KENTUCKY BURLEY TOBACCO VARIETY TESTS

1962-68

PROGRESS REPORT 183

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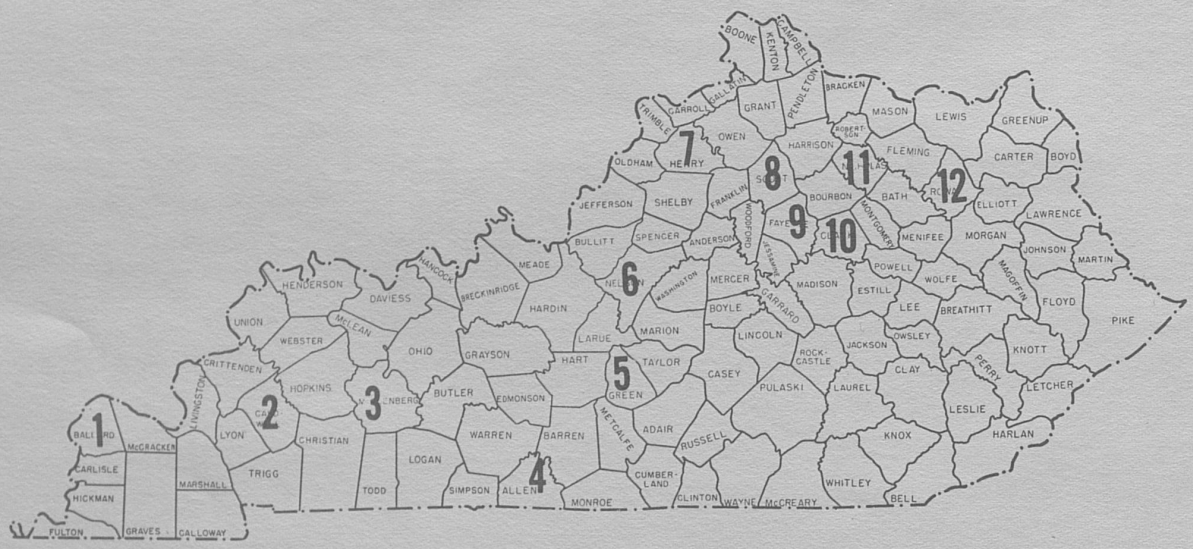

Fig. 1. - Testing Locations Of The Kentucky Burley Tobacco Variety Tests - 1968

Location	Cooperator
1. Ballard County	W. H. Bennett
2. Caldwell County	Homer Mitchell
3. Muhlenbuerg County	B. J. Winn
4. Allen County	Robert Whitlow
5. Green County	Shreve Loy & Sons
6. Nelson County	Thomas E. Gunning
7. Henry County	Alvin Croxton
8. Scott County	Billy Easley
9. Experiment Station, Lexington	-
10. Clark County	F. W. Rickard
11. Nicholas County	Glen Clay
12. Rowan County	Gordon Lewis

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KENTUCKY BURLEY TOBACCO VARIETY TESTS - SUMMARY

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The objective of the Kentucky Burley Tobacco Variety Tests is to provide information on the relative performance of burley varieties, hybrids, and breeding lines. The information on varieties and hybrids may be used by farmers, seedsmen, research workers, and extension personnel as an aid to the selection of the variety or hybrid which performs best in a given area. The tests are part of the University of Kentucky Agricultural Experiment Station program to evaluate new breeding lines as some of these breeding lines provide the basis for varietal release.

METHODS

An expanded program of variety testing began in Kentucky in 1968. Thirty-three varieties, hybrids, and breeding lines were tested at the University of Kentucky Agricultural Experiment Station at Lexington. In addition, tests were conducted on the farms of 11 cooperating tobacco growers throughout the state. The locations (Fig. 1) were selected to best represent the burley tobacco producing areas of Kentucky.

Each test was conducted on a disease-free soil and consisted of 15 entries in 1/50 acre plots replicated 3 times. Fertilizer was applied to each plot at the recommended rates based on soil tests. Some of the varieties were tested in all locations, but all tests did not contain the same varieties.

RESULTS AND RECOMMENDATIONS

A summary of the performance of eight of the more widely grown standard varieties and hybrids is given in Table 1. These were grown at five locations in 1968, two locations in 1965-67, and one location in 1964.

