A BURLEY TOBACCO VARIETY MANAGEMENT STUDY

ON FIVE KENTUCKY FARMS IN 1966

By J.H.Smiley, W.O.Atkinson, A.M.Wallace and I.E.Massie • Progress Report 171

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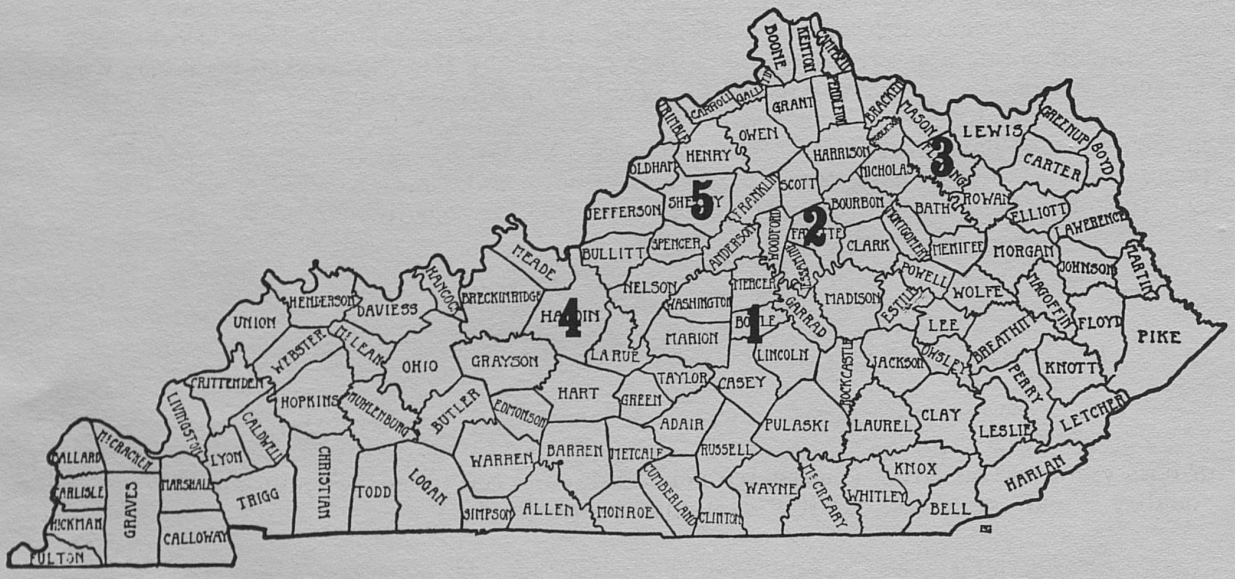

FARM LOCATIONS WHERE THE BURLEY TOBACCO VARIETY-MANAGEMENT STUDY WAS CONDUCTED IN 1966.

Location	County	Cooperator
1	Boyle	William Balden
2	Fayette	Robert Woods
3	Fleming	Roy Gray
4	Hardin	Ray Mackey
5	Shelby	Louis Payne

Acknowledgment:

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The small price differential in respect to quality of burley tobacco has given growers little incentive to produce leaf of the best quality. Instead, they have emphasized yield, apparently believing that the value of their increased poundage will more than compensate for any possible reduction in value per pound. A number of cultural practices generally accepted as being favorable for the production of good quality tobacco have, therefore, been changed. Nitrogen fertilization and plant populations have been increased, topping and harvesting times have been advanced, and sucker growth has been eliminated by chemical treatments.

OBJECTIVES AND METHODS

The objectives of this study were:

(1) To investigate the desirability of two management systems emphasizing a) yield and b) quality, and a third system c) aimed at achieving an acceptable level of both yield and quality. (These are hereafter referred to as the "high yield," "quality," and "yield and quality" systems, respectively.)

(2) To determine the effects of these management systems on the chemical and physical characteristics of the cured leaf and its usefulness to the tobacco industry.

Two varieties, Burley 21 and Ky 10, were grown under the three management systems, outlined in Table 1 (page 5), in 1/4 acre non-replicated plots at five locations in Kentucky. A three-year or older sod was selected at each location. Phosphorus and potassium were applied in all systems at rates based on soil tests. Applications were sufficiently large that these elements would not be limiting factors in plant growth.

