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GRAIN FLOWS IN KENTUCKY: 1970

By

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RESEARCH REPORT 23: October 1974

University of Kentucky :: College of Agriculture  
Agricultural Experiment Station :: Department of Agricultural Economics  
Lexington



Late-Stage Shifts in Baby Tobacco Allotments

1950-51

By Milton J. Holt, Robert E. Brown and Curtis M. Henderson

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### GRAIN PRODUCTION AND USE IN KENTUCKY

Table 1 compares the production and use of whole grain in Kentucky. The use estimates are for whole grain used in livestock feed, human food, distilled spirits, and other uses for feeding. The largest single use of grain is for livestock feed, and corn is the principal grain used in feed. For the entire whole, 1970 production exceeds use only slightly.

The use estimates are for whole grain only. They do not include, for example,

Author Professor of Agricultural Economics and Professor of Agricultural Economics, respectively. The research was conducted under Hatch Project 57, "Development and use of grain marketing systems."

Thanks to numerous other persons in the list of references.

This investigation is the product of the Agricultural Economics Group, March 1969, Kentucky, Louisiana, Mississippi, Ohio, South Carolina, and Tennessee.

## SUMMARY

This publication reports grain flows—receipts and shipments—in Kentucky for the 1970 calendar year. Information on these flows constitutes a portion of the results of a survey, conducted in 1971, of grain marketing firms. Consequently, only the flows of grain through commercial channels are reported. The quantity estimates reported here are expanded. That is, they are estimates of the results that would have been obtained if all grain marketing firms had been surveyed.

There are few surprises in the results, but the estimates have not been available heretofore. Most of the grain not produced in Kentucky comes from the corn belt; most of the surplus grain goes to states to the south and east of Kentucky. The largest concentration of flows—both receipts and shipments—occurs at harvest time, although the flow of shipments is more uniform than receipts. In western Kentucky (Area 18), country elevators account for most of the grain movements; in central Kentucky (Area 19), terminal elevators and soybean processors account for most of the movements; in eastern Kentucky (Area 20), feed mills and independent poultry processors account for all the grain movements. A majority of the grain receipts in all areas is by truck; a majority of the grain shipments is by rail, except in eastern Kentucky, where very little grain is shipped.

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## GRAIN FLOWS IN KENTUCKY: 1970

by

Harry H. Hall and D. Milton Shuffett\*

Historically, Kentucky has been a grain-deficit state—it uses more grain than it produces. According to projections by Browning et al. of trends in both crop and livestock production [1, 2], Kentucky will still use more grain than it produces in 1980.<sup>1</sup>

Despite its grain-deficit status, Kentucky ships substantial quantities of grain to other states. Moreover, large quantities of grain move through Kentucky from the grain-surplus states to the north to other grain-deficit states to the south or to foreign export.

The purpose of this report is to examine grain movements in Kentucky: the sources and destinations of grain, monthly variations in receipts and shipments, the modes of transportation, and the types of firms that handle grain. Results reported here are taken from a survey, conducted in 1971 as part of the SM-42 cooperative regional project, of Kentucky grain marketing firms.<sup>2</sup>

\* Assistant Professor of Agricultural Economics and Professor of Agricultural Economics, respectively. The research reported here was conducted under Hatch Project 87, "Predicted effects of selected policy and technology changes on the grain marketing system."

<sup>1</sup>Numbers in parentheses refer to items in the list of references.

<sup>2</sup>States cooperating in the project: Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Ohio, South Carolina, and Tennessee.

Figure 1 shows SM-42 areas of the U.S. Figure 2 shows SM-42 areas of Kentucky, with county detail. All area boundaries follow crop reporting district (CRD) boundaries. Area 18 includes Kentucky CRD's 1 and 2, which include much of Kentucky's cash-grain area, and generally produces a surplus of grain. Area 19 includes Kentucky CRD's 3, 4, and 5; this is primarily a livestock-producing area and generally uses more grain than it produces. Area 20 coincides with Kentucky CRD 6, which includes the foothills and mountains of eastern Kentucky. Although livestock production in Area 20 is light, more grain is used than is produced.

### GRAIN PRODUCTION AND USE IN KENTUCKY

Table 1 compares the production and use of whole grain in Kentucky. The use estimates are for whole grain used in livestock feed, human food, distilled spirits, and soybeans for crushing. The largest single use of grains is for livestock feed, and corn is the principal grain used in feed. For the state as a whole, 1970 production exceeds use only for wheat.

