FOCUS ON PACIFIC NORTHWEST GRAIN TRANSPORTATION ISSUES

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Focus On Grain Transportation In The Pacific Northwest

Grain transportation is a vital link in the marketing chain between Northwest grain growers and consumers throughout the world. When the transportation network is working smoothly it is taken for granted; "If it's not broken, don't fix it." But when it breaks — a labor strike, rate increase or equipment shortage — it gets everyone's attention, fast, because the whole grain industry is threatened.

But these aren't the only issues in grain transportation. In addition to the immediate problems that can arise, there are also more subtle longer term adjustments taking place. The whole grain industry is steadily changing in response to economic pressures created directly and indirectly by transportation requirements. Do we really understand what is happening as a result of deregulation, highway taxes, waterway user fees, cargo preference laws, deteriorating rural roads and competition among carriers?

The answers to such questions paint an intriguing picture of grain marketing in the Northwest. Understanding what is going on within the transportation network is important in planning and adjusting for change within the grain industry.

Extension grain marketing specialists in Washington, Montana, Idaho and Oregon will be addressing important grain transportation issues in a series over the next several months in this column. The first topic in this series serves as an introduction by providing an overview of one of the biggest fundamental changes to occur in grain transportation for nearly 100 years — deregulation. Subsequent columns will discuss: changes in the grain assembly network; problems with rural roads; the subterminal grain shipping elevator; how ocean freight rates affect marketing patterns; competition among grain carriers; farm level decisions concerning grain transport; and the impact of transportation deregulation on farm prices.

These findings and discussions are the result of an effort initiated in 1982 by University of Idaho agricultural economist Dr. Neil Meyer, to bring together the extension economists working on grain transportation issues in the region. The resulting Northwest Grain Transportation Project as reported on in this column was sponsored by the Western Rural Development Center located at Oregon State University.

Transportation Deregulation — Is It Working?

By Jim Cornelius

THE transportation of grain from producing regions in the Pacific Northwest (Washington, Oregon, Idaho and Montana) to terminal and export markets has undergone significant changes beginning in 1980 as the result of deregulation of transportation. The term "deregulation" is not entirely accurate in this case, since there is still extensive government regulation of transportation.

The U.S. government's involvement in regulation is composed of two general aspects, safety regulations and economic regulations. Safety regulations are designed to protect both the individual and society from unsafe transportation practices. Speed limits, weight limits and flight plans are typical examples of safety regulations.

Economic regulation is not so concise in either its intent or scope, but basically it is designed to influence the transportation industry's performance through various economic sanctions. Most of the debate concerning deregulation of transportation centers on economic rather than safety controls. Transportation deregulation has been concerned with relaxing the economic regulations imposed upon the railroad and trucking industry involved in interstate commerce.

Economic regulation in this case refers to the restrictions placed upon a carrier's ability to affect transportation rates, routes, frequency of service, as well as the freedom to enter or exit the transportation industry. Two specific changes were made in federal law that brought about this deregulation: the Staggers Rail Act of 1980, and the Motor Carrier Act of 1980. The intended result of this combined legislation as well as similar deregulation of the U.S. airline industry in 1979, and the passage of the Inland Waterways Revenue Act in 1978, is to place more reliance on allocation of transportation resources through the free market mechanism rather than government intervention and protection.

Idaho Farmer-Stockman, July 5, 1984

Dr. Cornelius is Extension Economist, Oregon State University.

PNW Grain Transportation Prior To Deregulation

Pacific Northwest grain transportation in the latter part of the 1970s prior to deregulation was characterized by declining rail service, and increasing reliance on truck/barge movement from the interior Pacific Northwest following the opening of subterminal river port facilities at Lewiston, Idaho.

The late 1970s were a time of extreme rail car shortages throughout the nation, forcing rail shippers to seek other transportation arrangements. In addition to rail car shortages, branch line abandonments became more common, and service to some rural areas declined. This period saw the demise of the Milwaukee Railroad, leaving the Burlington Northern as the dominant carrier along the northern route in the PNW. Although multicar rates existed in much of the Midwest, they had yet to be offered in the PNW.

Moreover, the major railroads service the PNW — the BN and the Union Pacific — were offering lower cost multicar "export rates" to shippers in the Midwest to export elevators on the Columbia River and Puget Sound. Rail shipments originating within the Pacific Northwest, however, were still subject to single-car rates, and where no intermodel competition existed such as in eastern Montana, rail shipping costs escalated rapidly.

As one solution to the high rates and declining rail service, truck transportation proved important as a means of moving grain. Wheat was routinely trucked from interior elevators to river subterminals, where it was then barged down the Columbia-Snake system to West Coast export elevators. Trucking grain from the Great Falls area in Montana to Lewiston — a distance of nearly 500 miles one way — became routine. Interstate truck transportation of raw agricultural commodities has always been exempt from economic regulation, and rates were set in the marketplace.

Barge transportation rates are also largely unregulated under guidelines provided by the Interstate Commerce Commission (ICC), such that the truck or truck/barge rate reflected the market conditions. Rail rates from throughout the PNW were often set only slightly below the competitive truck/barge rate, despite the fact that rail shipping costs were lower than trucking costs for distances beyond the 300- to 400-mile range.

The innovative grain shipping arrangements serving the Pacific Northwest in the later 1970s were largely in response to the necessity of moving grain under less than ideal circumstances. The inability of the railroads to meet shipper needs was cited as one of the most pressing marketing problems facing grain producers during this period, and it was difficult to foresee that in less than two years the conditions could change as quickly and significantly as actually occurred following deregulation in 1980.

Evaluating The Impacts Of Deregulation

Interstate truck transportation of grains within the Pacific Northwest has always been exempt from ICC economic regulation. As a result the major impacts on grain movements in the region have occurred as a result of deregulating rail transportation. The Staggers Rail Act of 1980 was an attempt to reverse the long-term downward trend in railroad industry earnings. The low earnings of the industry as a whole and the operating losses of several railroad companies were a major factor in the continued deterioration of the railroad industry in the 1970s.

The Staggers Act gave railroads a great deal of flexibility in setting rates, service schedules, initiating merges or branch line abandonments, and generally lifted many of the impositions previously associated with economic regulation. Operating with more freedom, railroads sought to streamline operations in accordance with their own efficiency criteria, which now is directed towards cost savings associated with large volume, point-to-point grain shipments. Railroads have been less willing to service unprofitable low-volume branchlines, or inefficient single-car loading which increases switching and other logistical costs.

Transportation rates, representing the cost of the grain transportation service, are really the focal point of transportation deregulation. Significant change in PNW grain shipping rates offered by railroads included the offering of multicar rates, multiple origin-multicar rates and contract rates, as well as the existing single-car rate.

The first significant impact of rail deregulation in the PNW occurred in June 1981, when the Burlington Northern railroad reduced its domestic and export single-rate car rates from Montana origins by 18 to 19%, equalized the domestic rates with the formerly lower export rates, and introduced multiple- and single-origin 26- and 52-car rates. The impact upon truck and rail shares in moving Montana grains was dramatic. Truck shipments from Montana to Lewiston came to an abrupt halt as a result of the lower cost rail rates straight through to the Coast. Similar rate reductions were offered by the Burlington Northern in the state of Washington, and the Union Pacific, serving southern Idaho and Oregon wheat-producing areas, has also introduced multiple-car rates.

Another change in rate offerings by PNW rail lines is the concept of contract rates. As the term implies, contract rates are the result of contracts between the railroad and shipper that establish specific rates for a specifically agreed upon level of service. Railroad contracting rules are specifically legislated in the Staggers Rail Act. Contracting can work for the benefit of both the railroad and the shipper, although there is concern that contract rates tend to favor larger volume shippers, at the exclusion of smaller elevators. That is, larger shippers can guarantee larger volume in turn for favorable rates and service much like the incentives offered by multicar rates.

The changes in transportation service and rates have led to further changes in the transportation infrastructure or network serving grain producers and shippers in the PNW. The favorable rates available to large volume shippers have encouraged the construction of larger grain shipping facilities, such as the subterminal elevator with multicar loading facilities. This is significant change from the previous country elevator concept that characterized shipments from interior elevators over the past 100 years.

Increasingly, the small country elevator lacking multicar loading facilities may be relegated to a local gathering and short-term storage facility, feeding grain supplies into centrally located subterminal elevators via truck rather than rail shipment. However, current elevator construction activity in the PNW indicates that no centralized agreements have been made over optimal location of subterminals, and there is the potential to overbuild subterminal facilities, at considerable capital investment costs.

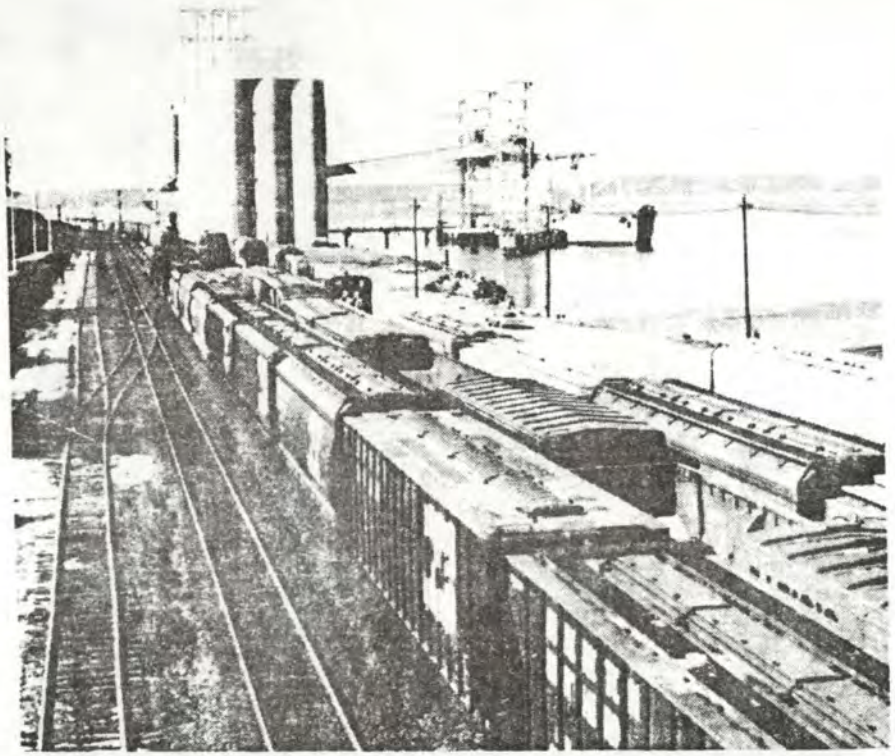
The rise in importance of subterminal rail shipping facilities has also influence the flow of grains by the alternative truck/barge mode. Intermodel competition has increased following deregulation, and grain shipment volume by barge on the Columbia-Snake system declined in 1982 for the first time in several years. Also, the trucking component of truck/barge grain shipments from interior Montana locations declined dramatically as a result of intermodel competition with rails.