Leaf produced under each management system was stripped into three or four farm grades which were displayed, under code, at a Lexington market in January 1967. Before sale of the tobacco, personnel from each of the six cooperating tobacco companies evaluated it, using a numerical rating of 0-4 with 0 = very poor and 4 = very good. Samples for determining filling values and for cigarette manufacture and chemical analysis were taken by randomly selecting five hands from each grade of each treatment. The five hands were kept in plastic bags until stemmed, after which the samples for chemical analysis were dried and ground to pass a 1 millimeter screen, then split into six 50-gram samples for mailing to the cooperating laboratories. (Owing to the variation in size of hands from different farms, there was not enough leaf for chemical analysis of samples representing all grades; consequently the leaf from only three farms is reported upon for chemical analysis.) The tobacco was then graded and sold in the normal way. The per acre values were computed using the actual selling price of each lot of tobacco. The per acre values and yields, values per hundred pounds, chemical data, and other measurements are shown in the tables, beginning on page

RESULTS

The "yield and quality" system resulted in the production of 121 pounds of leaf per acre more than from the "high-yield" system, and the yield from the "quality" system was much lower (Table 2). Ky 10 out-yielded Bur 21 by 306, 232, and 166 pounds per acre for the "quality," "yield and quality," and "high yield" systems, respectively. Values, expressed as dollars per 100 pounds, were slightly, but consistently, higher for variety Bur 21 and differed very slightly between management systems (Table 3). Acre values were in the same order as were yields and were always higher for Ky 10 (Table 4).

Average leaf appraisal values show that the "quality" system produced tobacco considered to be of better quality than did either the "high yield" or the "yield and quality" system, and Bur 21 was rated higher than Ky 10 in two of the three management systems (Table 5). Wide variations in quality of leaf were noted for locations and among companies (Table 6).

With the exception of total alkaloids, nitrogenous constituents were highest in cured leaf from the "high-yield" system and lowest in the "quality" system. Total alkaloids differed in that the highest concentration of alkaloids occurred in the "yield and quality" system and the lowest concentration was in leaf from the "high yield" system (Tables 7-12). There appeared to be a tendency for nitrogenous constituents to be higher in Ky 10 than in Bur 21 in the "high yield" system and "quality" system and lower in the "yield and quality" system.

Total ash and phosphorus concentration in the leaf varied little with respect to management or variety (Tables 13, 19). Potassium concentration was lowest in leaf from the "quality" system, and differed little between the others; in two of the three treatments, potassium concentration was higher in Bur 21 than in Ky 10 (Table 16). Similar trends were apparent for alkalinity number of the water-soluble ash (Table 15). Calcium concentration was lowest in leaf from the "high yield" system and highest in leaf from the "quality" system; just the reverse was the situation for magnesium, and there was no real varietal effect apparent for either constituent (Tables 17, 18). Manganese was present in higher amounts in leaf from the "high yield" (Table 20), which undoubtedly was related to lower soil pH resulting from high nitrogen fertilization.

Filling values, expressed as the volume occupied by a certain weight of shredded tobacco at a specified moisture content and under a standard pressure, were highest for leaf from the "quality" system and nearly the same for the other treatments. There was a tendency for Bur 21 to have the highest filling value (Table 21). Moisture equilibrium was not greatly affected by any variable in the study (Table 22).

It is important to note that these results and observations are based on one year's data; this experiment must be conducted for at least two more years before any definite conclusions can be drawn.

Table 1. — Farm Practices Employed in the 1966 Kentucky Burley Variety-Management Study

Practice	Management Systems		
	"High Yield"	"Yield and Quality"	"Quality"
Lb N/A	320	160	80
Plant spacing	40" x 12"	40" x 16"	40" x 20"
Topped at	Early flower	50% full flower	75% full flower
Suckering method	MH-30 (1 gal/A)	MH-30 (1 gal/A)	Hand
Maturity at harvest	Very immature[1/]	Slightly immature[2/]	Ripe[3/]

[1/] Harvested when only bottom leaves were yellow.
[2/] Harvested when bottom and middle leaves were yellow.
[3/] Harvested when whole plant was yellow.

Table 2. — Yields (pounds per acre)

Variety	County					
	Shelby	Fayette	Boyle	Fleming	Hardin	Average
			"High Yield"			
Bur 21	2,968	2,880	2,632	3,088	2,592	2,832
Ky 10	3,096	3,480	2,720	3,200	2,496	2,998
Average	3,032	3,180	2,676	3,144	2,544	2,915
			"Yield and Quality"			
Bur 21	2,920	3,088	2,600	3,256	2,736	2,920
Ky 10	3,128	3,832	2,600	3,046	3,152	3,152
Average	3,024	3,460	2,600	3,151	2,944	3,036
			"Quality"			
Bur 21	2,312	2,880	1,928	2,536	1,944	2,320
Ky 10	2,792	3,416	2,128	2,896	1,896	2,626
Average	2,552	3,148	2,028	2,716	1,920	2,473
			Average			
Bur 21	2,733	2,949	2,387	2,960	2,424	2,691
Ky 10	3,005	3,576	2,483	3,047	2,515	2,925
Average	2,869	3,262	2,435	3,004	2,469	2,808

Table 3. — Values (dollars per hundred pounds)