The use estimates are for whole grain only. They do not include, for example,

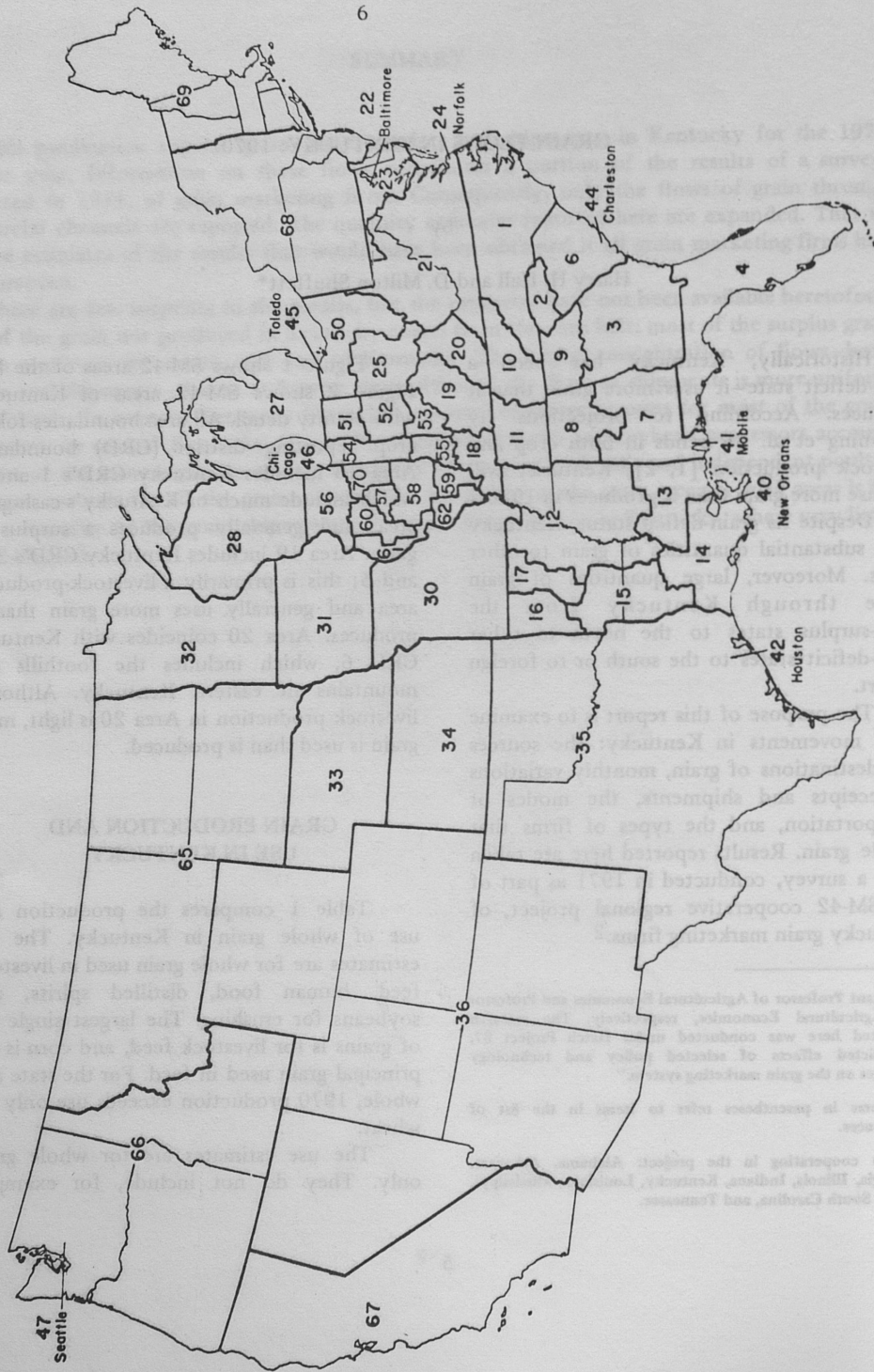


Fig. 1. Map of SM-42 areas. (Numbers are market areas used in SM-42 study)



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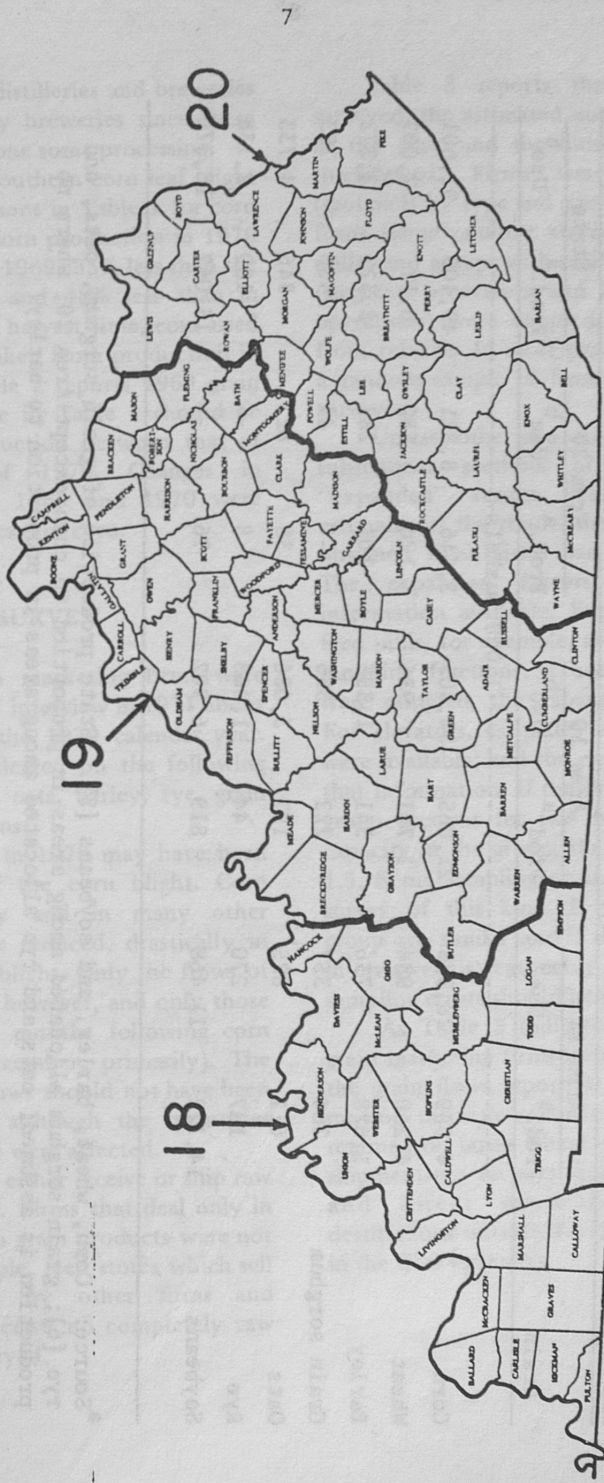


Fig. 2. SM-42 areas of Kentucky. (Numbers are market areas used in SM-42 study)

Table 1.--Production and Use of Grain in Kentucky by SM-42 Area, 1970

Grain	Area 18		Area 19		Area 20		State	
	Prod. a	Use b	Prod. a	Use b	Prod. a	Use b	Prod. a	Use b
	-----1,000 bushels-----							
Corn	24,989	28,375	21,065	54,405	3,346	8,821	49,400	91,601
Wheat	4,260	984	1,741	936	120	187	6,121	2,007
Barley	1,678	736	541	1,355	103	281	2,322	2,372
Grain sorghum	264	357	222	355	--	41	486	753
Oats	611	825	197	3,086	38	822	846	4,733
Rye	137	270	44	1,868	8	--	189	2,138
Soybeans	14,172	11,468	819	6,902	76	--	15,067	18,370

∞

<sup>a</sup>Source: Corn, wheat, barley, and soybeans [5]. State production of grain sorghum, oats, and rye [6]; grain sorghum allocated among areas in proportion to corn except Area 20, where no production is assumed; oats and rye allocated among areas in proportion to barley.