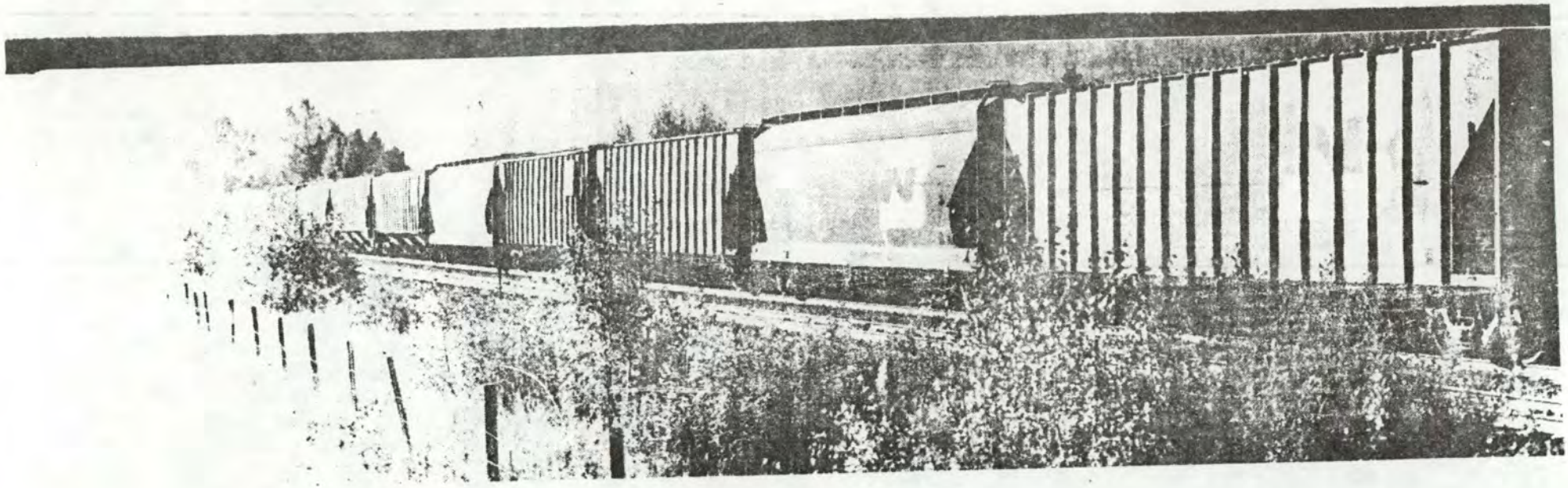
. An issue closely related to deregulation of motor carriers and railroads is the concept of user fees for waterways and highways. In the PNW, this could have a significant impact on river transportation from the viewpoint of both maintaining existing facilities or enlarging the Bonneville locks. User fees are more consistent with the market conditions sought through deregulation in the sense that direct users, rather than taxpayers in general, pay the costs of using the waterways.

The actual mechanism for assessing waterway user fees has yet to be reconciled, however, so the outcome is uncertain. It appears likely that increased user fees on the Columbia-Snake river system would increase shipping costs by barge, and could shift some grain movements to rail transport. Similarly, increases in highway fees, such as are contained in the Service Transportation Act of 1982, increase trucking costs for grain shipments, and some of these costs will be passed back to shippers and producers.

Is Deregulation Working?

Transportation deregulation in the PNW is creating some definite changes in the grain marketing system. The impact of deregulation of railroads and motor carriers has not solved all the problems in grain movement in the Pacific Northwest, but there are indications that the economic efficiency of grain transportation is being improved.





The general trend in the grain transportation network since deregulation has been a movement towards large volume, lower per-unit cost shipments. This has resulted in reestablishment of the more traditional cost-based mode efficiency, favoring trucks on shorter distance hauls, and rail or truck-barge movement (with relatively short trucking distances) for long haul grain movements.

The tradeoff has been in the area of service to smaller, less efficient shippers who face reduced service, often at higher rates. The potential market power of railroads is a concern to many, particularly for shippers with no other transportation alternative.

Inequities and losses resulting from deregulation have not yet run their course. It is likely that competitive market forces will continue to exact a toll on identifiable groups of shippers, producers and carriers. In this regard, it is important to maintain the competitive balance between grain producers and shippers on one hand, and the rail industry on the other. Ensuring this balance, the benefits to be gained through deregulation will acrrue over the long run, leading hopefully to a more viable, economically sound transportation industry, but with a corresponding healthy grain industry in the Pacific Northwest.

EXPORT GRAIN ASSEMBLY:

How Farmers Are Reacting To The Changing System

By Neil Meyer

Dramatic changes have taken place in the farm to market movement of Pacific Northwest (Idaho, Montana, Oregon and Washington) wheat in the past decade. First is the shift to dependence on export markets for disposal of over 80% of our annual production. Second is the introduction of barge transport on the Columbia-Snake river system to Lewiston, Idaho. Third is the introduction of multi-car rail rates for grain movement from a single or limited number of origin points to a single destination.

As the result of export market expansion in Asian Rim countries (Japan, Korea, Hong Kong, China, Taiwan, Philippines, Singapore, Indonesia), large quantities of wheat and feed grains have been exported through PNW ports. This new Asian demand has provided the incentive for expansion of grain handling and transporting facilities inland as well as at the ports. The end result is changing grain transport patterns and new markets for the continually increasing PNW grain production.

Completion of the Columbia-Snake inland waterway stimulated the development of river subterminals and barge loading facilities as far inland as Lewiston. As a result of this development, grain transport rates were influenced throughout the PNW. Grain volume movement by truck/barge combination increased steadily from 1975 through 1981. This was new competition for railroads and they responded by offering shipper multi-car rates in the early 1980s.

Idaho Farmer-Stockman, August 2, 1984

The author is Extension Economist, University of Idaho.

The purpose of this article is to outline the incentives offered to producers and shippers to change grain assembly patterns and the responses which have occurred, particularly since passage of the Staggers Rail Act in 1980. The first section outlines the incentives created to change grain assembly methods. The second section outlines the changes made by handlers and producers to adapt to the economic and regulatory climate.

Economic Incentives For New Assembly Patterns

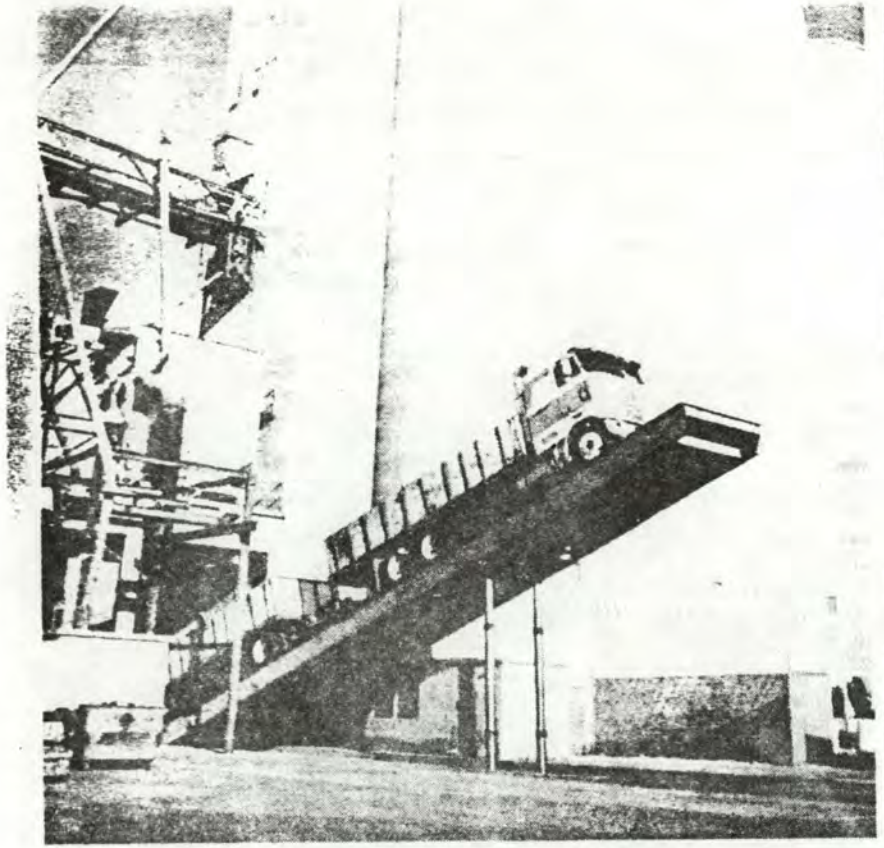
TWO basic incentives were created to change how grain moves from field to final user or export point. They were:

- A higher price offered for grain delivered to subterminals (rail or water).
- Economies of scale from using larger trucks to move grain from the farm to the subterminal elevator.

Response to these incentives to producers has changed PNW grain marketing patterns.

The System

The large export terminals on



Dumping a truck-trailer load of grain for export at Lewiston's port.