Variety	County					
	Shelby	Fayette	Boyle	Fleming	Hardin	Average
			"High Yield"			
Bur 21	70.45	70.49	67.36	65.67	67.86	68.36
Ky 10	67.22	70.63	67.65	63.38	66.99	67.24
Average	68.80	70.57	67.48	64.50	67.45	67.79
			"Yield and Quality"			
Bur 21	69.97	68.94	68.31	64.28	68.31	67.88
Ky 10	67.93	71.50	67.62	61.52	67.77	67.42
Average	68.92	70.45	67.98	62.96	68.00	67.61
			"Quality"			
Bur 21	71.28	71.60	66.86	65.93	68.11	68.92
Ky 10	69.63	69.41	65.23	63.98	67.04	67.21
Average	70.38	70.39	65.98	64.87	67.60	68.01
			Average			
Bur 21	70.51	70.33	67.57	65.24	68.11	68.34
Ky 10	68.22	70.55	66.94	62.95	67.32	67.29
Average	69.33	70.45	67.23	64.08	67.72	67.81

Table 4. — Values (dollars per acre)

Variety	County					
	Shelby	Fayette	Boyle	Fleming	Hardin	Average
			"High Yield"			
Bur 21	2,091	2,030	1,773	2,028	1,759	1,936
Ky 10	2,081	2,458	1,840	2,028	1,672	2,016
Average	2,086	2,244	1,806	2,028	1,716	1,976
			"Yield and Quality"			
Bur 21	2,043	2,129	1,776	2,093	1,869	1,982
Ky 10	2,125	2,740	1,758	1,874	2,136	2,127
Average	2,084	2,434	1,767	1,984	2,002	2,054
			"Quality"			
Bur 21	1,648	2,062	1,289	1,672	1,324	1,599
Ky 10	1,944	2,371	1,388	1,853	1,271	1,765
Average	1,796	2,216	1,338	1,762	1,298	1,682
			Average			
Bur 21	1,927	2,074	1,613	1,931	1,651	1,839
Ky 10	2,050	2,523	1,662	1,918	1,693	1,969
Average	1,989	2,298	1,637	1,925	1,672	1,904

Table 5. — Industry Evaluation* (treatments by locations)

	Systems						
	"High Yield"		"Yield and Quality"		"Quality"		
County	B 21	Ky 10	B 21	Ky 10	B 21	Ky 10	Av.
Shelby	1.09	0.71	1.04	1.12	1.97	1.16	1.18
Fayette	1.57	1.25	0.49	0.92	1.22	1.14	1.10
Boyle	0.99	1.04	1.05	1.31	1.36	0.56	1.05
Fleming	0.46	0.00	0.15	0.07	0.73	0.86	0.38
Hardin	1.61	0.80	1.30	0.68	2.09	1.53	1.34
Average	1.14	0.76	0.81	0.82	1.47	1.05	

* 0 = Very poor; 1 = poor; 2 = fair; 3 = good; 4 = very good

Table 6. — Industry Evaluation* (location by companies)

	County					
Company	Shelby	Fayette	Boyle	Fleming	Hardin	Average
1	1.10	1.20	1.27	0.36	1.50	1.09
2	0.68	1.07	0.85	0.22	1.52	0.86
3	1.89	1.81	2.02	0.58	1.02	1.46
4	1.94	1.82	1.84	0.95	2.22	1.75
5	0.00	0.00	0.00	0.00	1.46	0.29
6	1.48	0.67	0.32	0.17	0.29	0.59
Average	1.18	1.10	1.05	0.38	1.34	1.01

* 0 = very poor; 1 = poor; 2 = fair; 3 = good; 4 = very good

Table 7. — Chemical Analysis of Cured Leaf: Percent Total Nitrogen

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	4.23	4.20	4.03	
		2	5.11	4.36	4.47	
		3	5.28	5.20	5.20	
		4	-	5.06	5.59	
		Wt'd Av	4.65	4.71	4.87	4.75
	Ky 10	1	4.41	4.34	4.18	
		2	5.35	4.62	4.58	
		3	5.38	5.15	5.24	
		4	-	5.45	5.54	
		Wt'd Av	4.82	4.98	4.88	4.88
"Yield and Quality"	B-21	1	4.09	4.33	3.64	
		2	4.94	4.45	5.06	
		3	5.08	5.12	5.10	
		4	-	5.00	5.20	
		Wt'd Av	4.50	4.74	4.89	4.71
	Ky 10	1	4.04	3.93	3.96	
		2	4.42	4.31	4.35	
		3	5.10	4.94	5.44	
		4	-	5.04	5.48	
		Wt'd Av	4.41	4.50	4.73	4.54
"Quality"	B-21	1	3.46	3.78	3.06	
		2	4.52	3.85	3.53	
		3	4.55	4.01	4.41	
		4	-	4.29	4.88	
		Wt'd Av	4.06	3.98	4.07	4.04
	Ky 10	1	3.96	4.13	3.42	
		2	4.70	4.18	3.46	
		3	4.52	4.06	3.90	
		4	-	4.49	4.72	
		Wt'd Av	4.37	4.19	3.89	4.15
Wt'd Av	B-21		4.40	4.53	4.65	4.53
	Ky 10		4.54	4.50	4.52	4.52