<sup>b</sup>Estimated use for livestock feed, human food, distilled spirits, and soybeans for crushing.

barley malt used by distilleries and breweries or corn grits used by breweries since these products have undergone some processing.

Because of the southern corn leaf blight in 1970, the comparisons in Table 1 for corn may be misleading. Corn production in 1970 was 36% less than in 1969, 35% less than the average in 1965-69, and 48% less than in 1971. At least up to harvest time, corn used in 1970 had to be taken from production in 1969 or earlier. Table 2 reports 1969 grain production. Corn use in Table 1 should be compared with production between that of 1969 and that of 1970. Changes in production between 1969 and 1970 were modest for all grains except corn.

### THE SURVEY

Kentucky grain marketing firms were surveyed by personal interview in 1971 about their operations in the 1970 calendar year. Information was collected on the following grains: corn, wheat, oats, barley, rye, grain sorghum, and soybeans.

Flows of grain in 1970 may have been atypical because of the corn blight. Corn yields in Kentucky and in many other southern states were reduced, drastically in some cases, by the blight. Only the flows of corn were affected, however, and only those corn flows for the months following corn harvest (October-December, primarily). The direction of grain flows should not have been materially affected although the quantities flowing undoubtedly were affected.

Only firms that either receive or ship raw grain were surveyed. Firms that deal only in processed grain or in grain products were not surveyed. For example, feed stores which sell feed manufactured by other firms and breweries, which receive no completely raw grain, were not surveyed.

Table 3 reports the types of firms surveyed, the estimated number of each type in the state and the number of each type interviewed. Firms were first stratified (grouped) by type and size. Groups with large firms (large country elevators or large feed mills) and groups with small numbers of firms (soybean processors and integrated poultry operations) were sampled completely, apart from refusals. In most groups, however, only a random sample of firms in the group was surveyed.

Unless otherwise stated, all results in subsequent sections of this report are "expanded" results. That is, they are estimates of the results that would have been obtained if all firms had been interviewed. The expansion factors depend on the information available. Expansion factors for feed mills, for example, are reciprocals of the sampling fractions; if one-half of the firms were sampled, the expansion factor is two. For elevators, estimates of storage capacity were available, and the expansion factors use that information. If the firms interviewed in a group account for two-thirds of the storage capacity in the group, the expansion factor is 1.5. Some sampling errors are inevitable in a survey of this kind. If the firms within a group are similar and if the number of firms interviewed is reasonably large, however, the sampling errors should be small.

As Table 3 indicates, only commercial grain marketing firms were interviewed. Thus, the grain flows reported estimate only grain moving through commercial channels. Grain retained on farms where it is produced, direct shipments to farmers from outside the state, and direct shipments by farmers to destinations outside the state are not included in the flow estimates.

Table 2.--Production of Grain in Kentucky by SM-42 Area, 1969<sup>a</sup>

Grain	Area 18	Area 19	Area 20	State
1,000 Bushels				
Corn	41,517	30,532	4,797	76,846
Wheat	4,425	1,651	146	6,222
Barley	1,344	598	108	2,050
Grain sorghum	226	166	--	392
Oats	548	244	44	836
Rye	115	51	9	175
Soybeans	12,776	731	73	13,580

<sup>a</sup>Source: Corn, wheat, barley, and soybeans [4]. State production of grain sorghum, oats, and rye [6]; grain sorghum allocated among areas in proportion to corn except Area 20, where no production is assumed; oats and rye allocated among areas in proportion to barley.

Table 3. Types and Numbers of Firms Surveyed

Type of Firm <sup>a</sup>	State Total	Number Interviewed
Country elevators		
Less than 300,000 bu. storage	23	7
300,000 bu. storage or more	12	11
Terminal elevators	4	2
Feed mills		
Less than 10,000 tons feed	114	40
10,000 tons feed or more	8	8
Flour mills	5	3
Soybean processors	2	2
Integrated poultry operations	1	1
Distilleries	35	10

<sup>a</sup>Definitions of the types of firms are given in the Appendix. A list of firms is given in [3].

#### GRAIN RECEIPTS BY SOURCE

Table 4 reports expanded grain receipts from out-of-state sources in 1970. Table 5 reports expanded receipts from local farmers as well as from out-of-state sources. To avoid double-counting, shipments between grain-handling firms in the same area (from country elevators to terminal elevators, for example) are excluded from both tables.

Except for oats and grain sorghum, most out-of-state grain came from the corn belt (Illinois, Indiana, Missouri, and Ohio; no receipts of any grain were reported from Iowa). Most out-of-state oats came from Minnesota; most out-of-state grain sorghum came from Tennessee (Table 4).

*Corn*—Corn from local farmers constituted a substantial proportion of the

corn receipts only in Area 18, where 79% of the total receipts was from local farmers. In Area 19, only 1% of the receipts was from local farmers and in Area 20, 6% was from local farmers. For the state, nearly all out-of-state corn came from the corn belt, 84% from Indiana. In Area 18, all out-of-state corn came from the corn belt: 60% from Illinois, 36% from Indiana, and 4% from Missouri. In Area 19, practically all out-of-state corn came from the corn belt; 93% of the corn belt corn was from Indiana with small amounts from Illinois and Ohio. In Area 20, all out-of-state corn came from the corn belt: 59% from Ohio, 41% from Indiana.

*Soybeans*—Receipts of soybeans from local farmers occurred only in Area 18, where they constituted 52% of total receipts. Of the out-of-state soybeans in Area 18, 96% came

Table 4. Expanded 1970 Grain Receipts in Kentucky from Out-of-state Sources by Origin

Grain	Corn Belt					Total	Percent of Grand Total	Mich. Minn. Wis.	Grand Total
	Ill.	Ind.	Mo.	Ohio	-----1,000 bushels-----				
Corn	3,977	30,077	176	1,425	35,655	99.6	4	141	35,800
Wheat	187	2,125	57	--	2,369	100.0	1	--	2,370
Barley	--	114	--	--	114	76.5	20	15	149
Grain sorghum	--	47	17	--	64	37.2	108	--	172
Oats	21	289	--	135	445	39.8	28	646	1,119
Rye	408	1,107	--	--	1,515	72.7	--	570	2,085
Soybeans	5,798	9,487	--	606	15,891	93.0	376	812	17,079

Table 5. — Expanded 1970 Grain Receipts in Kentucky by Area by Origin<sup>a</sup>