TABLE 1. GRAIN ASSEMBLY COSTS FROM MOSCOW, ID TO PORTLAND, OR AND EFFECTS ON FARM PRICE

	RAIL		TRUCK-BARGE		TRUCK	
	Via Local Elevator 1-Car	Via Local Elevator 3-Car	Via Local Elevator	Direct To Sub-Term.	Via Local Elevator	Direct To Exporter
Portland Price	3.75	3.75	3.75	3.75	3.75	3.75
Less						
Trans. to Coast	.34	.28	.155	.155	.55 *	.60*
Subterminal handling	—	—	.05	.05	—	—
Trans. to Subterm.	—	—	.124*	.19 *	—	—
Country elevator handling	.09	.09	.09	—	.09	—
Trans. to country elev.	.104	.104	.104	—	.104	—
Total Trans. & Handling Charges to Portland Area	.534	.474	.523	.395	.744	.60
FARM PRICE	3.22	3.28	3.23	3.36	3.01	3.15
Rank	4	2	3	1	6	5

*Costs are estimated using the Idaho Agricultural Commodities Micro Computer Model. Assumes 567 bushels per truck, 12 miles one way to country elevator, 40 miles one way to river subterminal direct from farm.

Puget Sound and the Columbia River combine with rail, barge and truck transport modes, inland terminals (rail and river), country elevators and on-farm storage to form the grain holding, flow and marketing system. Because the primary market for PNW wheat is for export, the role of the exporting firms and facilities for moving grain to the coast is critical to the regions' grain trade.

The system starts with the availability of inland on-farm and off-farm storage which allows producers to choose where grain will be stored, what costs will be incurred, and the optimum time for sale. For marketing export grain, there is the choice of country elevators, subterminals and direct shipment to terminal elevators. For transporting grain, the choices of shipping by rail, truck and truck-barge are continually made in moving grain to domestic consumers and export points.

The setting in which this system operates is constantly changing. During the mid 1970s unregulated grain barge transport from Lewiston to Portland began. In 1980, with passage of the Staggers Rail Act, railroads displayed new assertiveness in competing for business through the introduction of multi-car variable rates. User fees were imposed and later increased on the barges and most recently truck taxes were increased. Inland subterminal elevators and other multi-car loading sites were developed. All these factors affect the assembly of grain for export from the PNW.

The majority of the wheat exported from the PNW goes through the mouth of the Columbia River. Cost of various handlers as shown in Tables 1 and 2 provide examples of the transport-marketing alternatives available to producers and the effect these alternatives have on the price offered to producers. From Moscow, Idaho most wheat is shipped to the Portland area via truck-barge. Grain goes by truck from the farm directly to a river subterminal or through a local country elevator. The total estimated cost by the most economical method is almost 40¢ per bushel. In this case the country elevator has the option of shipping by 3-car rail or to the cooperative owned subterminal on the river (there are no 25-car rail shipments from Mos-

...How Farmers Are Reacting

cow to Portland). As producers purchase larger trucks, many are bypassing the country elevators and selling directly to the subterminal. The economics of direct selling show an increase in price and is covered in the following section.

Lewistown, Montana, a second example, is shown in Table 2. In this case, 52-car rail is the most economical way to transport grain to the PNW coast. It costs an estimated 76.2¢ per bushel. Truck-barge shipments through Lewiston ID are the next best alternative under present circumstances, although 26-car rates are very competitive. Subtracting all transportation and handling charges from the Portland price indicated direct shipment from farm to the rail subterminal shipping 52-car units results in the largest residual possible to pay the producer for his grain.

Choosing among various shipping and handling combinations can influence farm price offered by as much as 35¢ per bushel. In a number of cases, part of the freight rate saving must be used to pay for capacity increasing investments made by the handler. Therefore only a proportion is shared with the producer (a later article will deal specifically with this question).

Producer Transport Costs

As producers respond to the new incentives of higher bid prices for grain delivered to subterminals (rail or water), they are hauling more grain directly to subterminals. Idaho producers marketed about 30% of their wheat directly in 1982. Producers hauled their grain as much as 40% farther from on-farm storage to market when transporting to subterminals or direct users as compared with hauling to country elevators. As an example can be demonstrated, analyzing four situations available for producers in eastern Idaho. Their marketing choices are rail or truck combinations using country elevators and rail subterminals. Producers ship directly to market from the field to market, commercial storage or on-farm storage. Other times of the year they ship from on-farm storage to market.

Table 3 presents the costs of farm to market transport using a traditional two-axle truck hauling 333 bushels (Case I), a three-axle truck hauling 567 bushels (Case II), a three-axle truck pulling a trailer hauling 900 bushels (Case III), and a five-axle semi hauling 900 bushels. In Case I, the traditional case, a producer transporting grain 27 miles from on-farm storage to the country elevator would expect to pay 11.3¢/bushel variable cost and 23.4¢ per bushel total transportation cost.

However, if he purchases a larger three-axle truck and hauls his grain from on-farm storage directly to a unit train loading facility, the expected variable cost per bushel would be 8.3¢/bushel and total cost is expected to be 15.2¢ per bushel. This is because of higher utilization of a truck plus the scale economies associated with using a larger truck. An additional 3.1¢ savings can be achieved by

TABLE 2. GRAIN ASSEMBLY COSTS FROM LEWISTOWN, MT TO PORTLAND, OR AND EFFECTS ON FARM PRICE

	RAIL			TRUCK-BARGE		TRUCK	
	Via Local Elevator 1-Car	Direct To Subterm. 26-Car	52-Car	Via Local Elevator	Direct To Sub-Term.	Via Local Elevator	Direct To Exporter
Portland Price	3.75	3.75	3.75	3.75	3.75	3.75	3.75
Less							
Trans. to Coast	.996	.852	.762	.155	.155	1.10 **	1.15**
Subterminal handling	—	.05	.05	.05	.05	—	—
Trans. to Subterm.	—	.199*	.199*	.80 **	.88 **	—	—
Country elevator handling	.09	—	—	.09	—	.09	—
Trans. to country elev.	.133*	—	—	.133*	—	.133*	—
Total Trans. & Handling Charges to Portland Area	1.219	1.101	1.011	1.228	1.085	1.323	1.23
FARM PRICE	2.53	2.65	2.74	2.52	2.67	2.43	2.52
Rank	4	3	1	5	2	7	5

*Costs are estimated using the Idaho Agricultural Commodities Micro Computer Model. Assumes 567 bushels per truck, 19 miles one way to country elevator, 44 miles one way to subterminal elevator.
**Rate estimates based on quotes of commercial truckers.

"...Incentive to haul farther and take advantage of the higher bid prices..."

TABLE 3. COST COMPARISON: FOUR ALTERNATIVES FOR EASTERN IDAHO PRODUCERS TRANSPORTING GRAIN FROM FARM TO MARKET

	CASE I (333 Bu) 2-Axle		CASE II (567 Bu) 3-Axle		CASE III (900 Bu) Trailer		CASE IV (900 Bu) 5-Axle Semi	
	ND*	D**	ND	D	ND	D	ND	D
FIELD TO MARKET								
Miles shipped	28	35	28	35	28	35	28	35
Total cost cents/bushel	24.3	30.4	10.7	13.3	8.5	10.6	6.3	7.8
Variable cost cents/bushel	11.7	14.6	5.8	7.3	4.4	5.4	3.7	4.7
ON-FARM STORAGE TO MARKET								
Miles shipped	27	40	27	40	27	40	27	40
Total cost cents/bushel	23.4	34.7	10.3	15.2	8.2	12.1	6.0	8.9
Variable cost cents/bushel	11.3	16.7	5.6	8.3	4.2	6.2	3.6	5.3

*ND is the nondirect shipper selling at the country elevator
**D is the producer shipping grain direct to user or subterminal elevator

pulling a pup trailer behind the three-axle truck and 9.2¢ additional savings can be achieved using a five-axle semi. (The Agricultural Commodity Transportation Micro Computer Model will be available Sept. 1, 1989 for Agricultural Communications, University of Idaho, Moscow.)

The economies of scale achieved through using larger trucks exceed the additional costs of hauling wheat greater distances. That is a strong incentive to haul farther and take advantage of the higher bid prices at subterminal elevators.

As the result of higher bid prices made possible by changes in freight rate structures and economies of scale from larger trucks, producers are hauling their grain farther to receive a higher price while reducing their per-bushel farm to market transport cost. The result is a higher net price for producers. Both factors are changing how grain is assembled and transported to the export point at Portland. In the next issue, we will discuss some of the implications of this change in grain assembly for rural roads.

NEW GRAIN HANDLING PATTERNS:

THIRD IN A SERIES

Effects On Rural Roads

By Neil Meyer

Producers have changed marketing patterns and are putting increased pressure on farm to market roads leading to river and inland subterminals. Although the major portion of the longer truck transport distances for grain is on state and federally financed roads, many times local roads also need to be improved to support the heavier trucks and increased volume of trucks. This article reviews the changes which are occurring in grain farm to market transport, then projects the impact on roads leading to the grain handling facility, finally sources of revenue and costs of rehabilitation are discussed.

Changes Occurring In Rural Areas

The past decade has been a very dynamic time for agricultural commodity transportation. Particularly in the Pacific Northwest, dependence on export markets has grown to the point where exports absorb almost 80% of annual production for commodities such as wheat. To export this grain, it must move from fields to local storage facilities, to local markets, to terminals or export markets. In moving grain to these various points, trucks, rail, barge or some combination are generally used to transport grain to the terminal market, final user or export market. Since the opening of barge traffic on the upper Snake in 1975 and enactment of the 1980 Staggers Act for rails, the competitive climate has changed substantially for producers and local elevators shipping grain to the export markets at the mouth of the Columbia River. First, PNW grain production has increased 316% over the past 25 years to 481 million bushels. And, 178 million bushels of that increase have come since the 1972 crop year. A major part of this increase in production has been exported because production increased much faster than domestic use. This dependence on exports is causing a revision in farm to market grain transport patterns.

River Subterminals

Barge transport service from Lewiston ID to the Portland area began in 1975. Subterminals were constructed at various locations on the river. This brought grain to the river for shipment to the mouth of the Columbia River. Grain transport incorporated truck/barge as well as the previously used rail and truck modes for moving grain to market. By 1982, the average one-way transport distance for producers shipping grain from on-farm storage directly to river subterminals was 104 miles. At the same time, producers shipping to local elevators from on-farm storage were hauling grain an average one way distance of 38 miles. Construction of river subterminals changed grain assembly patterns to take advantage of barge transportation. The advent of barge transport resulted in development of truck transport from parts of Montana, eastern Idaho and the western Dakotas to Snake-Columbia river ports. There it was transferred to barges for the remainder of the trip to the mouth of the Columbia River. This forced state and local authorities to redesign and reconstruct numerous roads and bridges to accommodate traffic flows to new destinations.

