



Table 4. Black Shank Survival of selected flue-cured tobacco varieties in Brunswick County, Virginia in 2019.

Variety	<i>Ph_p</i> Gene	% Healthy Plants	Black Shank (race 1)*	
			Disease Index	Yield Index
NC 1226	+	98	98	116**
NC 1960	+	97	98	110**
K 346	-	94	95	93
NC 925	-	86	93	99
CC 143	-	80	93	104
NC 938	-	84	90	101
CC 33	-	74	90	99
CC 1063	-	84	90	98
PVH 1452	+	76	89	99
PVH 1600	+	74	89	100
PVH 1920	+	47	82	112
GL 395	-	57	80	95
GF 318	+	54	76	103
NC 196	+	36	72	104
CC 37	+	35	69	96
PVH 2275	+	0	38	100

*Disease index = measures season-long disease; Yield index is based on % healthy plants and yield indexes from the 2019 Virginia OVT test.

Table 5. Flue-cured tobacco variety reactions to Black Shank (race 1).

Varieties with the <i>Ph</i> gene ¹	Percent Survival ²	Relative Yield Index ³	
		With Black Shank	Without Black Shank
NC 196	68	71	104
PVH 1452	69	69	99
PVH 1118	61	61	100
CC 700	61	61	99
CC 67	63	59	93
PVH 1600	58	58	100
CC 37	54	52	96
NC 299	44	44	100
NC 72	38	38	102
CC 27	35	37	105
NC 297	34	35	102
PVH 2310	24	25	101
PVH 2275	11	11	100
Varieties without the <i>Ph_p</i> gene ¹			
NC 938	90	91	101
NC 925	85	84	99
CC 143	80	83	104
CC 1063	85	83	98
K 346	83	78	93
NC 606	71	70	98
CC 33	68	67	99
GL 395	66	62	95
GL 26H	48	52	108
CC 13	50	51	103
PVH 2254	48	48	100
CC 35	41	47	113
PVH 2110	43	46	108
K 326	34	36	106

¹ Varieties with the *Ph_p* gene possess very high resistance to race 0 of the black shank pathogen. Resistance to race 0 in varieties without the *Ph_p* 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 10 field experiments conducted in 2010-2015, 2017 & 2019 by Clemson and by North Carolina State Universities.

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 2010-2019 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.

Table 6. Performance of selected flue-cured tobacco varieties in 2019 Virginia Tech on-farm tests for resistance to Granville Wilt.

Variety	Final % Healthy Plants				
	Dolphin	Alberta	Basker1	Basker2	Avg.
NC 938	93	98	93	96	95
PVH 1920	91	100	90	96	94
CC 1063	89	99	97	95	95
PVH 1600	88	98	95	98	95
PVH 1452	87	99	98	99	96
NC 196	86	90	95	95	91
CC 27	85	99	90	99	93
CC 37	81	99	88	94	91
NC 606	81	95	88	96	90
CC 143	80	98	91	96	91
CC 33	79	96	92	93	90
GL 395	78	100	96	94	92
NC 299	74	96	88	94	88
NC 925	66	96	89	91	85
GF 318	60	98	89	81	82
CC 35	46	72	84	82	71

Table 7. Reactions of flue-cured tobacco varieties to Granville Wilt.

Varieties with the <i>Php</i> gene ¹ :	% Survival ²	Relative Yield Index ³	
		With Disease	Without Disease
CC 37	79	76	96
CC 27	70	73	105
CC 67	75	70	93
NC 196	53	55	104
NC 297	53	54	102
NC 299	51	52	100
CC 700	46	46	99
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Varieties without the <i>Php</i> gene ¹			
CC 1063	70	68	98
NC 606	68	67	98
CC 143	58	61	104
K 346	65	60	93
CC 33	59	58	99
NC 938	55	56	101
GL 395	58	55	95
GL 26H	50	55	108
GF 318	53	54	103
CC 13	51	52	103
NC 925	48	47	99
K 326	36	38	106
CC 35	18	20	113

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 presented are averages from 8 field experiments conducted in 2010, 2012-2017, and 2019 by Clemson and North Carolina State Universities.

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 2010-2019 Virginia OVT tests at the Southern Piedmont AREC, Blackstone. Yield indexes for “with Granville Wilt” = yield index without Granville wilt multiplied by average % Survival.

⁴ Ratings based on limited data available.

Table 9. Tobacco disease resistance in selected flue-cured tobacco varieties available in 2019.

Variety	Resistance Rating						
	Black Shank ¹		Granville Wilt ¹	Nematodes		Tobacco Cyst	Tobacco Mosaic Virus
	<i>Ph_p</i> gene (race 0 only) ²	Race 1		Root-Knot			
			<i>M.</i> <i>incognita</i>	Other species ³			
CC 13	-	50	51	+	+	-	-
CC 27	+	35	70	+	-	+	+
CC 33	-	68	59	+	+	-	-
CC 35	-	41	18	+	+	-	-
CC 37	+	54	79	+	+	+	+
CC 67	+	63	75	+	-	+	+
CC 143	-	80	58	+	-	-	-
CC 700	+	61	46	+	-	+	-
CC 1063	-	85	70	+	-	-	-
GF 318	+	46	53	+	-	+	-
GL 26H	-	48	50	+	-	-	+
GL 395	-	66	58	+	-	-	-
K 326	-	34	36	+	-	-	-
K 346	-	83	65	+	-	-	-
NC 196	+	68	53	+	-	+	-
NC 297	+	34	53	+	-	+	+
NC 299	+	44	51	+	-	+	-
NC 606	-	71	68	+	-	-	-
NC 925	-	85	48	+	-	-	-
NC 938	-	90	55	+	-	-	-

¹ Resistance rating = “% Survival”, the average % plants still alive near 2nd or 3rd harvest, without a soil fungicide or fumigant. See Tables 4-7 for more detailed information.

² Varieties with the *Ph_p* gene are almost immune to race 0 of the black shank pathogen; resistance to race 0 without the *Ph_p* 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. The guava root-knot nematode (*M. enterolobii*) has not been detected in Virginia.