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 8. — Chemical Analysis of Cured Leaf: Percent Total Alkaloids

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	3.55	3.31	2.21	
		2	4.39	3.40	2.69	
		3	3.74	2.87	3.57	
		4	-	2.07	3.41	
		Wt'd Av	3.80	2.87	3.01	3.24
	Ky 10	1	3.67	2.85	2.39	
		2	4.75	4.10	3.34	
		3	4.11	3.93	3.75	
		4	-	2.69	3.93	
		Wt'd Av	3.99	3.41	3.41	3.63
"Yield and Quality"	B-21	1	2.88	3.63	2.12	
		2	5.17	4.84	3.39	
		3	4.73	4.56	3.56	
		4	-	3.08	3.39	
		Wt'd Av	3.88	4.03	3.23	3.68
	Ky 10	1	3.36	2.57	3.33	
		2	4.67	3.66	3.30	
		3	4.69	3.77	3.13	
		4	-	2.26	3.34	
		Wt'd Av	4.18	3.26	3.29	3.66
"Quality"	B-21	1	3.53	2.59	2.14	
		2	4.67	3.41	2.91	
		3	4.10	3.21	3.31	
		4	-	2.87	3.29	
		Wt'd Av	4.06	3.02	3.04	3.45
	Ky 10	1	3.79	2.83	2.61	
		2	4.51	4.55	3.31	
		3	4.11	3.89	3.36	
		4	-	4.20	3.22	
		Wt'd Av	4.11	3.78	3.18	3.68
Wt'd Av	B-21		3.91	3.31	3.09	3.45
	Ky 10		4.09	3.48	3.29	3.65

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 9.— Chemical Analysis of Cured Leaf: Percent Nitrate Nitrogen

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	0.75	1.39	1.14	
		2	0.65	0.58	0.86	
		3	0.37	0.76	0.71	
		4	-	0.51	0.68	
		Wt'd Av	0.65	0.73	0.82	0.74
	Ky 10	1	0.91	1.34	1.14	
		2	0.45	0.97	1.05	
		3	0.32	0.83	0.74	
		4	-	0.40	0.49	
		Wt'd Av	0.69	0.82	0.87	0.79
"Yield and Quality"	B-21	1	0.96	0.81	1.03	
		2	0.39	0.69	0.79	
		3	0.37	0.51	0.52	
		4	-	0.26	0.48	
		Wt'd Av	0.69	0.55	0.70	0.66
	Ky 10	1	0.73	0.93	1.00	
		2	0.31	0.66	0.76	
		3	0.21	0.40	0.67	
		4	-	0.36	0.40	
		Wt'd Av	0.45	0.61	0.70	0.57
"Quality"	B-21	1	0.36	0.94	0.58	
		2	0.26	0.63	0.37	
		3	0.17	0.45	0.67	
		4	-	0.41	0.35	
		Wt'd Av	0.29	0.61	0.48	0.43
	Ky 10	1	0.54	1.16	0.61	
		2	0.17	0.68	0.36	
		3	0.09	0.30	0.38	
		4	-	0.42	0.18	
		Wt'd Av	0.27	0.68	0.36	0.40
Wt'd Av	B-21		0.55	0.63	0.68	0.62
	Ky 10		0.48	0.71	0.65	0.60

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 10.— Chemical Analysis of Cured Leaf: Percent Protein Nitrogen

System	Variety	Stalk Position*	County: Fayette	County: Boyle	County: Fleming	Weighted Average
"High Yield"	B-21	1	1.51	1.41	1.34	
		2	1.50	1.49	1.44	
		3	1.62	1.72	1.39	
		4	-	1.78	1.61	
		Wt'd Av	1.53	1.61	1.46	1.53
	Ky 10	1	1.48	1.50	1.58	
		2	1.58	1.53	1.51	
		3	1.58	1.73	1.53	
		4	-	1.77	1.76	
		Wt'd Av	1.52	1.66	1.59	1.58
"Yield and Quality"	B-21	1	1.50	1.65	1.40	
		2	1.34	1.64	1.48	
		3	1.60	1.61	1.40	
		4	-	1.74	1.61	
		Wt'd Av	1.46	1.66	1.48	1.52
	Ky 10	1	1.44	1.57	1.46	
		2	1.29	1.53	1.38	
		3	1.54	1.66	1.48	
		4	-	1.82	1.63	
		Wt'd Av	1.40	1.61	1.47	1.47
"Quality"	B-21	1	1.31	1.62	1.52	
		2	1.34	1.61	1.42	
		3	1.47	1.56	1.49	
		4	-	1.60	1.72	
		Wt'd Av	1.35	1.60	1.52	1.47
	Ky 10	1	1.36	1.78	1.44	
		2	1.31	1.51	1.26	
		3	1.43	1.59	1.36	
		4	-	1.62	1.58	
		Wt'd Av	1.37	1.64	1.40	1.44
Wt'd Av	B-21		1.45	1.63	1.49	1.51
	Ky 10		1.43	1.64	1.49	1.50