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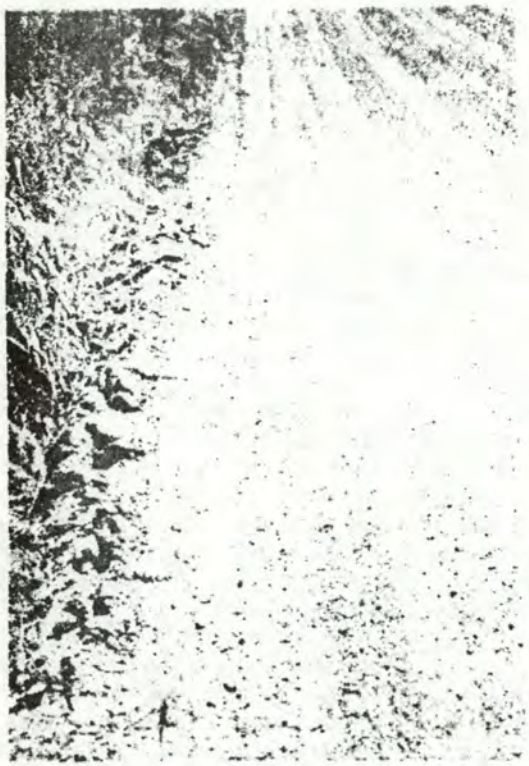
Land Subterminals

Producers responded to land/rail grain subterminals in a similar manner. They hauled grain past country elevators to subterminals to receive the higher prices associated with multi-car unit train shipments. For southern Idaho, producers hauling grain directly to subterminals are hauling an average one way distance of 85 miles from on-farm storage to market point. Producers hauling from on-farm storage to country elevators haul an average one way distance of 34 miles.

As the technical change of unit train car loadings continues, more grain is moving directly to subterminal elevators. Research at the University of Idaho shows almost all of the extra miles of the trip to the subterminal are on state and federal highways. However, in areas where grain flow direction changes, there can be substantial pressure on the local road system carrying traffic to the subterminal grain facility.

Road Requirements

The price incentives to producers have encouraged shipment of grains direct to final users, exporters or subterminals. New grain sheds (like watersheds) have been established for the subterminals that require different road capacities to meet the new demands. The photos show what happens to existing roads with the heavier weights and traffic volume. Some roads now need improved bases, surfaces and bridges, while others are no longer used as heavily. According to Idaho Department of Transportation officials, the average per mile cost to reconstruct a 40-foot-



This gravel road leading to the Whitman County Grain Growers' 25-car unit train loading facility at Fallon WA is being broken up by heavy grain trucks.

wide asphalt road is over $300,000 per mile. Just adding the surface overlay costs an average of $100,000 per mile. Obviously, the number of bridges, soil types and terrain have a large influence on the reconstruction cost per mile. Because the majority of the extra miles are on state and federal financed highways, revenue from registrations, fuel taxes and federal aid provide the majority of the resources to upgrade and maintain the highways trucks use. Recently, these user fees have been increased in all states to provide more revenue for construction and maintenance. The actual level of fees for farm trucks is shown in Table 1.

Larger Trucks

Producers have adapted to the longer hauls by hiring commercial trucking service and using larger trucks. Commercial trucks provided 33% of the direct to subterminal Idaho grain transport in 1982. Farmers are also replacing their traditional 2-axle truck with 3-axle units. For example, Idaho registrations of 2-axle trucks decreased 961 units (7.5%) from 1979 to 1983 while 3-axle unit registrations increased 815 units or 35% in the same period.

Most Idaho grain farmers own three trucks, and the majority of the extra producer mileage transporting grain is put on one larger truck. In many cases, this means the actual cost per bushel shipped from farm to market decreases with the larger truck. This has provided an additional incentive to producers to ship grain directly to multi-car loading facilities.

Impacts On Producers And Communities

Adjustment to the new technology are being made by producers and communities. Producers are changing how and where they market their grain. Those marketing directly to consumers, exporters and subterminals are hauling grain farther to receive the higher prices made possible by the efficiencies of volume handling and transport. Direct community impact is largely on roads.

When the grain assembly pattern changes, often existing infra-structure is no longer needed and routes to new destinations need their capacity increased. The burden of funding these county road improvements is shared. For local and county roads, the proportion paid by highway user fees is from 21 to 40%. Other revenue comes from property taxes, general fund appropriations, revenue sharing and various other sources. Actual percentages will vary by county, depending upon the dominant economic activities and quantity of public land in the county.

On state and federally financed highways which carry the majority of the extra miles traveled for grain transport, about equal parts of federal aid and highway users revenue provide around 97% of the revenue. Under present user fees, the more you drive the more you pay. For federal and state finance highways, the major share of the road maintenance and construction costs is paid by the users.

TABLE 1. TRUCK USER FEES[1] FOR FARMER-OWNED GRAIN TRUCKS

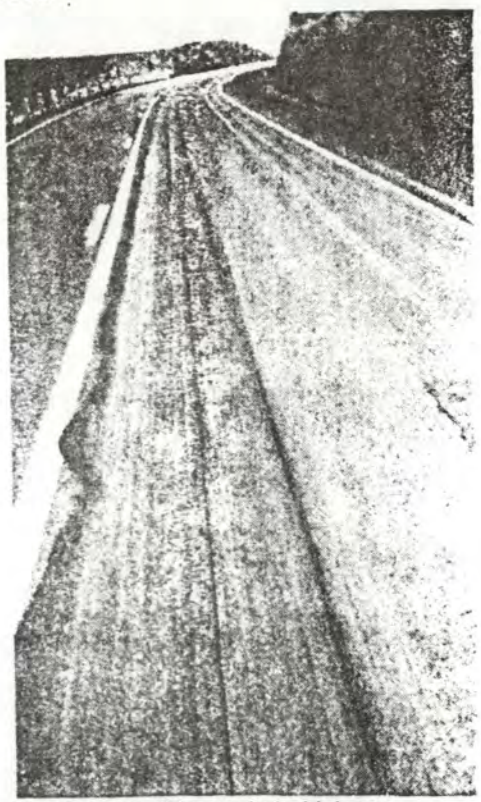
	Idaho	Montana	Oregon	Washington
FARM TRUCK 60,000 GVW (3 axle)				
Registration	311	139[3]	60	487 gas
Fuel Tax[2]				
gas/gal	23.4¢	24¢	18¢	27¢
diesel/gal	29.5¢	32¢	24¢	33¢
FARM TRUCK 80,000 GVW (5 axle)				
Registration	550	182[3]	168	1022 diesel
Fuel Tax[2]				
gas/gal	23.5¢	24¢	18¢	27¢
diesel/gal	29.5¢	32¢	24¢	33¢

[1]Commercial are higher in each state
[2]Includes state and federal tax (tax is 9¢/gal for gasoline and 15¢/gal for diesel fuel)
[3]Plus county property tax

Summary

Producers are adapting to the new environment by hauling larger loads greater distances to take advantage of higher prices offered for grain at subterminals. In cases where the grain flow pattern changes, improvements need to be made in the road system leading to the grain facility. For local and county roads, property taxes and other revenues, as well as user fees and registrations, often pay the reconstruction cost. However, most of the extra miles grain is transported to subterminals are on state and federal highways.

These highways are funded almost equally by user fees from state registrations and taxes and federal taxes. Here the cost is directly related to distance driven. The majority of the cost for reconstruction and improvement of state and federal highways is paid through user fees by the persons benefitting from changes in the system. The 1984 user fee revisions make the previous statement even more true. New grain transport patterns require new investment and improvements in roads. At the county level, users pay only a proportion of the cost, while state and federal maintained highways are almost entirely financed by users fees.



Patches on this asphalt highway between Central Ferry and Dusty in Washington show the effects caused by heavy trucks hauling grain to Central Ferry barge loading facilities on the Snake River.

FOURTH IN A SERIES

New Facilities For The Pacific Northwest

By Robert L. Sargent

The U.S. grain industry probably experienced more changes in the period 1972 to 1983 than in any comparable period in history. Grain (wheat and coarse grains) production increased 48% from 1972 to 1982, and exports increased 173% from the 1971/72 marketing year until their recent peak in 1980/81. Exports then declined nearly 15% by 1982/83.

The near tripling of exports in just nine years placed considerable strain on the transportation system to get the grain to the ports. It required vast amounts of new capital investment for internal transportation. Country elevators had to expand and up-grade their facilities to handle the large crops and the larger farm trucks delivering the grain. They also had to provide faster loading of out-going cargoes. And, at the ports, substantial new investment was necessary to handle the sharply increased volume coming from the country and being loaded on ocean vessels. World grain trade almost doubled from 1971/72 to 1980/81. This required expansion of the ocean-going fleet.

The author is Extension Economist in the College of Agriculture and Home Economics at Washington State University, Pullman.

Growth In Storage Needs

The increase in U.S. grain production, which by its very nature is harvested in a relatively short time span, created a need for additional storage. This did not present a problem during the early- to mid-1970s because beginning stocks (the carryover) were drawn down sharply. But national grain carryover nearly doubled in 1977/78. When combined with record grain production, this resulted in the largest grain supply since at least 1960, if not ever. Total grain supplies continued to increase until reaching a record 431.4 MMT (million metric tons) in 1982/83.

On Farm Storage

Congress responded to the rising storage needs by including very favorable financing terms in the Food and Agriculture Act of 1977. Data on the actual amount of on-farm storage is, however, very limited. USDA's ASCS offices conducted surveys in 1978 and again in 1983 to try to get a clearer idea of how much farm storage capacity was available. Their findings for the four PNW states, and the nation, are shown in Table 1.

There is concern that these figures understate the total amount of farm storage capacity that is available, and the increases that have occurred during the period 1978 to 1983. There would appear to be some justification for these concerns if one reviews the reported farm-stored stocks of grain in USDA's Grain Stocks Report. If wheat can be used as an indicator, there was a sharp expansion in on-farm storage capacity in the Pacific Northwest.

