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PROGRESS REPORT

Idaho Inland Elevator Wheat and Barley Marketing Patterns

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INTRODUCTION

This report presents the results of a survey conducted to identify marketing patterns for wheat and barley handled by firms within Idaho. Information concerning the origins and destinations of shipments, the volumes of grain flow, the seasonal distribution of the shipments, and the modes of transportation employed are presented for wheat and barley marketed during calendar year 1977.

The survey is part of a national research project currently underway to compile grain flow data for inland grain shipments throughout the United States.[1/] The purpose of the project is to provide information useful to industry and to government agencies in considering investments in transportation and marketing facilities. The information is also useful in the resolution of questions dealing with rail line abandonments and other grain transportation and marketing issues. Only the Idaho portion of the survey is reported here.

Shipping Data

The data for this study were gathered in interviews with managers of a sample of inland elevators throughout Idaho. Inland elevators are defined as landlocked firms whose primary activity is the collection

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1/ The project is conducted as part of the North-Central Regional Research Project (NC-139) "Economic Analysis of the United States Grain Exporting Systems." The University of Illinois provided overall coordination in the design and fulfillment of the project. Financial support is provided by the U.S. Army Corps of Engineers, the Federal Railway Administration, the U.S. Department of Agriculture, and various participating land grant universities including the University of Idaho.

and merchandising of raw grains. This does not include firms such as feedlot operators or feed millers, who handle substantial quantities of grain but are not primarily involved in grain merchandising. The sample quantities were then expanded to estimate total shipments made by all Idaho inland elevators.[2/] Since the main agricultural areas of Idaho are geographically separated, the state was divided into two reporting districts at the southern boundary of Idaho county. Distinct data are presented for the southern and northern Idaho districts. Origins of grains were those farms or elevators which were the loading points for direct shipments of wheat or barley to the sampled elevators. Destinations were those elevators, terminals, or ports to which a direct shipment was made. Any movements of the grains made prior to the point of origin or following the point of destination of these shipments are disregarded for this report.

The mode of transport for each shipment was that by which the grain entered or left the reporting districts or, for shipments within a single district, the mode by which grains were received or shipped from the Idaho elevator. For example, in the case of a truck-barge shipment from southern Idaho to Portland with the transfer to barge made at Arlington, Oregon, the Idaho shipper would show a destination of Arlington shipped by truck. Researchers in Oregon would record the subsequent shipment. Since there are only two river terminals at the Port of Lewiston, it was not possible to present the volumes of grain shipped through the Port and at the same time maintain the confidentiality of the receipts and shipments of those

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[2/] See the Appendix for the derivation of multipliers used to expand the samples.

firms. Therefore, shipments through the Port of Lewiston have been included in the general category of Inland River Terminals which includes all inland terminals on the Snake and Columbia Rivers.

Origins of Grains

It was estimated that inland elevators in southern Idaho received 25,192,692 bushels of wheat and 16,543,656 bushels of barley during 1977 (see Table 1). Of the total wheat received, approximately 87% was of the soft white variety, the remainder being varieties of hard red wheats. There was a higher proportion of white wheat receipts than would be suggested by production data for southern Idaho. In 1974, (the most recent data available) over 50% of the total wheat acreage in southern Idaho was used in the production of red wheat varieties. While there is some evidence of a shift toward increased production levels of white wheat, it remains likely that the sample resulted in understatement of red wheats in southern Idaho.

It was impossible to differentiate among the feed and malting classes of barley received. Nearly all of these grains were taken in directly from Idaho farms. Trucks were used almost entirely for these shipments and it was determined that the maximum hauling distance for shipments from farms to these firms averaged approximately 35 miles.

The seasonal distribution of shipments for each of these grains varied considerably. Of the totals received from Idaho's farms, 91% of the white wheat was taken in during the harvesting months of August and September and 83% of barley was received during the same period. However, only 63% of the red wheat was received during those months,

Table 1

Origins and Volumes of Grain Received by Idaho Elevators in 1977

	Idaho (Farm)	Idaho (Non-Farm)	Montana	Washington	North Dakota	Wyoming	Nebraska	Totals
Southern Idaho Firms								
White wheat	21,595,748	348,052	63,583	--	1,056	--	--	22,008,439
Red wheat	2,945,267	114,175	23,386	--	2,068	78,760	20,597	3,184,253
Barley	16,308,627	12,144	20,649	--	--	--	--	16,543,656
Northern* Idaho Firms								
White wheat	14,341,664	--	--	260,000	--	--	--	14,601,664
Barley	6,995,474	--	--	42,628	--	--	--	7,038,102

*These totals do not include shipments to river terminals at the Port of Lewiston.

the remainder flowing in at a fairly constant rate over the rest of the year. This lighter marketing of red wheat during the harvest period might have been expected since huge crops in the midwest both in 1976 and 1977 had driven red wheat prices down. It is conjectured that farmers preferred to hold the red wheats hoping that prices would improve as supplies dwindled. This cannot be substantiated by the survey results, however, since the reason for timing marketing of wheat was not addressed in the questionnaire.