The relative performance of the Black Shank resistant varieties and hybrids is given in Table 2. Burley 37 (B 37), male sterile B 37 (MS B 37) x L-8, and male sterile Burley 21 (MS B 21) x L-8 were grown at five locations in 1968, and at two locations in 1964-67. The tests in 1964-67 also included male sterile Ky 12 (MS Ky 12) x L-8.

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 as well

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at others. For example, in 1968 in Caldwell county, Ky 10 yielded 350 pounds per acre more than Ky 14, but in Rowan county, Ky 14 yielded 375 pounds per acre more than Ky 10 (Table 3). Also note that the varieties do not always perform the same, relative to each other, year after year at the same location. For example, at the West Kentucky Substation in 1965, Ky 10 yielded 206 pounds per acre more than Ky 14, but in 1967 Ky 14 yielded 167 pounds per acre more than Ky 10 (Tables 2 and 5). The average yield for Ky 14 for the 12 locations was 3,095 pounds per acre, while that of Ky 10 was 2,955 pounds per acre.

In selecting the best variety for a given situation, an important point for consideration is that of disease. If diseases are a factor, selection of the proper variety may mean the difference between a good yield of desirable tobacco or a crop failure. Table 4 gives the degree of resistance to diseases of the more important standard varieties and hybrids tested in Kentucky.

For land infested with black root rot or fusarium wilt (or both), Ky 14 or Ky 12 is recommended. If wildfire is a problem, Ky 14, Ky 12, or Burley 21 (B 21) is recommended.

Black shank is one of the hardest tobacco diseases to control without reducing potential yield. The best control is to eliminate the organism from the farm by long-cycle rotation and good sanitation practices. If, however, sufficient land is not available for crop rotation or if rotation does not conrol 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 B 37 and Burley 49 (B 49) are moderately resistant to both races, but they have other disadvantages. Both varieties have a low level of resistance to fusarium wilt, and B 37 is susceptible to mosaic. B 49 is late maturing and has relatively small leaves. However, if it is necessary to use a field infested with black shank and it is not known which race is present, then the use of B 37 or B 49 is a safeguard against a crop failure.

To determine which race of the black shank organism is present in a field, try a stick row test of one of the L-8 hybrids such as MS Ky 12 x L-8 or MS B 21 x L-8. If these hybrids do not become diseased, this means that race 0 is present, and the next year the entire field can be grown in one of the black shank resistant hybrids.

The choice of which black shank resistant hybrid to grow for the control of race should be based on other disease resistances needed. For example, MS Ky 12 x L-8 is resistant to the major diseases; mosaic, fusarium wilt, black root rot, and wildfire, as well as race 0 of the black shank fungus.

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 12

Ky 12 is a stand-up type, high-yielding variety with fair-to-good quality. It has shorter leaves than other varieties, but there are more of them. The leaves will be longer if plants are topped early (when half of the plants are in bloom) and to 22-25 leaves per plant. It is a late-maturing variety that is most useful where severe black root rot and fusarium wilt are problems.

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, thin, 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 as wide. Yields of B 49 are about the same as those of B 37, but it matures later than B 37. (Use B 49 only where black shank and black root rot are problems.)

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. Seed producers have used the 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 differences in reciprocal crosses in the burley hybrids have been found.

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. MS Ky 12 x L-8 should be more useful than MS B 21 x L-8 where black root rot or fusarium wilt is a problem.

A hybrid may have a lower degree of resistance to a certain disease than the more resistant parent. For example, the MS B 21 - Ky 10 hybrid will have less black root rot resistance than Ky 10.

Table 1. Yield (pounds per acre) of eight burley tobacco varieties and hybrids tested at five locations in 1968 at Lexington 1964-1968, and at Princeton 1965-1967

Location	Year	B 21	Ky 9	Ky 10	Ky 12	Ky 14	MS B 21 x Ky 9	MS B 21 x Ky 10	MS B 21 x Ky 12
Allen Co.	1968	3175	3367	3217	3250	3458	3333	3292	3400
Green Co.	1968	2859	3316	3177	2903	3257	3269	3192	3189
Nelson Co.	1968	3404	3154	3488	3910	3737	3458	3550	3492
Henry Co.	1968	2808	2721	2704	2333	2946	2834	3088	2817
Lexington	1968	3012	2975	2821	2971	2940	2810	2910	3036
Average	1968	3052	3107	3081	3073	3268	3141	3206	3187
Lexington	1968	3012	2975	2821	2971	2940	2810	2910	3036
"	1967	2590	2770	2953	2792	2946	2635	2926	2968
"	1966	2439	2620	2806	2870	2955	2620	2721	2844
"	1965	1808	1711	1724	1510	1799	1975	1933	1694
"	1964	2237	2547	2534	2515	2532	2543	2499	2385
Lexington	1964-1968	2417	2525	2568	2532	2634	2517	2598	2585
Princeton	1967	3118	3263	3383	2866	3550	3456	3510	3148
"	1966	2473	2361	2738	2402	2654	2778	2496	2566
"	1965	1896	2109	2111	1930	1905	2092	2084	2030
Princeton	1965-1967	2496	2578	2744	2399	2705	2775	2697	2581
Average of 12 Variety Tests	1964-1968	2652	2743	2805	2688	2890	2817	2850	2797

