rep	Sap	Dry	% symptoms	
				7/18/2017	8/7/2017
Atlantic	1	1000	500	5	70
Atlantic	2	1000	6	5	20
Atlantic	3	1000	0	5	60
Red Norland	1	400	0	20	100
Red Norland	2	700	0	25	90
Red Norland	3	1000	400	25	100
Ranger Russet	1	600	206	10	25
Ranger Russet	2	700	0	15	30
Ranger Russet	3	35	22	5	25
Russet Burbank	1	1000	0	5	45
Russet Burbank	2	1000	200	5	40
Russet Burbank	3	1000	0	5	30
Russet Norkotah	1	900	200	20	90
Russet Norkotah	2	1000	0	35	100
Russet Norkotah	3	1000	0	25	80
Superior	1	1000	32	25	90
Superior	2	1000	0	15	80
Superior	3	1000	400	40	95

White Pearl	1	1000	200	0	60
White Pearl	2	700	0	15	60
White Pearl	3	1000	200	5	60
Yukon Gold	1	1000	0	15	80
Yukon Gold	2	1000	140	25	90
Yukon Gold	3	500	0	10	80
AF5179-4 (3016)	1	1000		0	0
AF5179-4 (3016)	2	1000		0	10
AF5179-4 (3016)	3	1000		0	30
AF5225-1 (3038)	1	1000		5	35
AF5225-1 (3038)	2	1000		5	5
AF5225-1 (3038)	3	1000		5	5
AF5406-7 (3019)	1	1000		0	5
AF5406-7 (3019)	2	350		0	40
AF5406-7 (3019)	3	1000		0	30
AF5429-3 (3046)	1	1000		5	23
AF5429-3 (3046)	2	1000		5	50
AF5429-3 (3046)	3	1000		0	20
NDAF092412-3 (3054)	1	900		5	15
NDAF092412-3 (3054)	2	1000		0	5
NDAF092412-3 (3054)	3	1000		5	40
MSR127-2	1	280		0	15
MSR127-2	2	1000		0	20
MSR127-2	3	0		5	5
MSW485-2	1	600		0	20
MSW485-2	2	700		5	0
MSW485-2	3	1000		0	10
MSX540-4	1	210	148	0	15
MSX540-4	2	8	12	0	20
MSX540-4	3	200	0	0	20
MSZ219-14	1	100	120	10	30
MSZ219-14	2	4	0	5	10
MSZ219-14	3	0	0	5	20
A03921-2	1	350	0	0	30
A03921-2	2	1000	0	0	20
A03921-2	3	0	260	5	40
A07061-6	1	900		10	40
A07061-6	2	900		15	30
A07061-6	3	420		5	15
A071012-4BF	1	500		5	20
A071012-4BF	2	1000		5	15
A071012-4BF	3	1000		5	5
COA07365-4RY	1	1000		15	30
COA07365-4RY	2	1000		10	70
COA07365-4RY	3	750		15	60
NDA081453CAB-2C	1	1000	106	5	25
NDA081453CAB-2C	2	150	2	5	60
NDA081453CAB-2C	3	37	126	5	0
ND050032-4Russ	1	1000		0	25

ND050032-4Russ	2	1000		0	40
ND050032-4Russ	3	0		0	10
ND060735-4Russ	1	1000		5	25
ND060735-4Russ	2	800		0	30
ND060735-4Russ	3	250		0	20
ND091933ABCR-2Russ	1	500		0	25
ND091933ABCR-2Russ	2	600		5	60
ND091933ABCR-2Russ	3	1000		10	50
ND091933ABCR-7Russ	1	800		0	75
ND091933ABCR-7Russ	2	100		10	80
ND091933ABCR-7Russ	3	1000		10	80
ND091938BR-2Russ	1	800		5	25
ND091938BR-2Russ	2	1000		5	20
ND091938BR-2Russ	3	1		5	0
CO07015-4RU	1	1000		30	90
CO07015-4RU	2	1000		30	100
CO07015-4RU	3	1000		25	80
CO07049-1RU	1	130	220	10	45
CO07049-1RU	2	17	0	5	20
CO07049-1RU	3	180	0	10	40
CO05068-1RU	1	1000		20	30
CO05068-1RU	2	400		5	10
CO05068-1RU	3	1000		5	10
CO05035-1PW/Y	1	1000		5	20
CO05035-1PW/Y	2	1000		10	15
CO05035-1PW/Y	3	1000		10	30
AOR6576-1	1	700		0	20
AOR6576-1	2	400		5	20
AOR6576-1	3	184		10	20
POR12NCK50-1	1	700		0	35
POR12NCK50-1	2	800		5	25
POR12NCK50-1	3	1000		10	30
AOR07821-1	1	1000		0	5
AOR07821-1	2	500		0	5
AOR07821-1	3	1000		0	5
AOR7781-5	1	1000		5	50
AOR7781-5	2	1000		5	30
AOR7781-5	3	1000		5	40
AO03123-2	1	3	0	5	25
AO03123-2	2	16	0	10	25
AO03123-2	3	80	0	10	80
AOR06070-1KF	1	34	200	0	25
AOR06070-1KF	2	200	0	5	25
AOR06070-1KF	3	250	0	25	30