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 11.— Chemical Analysis of Cured Leaf: Percent Alpha Amino Nitrogen

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	0.464	0.300	0.267	
		2	0.770	0.625	0.685	
		3	1.026	1.001	0.964	
		4	-	1.080	1.084	
		Wt'd Av	0.645	0.784	0.791	0.739
	Ky 10	1	0.521	0.283	0.213	
		2	0.969	0.509	0.603	
		3	1.063	0.730	0.864	
		4	-	1.062	1.020	
		Wt'd Av	0.732	0.702	0.694	0.710
"Yield and Quality"	B-21	1	0.403	0.377	0.246	
		2	0.867	0.447	0.889	
		3	0.798	0.853	1.126	
		4	-	0.869	0.979	
		Wt'd Av	0.608	0.648	0.859	0.714
	Ky 10	1	0.367	0.308	0.241	
		2	0.686	0.521	0.584	
		3	0.999	0.774	1.073	
		4	-	0.766	1.246	
		Wt'd Av	0.629	0.576	0.760	0.660
"Quality"	B-21	1	0.329	0.201	0.169	
		2	0.755	0.242	0.345	
		3	0.774	0.397	0.539	
		4	-	0.602	0.851	
		Wt'd Av	0.573	0.357	0.505	0.498
	Ky 10	1	0.419	0.213	0.267	
		2	0.802	0.356	0.341	
		3	0.753	0.446	0.489	
		4	-	0.581	0.859	
		Wt'd Av	0.648	0.378	0.500	0.531
Wt'd Av	B-21		0.608	0.623	0.734	0.659
	Ky 10		0.668	0.569	0.655	0.639

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 12. — Chemical Analysis of Cured Leaf: Percent Total Nitrogen Soluble

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	64.3	66.4	66.7	
		2	70.6	65.8	67.8	
		3	69.3	66.9	73.3	
		4	-	64.8	71.2	
		Wt'd Av	66.8	65.8	69.8	67.6
	Ky 10	1	66.4	65.4	62.2	
		2	70.5	66.9	67.0	
		3	70.6	66.4	70.8	
		4	-	67.5	68.2	
		Wt'd Av	68.2	66.7	67.3	67.5
"Yield and Quality"	B-21	1	63.3	61.9	61.5	
		2	72.9	63.1	70.8	
		3	68.5	68.6	72.5	
		4	-	65.2	69.0	
		Wt'd Av	67.1	64.7	69.3	67.3
	Ky 10	1	64.4	60.0	63.1	
		2	70.8	64.5	68.3	
		3	69.8	66.4	72.8	
		4	-	63.9	70.2	
		Wt'd Av	68.1	63.9	68.5	67.2
"Quality"	B-21	1	62.1	57.1	50.3	
		2	70.4	58.2	59.8	
		3	67.7	61.1	66.2	
		4	-	62.7	64.8	
		Wt'd Av	66.3	59.7	61.9	63.2
	Ky 10	1	65.6	56.9	57.9	
		2	72.1	63.9	63.6	
		3	68.6	60.8	65.1	
		4	-	63.9	66.5	
		Wt'd Av	68.6	60.9	63.8	65.0
Wt'd Av	B-21		66.8	64.7	67.3	66.4
	Ky 10		68.3	64.1	66.6	66.7

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 13.— Chemical Analysis of Cured Leaf: Percent Total Ash

System	Variety	Stalk Position*	County Fayette	County Boyle	County Fleming	Weighted Average
"High Yield"	B-21	1	21.3	27.3	28.3	
		2	19.7	21.8	21.3	
		3	16.4	20.0	19.8	
		4	-	18.9	18.9	
		Wt'd Av	20.0	21.5	21.4	20.9
	Ky 10	1	21.7	28.5	27.3	
		2	18.0	22.3	21.3	
		3	17.3	20.2	19.1	
		4	-	17.4	18.1	
		Wt'd Av	20.0	21.3	21.0	20.7
"Yield and Quality"	B-21	1	22.5	23.9	29.0	
		2	19.2	20.6	20.1	
		3	19.4	18.5	19.4	
		4	-	14.6	18.5	
		Wt'd Av	21.0	19.0	20.9	20.4
	Ky 10	1	17.5	26.6	28.2	
		2	19.4	22.8	22.1	
		3	17.0	18.8	19.2	
		4	-	16.9	18.2	
		Wt'd Av	18.2	21.8	21.8	20.3
"Quality"	B-21	1	23.2	25.2	25.3	
		2	18.5	22.2	21.6	
		3	17.8	21.8	21.6	
		4	-	21.3	18.6	
		Wt'd Av	20.4	22.6	21.3	21.2
	Ky 10	1	22.9	25.5	25.6	
		2	17.8	21.8	21.5	
		3	16.4	21.8	20.1	
		4	-	21.3	17.9	
		Wt'd Av	19.1	22.9	20.9	20.6
Wt'd Av	B-21		20.5	20.9	21.2	20.8
	Ky 10		19.1	21.9	21.3	20.5