Area	Grain	Local Farmers	Corn Belt										Grand Total	
			Ill.	Ind.	Mo.	Ohio	Total Corn Belt	Ky. 18	Ky. 19	Miss.	Tenn.	Mich. and Wis.		Minn.
18	Corn	17,664	2,752	1,617	176	--	4,545	--	70	4	--	--	--	22,283
	Wheat	3,375	187	301	57	--	545	--	--	--	1	--	--	3,921
	Barley	856	--	--	--	--	--	--	--	--	--	--	--	856
	Grain sorghum	63	--	--	17	--	17	--	--	--	108	--	--	188
	Oats	144	17	32	--	--	49	--	--	--	28	--	--	221
	Rye	--	--	--	--	--	--	--	4	--	--	--	--	354
Soybeans	10,478	4,800	3,751	--	606	9,157	--	--	--	--	376	--	20,011	
19	Corn	370	1,225	28,100	--	909	30,234	5	--	--	--	141	--	30,750
	Wheat	359	--	1,824	--	--	1,824	1	--	--	--	--	--	2,184
	Barley	12	--	114	--	--	114	41	--	--	20	--	15	202
	Grain sorghum	--	--	47	--	--	47	--	--	--	--	--	--	47
	Oats	124	4	257	--	--	385	6	--	--	--	16	630	1,161
	Rye	41	408	1,107	--	124	1,515	--	--	--	--	--	216	1,772
Soybeans	--	998	5,736	--	--	6,734	245	--	--	--	--	812	7,791	
20	Corn	56	--	360	--	516	876	--	8	--	--	--	--	940
	Wheat	--	--	--	--	--	--	154	--	--	--	--	--	154
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	--	--	--	--	--	11	11	--	--	--	--	--	11
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--
Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	

<sup>a</sup>Shipments between grain-handling firms in the same area are excluded.

from the corn belt (50% from Illinois, 39% from Indiana, and 7% from Ohio), and 4% from Tennessee. Area 19 received some soybeans from Area 18 but most soybeans were from out of state. Eighty-nine percent of the out-of-state soybeans was from the corn belt (76% from Indiana, 13% from Illinois), and 11% from Minnesota. Area 20 received no soybeans. For the state, 62% of the soybeans was from out-of-state; 58% of them from the corn belt, 3% from Minnesota, and 1% from Tennessee.

*Wheat*—In Area 18, receipts from local farmers made up 86% of total wheat receipts. In area 19, receipts from local farmers constituted 16% of the total. In Area 20, there were no receipts from local farmers. All out-of-state wheat came from the corn belt. In Area 18, 55% of the out-of-state wheat was from Indiana, 34% from Illinois, and 11% from Missouri. In Area 19, all out-of-state wheat was from Indiana. All wheat receipts in Area 20 were from Area 18 of Kentucky.

*Rye*—In Kentucky, rye is used principally to produce alcoholic beverages. All Kentucky distilleries are located in either Area 18 or 19. Only these two areas reported receipts of rye. Some rye was produced in Kentucky (Tables 1 and 2) but most of it came from out-of-state. In Area 19, only 2% of the rye receipts was from local farmers. Of the out-of-state receipts, in Area 19, 86% was from the corn belt (63% from Indiana and 23% from Illinois) and 12% from Minnesota. In Area 18, no rye receipts were from local farmers, and all out-of-state receipts were from Minnesota.

*Oats, grain sorghum and barley*—Kentucky grain marketing firms received relatively small quantities of oats, grain sorghum, and barley. More than 80% of the barley receipts were from local farmers. One-fourth or less of either oats or grain sorghum were from local farmers. Most out-of-state oats (58%) came from Minnesota

and 40% from the corn belt, primarily from Indiana. Roughly 62% of the out-of-state grain sorghum came from Tennessee, and the remainder came from the corn belt, primarily from Indiana.

#### GRAIN SHIPMENTS BY DESTINATION

Table 6 reports expanded grain shipments to out-of-state destinations in 1970. Table 7 reports expanded shipments to local farmers as well as to out-of-state destinations. To avoid double-counting, once again, shipments between grain-handling firms in the same area are excluded from both tables.

Most grain shipments went to states to the south or east of Kentucky. For corn and soybeans, however, large quantities were also exported. The export quantities in Tables 6 and 7 are the estimated quantities going directly from Kentucky to export ports. There is no way to estimate, from the survey data, how much if any grain shipped to other states was subsequently exported.

*Corn*—Of the total corn shipments from grain-handling firms in Kentucky, 89% went to other states or to export; only 11% went to local farmers. Large quantities of corn are included in processed feeds that go to local farmers, of course, but these quantities were not estimated. Of the corn shipped out-of-state, 86% went to other southern states, 12% went to export, and the remainder went to other states. In Area 18, 17% of the corn shipments was to local farmers and 83% out of state. Of the out-of-state corn, 28% went to Tennessee, 22% to Georgia, 20% to export, and 19% to Alabama, and the remainder to several other states. In Area 19, only 4% of the corn shipments was to local farmers. Nearly as much corn was shipped out of state as from Area 18, but very little of it was for export. Of the out-of-state shipments,



Table 6. — Expanded 1970 Out-of-state Grain Shipments from Kentucky by Destination

Grain	South							Tenn.	S. C.	Total South	Percent of Grand Total	Export	Other <sup>a</sup>	Grand Total
	Ala.	Fla.	Ga.	Miss.	N. C.	(1,000 bushels)	(1,000 bushels)							
Corn	2,351	707	4,298	11	5,430	3,185	4,477	20,459	85.8	2,833	556	23,848		
Wheat	36	--	735	--	277	58	1,064	2,170	80.1	511	27	2,708		
Barley	4	--	147	--	--	--	342	493	100.0	--	--	493		
Grain sorghum	--	--	--	--	--	--	3	3	100.0	--	--	3		
Oats	--	--	52	--	58	10	111	231	94.7	13	--	244		
Rye	--	--	--	--	--	--	--	--	--	--	--	--		
Soybeans	--	--	1,925	1,002	14	5	575	3,521	50.8	3,405	--	6,926		

<sup>a</sup>Corn belt, California, Texas, Virginia, West Virginia, Northeastern United States.