Montana had a 34% increase in their reported October 1 (the first report after harvest) farm stored wheat stocks from 1978 to 1982 when they had their highest stocks levels. This compares with 14.2% in Table 1. Montana relies heavily on on-farm storage. The other three PNW states rely more on off-farm storage, but Idaho's farm stored wheat increased 50% from 1978 to 1981 when its peak was reached. In Oregon and Washington, the increases were 44% and 42%, respectively, from 1978 to 1983, when their peaks were reached.

A 1982 study by the Washington State Department of Agriculture adds further support to the concern that farm storage capacities are understated. This study concluded that 15 eastern Washington counties had 104.7 million bushels of on-farm storage capacity at that time. In that study, the commissioners of Whitman County, the largest wheat producing county in the state, authorized a farm-to-farm survey of

available farm storage in the county. The official ASCS records had estimated the farm storage capacity at 11,756,000 bushels. The survey, however, revealed 41 million bushels of farm storage capacity.

This suggests that the study's adjustments for the other 14 counties are still understated. The study indicates that Whitman County alone accounted for 40% of the state's on-farm storage capacity, but in 1982 and 1983, that county only accounted for 15 and 17% of the state's wheat production. Casual observation does not suggest that such a high proportion of the state's on-farm capacity is concentrated in just this one county. The author is not aware of similar studies in other PNW states.

Off-Farm Storage

The USDA surveys commercial (off-farm) grain storage facilities annually to determine their capacities. Commercial facilities in Washington, Oregon and Idaho increased their capacities 17.5%, but in Montana there was a 7% decrease from 1978 to 1983.

The foregoing suggests some uncertainty as to just how much storage capacity is available in the Pacific Northwest. The 1982 and 1983 harvests dispelled part of that uncertainty — there was not enough. Estimates following the 1983 harvest indicated there were nearly 50 million bushels of grain (47.6 million of wheat and 1.7 million of barley) piled on the ground in Washington, Oregon and Idaho.

Table 1. On-Farm Storage Capacity Estimates, 1978 and 1983.

	1978	1983	
	000 bushels		% Increase
Idaho	81,614	110,221	35.0
Montana	280,809	320,691	14.2
Oregon	35,715	43,827	22.7
Washington	61,783	73,448	18.9
Total PNW	459,921	548,187	19.2
U.S. Total	9,946,875	11,671,316	17.3

SOURCE: Personal contact with Kendall Keith, National Grain and Feed Association, Washington DC, relative to 1978 and 1983 ASCS Surveys.

But storage capacity increases reflect only a portion of the changes that have taken place in commercial grain facilities in recent years. Country elevators, particularly in those areas which rely heavily on off-farm storage, have found themselves faced with a much shorter, more concentrated harvest period. They have had to increase their receiving capacity sharply in order to adjust to this change to avoid long waits by farm grain trucks. Farmers are using larger (often three-axle) trucks to deliver their grain, and new scales have been required to handle them in many cases. Some country elevators have found themselves situated to act as inland subterminals. These facilities have to be able to handle five-axle truck-trailers and must have the attendant increased receiving and loading capabilities.

Inland Subterminals

Unit-train rates became available in the Pacific Northwest in 1981. Currently, progressively lower rates are available for 3, 5, 10, 26 and 52 car units from single origins to single destinations. Additional flexibility is sometimes offered in the form of multiple origin, single destination units in the larger multiples.

Limits are imposed on how much time can be taken to load one of these multiple units. This has often meant that facilities have had to increase their load-out capacity. In addition, they may have to buy or build sufficient trackage to hold the unit until it can be picked up.

In any event, this may mean a substantial investment for a country elevator to convert to a multiple-car facility. But, Neil Meyer, University of Idaho extension economist, points out that the freight savings on multi-car unit-train rates vs. single-car rates are substantial. He found savings ranging from 20¢/cwt. (12¢/bu.) for 25/26 car single origin shipments from eastern Washington. to 36¢/cwt. (21.6¢/bu.) for 50/52 car single origin shipments from eastern Montana.

Thus, if a farm in eastern Washington were to load out 1 million bushels of wheat per year in 25/26 car unit trains, it would gross an additional $120,000 from freight savings alone over single car rates.

In order to assure getting this volume of grain to put through the facility, and to better serve the grower clientele, let's assume that half of this amount (6¢/bu.) is passed to the grower in the form of higher prices. Perhaps an additional 1¢/bu. is needed to cover additional operating costs. This would leave 5¢/bu. ($50,000/yr.) that could be used to service debt on some capital improvements, such

"...In Idaho, there are at least 21 such facilities..."

as additional trackage, receiving capacity, load-out capacity and/or storage capacity. The firm could add capital improvements of $171,654 if it had to pay 14% interest over a five-year period.

Obviously, other considerations have to enter the final decision:

1. will the unit-train vs. single-car rate savings remain the same over the entire five-year period?
2. Is there, or may there become, less savings when compared with, for example, truck-barge rates?
3. Will the competitive situation remain such that the firm is assured of getting this volume of grain over the entire period without having to raise the amount paid to farmers?
4. May the firm have to pay premiums at some times in order to fill the last part of its unit-train commitment?
5. May other costs increase as a result, for example, of additional rail line abandonment?
6. What impact may new users fees have upon barge, truck and/or rail rates?

These questions are cited to illustrate the complexity of a decision to adapt a firm to take advantage of unit-train rates. Certainly, other equally important questions could enter into the decision.

In spite of some of these problems, country elevators in the Pacific Northwest moved rapidly to up-grade their operations so that they could take advantage of the lower unit-train rates. In Washington, Oregon and northern Idaho, where large cooperative elevators have served as primary storage facilities for their members' grain, the unit-train rates were initiated somewhat simultaneously with large increases in on-farm storage. These firms were often able, with relatively minor adjustments, to alter their operations to serve as put-through rather than storage facilities. They should, it was reasoned, be able to offset some losses in storage revenue, due to increased on-farm storage, with greater put-through revenues.

But, as circumstances have developed up to this writing, most firms have not even suffered any loses of storage revenues. For many, it has actually been enhanced. The combination of greater production, lower exports and the heavy placement of grain under government CCC or farmer-owned reserve (FOR) loans has meant that virtually all storage facilities are being used. Often, as was mentioned earlier, it has been necessary to store, at least temporarily, vast amounts of grain on the ground.

Grain that was under CCC loans often earned storage for at least the nine-month term of these loans. That which was under FOR loans earned storage for the full three-year terms of these loans, many of which have been extended for two additional year to five years in all.

In Washington, 23 unit-train loading facilities are operational as of this writing. In Idaho, there are at least 21 such facilities, and there are at least 33 in Montana. Oregon, with much easier access to the Columbia River barge system, has only three known unit-train loading facilities.

Train, Barge And Ocean Freight Rates Affect Grain Shipments

By Robert L. Sargent

THE incidence of inland subterminals has increased considerably in recent years in response to the Staggers Railroad Deregulation Act of 1980 and with it, the availability of reduced unit-train and multiple-car rates.

The unit-train concept was initiated in 1968 when the Illinois Central Railroad published its "Rent-A-Train" rate. "Working with Cargill, the IC built a rate on the concept of an annual fee for the use of tracks, locomotive power, and related services with additional fees for the loaded movement, empty movement, switching and furnishing of cars. In the first year under this rate, a single train of 115 covered hopper cars delivered more than 6,500 carloads of grain to the Louisiana Gulf from central Illinois." This is equivalent to 56.5 trainloads in a year, or one every 6.4 days. Post continues: "The efficiency of unit-train grain movements was quickly demonstrated. They moved three times as much grain as hopper cars in single-car service."

TABLE 1. COVERED HOPPER CARS, NUMBER BY OWNERSHIP, JAN. 1, 1977-84

	Class I RR	Class II & S & T Co.	All Other Private	Total
1977	158,850	1,074	70,145	230,069
1978	159,766	2,960	73,103	235,829
1979	161,885	3,427	80,775	246,087
1980	164,959	5,317	98,643	268,919
1981	171,585	7,627	120,774	299,986
1982	173,628	9,356	128,394	311,378
1983	166,150	9,336	130,736	306,222
1984	164,466	9,632	129,074	303,172

TABLE 2. GRAIN SHIPMENTS ON THE COLUMBIA AND SNAKE RIVERS, THROUGH SELECTED LOCKS, 1970-83* (000 TONS)

Year	Bonneville	McNary	Ice Harbor	Lower Monumental	Little Goose	Lower Granite
1970	1,742	1,532	397	127	122	
1971	1,527	1,348	564	346	319	
1972	2,647	2,484	1,307	1,012	861	
1973	2,361	2,116	1,177	899	780	
1974	2,189	1,907	993	796	684	
1975	2,754	2,408	1,218	949	847	148
1976	3,737	3,287	1,826	1,545	1,358	486
1977	3,486	3,025	1,958	1,717	1,541	659
1978	4,638	4,080	2,779	2,464	2,303	1,180
1979	4,467	3,840	2,897	2,336	2,206	1,130
1980	5,357	NA	NA	NA	NA	NA
1981	6,247	5,521	3,889	3,258	3,039	1,662
1982	5,426	4,739	3,292	2,774	2,633	1,425
1983	5,088	4,442	3,238	2,786	2,690	1,476

*Includes wheat, barley, oats and rye (historically wheat is 95% of total movement)

Covered Hopper Car Fleet

The rise in exports combined with greater domestic use meant that vastly greater amounts of grain had to be transported from the points of production. The unit-train concept resulted in vastly improved efficiency of car usage for grain movements. There was also a need for an expanded covered hopper car fleet. The Class I railroads responded by adding nearly 15,000 covered hopper cars to their fleets from 1977 to 1982 (Table 2). Between 1982 and 1984 their fleet declined 9,162 covered hopper cars to a little less than the 1980 number on the same date.

The really big growth in covered hopper car numbers has come in the "other private fleet" category. They increased about 86% (60,591 cars) from 1977 to 1983 but experienced a small decline by Jan. 1, 1984. They were anxious to assure the availability of cars when they needed them. A large share of these cars are owned by various shipping and export firms.

Both of these major ownership groups sharply curtailed their fleet expansion activities following the declines in total shipments (domestic and export) during the 1980-81 marketing year. The entire fleet has declined since reaching a peak on Jan. 1, 1982.

