PROGRESS REPORT 200

KENTUCKY BURLEY TOBACCO VARIETY TESTS 1964-70

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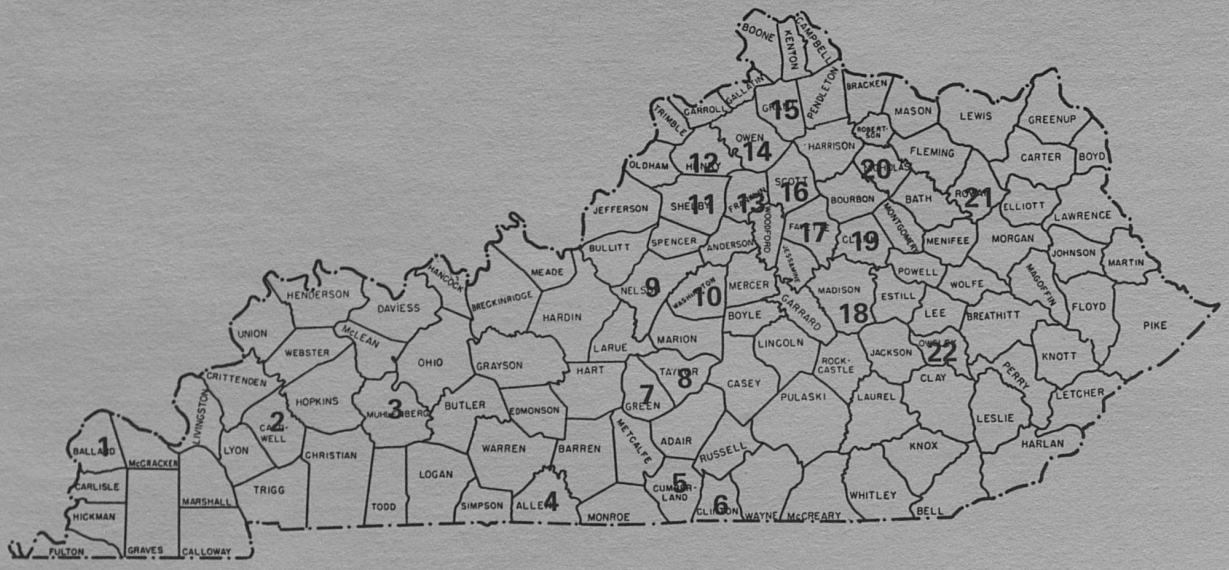

Fig. 1 - Testing Locations of the Kentucky Burley Tobacco Variety Tests - 1968,1969, and 1970

Location	Cooperator
1. Ballard County	Wyatt H. Bennett, 1968
2. Caldwell County	Homer Mitchell, 1968, 1969, and 1970
3. Muhlenberg County	B. J. Winn, 1968
4. Allen County	Robert Whitlow, 1968, 1969, and 1970
5. Cumberland County	Charlie Wilson, 1969 and 1970
6. Clinton County	Riley Combest, 1970
7. Green County	Shreve Loy & Sons, 1968 and 1969
8. Taylor County	Tommy Noe, 1970
9. Nelson County	Thomas E. Gunning, 1968
10. Washington County	Joe Cleveland, 1969
11. Shelby County	Louis Payne, 1969
12. Henry County	Alvin Croxton, 1968 Gerald T. Steverson, 1969
13. Franklin County	Carey Sheets, 1969
14. Owen County	Billy Karsner, 1969
15. Grant County	Clarence P. Hutchinson, 1970
16. Scott County	Billy Easley, 1968
17. Experiment Station, Lexington	1968, 1969, and 1970
18. Madison County	James M. Adams, 1969
19. Clark County	F. W. Rickard, 1968
20. Nicholas County	Glen Clay, 1968, 1969, and 1970
21. Rowan County	Gordon Lewis, 1968 and 1969
22. Owsley County	Edward Harvey, 1970

KENTUCKY BURLEY TOBACCO VARIETY TESTS - SUMMARY[1]

1964-70

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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 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 which may become candidates for varietal release.

METHODS

An expanded program of variety testing began in Kentucky in 1968. In addition to the tests at the University of Kentucky Agricultural Experiment Station at Lexington, others were conducted on the farms of 11 cooperating tobacco growers throughout the state in 1968, 12 locations in 1969, and 6 locations in 1970. The locations (Fig. 1, p. 2) were selected to represent the burley tobacco producing areas of Kentucky.