Table 7. — Expanded 1970 Grain Shipments from Kentucky by Area by Destination<sup>a</sup>

Area	Grain	South										Va., W. Va., &		Grand Total		
		Farmers	Ala.	Fla.	Ca.	Ky.	Miss.	N. C.	S. C.	Tenn.	Total South	Corn Bell <sup>b</sup>	Cal. & Texas		N. E.	Export
18	Corn	2,423	2,332	661	2,666	--	11	--	--	3,415	9,085	58	112	376	2,389	14,443
	Wheat	466	36	--	516	--	--	23	514	1,089	19	--	--	--	360	1,934
	Barley	123	4	--	147	9	--	--	342	502	--	--	--	--	--	625
	Grain sorghum	2	--	--	--	--	--	--	3	3	--	--	--	--	--	5
	Oats	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Soybeans	3	--	--	1,470	--	1,002	--	--	575	3,047	--	--	--	3,211	6,261
19	Corn	490	19	46	1,632	--	--	5,430	3,185	1,062	11,374	--	--	10	444	12,318
	Wheat	28	--	--	219	--	--	254	58	550	1,081	--	--	8	151	1,268
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	252	--	--	52	--	--	58	10	111	231	--	--	--	13	496
	Rye	20	--	--	--	--	--	--	--	--	--	--	--	--	--	20
	Soybeans	--	--	--	455	--	--	14	5	--	474	--	--	--	194	668
20	Corn	36	--	--	--	--	--	--	--	--	--	--	--	--	--	36
	Wheat	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

<sup>a</sup>Shipments between grain-handling firms in the same area are excluded. Data are in units of 1,000 bushels.

<sup>b</sup>Illinois, Indiana, Missouri, and Ohio.

46% went to North Carolina, 27% to South Carolina, 14% to Georgia, 9% to Tennessee, and small amounts elsewhere. In Area 20, all corn shipments were to local farmers.

*Soybeans*—Almost no soybeans were returned to local farmers as soybeans. Of the out-of-state shipments, 51% were to other southern states and 49% to export. In Area 18, 49% of the shipments was to other southern states (Georgia, Mississippi, and Tennessee) and 51% to export. In Area 19, 71% of the soybean shipments was to other southern states, primarily to Georgia, and 29% to export.

*Wheat*—Some wheat is returned as wheat to local farmers but most shipments went out-of-state—80% to other southern states (primarily Georgia and Tennessee) and 19% to export. In Area 18, 74% of the out-of-state shipments went to other southern states (primarily Georgia and Tennessee) and 25% to export. In Area 19, 87% of the out-of-state shipments went to other southern states (primarily Georgia, North Carolina, and Tennessee) and 12% to export.

*Other Grains*—Small amounts of barley and oats were shipped out-of-state. Most of the barley went to either Georgia or Tennessee. Most of the oats went to Tennessee, but small amounts also went to Georgia and North Carolina. Very little grain sorghum was shipped, either to local farmers or out-of-state; most of the grain sorghum received in Kentucky is apparently processed into feed. Except for a small quantity of rye shipped to local farmers, no rye shipments were reported.

#### GRAIN RECEIPTS BY MONTH

Table 8 reports expanded grain receipts, including receipts from local farmers, by SM-42 area by month. As in the two preceding sections, shipments between

grain-handling firms in the same area are excluded.

Although Kentucky is a grain-deficit state, receipts over the year are largest at harvest time and relatively uniform over the remainder of the year, except in Area 20. There, grains are used primarily as feed ingredients and local production is limited. The demand for feed over the year is apparently fairly uniform, and so is the inflow of grain.

*Area 18*—Nearly 53% of the year's corn receipts was in September, October, or November, an average of nearly 18% per month. (Although data to support the contention are not available, the September-November figures would probably have been higher except for the corn blight.) Among the remaining 9 months, the largest single month was February with 9%. More than 45% of the year's soybean receipts was in October or November; the largest single remaining month was December with 8%. June and July accounted for 68% of the year's wheat receipts. June accounted for 77% of the year's barley receipts.

*Area 19*—Except for October, when 15% of the year's receipts occurred, monthly corn receipts were fairly uniform. Although the blight apparently reduced corn production less in Area 19 than in Area 18 (compare Tables 1 and 2), data are not available for determining whether the monthly distribution of receipts was affected. October and November accounted for 46% of the year's soybean receipts, the same as in Area 18, but this coincidence is completely unrelated to local production (see Table 1). Together, June and July accounted for 60% of the year's wheat receipts. The remaining grains follow no obvious pattern.

*Area 20*—Only small amounts of grain are produced locally, and imported grain is apparently used primarily as a feed ingredient. Only corn and wheat are received in sizable

Table 8. — Expanded 1970 Grain Receipts in Kentucky by Month<sup>a</sup>

Area	Grain	Month												Total
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
18	Corn	1,814	1,953	1,301	1,038	844	764	832	954	4,934	4,022	2,755	1,072	22,283
	Wheat	278	192	85	75	75	1,590	1,058	238	97	79	72	82	3,921
	Barley	20	22	10	13	58	657	15	18	14	9	8	12	856
	Grain sorghum	10	11	8	12	12	8	8	8	34	32	26	19	188
	Oats	14	12	4	5	8	93	44	16	8	8	4	5	221
	Rye	--	--	17	89	17	--	--	60	--	45	20	110	358
	Soybeans	1,414	1,294	1,233	970	762	786	624	772	1,636	3,993	5,020	1,507	20,011
19	Corn	2,174	2,775	2,557	2,504	1,999	2,110	2,208	2,053	2,662	4,554	2,950	2,204	30,750
	Wheat	63	63	86	8	15	388	921	114	56	33	55	382	2,184
	Barley	12	6	6	--	6	38	40	17	28	6	6	29	202
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	12	35	47
	Oats	121	173	190	37	31	42	112	159	115	40	76	65	1,161
	Rye	169	109	111	200	137	52	125	215	383	49	134	88	1,772
	Soybeans	352	569	529	386	374	645	219	71	681	1,916	1,683	366	7,791
20	Corn	92	82	64	89	83	59	73	73	73	96	90	67	940
	Wheat	15	11	11	15	11	11	15	11	11	15	15	12	154
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	--	--	--	3	--	--	--	4	--	--	--	4	11
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--
	Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--

<sup>a</sup>Shipments between grain-handling firms in the same area are excluded.

amounts, and the receipts of both are relatively uniform over the year.