Grain Barges

Barges normally provide a low-

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"...Dramatic increase in terms of ton miles shipped..."

cost means of moving bulk cargo (grains) over inland waters. The Columbia-Snake barge system has experienced considerable growth as new dams and locks have been added to the system and exports have increased. Movement through the Bonneville Lock and Dam, the lowest of the series, and incidcntally a bottleneck, increased nearly 3.6 times from 1970 to 1981 (Table 2). Much of this growth, particularly since 1976, originated at Snake River subterminals. These points are the most distant from the Columbia River terminals, so there was a dramatic increase in terms of ton miles shipped.

This kind of growth gave clear signals of a need for additional capacity and the barge companies responded. They put new larger barges in service as well as expanding the total number of barges. The capacity per barge was increased by 923 tons from 1977 to 1983 (Table 3), but there was only a net increase of 12 barges.

After many of these newer barges had been placed in service, or at least ordered, exports from the Columbia River ports declined. In addition, competition from the railroads increased considerably. This has resulted in a fairly sharp drop in grain movements down the river system. Either of these developments would have been difficult to predict at the time decisions were made on increasing barge capacities.

The net result is that there is currently excess barge capacity on the river systems. Paradoxically, this has occurred at the same time that new users' fees have been imposed on the barge companies. Further increases will result from legislation that has been passed. Pending legislation could impose more. Declining volumes, higher users' fees, and higher capital investment, combined with more competitive rates from the railroads certainly places the barge companies in a more tenuous financial position than might have been anticipated when they increased their capacities.

Growth In Exports And Port Terminal Needs

Wheat exports from the Pacific Northwest grew quite steadily during the 1970s and peaked at 433.7 million bushels in 1981 (Figure 1). They dropped to 401.1 million bushels in 1982 and then recovered to 427.8 million bushels in 1983. This pattern of wheat exports was not sharply different from what took place nationally. Wheat exports through the Puget Sound ports were quite variable during the 1977-83 period, ranging from a little less than 5 million bushels in 1980 to 47.5 million bushels in 1977.

Unit-train rates from the western Corn Belt became available in 1978. This resulted in a dramatic increase in corn exports through Pacific Northwest ports in just a three-year period — from none in 1977 to 269.5 million bushels in 1980. The Puget Sound terminals captured virtually all of this early trade. But corn exports nationally declined from 1980 to 1983. In the Pacific Northwest they dropped precipitously to only 56.8 million bushels in 1982. In 1983 the region recovered part of the lost corn export movement with 176.3 million bushels of corn moving through terminals in the region.

Some exporting firms, particularly in the Columbia River area, sought to expand their share of the growing corn export market and contracted to increase their capacities. Capacities can, of course, be expanded either through greater receiving and load-out capacity or through additional storage capacity or all of them. Information from the Federal Grain Inspection Service indicates that there was a 26% increase in the storage capacity of Columbia River export terminals from 1981 to 1984. This enabled the firms involved to handle more classes of wheat and corn. Data provided by FGIS also indicate that there was some increase in load-out capacity.

But then, just as additional capacity became operational, PNW exports of wheat declined and those of corn dropped precipitously. Exports of the two grains combined dropped 211 million bushels by 1982 from the 1980 peak.

Impact Of Ocean Freight Rates

A relatively small portion of the decline in exports (particularly corn) from the PNW ports can be attributed to the decline in total U.S. exports. More of the change was probably associated with ocean freight rate changes. These rates rose rapidly in the late 1970s as world trade in grain and coal expanded significantly. There was a strong expectation that this growth, especially in coal, would continue. Coal was to serve as an alternate energy source for much more expensive petroleum products. And coal competes for the same type of ocean carrier as is used for grain.

Commenting on the situation Taylor noted that "grain exporters in November 1978 paid $7.50 to move a ton of grain from the U.S. Gulf to Holland. Today [January 1980] that rate is approximately

TABLE 3. COLUMBIA-SNAKE RIVER BARGE CAPACITY

	1977	1983
Barges (number)	62	78
Capacity per barge (tons)	1,000-3,000	1,000-3,750
Total grain capacity (tons)	129,850	235,300
Average capacity/barge (tons)	2,094	3,017

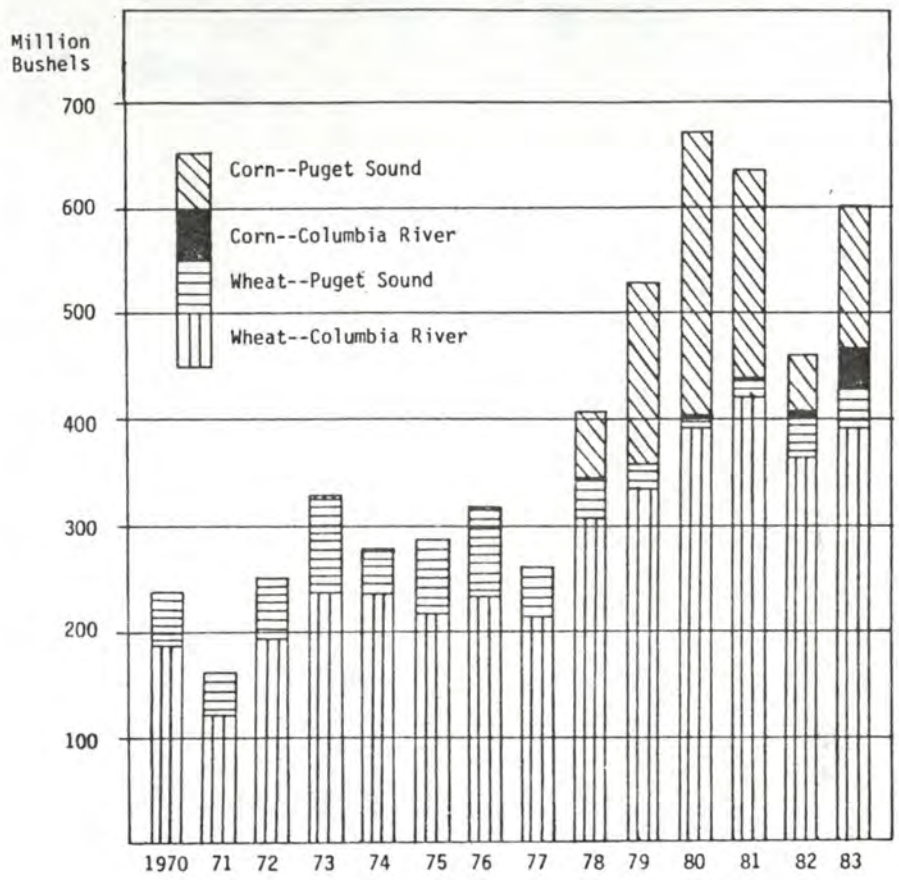
$18.00 (*Taylor, Lawrence C., "Ocean Transportation and the Exporter," Cargill Crop Bulletin, Minneapolis MN, January 1980.*).

Quite naturally, ocean shipping interests responded to this rising actual and prospective demand by ordering new ship construction. Ship orders are often placed as much as two years in advance of delivery. They did not foresee that energy conservation efforts would sharply reduce the projected growth in demand for coal. Nor did they foresee the impact of the worldwide recession on trade in many other products and the attendant decline in demand for ocean transport capacity. Much of the new ocean shipping capacity came on line at about the same time as demand for this service dropped. The result — a serious over-capacity. Shipping interests cut rates sharply, but not uniformly, in their attempts to keep ships operating. For example, rates from the U.S. Gulf to Japan dropped from $40.50 per long ton in February 1981 to $25 in October. From the Pacific Northwest to Japan they only dropped from $30.50 to $28.75. What has been a $10 per long ton freight advantage for the Pacific Northwest became a $3.75 disadvantage in just eight months. It had become cheaper to ship to Japan and other Far East markets through the Gulf than through the Pacific Northwest. This situation continued through most of 1982, but in late 1982 and 1983, the PNW regained a part of its former overall freight advantage, and exports, particularly of corn, have made a substantial recovery.

What Lies Ahead

The various situations outlined earlier illustrate that the future cannot be projected with clarity. Changes from what may have been anticipated when plans and commitments are made are also certain to occur. Perhaps some "worst case" scenarios should be incorporated into any plans that are made before actually making commitments. How might we cope with such a situation if it did occur? This is not to suggest that one should enter a new endeavor only if it would work in a "worst case" situation. Little, if any, progress would ever be made if all firms took this approach. But if one considers such situations in his planning, assigns some probabilities to their occurrence, and devises strategies for coping with them, ultimate success becomes a much more likely prospect.

Wheat and Corn Export Inspections, PNW Ports, January-December, 1970-83.



Source: USDA, AMS, Grain and Feed Market News, Various Issues.

