Progress Report 230

KENTUCKY BURLEY TOBACCO VARIETY TESTS 1968–1976

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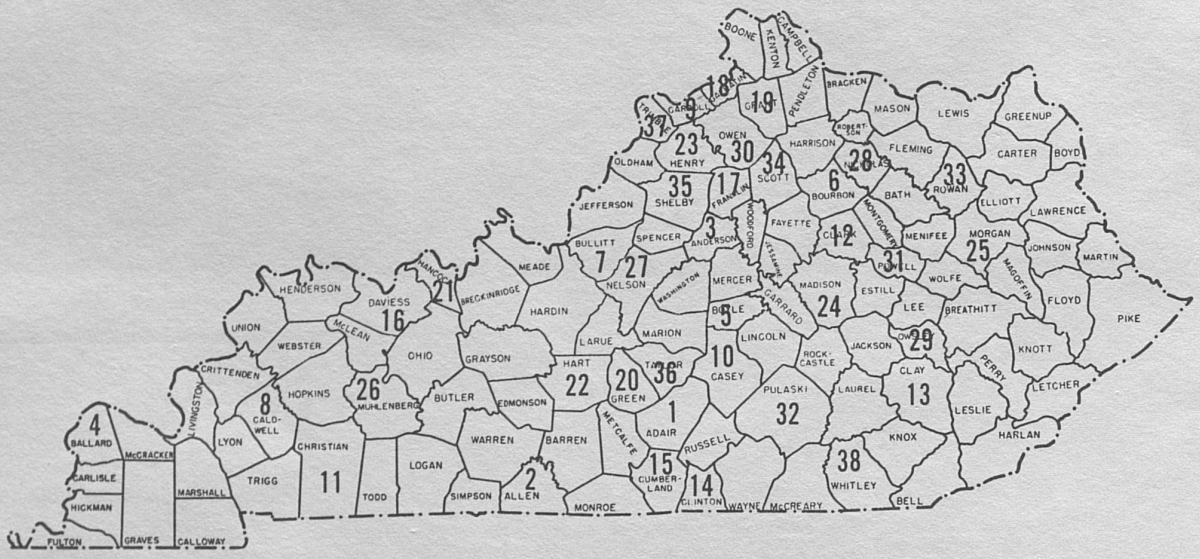

Fig. 1. - Testing Locations of the Kentucky Burley Tobacco Variety Tests - 1968-76.

Location	*Cooperator*
1. Adair County	William A. Murrell
2. Allen County	Robert Whitlow
3. Anderson County	George Cook
4. Ballard County	Wyatt H. Bennett
5. Boyle County	Alfred Whitehouse
6. Bourbon County	Randy K. Roberts
7. Bullitt County	Dean Armstrong
8. Caldwell County	Homer Mitchell
9. Carroll County	William G. Diuguid
10. Casey County	Ed and Terry Mullins
11. Christian County	W. D. Bailey
12. Clark County	F. W. Rickard
13. Clay County	John Brown
14. Clinton County	Riley Combest
15. Cumberland County	Charlie Wilson
16. Daviess County	Tommy Cecil
" "	Clem Cecil
17. Franklin County	Carey Sheets
" "	Eugene and Willie Gatewood
" "	Lowell Clark and A. W. Hazelwood
" "	Allen Tracey
" "	Wilbert Perkins
18. Gallatin County	F. S. Connely
" "	John and Ed Brown
19. Grant County	Future Farmers of America - Grant Co. High School
" "	Clarence P. Hutchinson
20. Green County	Don Mitchell
" "	Shreve Loy and Sons
" "	J. W. Edwards
21. Hancock County	Russell House
22. Hart County	K. S. Grady
23. Henry County	Alvin Croxton
" "	Gerald T. Steverson

Location	*Cooperator*
24. Madison County	James M. Adams
" "	Lowell Mulliken
" "	John Carnes
25. Morgan County	Norman Smith
26. Muhlenberg County	B. J. Winn
27. Nelson County	Thomas E. Gunning
" "	H. J. Eaves
28. Nicholas County	Glen Clay
29. Owsley County	Dorcie Price
" "	Edward Harvey
" "	Quenton Callahan
30. Owen County	Billy Karsner
31. Powell County	Gary Bowen and Dale Anderson
32. Pulaski County	Paul Dunagan
" "	William Simpson
" "	Wilford Purcell
33. Rowan County	Dorsie Jennings
" "	Gordon Lewis
" "	Harve McBrayer
" "	Wilber Hardin
34. Scott County	Billy Easley
" "	Robert Gregory
" "	J. W. Showalter
" "	Walker Kelley
" "	Elbert True
" "	Robert McMillan
35. Shelby County	Louis Payne
" "	Sanford Scearce
36. Taylor County	Tommy Noe
" "	Milton Jones
37. Trimble County	J. C. and Niles Bray
38. Whitley County	Drex McKeehan