Table 2. Yield (pounds per acre) of Black Shank Resistant Burley Tobacco Varieties and Hybrids tested at five locations in 1968 at Lexington 1964-1968, and at Princeton 1964-1967

Location	Year	B 37	MS B 37 x L-8	MS B 21 x L-8	MS Ky 12 x L-8
Allen Co.	1968	2888	3100	3208	--
Nelson Co.	1968	3055	3096	3367	--
Scott Co.	1968	2385	2655	2640	--
Lexington	1968	2433	2895	3060	2746
Rowan Co.	1968	1675	2179	2292	--
Average	1968	2487	2785	2913	--
Lexington	1968	2433	2895	3060	2746
"	1967	2377	2343	2453	2655
"	1966	2232	2056	2132	2514
"	1965	1639	1767	1794	1817
"	1964	2277	2394	2170	2485
Lexington	1964-1968	2192	2291	2322	2443
Princeton	1967	3182	3252	3384	3299
"	1966	2074	2374	2379	2565
"	1965	1763	1972	1940	1909
"	1964	2265	2385	2319	2796
Princeton	1964-1967	2321	2496	2506	2642
Average of 13 Variety Tests	1964-1968	2327	2498	2549	--

Table 3. Yield (pounds per acre) of varieties and hybrids in the 1968 Burley Tobacco Variety Tests

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
Ky 16	2801	2846	2708	----	----	----	----	----	2555	----	2725	----
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	----	----	----
MS B 21 x Ky 16	----	2872	----	----	----	----	----	----	2514	----	----	----
VA 509	----	----	----	----	----	----	----	----	2970	----	----	----
B 49	----	----	----	----	----	----	----	----	2536	----	----	----

---- (not planted)

Table 4. Relative disease and aphid resistance of tobacco varieties and hybrids.

Variety	Black Root Rot	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 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]	**
			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 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]	*

* Indicates little or no resistance
** Unknown

[1] Resistant to Race 0 and Race 1.
[2] Resistant to Race 0.

Table 5. Yield (pounds per acre) of varieties and hybrids in the Burley Tobacco Variety Tests, University of Kentucky, Agricultural Experiment Station, Lexington and University of Kentucky Agricultural Experiment Substation, Princeton, 1962-1967

Variety	Lexington 1967	Princeton 1967	Lexington 1966	Princeton 1966	Lexington 1965	Princeton 1965	Lexington 1964	Princeton 1964	Lexington 1963	Average 5 locations 1962
B 21	2590	3118	2439	2473	1808	1896	2239	----	2358	2596
Ky 10	2953	3383	2806	2738	1724	2111	2534	----	2776	2700
Ky 12	2792	2866	2870	2402	1510	1930	2515	----	2645	2710
Ky 14	2946	3550	2955	2659	1799	1905	2532	2547	2701	----
Ky 9	2770	3263	2620	2361	1711	2109	2547	----	2509	2782
B 37	2377	3182	2232	2074	1639	1763	2277	2265	2092	2392
B 49	2408	3114	2208	2126	1160	1789	2293	----	----	----
MS B 21 x Ky 9	2635	3456	2620	2778	1995	2092	2543	2596	----	2708
MS B 21 x Ky 12	2968	3148	2844	2566	1644	2030	2385	2747	2495	2662
MS B 21 x Ky 10	2926	2844	2921	2496	1933	2034	2499	2637	2546	----
MS B 21 x L-8	2453	3384	2132	2379	1794	1940	2170	2319	2015	----
MS Ky 12 x L-8	2655	3299	2514	2565	1817	1909	2485	2796	----	----
MS B 37 x L-8	2343	3252	2056	2374	1767	1972	----	----	----	----