It was estimated that inland elevators in northern Idaho received 14,601,664 bushels of wheat, all soft white, and 7,038,102 bushels of barley during 1977.[3/] All of these grains were taken in from northern Idaho and eastern Washington farms (Table 1). Virtually all of the grains were received during the harvest months of July, August, and September with 90% of the wheat and 87% of the barley received during August alone. The small amounts of grains flowing into inland elevators in northern Idaho during non-harvest periods is possibly the result of farmers storing their grains in the many large cooperative elevators in the area and making comparatively less use of on-farm storage than their counterparts in southern Idaho. Also, for grain which is stored on the farm, the near proximity of the river terminals makes direct farm-to-terminal shipment an often attractive alternative to shipping through an inland elevator. Trucks served as the singular mode of transportation from farms to elevators and maximum hauling distance to the firms sampled was approximately 20 miles, much less than the 35 mile maximum average estimated in southern Idaho.

[3/] Excluding the Port of Lewiston elevators.

Grain Destinations

Inland elevators in southern Idaho shipped an estimated 24,778,693 bushels of wheat during 1977. Soft white wheat made up 86% of the shipments and red wheats comprised the remaining 14%. The bulk of these wheat shipments were to the lower Columbia ports of Portland, Vancouver, Longview, and Kalama (Table 2). However, when the soft white and hard red wheats are isolated, unique shipping patterns emerge. Four of every five bushels of white wheat produced in southern Idaho were moved into what are potentially exporting lanes at Lewiston, the Columbia River terminals and ports, and at Seattle. These volumes make up part of the 85-95% of soft white wheat produced in the Pacific Northwest which has been exported during recent years.[4/] Most of the remaining white wheat was shipped into Utah and California presumably for domestic use.[5/] The shipping patterns for the red wheats were quite different with about 45% flowing into Northwest shipping lanes, either to coastal ports or river terminals, while over 50% was shipped south to Utah and California. Very little of either type of wheat remained within Idaho, the largest in-state market being for reseeding.[6/]

[4/] Casavant, Ken and Robert Thayer, Economics and Emerging Issues of Wheat Transportation in the Pacific Northwest. College of Agriculture Research Center, Circular 612, Washington State University, 1978, p. 3.

[5/] Several managers indicated that a fairly large volume of the shipments destined for Utah were the results of railroad logistics. Such shipments were actually bound for subsequent destinations, most often California, but were assembled and distributed from points in northern Utah. An exact figure for these shipments could not be obtained, however.

[6/] Turnbull, Neil R. and Robert L. Sargent, Changing Characteristics of the Elevator Industry in Idaho Since 1972. Idaho Agricultural Experiment Station, Progress Report No. 201, 1978, p. 9.

Table 2

Destinations of Southern Idaho Grain Shipments by Mode
(Bushels)

Wheat (All)	Southern Idaho	Inland River Terminals	Lower Columbia Coastal Ports	Seattle	Utah	California	Other*	Total
Rail	78,858	26,035	6,599,158	802,757	2,636,501	2,103,203	52,683	12,299,195
Truck	193,500	1,776,437	9,257,131	120,961	797,914	231,602	101,953	12,479,498
Total (Percentage)	272,358 (1%)	1,802,472 (7%)	15,856,289 (64%)	923,718 (4%)	3,434,415 (14%)	2,334,805 (9%)	154,636 (1%)	24,778,693 (100%)
White Wheat								
Rail	--	26,035	5,822,772	688,899	1,680,490	1,459,287	40,236	9,717,719
Truck	135,933	1,620,166	8,910,178	6,378	763,396	143,202	88,234	11,667,487
Total (Percentage)	135,933 (1%)	1,646,201 (8%)	14,732,950 (69%)	695,277 (3%)	2,443,886 (11%)	1,602,489 (7%)	128,470 (1%)	21,385,206 (100%)
Red Wheat								
Rail	78,858	--	776,386	113,858	956,011	643,916	12,447	2,581,476
Truck	57,567	156,271	346,953	114,583	34,518	88,400	13,719	812,011
Total (Percentage)	136,425 (4%)	156,271 (5%)	1,123,339 (33%)	228,441 (7%)	990,529 (29%)	732,316 (22%)	26,166 (1%)	3,393,487 (100%)
Barley								
Rail	927,758	3,059,285	1,400,429	--	1,573,869	1,623,547	469,475	9,054,363
Truck	2,900,014	108,274	462,244	--	1,588,915	375,652	398,744	5,833,843
Total (Percentage)	3,827,772 (26%)	3,167,559 (21%)	1,862,673 (13%)	--	3,162,784 (21%)	1,999,199 (13%)	868,219 (6%)	14,888,206 (100%)