Kentucky Burley Tobacco Variety Tests—Summary 1968-1976

J. H. Smiley, A. M. Wallace, George Everette, G. B. Collins, Paul Legg, and C. C. Litton[2]

The primary objective of the Kentucky Burley Tobacco Variety Tests is to provide information on the relative performance of burley varieties, hybrids, and breeding lines which may become candidates for varietal release. Such information obtained on varieties and hybrids may be used by farmers, seedsmen, research workers, and extension personnel.

METHODS

An expanded program of variety testing began in Kentucky in 1968. In addition to the tests conducted on the University of Kentucky Agricultural Experiment Station farms, others were conducted in 1968 on farms of 11 cooperating tobacco growers throughout the state. Since that time tests have been conducted each year, with the number of locations ranging from 6 to 15. The locations were selected to represent the burley tobacco producing areas of Kentucky. At least three replications of each variety were grown at each location.

In addition to these tests which were conducted on disease-free soils, black shank-resistant varieties and breeding lines have been tested at various locations on black shank-infested soils; and black root rot-resistant varieties and breeding lines have been tested on black root rot-infested soils.

RESULTS

Yield data for on-farm tests conducted on disease-free soils in 1968-76 are summarized in Tables 1-9 for each year by county for all standard varieties tested. The yield performance of three standard varieties is summarized in Table 10. Average yields are shown on tests conducted at Lexington 1974-76, at Princeton in 1976, and in 27 on-farm tests 1974-76.

Average yields for the black shank-resistant burley tobacco varieties tested in 1976 and 1977 on black shank-infested soils are shown by location in Table 11.

Average yields for two black shank-resistant varieties and Ky 10 tested on disease-free soil at Lexington 1974-76 are shown in Table 12.

Yields are shown for varieties tested on a black root rot-infested soil and on a disease-free soil on the same farm in 1971 (Table 13); and for varieties grown in 1976 on a disease-infested soil (Table 14).

Yields of burley tobacco varieties tested on the Soils Experimental Plot, Campbellsville, in 1971 are shown in Table 15.

DISCUSSION AND RECOMMENDATIONS

These variety test results should help farmers decide which varieties or hybrids to grow. Note that certain varieties performed well at some locations but not so well at others. However, varieties do not always perform the same, relative to each other, year after year at the same

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[1]Cooperative investigations of the Kentucky Cooperative Extension Service, the Kentucky Agricultural Experiment Station, and the Plant Science Research Division, Agricultural Research Service, U.S. Department of Agriculture.

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locations. For example, in Caldwell County in 1968, Ky 10 yielded 350 pounds per acre more than Ky 14, but in 1969 Ky 14 yielded 183 pounds per acre more than Ky 10.

In selecting the best variety for a given situation, it is important to consider diseases. If diseases are a factor, selection of the proper variety may mean the difference between a good yield of desirable tobacco and a crop failure. The degree of resistance of the more important standard varieties and hybrids to diseases is shown in Table 16.

For land infested with black root rot or fusarium wilt (or both), Ky 14 and Ky 15 are recommended. If wildfire is a problem, Ky 14, Ky 15 or Burley 21 (B 21) is recommended.

Black shank is one of the most difficult tobacco diseases to control without reducing potential yield. If, however, sufficient land is not available for crop rotation or if rotation does not control black shank, then the use of a resistant variety or hybrid is recommended. Two races of black shank are found in Kentucky. Race 0 is the most common, while race 1 is found on only a few farms. Satisfactory control of race 0 can be obtained from the use of a hybrid of L-8, but control of race 1 is more difficult. Varieties Burley 37 (B 37), Burley 49 (B 49), Burley 64 (B 64) and Ky 17 are moderately resistant to both races. However, if it is necessary to use a field infested with black shank, Ky 17 is the best variety to use because of its high yield and other characteristics.

