Changes to 2014 Flue-Cured Tobacco Production Guide
Disease Chapter – Disease Resistance Tables

New Table 3. Reactions of flue-cured tobacco varieties to Black Shank.

Varieties with the *Php* gene[1]:	% Survival (Race 1)[2] 2009-2013	2009-2013 Yield Index[3] Black Shank (Race 1)	2009-2013 Yield Index[3] No Black Shank
SP 225	86	73	85
SP 227	76	70	92
PVH 1452	67	67	99
NC 196	62	65	106
SP 168	66	61	93
CC 67	60	60	99
SP 220	62	58	95
PVH 1118	56	55	99
GL 939	56	53	95
CC 700	48	50	103
NC 71	46	50	108
CC 37	48	49	102
NC 299	42	43	103
GF 318	39	41	105
NC 291	36	39	106
NC 72	32	33	103
CC 27	30	32	106
NC 297	30	31	104
NC 92	24	23	100
PVH 2275[4]	10	10	99
Varieties without the *Php* gene[1]			
CC 143[4]	**77**	**81**	**106**
NC 925[4]	**80**	**80**	**100**
SP 236	88	75	86
K 346	81	75	93
NC 606	68	67	99
CC 65	58	65	112
CC 33	60	61	102
GL 395[4]	**65**	**60**	**93**
CC 13	46	47	104
CC 35	40	46	114
PVH 2110	41	44	107
K 326	31	33	108

[1] Varieties with the *Php* gene possess very high resistance to race 0 of the black shank pathogen. Resistance to race 0 in varieties without the *Php* gene is similar to or higher than that to race 1.

[2] Average % Survival near 2nd harvest without a soil fungicide. Results are averages from 9 field experiments conducted in 2009-2013 by Clemson and North Carolina State Universities as part of the Regional Flue-Cured Tobacco Variety Evaluation Program.

[3] Relative Yield Index = yield of each cultivar relative to the yield of all other cultivars in the experiment(s). Yield indexes for "No Black Shank" = average relative yield from the 2009-2013 Virginia OVT tests conducted at the Southern Piedmont AREC, Blackstone. Yield indexes for "Black Shank (race 1)" = yield index without black shank multiplied by the average proportional survival near 2nd harvest.

[4] *Ratings based on limited data available.* **Varieties in bold are new for 2014 growing season.**

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New Table 4. Reactions of flue-cured tobacco varieties to Granville Wilt.

Varieties with the *Php* gene[1]:	% Survival[2] 2009-2013	2009-2013 Yield Index[3] With Granville Wilt	2009-2013 Yield Index[3] No Granville Wilt
SP 227	93	86	92
CC 37	83	85	102
CC 27	80	85	106
SP 220	88	83	95
PVH 1452	83	83	99
CC 67	82	82	99
SP 168	83	77	93
NC 72	73	75	103
NC 196	71	75	106
GF 318	70	74	105
SP 225	86	73	85
NC 299	71	73	103
NC 92	72	72	100
CC 700	68	70	103
NC 297	67	70	104
NC 71	61	67	108
NC 291	61	64	106
PVH 2275[4]	62	61	99
PVH 1118	60	60	99
Varieties without the *Php* gene[1]			
CC 143[4]	**79**	**83**	**106**
NC 606	81	81	99
CC 33	75	76	102
K 346	78	73	93
GL 939	76	72	95
PVH 2110	67	72	107
GL 395[4]	**73**	**68**	**93**
CC 13	65	67	104
SP 236	77	66	86
NC 925[4]	**63**	**63**	**100**
K 326	54	58	108
CC 65	41	46	112
CC 35	40	45	114

[1] Varieties with the *Php* gene possess very high resistance to race 0 of the black shank pathogen. Resistance to race 0 in varieties without the *Php* gene is similar to or higher than that to race 1.

[2] Average % Survival near 2nd harvest without soil fumigation. Results are averages from 4 field experiments conducted in 2008-2010 and 2012 by Clemson University as part of the Regional Flue-Cured Tobacco Variety Evaluation Program.

[3] Relative Yield Index = yield of each cultivar relative to the yield of all other cultivars in the experiment(s). Yield indexes for "No Granville Wilt" = average relative yield from the 2009-2013 Virginia OVT tests at the Southern Piedmont AREC, Blackstone. Yield indexes for "with Granville Wilt" = yield index without black shank multiplied by average % Survival.