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 14. — Chemical Analysis of Cured Leaf: Percent Water-soluble Acids

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	3.30	2.28	1.61	
		2	4.20	3.63	3.20	
		3	5.54	4.16	4.04	
		4	-	3.93	4.78	
		Wt'd Av	3.94	3.60	3.57	3.71
	Ky 10	1	3.34	2.22	1.81	
		2	4.93	3.50	3.50	
		3	5.18	4.05	4.34	
		4	-	5.20	4.96	
		Wt'd Av	4.07	3.95	3.67	3.93
"Yield and Quality"	B-21	1	2.16	2.78	1.90	
		2	4.55	3.90	4.40	
		3	4.83	5.50	5.04	
		4	-	5.25	5.20	
		Wt'd Av	3.30	4.43	4.34	4.00
	Ky 10	1	2.46	2.65	1.67	
		2	4.06	3.67	3.18	
		3	4.88	4.95	4.55	
		4	-	4.80	4.74	
		Wt'd Av	3.62	3.95	3.50	3.66
"Quality"	B-21	1	2.81	2.25	1.67	
		2	4.55	3.07	2.79	
		3	4.84	3.68	2.95	
		4	-	4.60	4.23	
		Wt'd Av	3.85	3.39	3.06	3.46
	Ky 10	1	2.88	2.16	2.16	
		2	4.89	3.84	3.05	
		3	5.61	4.23	3.75	
		4	-	4.77	4.77	
		Wt'd Av	4.42	3.60	3.53	3.90
Wt'd Av	B-21		3.69	3.86	3.71	3.74
	Ky 10		4.00	3.85	3.60	3.82

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 15.— Chemical Analysis of Cured Leaf: Alkalinity Number of Water-soluble Ash

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	4.13	8.82	6.10	
		2	4.56	6.87	6.35	
		3	4.46	7.97	6.00	
		4	-	8.07	5.82	
		Wt'd Av	4.30	7.79	6.09	5.96
	Ky 10	1	4.77	6.25	5.48	
		2	2.77	5.79	6.25	
		3	4.05	5.18	6.71	
		4	-	5.15	5.18	
		Wt'd Av	4.19	5.50	5.95	5.17
"Yield and Quality"	B-21	1	3.23	5.85	6.61	
		2	3.69	5.33	6.20	
		3	3.72	5.13	6.97	
		4	-	4.72	6.87	
		Wt'd Av	3.45	5.21	6.57	5.11
	Ky 10	1	3.72	8.61	5.89	
		2	2.67	8.23	6.07	
		3	1.74	7.23	5.69	
		4	-	7.18	6.23	
		Wt'd Av	2.88	7.90	6.01	5.16
"Quality"	B-21	1	2.87	6.64	7.38	
		2	2.46	6.77	6.97	
		3	3.08	5.79	6.84	
		4	-	6.15	5.15	
		Wt'd Av	2.76	6.37	6.54	4.96
	Ky 10	1	3.33	3.64	4.82	
		2	2.79	3.61	4.25	
		3	3.28	3.90	4.05	
		4	-	2.67	3.38	
		Wt'd Av	3.15	3.51	4.07	3.58
Wt'd Av	B-21		3.50	6.46	6.40	5.36
	Ky 10		3.39	5.81	5.37	4.69

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 16.— Chemical Analysis of Cured Leaf: Percent Potassium

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	3.10	4.70	4.55	
		2	3.05	4.45	4.60	
		3	2.95	4.75	3.95	
		4	-	4.90	3.85	
		Wt'd Av	3.05	4.69	4.25	4.00
	Ky 10	1	3.60	4.00	4.00	
		2	2.55	3.60	3.95	
		3	3.20	3.60	4.05	
		4	-	3.75	3.55	
		Wt'd Av	3.29	3.72	3.88	3.63
"Yield and Quality"	B-21	1	2.80	4.20	5.30	
		2	2.85	3.78	4.00	
		3	3.00	3.65	4.25	
		4	-	4.00	4.48	
		Wt'd Av	2.84	3.90	4.35	3.70
	Ky 10	1	3.15	5.65	4.50	
		2	2.70	4.98	3.70	
		3	2.25	4.55	3.85	
		4	-	4.40	4.25	
		Wt'd Av	2.78	4.93	4.01	3.91
"Quality"	B-21	1	2.55	4.70	4.25	
		2	2.55	4.50	4.30	
		3	2.95	3.95	4.15	
		4	-	4.25	3.70	
		Wt'd Av	2.62	4.36	4.10	3.69
	Ky 10	1	2.95	3.70	4.20	
		2	2.75	3.75	3.40	
		3	3.05	3.70	3.70	
		4	-	3.25	3.35	
		Wt'd Av	2.92	3.62	3.60	3.38
Wt'd Av	B-21		2.84	4.32	4.23	3.80
	Ky 10		3.00	4.09	3.83	3.64