CHARACTERISTICS OF SOME VARIETIES

Kentucky 10

Ky 10 is a rather short, compact, stand-up type, high-yielding variety of fair quality. It has a small percentage of the plants which are slow growing because of an abnormally prolific root system (hairy root). It matures 7-10 days later than B 21 and, when cut immature, the leaves tend to cure with green spots.

Kentucky 15

Ky 15 is a high quality, stand-up burley tobacco variety which yields extremely well. It possesses near immunity to the black root rot disease. It is also resistant to tobacco mosaic virus, wildfire and the fusarium wilt diseases. Ky 15 is taller than Ky 10, but the leaf size and number are very similar to those of Ky 10. Ky 15 matures 5-6 days earlier than Ky 10. Ky 15 was released cooperatively by the Kentucky Agricultural Experiment Station and the U.S. Department of Agriculture in 1977 for production by producers in 1978.

Kentucky 17

Ky 17 is a stand-up burley tobacco which produces reasonable yields of high quality leaf. This new variety is distinguished by possessing good field level resistance to both races of black shank. In addition, Ky 17 is resistant to tobacco mosaic virus, wildfire, black root rot and fusarium wilt. Ky 17 is taller than Ky 10 and has a leaf number and size similar to Ky 10. Ky 17 matures 3-4 days earlier than Ky 10. Leaf yields produced by Ky 17 have averaged 400-500 pounds per acre more than Burley 49 in replicated tests.

Kentucky 14

Ky 14 is a stand-up type, good yielding variety with good quality. The leaves are approximately the same length as those of B 21 but a little wider. The leaf number and plant height are about the same as those of B 21. It matures about 5-7 days later than B 21. There is good retention of bottom leaves on the stalks before and during harvest.

Burley 21

B 21 is an extreme stand-up type, good-yielding variety of high quality leaf. The plants are early and vigorous. It is one of the easier varieties to work (cultivate, prime, spray) because of its extreme stand-up qualities. There is a tendency for leaves to drop from the stalks in this variety under some conditions, especially when grown in a shallow, compact soil or during a dry season.

Burley 37

B 37 is moderately resistant to both races of black shank. It is a stand-up type, fair yielding, good quality, broadleaf, uniformly maturing variety.

Burley 49

B 49 is slightly more resistant to both races of black shank than B 37 and has high resistance to black root rot. It is an extreme stand-up type with more leaves than B 37, but the leaves are shorter and not so wide. Yields of B 49 are about the same as those of B 37, but B 49 matures later than B 37.

Hybrids

The Kentucky Agricultural Experiment Station released male-sterile B 21 to seedsmen in 1959. The purpose was to encourage the production of hybrids with levels of black shank resistance not available in standard varieties by utilizing the L-8 source of resistance. Seed producers have used male sterile B 21 as the foundation of the present burley hybrid program.

The combined names of the two parents used in making the hybrid are used as the name of the hybrid and are printed on each seed package offered for sale.

No yield or quality differences in reciprocal crosses in the burley hybrids have been found. In other words, no differences have been found in yield or quality of MS B 21 X L-8 and MS L-8 X B 21.

Most hybrids offered for sale will have MS B 21 as one of the parents. This should improve smoking quality and acceptance of the leaf since B 21 is a high quality variety. MS Ky 14 X L-8 should be more useful than MS B 21 X L-8 where black root rot or fusarium wilt is a problem because of the Ky 14 contribution of resistance.

Several cases exist where the hybrid may have a lower degree of resistance to a certain disease than the more resistant parent. For example, the MS B 21 X Ky 10 hybrid has less black root rot resistance than Ky 10. Therefore, if a hybrid is selected, care should be exercised to make sure that the reduced resistance can be tolerated.