*Inland elevators and feedlots throughout Nevada, Oregon, Washington and in the case of barley, Montana and Wisconsin.

Southern Idaho inland elevators shipped approximately 14,888,206 bushels of barley in 1977 and 26% of that total remained within the state for use in the area's cattle industry. Columbia River destinations received 21% of this total and the managers indicated that these grains were used predominantly in area feedlots rather than being shipped to the coast. The Northwestern ports did receive 13% of the southern Idaho barley and accompanying studies in Washington and Oregon will determine the actual amounts exported. The 13% of southern Idaho barley moving into California was fairly evenly split between Los Angeles and northern California feedlots. Finally, 21% of the barley was shipped into Utah with the remaining 6% going to "other" locations.

Seasonal shipments of white wheat and barley from the southern Idaho elevators were quite similar in proportions. Shipping volumes fluctuated over the months but averaged about 7% of the total per month, swelling to approximately 20% during August. Seasonal shipments of the red wheats followed a slightly different pattern with proportionately larger non-harvest shipments and much less increase in volume shipped during the harvest period. This appears to be partly the result of farmers preferring to hold larger amounts of their red wheats in on-farm storage during the year studied, as was discussed earlier.

The mode of transportation for wheat shipments from southern Idaho appears to be largely affected by the distance of overland travel. For shorter distances, within the Pacific Northwest, the flexibility of trucks partially overcomes any higher mileage costs relative to the

railroads. If the wheat is being shipped as a backhaul, as is sometimes the case for truck shipments to coastal areas, the actual shipping rate may be lower than that of the railroads.[7/] As a result, most of the soft white wheat, which flows predominantly to Pacific Northwest coastal ports, is shipped by truck.[8/] In contrast, a much larger share of red wheats serve a domestic market of mills located in more distant centers of population, and hence, a larger proportion is shipped by rail. In the case of barley, however, trucks were used only sparingly, mainly for very short distances such as within southern Idaho or to Utah, despite virtually all of the barley being shipped to points within the Pacific Northwest.

Virtually all (98%) of the estimated 16,530,274 bushels of white wheat shipped from the sample of northern Idaho firms moved to the Columbia River terminals or to coastal ports (Table 3). Whether or not this entire amount was actually exported will be determined by corresponding studies in Washington and Oregon. The 6,192,747 bushels of barley shipped from the northern Idaho elevators also went primarily to the coastal ports and Columbia River terminals. As with the barley shipped from southern Idaho, much of that shipped to Columbia River destinations may have been channeled into feedlot operations. A substantial part of the barley (9%) was shipped to Los Angeles and an additional 6% was shipped into Washington feedlots. Without a

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[7/] Turnbull-Sargent, p. 13.

[8/] Shipping by truck increased the possibility of bypassing inland elevators through loading the trucks in fields or at farm storage sites. Several managers mentioned increasing competition from this source.

Table 3

Destinations of Northern Idaho Grain Shipments
(Bushels)

	Inland River Terminals	Lower Columbia Coastal Ports	Seattle	Washington	Oregon	California	Other	Total
White Wheat								
Rail	221,778	1,526,448	600,613	104,472	182,806	--	--	2,636,117
Truck	13,783,537	--	--	--	--	--	110,620	13,894,157
Total	14,005,315	1,526,448	600,613	104,472	182,806	--	110,620	16,530,274
(Percentages)	(85%)	(9%)	(4%)	(.5%)	(1%)	--	(.5%)	(100%)
Barley								
Rail	30,450	4,065,633	47,150	373,393	61,418	559,403	119,185	5,256,632
Truck	928,718	6,465	--	--	--	932	--	936,115
Total	959,168	4,072,098	47,150	373,393	61,418	560,335	119,185	6,192,747
(Percentages)	(15%)	(66%)	(1%)	(6%)	(1%)	(9%)	(2%)	(100%)

significant livestock industry, and the only other major market being for reseeding, the amount of northern Idaho barley remaining within the state is quite small.