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 17.— Chemical Analysis of Cured Leaf: Percent Calcium

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	6.32	6.55	6.92	
		2	5.40	5.15	5.30	
		3	3.90	4.05	4.65	
		4	-	3.10	4.10	
		Wt'd Av	5.64	4.54	5.08	5.12
	Ky 10	1	5.70	7.25	6.75	
		2	5.15	6.10	5.60	
		3	4.20	5.25	4.75	
		4	-	3.52	4.05	
		Wt'd Av	5.26	5.27	5.23	5.25
"Yield and Quality"	B-21	1	7.20	5.95	6.45	
		2	5.15	5.40	5.10	
		3	4.90	4.40	4.15	
		4	-	3.05	3.40	
		Wt'd Av	6.22	4.60	4.71	5.20
	Ky 10	1	7.00	5.55	6.95	
		2	5.55	4.95	6.05	
		3	4.65	3.70	4.40	
		4	-	2.70	3.50	
		Wt'd Av	5.92	4.44	5.33	5.36
"Quality"	B-21	1	7.70	6.25	6.40	
		2	5.30	5.35	5.50	
		3	4.45	5.55	5.45	
		4	-	4.72	3.95	
		Wt'd Av	6.19	5.46	5.22	5.67
	Ky 10	1	6.95	6.78	6.65	
		2	4.45	5.60	6.05	
		3	3.25	5.15	4.90	
		4	-	5.55	4.00	
		Wt'd Av	4.93	5.84	5.31	5.28
Wt'd Av	B-21		6.02	4.80	4.98	5.31
	Ky 10		5.41	5.13	5.29	5.30

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 18. — Chemical Analysis of Cured Leaf: Percent Magnesium

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	0.63	0.53	0.61	
		2	.56	.46	.53	
		3	.53	.44	.46	
		4	-	.40	.48	
		Wt'd Av	0.59	0.45	0.51	0.52
	Ky 10	1	0.58	0.56	0.53	
		2	.62	.54	.55	
		3	.58	.52	.48	
		4	-	.46	.56	
		Wt'd Av	0.59	0.51	0.54	0.55
"Yield and Quality"	B-21	1	0.67	0.48	0.49	
		2	.54	.50	.46	
		3	.56	.48	.48	
		4	-	.42	.44	
		Wt'd Av	0.61	0.47	0.46	0.52
	Ky 10	1	0.64	0.49	0.57	
		2	.53	.49	.61	
		3	.53	.42	.50	
		4	-	.37	.46	
		Wt'd Av	0.57	0.45	0.55	0.53
"Quality"	B-21	1	0.58	0.48	0.52	
		2	.52	.45	.44	
		3	.49	.46	.47	
		4	-	.41	.43	
		Wt'd Av	0.54	0.45	0.46	0.49
	Ky 10	1	0.62	0.50	0.50	
		2	.48	.47	.56	
		3	.44	.39	.46	
		4	-	.48	.42	
		Wt'd Av	0.52	0.46	0.49	0.49
Wt'd Av	B-21		0.58	0.46	0.48	0.51
	Ky 10		0.56	0.48	0.52	0.53

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 19.— Chemical Analysis of Cured Leaf: Percent Phosphorus

System	Variety	Stalk Position*	County Fayette	County Boyle	County Fleming	Weighted Average
"High Yield"	B-21	1	0.33	0.18	0.18	
		2	.32	.28	.20	
		3	.28	.28	.22	
		4	-	.31	.26	
		Wt'd Av	0.32	0.27	0.22	0.27
	Ky 10	1	0.27	0.21	0.22	
		2	.31	.20	.26	
		3	.26	.26	.26	
		4	-	.30	.26	
		Wt'd Av	0.28	0.25	0.25	0.26
"Yield and Quality"	B-21	1	0.24	0.23	0.19	
		2	.26	.24	.26	
		3	.25	.26	.28	
		4	-	.26	.28	
		Wt'd Av	0.25	0.25	0.26	0.25
	Ky 10	1	0.26	0.22	0.22	
		2	.29	.21	.24	
		3	.24	.25	.28	
		4	-	.26	.30	
		Wt'd Av	0.27	0.23	0.26	0.26
"Quality"	B-21	1	0.24	0.18	0.18	
		2	.28	.19	.24	
		3	.22	.22	.25	
		4	-	.24	.25	
		Wt'd Av	0.25	0.21	0.24	0.24
	Ky 10	1	0.23	0.23	0.22	
		2	.26	.24	.24	
		3	.23	.26	.22	
		4	-	.23	.24	
		Wt'd Av	0.24	0.24	0.23	0.24
Wt'd Av	B-21		0.27	0.25	0.24	0.25
	Ky 10		0.26	0.24	0.25	0.25