TABLE 1.—YIELD OF VARIETIES AND HYBRIDS IN THE 1968 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Ballard Co.	Caldwell Co.	Muhlenberg Co.	Allen Co.	Green Co.	Nelson Co.	Henry Co.	Scott Co.	Sta Farm Lexington	Clark Co.	Nicholas Co.	Rowan Co.
B 21	2498	2904	2787	3175	2859	3404	2808	2505	3012	----	2783	2146
Ky 10	2702	3246	2879	3217	3177	3488	2704	2595	2821	3582	2842	2204
Ky 12	2543	3092	3000	3250	2903	3910	2333	2700	2971	----	3000	1844
Ky 14	2711	2896	3208	3458	3257	3737	2946	2865	2940	3458	3083	2579
B 37	2470	2537	2535	2888	2732	3055	2362	2385	2433	----	2492	1675
Ky 9	----	----	----	3367	3316	3154	2721	----	2975	3677	----	2303
B 21 x Ky 10	2757	----	3079	----	----	----	----	2850	2990	3666	3367	2217
MS B 21 x Ky 10	----	3372	----	3292	3192	3550	3088	----	2910	----	----	----
MS B 21 x Ky 12	----	2829	3000	3400	3189	3492	2817	2805	3036	----	----	2117
MS B 21 x Ky 9	----	----	----	3333	3269	3458	2834	2995	2810	3500	----	2313
MS B 37 x L-8	----	----	----	3100	2876	3096	2413	2655	2895	----	----	2179
MS B 21 x L-8	----	----	----	3208	----	3367	----	2640	3060	3531	----	2292
MS Ky 12 x L-8	----	----	----	----	3242	----	2871	----	2746	----	----	----

---- (not planted)

TABLE 2.—YIELD OF VARIETIES AND HYBRIDS IN THE 1969 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Allen Co.	Caldwell Co.	Franklin Co.	Green Co.	Henry Co.	Madison Co.	Nicholas Co.	Owen Co.	Rowan Co.	Shelby Co.	Washington Co.	Station Farm Lexington
Ky 14	2886	2643	3516	3157	3019	3094	2939	3261	3158	3432	3931	2823
Ky 10	2819	2460	3293	3183	3071	2871	3004	3182	3299	3391	3815	2887
MS Ky 12 x L8	2838	2466	3256	3042	2766	2751	2543	3078	2963	3600	3670	----
Ky 9	2831	2381	3333	2976	2445	2618	2523	3139	3318	3047	3710	----
MS B 21 x 10	2710	2558	3251	2976	2641	2444	2644	3127	3055	3016	3556	2759
MS B 21 x L8	2749	2303	3211	3021	2896	2274	2533	2953	3217	3330	3407	2626
MS B 37 x L8	2795	2290	3093	3003	2735	2931	2386	2875	3186	2953	3430	2671
Va 509	2629	2130	3255	3290	2520	2708	2567	2937	2975	3286	3349	2641
Ky 12	2559	2218	3105	2544	----	2907	2623	2857	3060	----	3573	2677
Ky 16	2375	2339	3052	2835	2929	2648	2511	3001	2837	3111	3357	2632
B 21	2405	2359	3010	2903	2558	2788	2394	2620	2775	2997	2513	2640
B 37	2266	2359	2971	2592	2393	----	2194	2797	2699	2637	3185	2287
B 49	2644	2326	2825	2270	2151	2647	2379	2749	2696	2877	3063	2364

TABLE 3.—YIELD OF VARIETIES AND HYBRIDS IN THE 1970 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Owsley Co.	Allen Co.	Caldwell Co.	Clinton Co.	Taylor Co.	Grant Co.	Sta Farm Lexington	Average 6 Locations	Average 7 Locations
MS B 21 x Ky 14	2884	3255	2714	3523	4173	3054	----	3267	----
MS B 21 x Ky 10	2944	3395	2788	3468	4032	2963	2846	3265	3205
Ky 10	2882	3234	2766	3076	4128	3216	2932	3217	3176
Ky 14	2891	3235	2684	3260	4064	2926	2845	3177	3129
MS L8 x Ky 14	2982	3297	2405	3394	3668	3046	----	3132	----
MS Ky 12 x L8	2906	3499	2585	3168	3617	2834	----	3102	----

TABLE 4.—YIELD OF VARIETIES AND HYBRIDS IN THE 1971 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Madison Co.	Hart Co.	Taylor Co.	Christian Co.	Hancock Co.	Pulaski Co.	Scott Co.	Sta Farm Lexington	Nicholas Co.	Average
Ky 14	2945	2843	3576	2651	2764	2884	3028	2770	2763	2914
MS L8 x Ky 14	2791	2927	3491	2822	2935	2861	3122	2653	3110	2968
MS Ky 14 x L8	2826	2977	3523	2659	2951	2665	3347	2472	2921	2927
MS L8 x Ky 12	2803	2647	3119	2346	2547	2649	2974	2595	2780	2718
MS Ky 12 x L8	2880	2710	3172	2442	2745	2710	3080	2897	2860	2833
B 21	2659	2670	3407	2221	2529	2565	2756	2422	2613	2649