With one exception, each test was conducted on a disease-free soil and consisted of 15 entries in 1968, 13 entries in 1969, and 6 entries in 1970 in 1/50-acre plots replicated three times. Fertilizer was applied to each plot at the recommended rates based on soil tests. In 1968, 33 varieties, hybrids, and breeding lines were tested. Some were tested at all locations, but all tests did not contain the same varieties. In 1969 and 1970, with a few exceptions, all tests consisted of the same entries.

RESULTS AND RECOMMENDATIONS

A summary of the yield performance of five of the more widely grown standard varieties and hybrids is given in Table 1. Average yields are shown on tests conducted at Lexington in 1964-70, at Princeton 1965-67, and in on-farm tests at four locations in 1968, nine locations in 1969, and six locations in 1970.

Average yields are shown for tests conducted at Lexington 1965-68, at Princeton 1965-67, in on-farm tests at four locations in 1968, 10 locations in 1969, and six locations in 1970 (Table 2). Also included in Table 2 are yields for Lexington in 1970 and yields of these varieties and hybrids grown in 1969 and in 1970 on a black shank infested soil. Yields are shown for 1968, 1969, and 1970 on-farm tests in Tables 3, 4, and 5, respectively.

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[1]Cooperative investigations of the Kentucky Agricultural 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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Table 1. Yield (pounds per acre) of five burley tobacco varieties and hybrids tested at Lexington 1964-70, at Princeton 1965-67, and in on-farm tests at four locations in 1968, nine locations in 1969, and six locations in 1970.

Location	Year	B 21	Ky 10	Ky 12	Ky 14	MS B 21 x Ky 10
Lexington	1964-1970	2500	2665	2640	2691	2656
Princeton	1965-1967	2496	2744	2399	2705	2697
On-Farm Tests	1968	3062	3146	3099	3350	3280
On-Farm Tests	1969	2641	3103	2827	3176	2924
On-Farm Tests	1970	----	3217	----	3177	3265

Table 2. Yield (pounds per acre) of black shank resistant burley tobacco varieties and hybrids and Ky 14 tested on disease-free soil at Lexington 1965-1968, at Lexington 1970, at Princeton 1965-1967, and in on-farm tests at four locations in 1968, ten locations in 1969, and six locations in 1970, and on black shank infested soil at one location in 1969 and 1970.

Location	Year	B 37	MS B 37 x L-8	MS B 21 x L-8	MS KY 12 x L-8	Ky 14
Lexington	1965-1968	2170	2265	2335	2432	2660
Lexington	1970	2524	2705	2725	----	2845
Princeton	1965-1967	2340	2533	2568	2591	2705
On-Farm Tests	1968	2501	2758	2877	----	3160
On-Farm Tests	1969	2609	2875	2962	3022	3202
On-Farm Tests	1970	----	----	----	3102	3177
Cumberland Co. (Black Shank Infested Soil)	1969	2537	3100	3124	3092	893
	1970	2608	2779	2842	2673	746

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
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 4. Yield (pounds per acre) of varieties and hybrids in the 1969 Burley Tobacco Variety Tests

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 5. Yield (pounds per acre) of varieties and hybrids in the 1970 Burley Tobacco Variety Tests

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	----

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 at others. However, varieties do not always perform the same, relative to each other, year after year at the same 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 they are a factor, selection of the proper variety may mean the difference between a good yield of desirable tobacco or a crop failure. The degree of resistance of the more important standard varieties and hybrids to diseases is shown in Table 6.

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

Black shank is one of the hardest 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) 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 black shank organism is present in a field, grow a stick row 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, 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 0 should be based on other disease resistances needed. For example, MS Ky 12 x L-8 is resistant to 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 (hair root). It matures 7-10 days later than B 21 and, when cut immature, the leaves tend to cure with green spots.

Table 6. 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 16	Low	*	*	*	*	**
B 21	Low	High	*	High	*[1]	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

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, which is not reported here, is moderately resistant to both races of black shank. It is a stand-up type, fair yielding, good quality, broad-leaf, uniformly maturing variety.

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 x Ky 10 hybrid has less black root rot resistance than Ky 10.

5M---2-72