### GRAIN SHIPMENTS BY MONTH

Table 9 reports expanded grain shipments, including shipments to local farmers, by area by month. Shipments between grain-handling firms in the same area are again excluded. Fewer grains are shipped than are received and the quantities shipped are, of course, smaller than the quantities received. Although shipments vary some from month-to-month, they are more uniform than receipts. Corn is the principal grain shipped.

*Area 18*—Approximately 14% of the corn shipments occurred in January, the largest single month. Only 5% of the shipments occurred in December, one of the smallest months. The January shipments were from 1969 production, whereas the December shipments, presumably, were from 1970 production. More than 54% of the soybean shipments was in either October or November; over 50% of the wheat shipments was in either July, August, or September; 62% of the barley shipments was in June.

*Area 19*—There were slightly fewer corn shipments from Area 19 than from Area 18, but the distribution of shipments was more uniform. The maximum month, January, was the same, accounting for 12% of the total. December was the minimum month, with only 7%. Wheat shipments are not obviously related to harvest; 59% of the shipments was in January, February, or March. Over 51% of the soybean shipments was in either October or November, much as in Area 18. There was no obvious pattern for oats shipments.

### GRAIN MOVEMENTS BY TYPE OF FIRM

This section reports grain movements by type of firm. All grain movements, including

shipments between grain-handling firms in the same area, are included. Consequently, some grain is counted two or more times, but the results give a clearer picture of the relative importance of the different types of firms.

### Receipts by Type of Firm

Table 10 reports expanded grain receipts by type of firm. Some firm types have been combined to avoid disclosing confidential information. Total receipts in Table 10 equal or exceed those in Tables 5 and 8. That is, everything included in Table 5 or 8 is also included in Table 10. The only substantial double-counting is for corn in Area 18, and corn and rye in Area 19.

*Area 18*—Receipts from local farmers constituted a substantial proportion of total grain receipts in Area 18 (Table 5). Most of those receipts went first to country elevators (CE's). Consequently, CE's received more grain than any other type of firm in Area 18. They received 70% of the corn, 62% of the wheat, 75% of the barley, but only 43% of the soybeans. Most of the soybeans (57%) went to terminal elevators (TE's) or soybean processors (SBP). Soybean receipts were large enough that this group of firms ranks second in the volume of receipts. Feed mills (FM's) ranked third. They received 16% of the corn, 12% of the wheat, 25% of the barley, but 74% of the grain sorghum and 77% of the oats. Distilleries received 7% of the corn and 43% of the rye.

*Area 19*—In Area 19, very few grain receipts were from local Kentucky farmers (Table 5). Largely as a consequence, there are few country elevators in Area 19, those that exist are small, and as a group they receive only a small proportion of the grain receipts. Terminal elevators and soybean processors received more than any other single group. They received 49% of the corn, 76% of the wheat, 46% of the oats, 36% of the rye, and

Table 9. — Expanded 1970 Grain Shipments from Kentucky by Month<sup>a</sup>

Area	Grain	Month												Total
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	
		(1,000 bushels)												
18	Corn	2,084	1,434	1,433	1,198	1,322	871	762	905	1,234	1,153	1,263	784	14,443
	Wheat	145	136	111	91	67	120	366	266	344	94	62	132	1,934
	Barley	31	9	11	1	2	388	52	59	17	4	27	24	625
	Grain sorghum	1	1	3	--	--	--	--	--	--	--	--	--	5
	Oats	--	--	--	--	--	--	--	--	--	--	--	--	--
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--
	Soybeans	903	388	85	287	168	122	150	109	267	1,410	1,995	377	6,261
19	Corn	1,482	934	1,272	1,006	1,024	837	812	1,003	634	1,369	1,142	803	12,318
	Wheat	248	339	166	78	21	12	5	21	52	88	144	94	1,268
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	60	49	54	45	32	32	14	35	25	37	49	64	496
	Rye	--	--	--	--	--	--	--	--	--	20	--	--	20
	Soybeans	--	53	18	96	--	18	57	9	74	150	193	--	668
20	Corn	8	--	8	--	8	--	--	--	--	--	--	12	36
	Wheat	--	--	--	--	--	--	--	--	--	--	--	--	--
	Barley	--	--	--	--	--	--	--	--	--	--	--	--	--
	Grain sorghum	--	--	--	--	--	--	--	--	--	--	--	--	--
	Oats	--	--	--	--	--	--	--	--	--	--	--	--	--
	Rye	--	--	--	--	--	--	--	--	--	--	--	--	--
	Soybeans	--	--	--	--	--	--	--	--	--	--	--	--	--

<sup>a</sup>Shipments between grain-handling firms in the same area are excluded.

Table 10.--Expanded 1970 Grain Receipts in Kentucky by Type of Firm<sup>a</sup>

Area	Grain	Type of Firm							Total
		CE	TE & SBP	FM & IP	FLM	Dist.	Other		
-----1,000 bushels-----									
18	Corn	17,044	1,087	4,000	149	1,582	429	24,291	
	Wheat	2,412	100	474	166	--	769	3,921	
	Barley	638	--	218	--	--	--	856	
	Grain sorghum	48	--	140	--	--	--	188	
	Oats	57	--	192	--	--	--	249	
	Rye	--	354	--	--	270	--	624	
	Soybeans	8,539	11,523	--	--	--	--	20,062	
19	Corn	43	17,476	8,483	153	8,647	539	35,341	
	Wheat	55	1,650	321	150	--	8	2,184	
	Barley	2	54	146	--	--	--	202	
	Grain sorghum	--	--	47	--	--	--	47	
	Oats	10	551	623	--	--	4	1,188	
	Rye	3	1,108	38	--	1,868	20	3,037	
	Soybeans	--	7,791	--	--	--	--	7,791	
20	Corn	--	--	941	--	--	--	941	
	Wheat	--	--	153	--	--	--	153	
	Barley	--	--	--	--	--	--	--	
	Grain sorghum	--	--	--	--	--	--	--	
	Oats	--	--	11	--	--	--	11	
	Rye	--	--	--	--	--	--	--	
	Soybeans	--	--	--	--	--	--	--	

<sup>a</sup> Includes receipts from local farmers, from other firms in the same area, and from firms in other areas of Kentucky.

all the soybeans. Terminal elevators in Area 19 get large quantities of grain from farmers in southern Indiana. Nevertheless, the majority of their grain comes from other grain-handling firms, not from farmers. In tonnage, distilleries ranked second in grain receipts although they received only two whole grains. They received 24% of the corn and 62% of the rye. Feed mills received 24% of the corn, 15% of the wheat, 72% of the barley, and 52% of the oats.