TABLE 5.—YIELD OF VARIETIES AND HYBRIDS IN THE 1972 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Owsley County	Franklin County	Taylor County	Average
Ky 14	2835	3679	3803	3439
B 49	2489	2791	2788	2689
Va 509	2512	3132	3653	3099
MS L8 x Ky 14	2831	3297	3779	3302
B21	2554	3345	3482	3127

TABLE 6.—YIELD OF VARIETIES AND HYBRIDS IN THE 1973 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

	Location					
Variety	Hancock	Clay	Bourbon	Taylor	Pulaski	Average
Ky 14	3219	2192	2638	3490	3081	2924
Ky 15	3021	2405	2589	3390	2954	2872
MS B21 x Ky 14	3061	2075	2768	3438	2626	2794
MS L8 x Ky 14	2952	2252	2628	3492	2827	2830
MS B21 x Ky 10	2383	2192	2484	3799	2694	2690
B 49	3081	1990	2018	2917	2526	2506

TABLE 7.—YIELD OF VARIETIES AND HYBRIDS IN THE 1974 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Nelson Co.	Morgan Co.	Grant Co.	Whitley Co.	Madison Co.	Green Co.	Pulaski Co.	Daviess Co.	Average
MS B21 x Ky 14	2674	2615	3067	3228	3101	3190	3782	3793	3181
Ky 14	2748	2317	2867	3782	2882	2408	3811	3263	3010
Ky 15	2006	2142	2953	4037	2808	2456	3791	3822	3002
B 64	3120	1643	2652	3552	3354	2526	3033	3822	2693
B 49	2600	2390	2320	3690	3250	2867	2874	3381	2922
Ga 2019	2451	2260	2265	3148	2704	2153	3365	3763	2764
Ky 41A	2377	1988	2135	2979	3192	2564	3095	2969	2662

TABLE 8.—YIELD OF VARIETIES AND HYBRIDS IN THE 1975 BURLEY TOBACCO ON-FARM VARIETY TESTS, POUNDS PER ACRE

Variety	Anderson Co.	Casey Co.	Clay Co.	Daviess Co.	Powell Co.	Pulaski Co.	Rowan Co.	Scott Co.	Taylor Co.	Average
Ky 15	3059	2346	3397	4072	2197	3151	2371	3999	3584	3131
Ky 10	3019	2790	2542	3949	1991	2948	2203	3876	3439	2973
Ky 14	2857	2771	2734	3869	2078	2958	2104	3778	3329	2942
MS B21 x Ky 10	3380	2716	2881	4016	2108	3032	2312	3763	3552	3084
MS B21 x Ky 14	2877	2696	2432	4085	2103	2971	2385	3873	3460	2987
B 49	2415	2468	2332	3488	1905	2017	1812	2923	2500	2429
MS B37 x B 49	2947	2445	3199	3557	1972	2704	2084	3738	2440	2787

TABLE 9.—BURLEY TOBACCO VARIETY TEST 1976, POUNDS PER ACRE

Variety	Rowan Co.	Taylor Co.	Owsley Co.	Clay Co.	Boyle Co.	Pulaski Co.	Daviess Co.	Scott Co.	Adair Co.	Powell Co.	Average
Ky 15	2830	3308	2557	2040	3420	3157	3661	2864	3342	2384	3056
Ky 14	3366	3518	2767	2327	3104	3117	3089	2892	2990	2399	2957
MS B21 x Ky 10	3039	2824	2648	2165	3337	3240	3439	3203	3188	2488	2957
Ky 10	3046	3170	2494	2114	3268	3203	3430	2847	2927	2472	2897
MS B 21 x Ky 14	2913	3164	2661	2316	3112	2988	3323	2975	2922	2400	2877

TABLE 10.—YIELD OF THREE BURLEY TOBACCO VARIETIES TESTED FOR THREE YEARS AT LEXINGTON, PRINCETON, AND IN ON-FARM TESTS, POUNDS PER ACRE

Variety	Lexington '74	Lexington '75	Lexington '76	On Farm* '74	On Farm* '75	On Farm* '76	Princeton '76	Average Years and Locations
Ky 15	3040	3245	3431	3002	3131	3056	2869	3111
Ky 10	2935	3162	3387	3010	2973	2897	2601	2996
B 49	2187	2926	2862	2922	2429	-	2373	2616