Ratings based on limited data available. ***Varieties in bold are new for 2014 growing season.***

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New Table 5. Performance of selected flue-cured tobacco varieties in 2013 Virginia Tech on-farm tests of resistance to Granville Wilt in Brunswick and Mecklenburg Counties.

		% Plants Surviving in Non-Fumigated Soil at 4 locations:					Yield Index with Granville Wilt[2]
Variety	Ph_p gene[1]	Baskerville	Rawlins	Dolphin	Union Level	Average	
NC 299	+	99	96	45	94	84	90
NC 196	+	99	96	33	95	81	86
CC 37	+	97	98	49	95	85	83
PVH 1425	+	99	96	56	95	86	82
CC 67	+	98	96	34	99	82	81
CC 143	**-**	**97**	**89**	**21**	**96**	**76**	**80**
CC 700	+	99	94	21	94	77	77
CC 33	-	100	91	23	95	77	76
GF 318	+	95	91	11	90	72	74
GL 395	**-**	**98**	**98**	**20**	**92**	**77**	**73**
NC 925	**-**	**100**	**88**	**12**	**89**	**72**	**70**

[1]The Ph_p gene provides very high resistance to race 0 of the black shank pathogen, but no resistance to Granville wilt.

[2] Yield Index with Granville Wilt = proportion of plants surviving for each variety multiplied by the 2013 relative yield for that cultivar in the 2013 Virginia OVT test conducted at the Southern Piedmont AREC, Blackstone.

Changes to 2014 Flue-Cured Tobacco Production Guide Disease Chapter – Disease Resistance Tables

New Table 6. Tobacco disease resistance possessed by selected flue-cured tobacco varieties available in 2014.

	Resistance Rating[1]			Nematodes			
	Black Shank			Root-Knot			Tobacco
Variety	*Ph* gene (race 0 only)[2]	Race 1	Granville Wilt	*M. incognita*	Other species[3]	Tobacco Cyst	Mosaic Virus
CC 13	-	46	65	+	+	-	-
CC 27	+	30	80	+	-	+	+
CC 33	-	60	75	+	+	-	-
CC 35	-	40	40	+	+	-	-
CC 37	+	48	83	+	+	+	+
CC65	-	58	41	+	+	-	-
CC 67	+	60	82	+	-	+	+
CC 143[4]	**-**	***76***	***79***	**+**	**-**	**-**	**-**
CC 700	+	48	68	+	-	+	-
GF 318	+	39	70	+	-	+	-
GL 395[4]	**-**	***64***	***73***	**+**	**-**	**-**	**-**
GL 939	-	56	76	+	-	-	-
K 326	-	30	54	+	-	-	-
K 346	-	81	78	+	-	-	-
NC 71	+	46	61	+	-	+	-
NC 72	+	32	73	+	-	+	-
NC 92	+	24	72	+	-	+	-
NC 196	+	62	71	+	-	+	-
NC 291	+	36	61	+	-	+	-
NC 297	+	30	67	+	-	+	+
NC 299	+	42	71	+	-	+	-
NC 606	-	68	81	+	-	-	-
NC 925[4]	**-**	***80***	***63***	**+**	**-**	**-**	**-**
PVH 1118	+	56	60	+	-	+	-
PVH 1452	+	67	83	+	-	+	-
PVH 2110	-	41	67	+	-	-	-
PVH 2275	+	10	62	+	+	+	+
SP 168	+	66	83	+	-	+	-
SP 220	+	62	88	+	-	+	-
SP 225	+	86	86	+	-	+	-
SP 227	+	76	93	+	-	+	-
SP 236	-	88	77	+	-	-	-

[1] Resistance rating = average % plants still alive near 2nd harvest, without a soil fungicide or fumigant. See Tables 3 and 4 for more detailed information.

[2] Varieties with the *Php* gene are almost immune to race 0 of the black shank pathogen; resistance to race 0 without the *Php* gene is at least as high as resistance to race 1.

[3] "Other species" of root-knot nematode include *Meloidogyne arenaria* (peanut root-knot nematode) or *M. javanica* (Javanese root-knot nematode. These other species are now common in Virginia.

[4] *Ratings based on limited data available.* **Varieties in bold are new for 2014 growing season.**