Idaho Farmer-Stockman, October 18, 1984

SIXTH IN A SERIES

Competition Among Grain Carriers

By James C. Cornelius

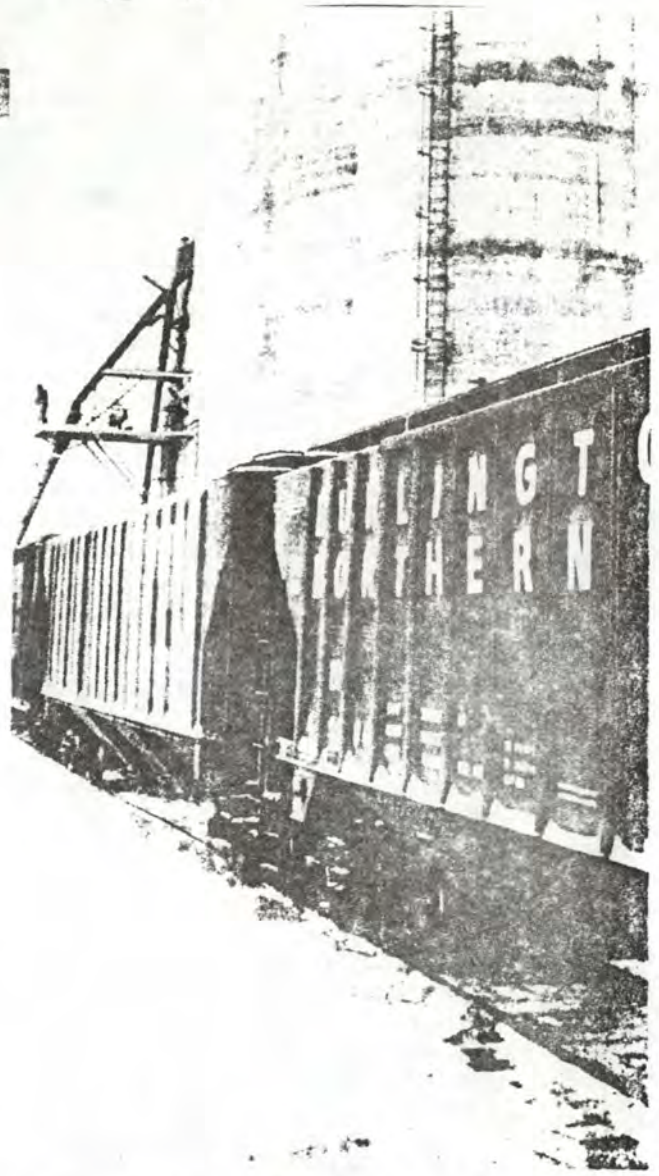
ACCESS to transportation has long been recognized as one of the key elements governing agricultural and economic development of a region. Economic development and prosperity in the United States during the 19th century was due in part to the expansion of transportation facilities (railroads, inland waterways, roads and ports) to facilitate the movement of people and commerce. By the late 1800s, the railroads had created an effective means of transporting agricultural commodities across the then-developing nation, and in so doing enhanced interregional trade and development. But the concentration of transportation market power in the hands of relatively few railroads led to the exploitation of farmers and other shippers in some instances. The Granger movement, representative of farm interests, was the driving force behind legislation to control railroads. After a 13-year struggle in Congress, federal control of the railroads was enacted in 1887 with the act to regulate commerce, now known as the Interstate Commerce Act.

In the 93 years since this initial act, subsequent legislation has added to, amended and in some cases reduced federal regulation of the railroads and other carriers. The most recent development in this history was the Staggers Rail Act of 1980, which substantially reduced the economic regulation of railroads in the transportation of grain as well as other freight.

try into the trucking industry, combined with an extensive highway network in the Pacific Northwest, competition among grain truckers is fairly active. The potential of these carriers to charge excessive rates is limited. Some truckers would argue that there is too much competition among motor carriers, and "cut-throat" rates are below their operating costs.

Both railroad and barge companies have higher overhead costs than motor carriers, and rely on longer distance hauls to "spread" these fixed costs. In terms of fuel costs, rail and barge transport is relatively cheaper than trucking. Thus, in the intermediate to long distance hauls, rail and barge rates become more competitive than motor carriers. There is no precise distance at which rail transport becomes cheaper than trucking, but at distances beyond 200 miles, competition begins to favor railroads over trucks, depending upon back haul opportunities for trucks and shipment volume for rails.

The competition among grain carriers on distances beyond 200 or 300 miles is primarily between barge transport and railroads. Barge transport may be the least expensive in terms of moving a given tonnage over a given distance, but barge transport is dependent upon access to a navigable river, such as the Columbia-Snake system in the Pacific Northwest. Nearly all grain shipped by barge must first be trucked from the farm to the river subterminal and then transferred to the barge. Thus,



A unit train loading grain at Great Falls MT.

along the Columbia-Snake system in the past few years. By offering rate discounts for multi-car shipments, the railroads have been able to regain a sizable portion of the grain traffic lost to truck or truck-barge alternatives in the 1970s.

It seems ironic that grain shippers and producers today are still grappling with the issue of regulation of grain carriers, despite 93 years of legal attempts to remedy the problem. The grain growers' concern today, as in the 1800s, is whether or not sufficient competition exists among carriers to provide fair and equitable transportation service.

Competition among grain carriers — or the lack of it — depends upon several variables. First, the distance of transport may well dictate what type of carriers are involved. Relatively short-distance hauls of less than 50 miles are almost exclusively the domain of trucks. Because of the comparative ease of entry, a more accurate description of this mode is truck-barge shipment. There has been active competition in the past four years between railroads and truck-barge for grain shipment 50 to 100 miles inland from the Columbia-Snake system. The relatively high trucking costs (500 miles plus) necessary to combine truck-barge transport from interior Montana or Idaho shipping points has allowed railroads to successfully capture this market by offering lower cost multi-car rail rates.

Loading a barge with grain at Lewiston ID.

The real concern over competition centers on the regions that have become increasingly dependent upon a single railroad for grain shipments. Although truck or truck-barge transport has been used in times of emergency, the higher transport costs erode the returns to grain growers.

The situation in the Pacific Northwest presents some interesting contrasts regarding the degree of competition among carriers. The closer the shipper is to a market or alternative transportation modes — such as the Columbia-Snake navigation system — the more competition among carriers. Research conducted by economists at Washington State University has documented the competitiveness between competing grain carriers in terms of sensitivity to rate changes.

For example, researchers estimated that a 10% increase in rail rates would cause the railroads to lose nearly 8% of their wheat volume to truck-barge competition. Moreover, a 10% reduction in rail rates would be expected to increase the railroads' share of grain traffic by nearly 15%. These estimates provide a good explanation for the increased competition between the rail and truck-barge carriers

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In contrast, economic studies at North Dakota State University by Dr. Bill Wilson document the precarious position of remote, inland grain shipping areas. Wilson's findings suggest that a railroad serving these "captive shippers" could expect to pass along substantial rate increases without losing any appreciable shipping volume.

In the first few years of experience with the Staggers Act, rail service to grain shippers in the Northwest appears to have improved. The slowdown in grain exports during this same period, however, has lessened the demand for shipping services. This has heightened competition among carriers for available shipping business, probably to the benefit of shippers and producers. Ironically, a lack of competition among carriers could resurface if and when exports — and therefore grain shipments — pick up. The concern within the grain industry lies with the potential of the railroads to exploit shippers where little or no competition exists, especially in remote interior regions of the Pacific Northwest. Sufficient concern exists on the part of shippers and smaller railroads about potential abuses from larger carriers that the Interstate Commerce Commission has decided to reexamine the issue once again. The major areas of controversy include contract rates, market dominance criteria, joint rate and route cancellations, and the "reasonable rate" guidelines, all arising from the Staggers Rail Act.

This has been the sixth in a series of articles discussing grain transportation in the Pacific Northwest. The first six columns have focused on the large, structural issues facing the grain industry. The next two columns will look more closely at how the individual shipper or grain producer is affected by the current situation, and how this might change in the future.

SEVENTH IN A SERIES

Transportation Management Important To Producers

By J.H. Bahn

THE changes taking place in the agricultural transportation environment are exogenous or beyond the direct control of individual farmers and marketers. Deregulation, technological advances, competitive adjustments in rates and service, and changing market shares all directly affect the prices offered for farm products. Farmers can do little to alter the structure and cost of the transportation services they must utilize to serve distant domestic and export markets.

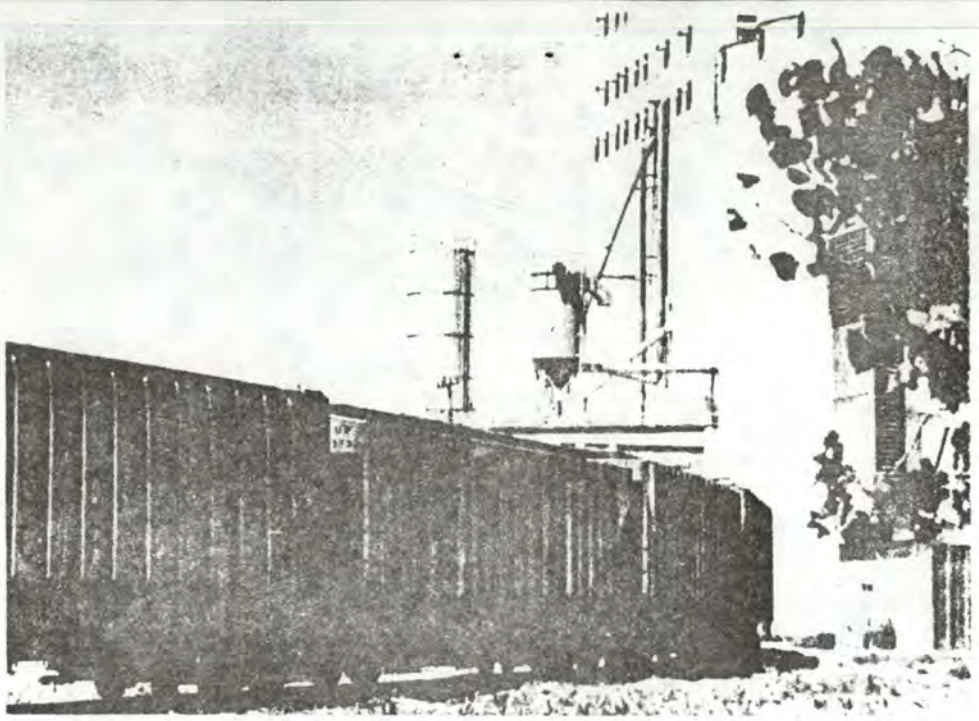
Changes in transportation services or costs demand a reactive response by farmers and marketers. Some adjustments, like the construction of grain subterminals to load unit trains, may have positive price impacts on producers in one area while leaving others unaffected. Other changes, like the loss of service, may force producers to seek entirely new markets for their products or perhaps even to change enterprises. In any event, the profitability of farmers directly affected will be changed whenever per-unit transportation costs or prices offered to farmers are changed.

Transportation management is thus becoming more important to grain producers and shippers. Those who assemble and schedule transportation service no longer have the luxury of simply gathering rates from the cumbersome but relatively constant tariff schedules. Flexibility in adjusting rates may enhance the efficiency or profitability of the railroads but it places increased demands upon rail users to seek out current rates. The confidential nature of contracts can make forward pricing more difficult for competing firms.

Other transportation providers are also affected. If the dominant carrier (in terms of volume or market share) has the ability to change rates quickly, competitors are forced to respond. The dominant carrier may be able to adjust its market share almost at will by changing rates while the motor carriers (who provide a potential ceiling on the dominant carrier's rates) adjust their rates accordingly to serve the residual portion of the market. In either case, transportation costs and the net prices received by farmers are affected.