*Nine on-farm tests each year

TABLE 11.—YIELD OF BLACK SHANK-RESISTANT VARIETIES TESTED IN 1976 ON BLACK SHANK-INFESTED SOIL, POUNDS PER ACRE

	County						
	Franklin*	Trimble	Scott	Gallatin	Casey	Franklin**	Ave.
Ky 17	3435	3293	2683	2380	2279	2624	2782
B 49	2940	3073	2484	2045	2230	2192	2494
B 11 A	2446	2794	2132	1856	2496	2172	2308
B 37	2086	2336	2216	2150	2540	2100	2238

*Allen Tracey farm

**Wilbert Perkins farm

TABLE 12.—YIELDS OF TWO BLACK SHANK-RESISTANT VARIETIES AND KY 10 TESTED AT LEXINGTON, 1974-76, POUNDS PER ACRE

Variety	1974	1975	1976	Average
Ky 17	2634	3286	3267	3062
B 49	2599	2771	2544	2638
Ky 10	3129	3328	3155	3204

TABLE 13.—YIELD OF NINE BURLEY TOBACCO VARIETIES AND HYBRIDS TESTED ON BLACK ROOT ROT-INFESTED SOIL AND ON DISEASE-FREE SOIL ON THE SAME FARM IN CLINTON COUNTY IN 1971, POUNDS PER ACRE

	B 49	Ky 14	MS Ky 14 x L8	Ky 16	MS Ky 12 x L8	MS B 21 x L8	MS L8 x Ky 14	MS B 37 x L8	MS L8 x Ky 12
Disease-free soil	3429	3326	3062	2800	2685	2606	2584	2574	2547
Infested soil	1863	1988	1726	1273	2067	1872	1833	1619	2019

TABLE 14.—YIELD OF BURLEY TOBACCO VARIETIES AND HYBRIDS TESTED ON BLACK ROOT ROT-INFESTED SOIL IN CLINTON COUNTY IN 1976, POUNDS PER ACRE

Ky 15	Ky 14	Ky 10	MS B 21 x Ky 10
2907	2830	2842	2894

TABLE 15.—YIELD OF BURLEY TOBACCO VARIETIES TESTED ON THE SOILS EXPERIMENTAL PLOT, CAMPBELLSVILLE, IN 1971, POUNDS PER ACRE

Variety	Y/A	Variety	Y/A	Variety	Y/A
Ky 12	3,330	Ky 41 A	3,117	Burley 37	2,971
Ky 9	3,257	Burley 2	3,077	Burley 11 A	2,907
Ky 16	3,239	Ky 14	3,005	Burley 49	2,901
Ky 10	3,206	Burley 1	2,998	Burley 21	2,860
				Burley 11 B	2,742

TABLE 16.—RELATIVE DISEASE AND APHID RESISTANCE OF TOBACCO VARIETIES AND HYBRIDS

Variety	Black Root	Mosaic	Fusarium Wilt	Wildfire	Black Shank	Aphid
			Standard Varieties			
Ky 10	Medium	High	Medium	*	*	*
Ky 12	Med-High	High	High	High	*	*
Ky 14	Med-High	High	High	High	*	*
Ky 15	High	High	Medium	High		
Ky 16	Low	*	*	*	*	**
B 21	Low	High	*	High	*	Med-Low
B 37	Low	*	Low	High	Medium[1]	Med-Low
B 49	High	High	*	High	Medium[1]	**
Ky 17	High	High	High	High	Medium[1]	**
			Hybrids			
MS B 21 x Ky 9	Med-Low	High	*	High	*	**
MS B 21 x Ky 10	Med-Low	High	Low	High	*	Low
MS B 21 x Ky 12	Medium	High	Med-High	High	*	*
MS B 21 x L-8	Med-Low	High	*	High	High[2]	Low
MS L-8 x B 37	Low	High	*	High	High[2]	Low
MS Ky 12 x L-8	Medium	High	Med-High	High	High[2]	*
MS Ky 14 x L-8	Medium	High	Med-High	High	High[2]	*

*Indicates little or no resistance

**Unknown

[1]Resistant to Race 0 and Race 1

[2]Resistant to Race 0

6M---2-78