Most of the wheat shipped from northern Idaho travels in the truck-barge combination. The railroads, in most cases, cannot meet the low cost of water transportation.

In the case of barley, the railroads were employed in all but the shortest distances. Several reasons may account for this. While a large proportion of the barley flows to the lower Columbia ports, it does so in much smaller volumes. Valuable bin space at the river terminals would be occupied by the barley until a sufficient volume was obtained for barge shipment, displacing wheat inventories which would otherwise have turned over much faster thereby making more efficient use of the facilities. In short, the river terminals make very expensive storage houses. Also, the coastal markets prefer to receive grains in consistent volumes rather than in large intermittent shipments, keeping storage costs at a minimum. Wheat is shipped in sufficiently large volumes that 50,000 - 100,000 bushel capacity barges can be employed at a relatively consistent flow throughout the year. However, with a smaller volume of barley being shipped the railroads meet the need for consistency of shipments much more adequately than do barges.[9/]

[9/] Interviews with terminal operators.

SUMMARY

The origins and destinations and seasonal variations of wheat and barley shipments made by inland elevators in Idaho have been used in this report to estimate the marketing patterns for merchandised grains during the calendar year 1977. Soft white wheat made up the largest portion of the shipments both from northern and southern Idaho elevators, coming from Idaho farms and predominantly moving into the export lanes at the Snake and Columbia River terminals and Lower Columbia coastal ports. From southern Idaho, red wheats were also shipped into the exporting channels but a larger proportion was moved into Utah and California markets. Barley shipments from northern Idaho were made primarily to the Lower Columbia coastal ports and to Snake and Columbia River terminals. Southern Idaho barley shipments were more evenly distributed among the coastal ports, southern markets in Utah and California, and feedlots in southern Idaho and at other Northwest locations.

Seasonally, white wheat and barley were received almost entirely during the harvest period while red wheat, which was handled only by those inland elevators in southern Idaho, flowed in more evenly throughout the year. The effects of these lower harvest period receipts of red wheats transcended into the elevators' shipping schedules as shipments of red wheats increased approximately 50% during the month of August compared to a tripling of normal volumes in the cases of white wheat and barley during the same period.

With water transportation readily available to northern Idaho inland elevators, most of the wheat shipments from this area were made by

truck, moving in a truck-barge combination. The northern Idaho elevators continued to ship their barley primarily by railroad. Wheat shipments by southern Idaho inland elevators were nearly equally divided between railroad and truck. Shipments of white wheat though, being destined largely for the river terminals and coastal ports in the Pacific Northwest, were made primarily by truck while a larger proportion of the dark wheats were destined for more distant points outside of the Northwest and were thus moved by rail. The southern Idaho farms made heavier use of trucks in barley shipments than did the northern firms since a large part of their barley was destined for local feed firms and feedlots.

APPENDIX

Multipliers

The population of inland elevators was stratified into two segments. Beginning with the largest firm in terms of storage capacity and descending in order of size, all firms were contacted whose accumulated storage capacity totaled 42% of state storage capacity - ten firms. Of the remaining 105 firms, a random sample of fourteen firms was contacted and responded.

Of the larger ten firms, one firm located in the southern district chose not to respond. To adjust for this, the totals for this stratum of larger elevators in the southern district were expanded in order to prevent an understatement of grain flows.

Since storage capacity was the basis used to determine the sample size of the larger elevators, consistency was maintained by using storage capacity as the basis for expanding the grain flows through those elevators in the southern district. On the other hand, number of elevator firms served as the basis of sampling in the smaller elevators (14 firms out of a total of 105), so number of firms served as the basis of expansion for the sample data in this stratum. The expansion factors for the survey are shown below.

Inland Elevators	Population	Sample	Expansion Factor
Northern District			
Larger firms	21,693,063 bu.	21,693,063 bu.	1.0000
Smaller firms	19 firms	3 firms	6.3333
Southern District			
Larger firms	7,910,229	6,360,920	1.2436
Smaller firms	86 firms	11 firms	7.8182

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