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 20. — Chemical Analysis of Cured Leaf: Parts per Million Manganese

System	Variety	Stalk Position*	County			Weighted Average
			Fayette	Boyle	Fleming	
"High Yield"	B-21	1	92	170	231	
		2	93	94	125	
		3	92	88	120	
		4	-	75	121	
		Wt'd Av	92	100	139	112
	Ky 10	1	90	180	279	
		2	81	118	175	
		3	79	150	180	
		4	-	83	124	
		Wt'd Av	86	128	179	131
"Yield and Quality"	B-21	1	108	86	246	
		2	104	81	136	
		3	111	73	110	
		4	-	62	96	
		Wt'd Av	107	75	138	110
	Ky 10	1	71	108	178	
		2	78	82	112	
		3	87	75	101	
		4	-	64	98	
		Wt'd Av	77	84	120	93
"Quality"	B-21	1	95	105	137	
		2	82	90	131	
		3	98	100	139	
		4	-	104	112	
		Wt'd Av	91	99	130	107
	Ky 10	1	84	116	145	
		2	86	76	114	
		3	91	98	108	
		4	-	87	116	
		Wt'd Av	87	96	118	101
Wt'd Av	B-21		97	91	136	110
	Ky 10		83	103	139	108

* 1 = flyings; 2 = lugs; 3 = leaf; 4 = tips

Table 21.— Filling Values (cc./0.33 gm)

System	Variety	County				Average
		Fayette	Boyle	Fleming	Hardin	
"High Yield"	B 21	1.63	1.55	1.56	1.64	1.60
	Ky 10	1.60	1.49	1.53	1.50	1.53
	Av.	1.62	1.52	1.54	1.57	1.56
"Yield and Quality"	B 21	1.41	1.34	1.73	1.70	1.54
	Ky 10	1.43	1.47	1.66	1.67	1.56
	Av.	1.42	1.40	1.70	1.68	1.55
"Quality"	B 21	1.85	1.62	1.59	1.70	1.69
	Ky 10	1.77	1.55	1.53	1.71	1.64
	Av.	1.81	1.59	1.56	1.70	1.67
Average	B 21	1.63	1.50	1.63	1.68	1.61
	Ky 10	1.60	1.50	1.57	1.63	1.58
	Av.	1.62	1.50	1.60	1.65	1.59

Table 22. — Percent Moisture Equilibrium at 60% Relative Humidity

System	Variety	County				Average
		Fayette	Boyle	Fleming	Hardin	
"High Yield"	B 21	11.2	11.4	11.0	11.2	11.2
	Ky 10	10.9	11.0	11.3	11.1	11.1
	Av.	11.0	11.2	11.2	11.2	11.2
"Yield and Quality"	B 21	11.5	11.6	10.8	11.0	11.2
	Ky 10	11.6	11.7	11.1	11.0	11.4
	Av.	11.6	11.6	11.4	11.0	11.3
"Quality"	B 21	10.4	10.4	11.0	10.7	10.6
	Ky 10	10.4	10.4	10.9	10.7	10.6
	Av.	10.4	10.4	11.0	10.7	10.6
Average	B 21	11.0	11.1	10.9	11.0	11.0
	Ky 10	11.0	11.0	11.1	10.9	11.0
	Av.	11.0	11.0	11.0	11.0	11.0

Table 23. — Inches of Rainfall and Irrigation on Each Farm During May-August 1966

		County				
		Shelby	Fayette	Boyle	Fleming	Hardin
May	1-10	1.70	0.45	0.75	----	----
	11-20	1.80	2.30	1.69	1.80	4.60
	21-31	0.50	0.27	----	0.30	1.00
	Total	4.00	3.02	2.44	2.10	5.60
June	1-10	0.40	0.70	1.80	----	0.10
	11-20	0.70	----	0.44	0.70	1.60 (1.50)*
	21-30	----	1.72 (1.20)*	1.35	0.70	----
	Total	1.10	2.42 (1.20)*	3.59	1.40	1.70 (1.50)*
July	1-10	3.50 (1.50)*	1.70	3.78	1.40	4.50
	11-20	----	1.03	1.77	1.80	----
	21-31	2.70 (2.00)*	2.10 (1.50)*	0.37	1.10	0.60
	Total	6.20 (3.50)*	4.84 (1.50)*	5.92	4.30	5.10
August	1-10	2.15 (2.00)*	2.80	1.40 (1.25)*	4.90	1.25
	11-20	2.85	0.61	2.93	0.20	5.30
	21-31	----	0.02	0.50	1.80	1.80
	Total	5.00 (2.00)*	3.43	4.83 (1.25)*	6.90	8.35
Total		16.30 (5.50)*	14.32 (2.70)*	16.78 (1.25)*	14.70	20.75 (1.50)*

* Figures in parenthesis are amounts of total moisture represented by irrigation.

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