*Area 20*—Manufacturing feed is the principal grain-handling activity in Area 20. Feed mills and integrated poultry operations together accounted for all the grain receipts.

#### Shipments by Type of Firm

Table 11 reports expanded grain shipments by type of firm. Once again, some firm types have been combined to avoid disclosing confidential information. Total receipts in Table 11 equal or exceed those in Tables 7 and 9; that is, everything included in Table 7 or 9 is also included in Table 10. Distilleries made no whole-grain shipments and are not included in Table 11.

*Area 18*—Since country elevators in Area 18 received the most grain, and since they typically do no processing, country elevators also shipped the most grain. They accounted for 92% of the corn shipments, 94% of the wheat shipments, 97% of the barley shipments, and 99% of the soybean shipments. Terminal elevators and soybean processors accounted for 6% of the corn shipments, all of the rye shipments and little else. Feed mills and other firms shipped only small amounts of grain.

*Area 19*—Terminal elevators and soybean processors received the largest single quantity of grain in Area 19, and they also shipped the largest single quantity. They made 95% of the corn shipments, 94% of the wheat shipments,

53% of the oats shipments, 98% of the rye shipments, and all of the soybean shipments. Feed manufacturers ranked second and made 5% of the corn shipments and 46% of the oats shipments. Country elevators and other firms shipped only small amounts of grain.

*Area 20*—There were virtually no grain shipments from Area 20. All shipments went from feed mills to local farmers (Table 7).

#### METHODS OF TRANSPORTING GRAIN

This section reports grain movements by mode of transportation: rail, truck, or water. As in the previous section, all grain movements, including shipments between grain-handling firms in the same area, are included. Some double-counting results, but the estimate of the relative importance of the three modes of transportation should be more accurate.

#### Receipts by Mode of Transportation

Table 12 reports expanded grain receipts by area, by mode of transportation. The total receipts are the same as those in Table 10. For all three areas, truck transportation is the most common mode, rail is second, and water is third. Except in Area 18, receipts by water are negligible.

*Area 18*—In Area 18, country elevators accounted for the largest single share of receipts (Table 10). Since country elevators receive grain primarily from farmers, it is to be expected that a large share of the receipts will be by truck. Thus 94% of the corn, 96% of the wheat, all the barley, all the grain sorghum, all the oats, and 75% of the soybeans were received by truck. Only 13% of the rye receipts were by truck, however. Most of the rye receipts in Area 18 were from



Table 11.--Expanded 1970 Grain Shipments from Kentucky  
by Type of Firm<sup>a</sup>

Area	Grain	Type of Firm				Total
		CE	TE & SBP	FM	Other	
-----1,000 bushels-----						
18	Corn	14,797	1,028	199	--	16,024
	Wheat	1,813	125	--	--	1,938
	Barley	605	--	20	--	625
	Grain sorghum	5	--	--	--	5
	Oats	--	--	--	--	--
	Rye	--	265	--	--	265
	Soybeans	6,959	55	--	--	7,014
19	Corn	18	18,311	968	--	19,297
	Wheat	53	1,312	31	4	1,400
	Barley	--	27	--	--	27
	Grain sorghum	--	--	--	--	--
	Oats	1	291	254	4	550
	Rye	--	890	--	20	910
	Soybeans	--	703	--	--	703
20	Corn	--	--	36	--	36
	Wheat	--	--	--	--	--
	Barley	--	--	--	--	--
	Grain sorghum	--	--	--	--	--
	Oats	--	--	--	--	--
	Rye	--	--	--	--	--
	Soybeans	--	--	--	--	--

<sup>a</sup>Includes shipments to local farmers, to other firms in the same area, and to firms in other areas of Kentucky.

Table 12.--Expanded 1970 Grain Receipts in Kentucky  
by Mode of Transportation<sup>a</sup>

Area	Grain	Mode of Transportation			Total
		Rail	Truck	Water	
-----1,000 bushels-----					
18	Corn	1,398	22,893	--	24,291
	Wheat	153	3,768	--	3,921
	Barley	--	856	--	856
	Grain sorghum	--	188	--	188
	Oats	--	249	--	249
	Rye	72	84	468	624
	Soybeans	4,452	15,004	606	20,062
19	Corn	9,263	26,078	--	35,341
	Wheat	350	1,834	--	2,184
	Barley	72	130	--	202
	Grain sorghum	12	35	--	47
	Oats	728	430	30	1,188
	Rye	1,369	1,668	--	3,037
	Soybeans	3,648	4,143	--	7,791
20	Corn	347	594	--	941
	Wheat	--	153	--	153
	Barley	--	--	--	--
	Grain sorghum	--	--	--	--
	Oats	--	11	--	11
	Rye	--	--	--	--
	Soybeans	--	--	--	--

<sup>a</sup>Includes receipts from local farmers, from other firms in the same area, and from firms in other areas in Kentucky.

Minnesota (Table 5), and a large proportion of these moved by water; in Table 12, 75% of the rye receipts was by water. Over half of the out-of-state soybean receipts in Area 18 were from Illinois (Table 5), and many of these moved by rail. In Table 12, 22% of the soybean receipts was by rail. In addition, 6% of the corn, 4% of the wheat, and 12% of the rye were received by rail. All of the soybeans from Ohio were received by water (Table 5).

*Area 19*—Terminal elevators and soybean processors in Area 19 received the largest single share of receipts (Table 10). Most of these receipts came from the corn belt, primarily from Indiana (Table 5). Truck transportation was the single most important mode, but rail transportation accounted for a much larger share than in Area 18; only a small quantity of oats were received by water. Truck receipts accounted for 74% of the corn, 84% of the wheat, 64% of the barley, 74% of the grain sorghum, 36% of the oats, 55% of the rye, and 53% of the soybeans. Rail receipts, however, accounted for 26% of the corn, 16% of the wheat, 36% of the barley, 26% of the grain sorghum, 61% of the oats, 45% of the rye, and 47% of the soybeans.

*Area 20*—Feed mills and integrated poultry operations received all the grain in Area 20 (Table 10). Most of the grain in Area 20 came from Ohio, but 38% of the corn came from Indiana (Table 5). In Table 12, 37% of the receipts were by rail. All other grain was received by truck.

#### Shipments by Mode of Transportation

Table 13 reports expanded grain shipments by mode of transportation. The

total shipments are the same as those in Table 11. All shipments in Area 20 were to local farmers (Table 7) and were by truck. In Areas 18 and 19, however, rail was the most common mode of transportation, truck was second, and water was third.

*Area 18*—In Area 18, country elevators accounted for the largest single proportion of grain shipments (Table 11). Several of the country elevators are fairly large, however, and can use rail shipments to advantage. In Table 13, 51% of the corn, 49% of the wheat, 70% of the barley, and 52% of the soybeans were shipped by rail. Thirty-five percent of the corn, 37% of the wheat, 30% of the barley, all of the rye, and 2% of the soybeans were shipped by truck. Fourteen percent of the corn, 14% of the wheat, and 46% of the soybeans were shipped by water. Most of the water shipments went to New Orleans for foreign export (Table 7).

*Area 19*—Terminal elevators and soybean processors accounted for the largest single proportion of grain shipments (Table 11). Rail shipments were by far the most important. Eighty-eight percent of the corn, 88% of the wheat, 44% of the oats, 41% of the rye, and 95% of the soybeans were shipped by rail. Twelve percent of the corn, 15% of the wheat, 78% of the barley, 56% of the oats, 59% of the rye, and 5% of the soybeans were shipped by truck. Most of the foreign exports from Area 19 go by rail to Baltimore, Norfolk, or Charleston. None of the firms in Area 19 is equipped to ship grain by water, although some can receive by water.

Table 13.--Expanded 1970 Grain Shipments from Kentucky  
by Mode of Transportation<sup>a</sup>

Area	Grain	Mode of Transportation			Total
		Rail	Truck	Water	
-----1,000 bushels-----					
18	Corn	8,160	5,655	2,207	16,024
	Wheat	948	718	272	1,938
	Barley	439	186	--	625
	Grain sorghum	3	2	--	5
	Oats	--	--	--	--
	Rye	--	265	--	265
	Soybeans	3,673	130	3,211	7,014
19	Corn	16,893	2,404	--	19,297
	Wheat	1,187	213	--	1,400
	Barley	6	21	--	27
	Grain sorghum	--	--	--	--
	Oats	244	306	--	550
	Rye	374	535	--	909
	Soybeans	668	35	--	703
20	Corn	--	36	--	36
	Wheat	--	--	--	--
	Barley	--	--	--	--
	Grain sorghum	--	--	--	--
	Oats	--	--	--	--
	Rye	--	--	--	--
	Soybeans	--	--	--	--

<sup>a</sup>Includes shipments to local farms, to other firms in the same area, and to firms in other areas of Kentucky.

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## APPENDIX

### CLASSIFICATION OF FIRMS\*

*Country Elevator (CE)*—A firm whose primary activity is collection and merchandising raw grain. It will be classed as a country elevator if it receives more than 50% of the grain directly from the farmers and more than 50% of the raw grain received goes out of the facility as raw grain. The definition is not affected by where the grain goes or whether some manufacturing of feed or ingredients takes place.

*Distillery (Dist.)*—A firm for which the primary activity is distilling grain in the manufacture of distilled spirits.

*Feed Manufacturer of Feed Mill (FM)*—A firm whose primary activity is any kind of feed manufacturing, including such activities as production of complete feeds, production of feed ingredients and premixes, feed grinding, including custom grinding, feed mixing, etc. More than 50% of its revenue must come from sale of feed or feed ingredients.

*Flour Mill (FLM)*—A firm whose primary activity is the milling of wheat flour(s) that result from complete milling of at least 50% of the wheat flour(s) produced. The firm may also do blending of imported flour(s), but these cannot exceed the volume milled by the firm.

*Integrated Poultry (IP)*—A firm, which could otherwise be classed as a feed manufacturer or feed mill, but whose operation involves raising of broilers, eggs, or other poultry operations as part of a total operation, and more than 50% of its dollar revenue comes from the sale of poultry or poultry products. To qualify under this category, such a firm must receive at least some raw grain as part of the total operation.

*Soybean Processor (SBP)*—A firm whose primary activity is extracting oil from soybeans, and with soybean oil meal a product of the operation. It is not important, for the purposes of the definition, what is done with the product. The firm may use the SBOM in its own operation, and sell the oil, ship the SBOM out, and have other activities in any combination, so long as its primary activity is processing of soybeans and it receives more than 50% of its revenue from processed products of soybeans.

*Terminal Elevator (TE)*—A firm whose primary activity is collection and merchandising raw grain. It will be classed as a terminal elevator if it receives more than 50% of the grain from firms other

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\*Definitions developed for the Southern Regional Research Project SM-42.

than farmers. The definition is not affected by where the grain goes. Although it is typical that terminal elevators sell to firms other than farmers, some types of firms may be classed as terminal elevators who receive grain from other firms and sell directly to farmers. More than 50% of the raw grain received must go out of the facility as raw grain to be classified as a terminal elevator.

*Miscellaneous (M)*—Those firms not fitting any of the above-mentioned categories but receiving raw grains as part of their operation.

*County Elevator (CE)*—A firm whose primary activity is collection and merchandising raw grain. It will be classed as a county elevator if it receives more than 50% of the grain directly from the farmers and more than 50% of the raw grain received goes out of the facility as raw grain. This definition is not affected by where the grain goes or whether some manufacturing of feed or ingredients takes place.

*Distillery (Dis)*—A firm for which the primary activity is distilling grain in the manufacture of distilled spirits.

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*Soybean Processor (SBP)*—A firm whose primary activity is extracting oil from soybeans and with soybean oil meal a product of the operation. It is not important for the purpose of the definition, what is done with the product. The firm may use the SBOM in its own operation and sell the oil, ship the SBOM out, and have other activities in any combination, so long as its primary activity is processing of soybeans and it receives more than 50% of its revenue from processed products of soybeans.

*Terminal Elevator (TE)*—A firm whose primary activity is collection and merchandising raw grain. It will be classed as a terminal elevator if it receives more than 50% of the grain from firms other

Definition developed for the Southern Regional Research Project BR-42