Transportation Management At The Farm

The farm manager is faced with the challenge of selecting when and where to sell cash grain and thus begin the marketing process. Prices provide the market signals farmers use to make their sales decisions and the price received, net of transportation and other marketing costs, is the measure of their success. Since the net price received is what pays for production costs, the entire marketing process and its costs must be considered. Managing transportation, and minimizing its cost, is just one more marketing function performed by the farmer and grain marketer.



Farmers usually have a broadly defined geographic area in which they sell their grain. Within that area are country elevators, subterminals, terminal elevators and perhaps millers or feed purchasers. The geographic area is generally defined by the farmer's ability to service it, given his own transportation equipment or the cost and availability of custom hired transportation service. Within the feasible market area, the relevant marketing decision is to sell to the elevator, miller or feeder who offers the highest price, net of marketing costs. Determining the best net price requires a little thinking and calculation by the farmer.

In the short run, bids from competing buyers are compared at the farm, net of transportation. That is a relatively easy matter and simply means adjusting the buyer's bid by subtracting the per mile transportation cost times the number of miles the grain is transported. For a farmer using hired transportation, the bid is adjusted by subtracting the total transportation cost per bushel from the bid. Adjusting for owned transportation is slightly more complicated and involves subtracting the variable costs of transportation from the bid. These include fuel and lubrication, tires and repairs, and labor costs.

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Integration And Longer Term Adjustments

Intermediate and long run transportation management involves either expanding the geographic market area or more efficiently transporting within the existing area. These management decisions may involve capital expenditures for transportation equipment, facilities, or both. Unlike short term adjustments, these decisions require a more thorough analysis of both fixed and variable costs, debt repayment capacity and the effect on the profitability of the firm.

Transportation management in the long term perspective goes well beyond capital investment in new or better transport equipment or facilities. It may require adjustments to current enterprises or even adding new enterprises in an attempt to fully utilize the equipment and facilities.

Capital improvements generally are undertaken to reduce the per unit cost of production or marketing subject to the constraint of generating sufficient revenue to pay for the investment. The farmer/marketer wishing to reduce transportation costs per bushel mile may find the investment feasible only by increasing the total amount of grain transported, perhaps to a volume beyond his capacity to produce. Many farmers make bulk purchases of inputs or perform custom work for other farmers to more fully utilize their equipment. Such an approach may be worthwhile for transportation service as well and may enable the farmer to capture economies of scale, further reducing per unit costs.

Although state laws and bonding requirements vary, becoming a grain dealer or hauler may provide both vertical and horizontal integration opportunities. Vertical integration means performing more of the marketing activity of replacing (rather than eliminating) others in the marketing process. By servicing more distant terminal markets, processors or feed buyers, the farmer who expands his transportation capacity may be able to secure better prices for his commodity.

The relevant consideration is similar to the short term decision previously discussed: do the premiums equal or exceed the additional costs of transportation? If not, the farmer's net revenue will decline as he, in effect, subsidizes the buyers of his grain by absorbing more of the transportation costs.

Horizontal integration involves increasing volume or capacity in an attempt to reduce per unit costs. In the case of transportation, expansion of facilities or equipment might necessitate handling more grain than the farmer can produce, thus requiring him to provide services to other producers.

This kind of expansion increases the farmer's responsibilities and creates obligations to his customers. These include additional accounting and financial record keeping, the additional cost of licensing and bonding, cash flow requirements for purchasing and/or paying for grain, and possible additional labor requirements. The decision should be influenced by the expected reduction of per unit costs, availability of a sufficient volume of grain to justify the change, and an honest evaluation of the farmer's ability to function as a grain dealer or hauler.

Integration may place severe demands on available resources, particularly labor, during certain times. During peak periods like harvest, the farmer/grain dealer may have to make difficult decisions regarding labor allocation especially for long distance grain movements. Although the individual producer usually makes completion of harvest the priority, that decision may become more difficult if the farmer has customers who place a higher priority on his time as a grain transporter or merchandiser.

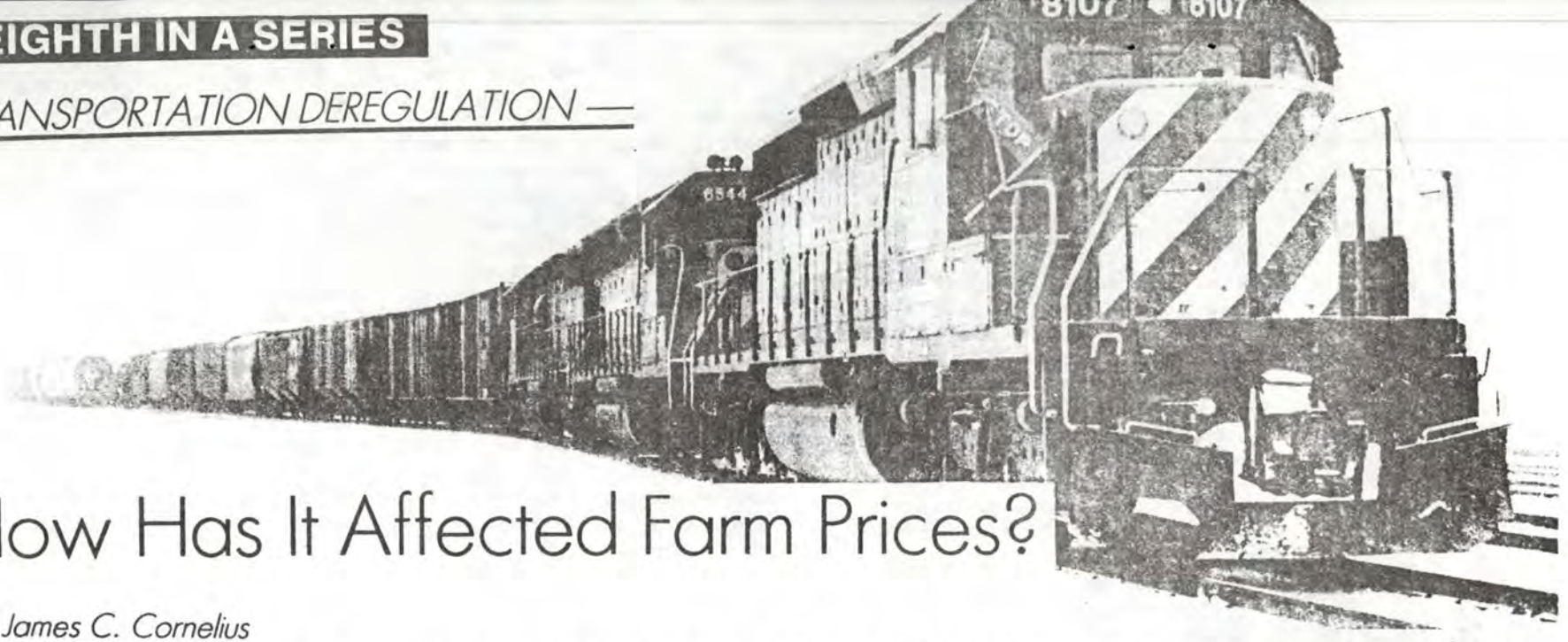
Integration can thus change the producer's mix of enterprises and has the potential to affect the overall structure and operation of the farm. This is not necessarily a negative impact but the individual considering a change in transportation management should realize the complications — and opportunities — that accompany the change.

Grain producers respond to exogenous changes in the transportation sector by taking a more active role in transportation management. The transportation costs they are most likely to control or manage effectively are those directly related in farm-to-elevator movement. Comparison pricing, net of transportation, allows farmers to respond to the most attractive bids from county elevators, subterminals or terminal elevators, processors and feed buyers.

When faced with intermediate to long-term changes, farmers need to consider expected market conditions and to do a cost analysis of the proposed changes. The feasibility of transportation management alternatives should depend heavily upon an accurate cost analysis. Per unit costs, fixed costs, debt repayment capacity, and the overall effect on the profitability of the farm must be considered. Some decisions such as use of owned versus custom hired transportation services are easy to compare. As the sophistication of the alternative increases, the decisions become more difficult. Buy versus lease considerations must be made and the ultimate producer response, adding a new transportation or grain merchandising enterprise, must be considered most carefully since it can involve a total structural change.

EIGHTH IN A SERIES

TRANSPORTATION DEREGULATION —



How Has It Affected Farm Prices?

By James C. Cornelius

PAST columns in this "Focus on Grain Transportation" series have examined the changing structure of agricultural transportation in the Pacific Northwest.

Changes in transportation regulations over the past four years have led to modifications in the way grain is assembled and shipped. Many of these developments in grain transportation are beyond the control of the individual farmer, but we often expect that changes will lead to improved, or more efficient service.

A major concern of the grain grower, therefore, is whether or not the changes that have occurred in transportation have led to improved service. More specifically, what effect has deregulation had on farm-level prices?

TABLE 1.
WHEAT MARKETING MARGINS BETWEEN FARM-LEVEL AND EXPORT MARKET PRICES, 1978-83

Marketing Year (June 1 - May 30)	PNW Portland (White Wheat)	Northern Plains - Duluth (DNS Wheat)	Central Plains - Gulf (HRW Wheat)
	($/Bu)	($/Bu)	($/Bu)
1978-79	.51	.58	.76
1979-80	.55	.72	.94
1980-81	.58	.56	.96
1981-82	.48	.65	.91
1982-83	.56	.58	.80
1983-84	.45	.62	.65

Adapted from: USDA, *Wheat Outlook and Situation*

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Presumably, deregulation would benefit the producer if a combination of improved service and lower rates resulted in higher farm-level prices. One way to address this question would be to compare average farm-level price received by grain producers before and after deregulation, adjusted for changes in price levels caused by external supply and demand variables.

Table 1 illustrates the marketing margins between farm-level and terminal export market prices for three classes of wheat from 1978 to 1984, the six-year interval covering the period before and after deregulation. The marketing margins represent the difference between annual average price received by producers in the indicated region, and the corresponding export market price in the same year.

The marketing margin includes costs in addition to transportation such as elevation and handling, but transportation costs are the major component of this margin. If significant reductions in transportation rates have occurred in the post-1980 period after deregulation, the reductions might show up either as higher farm-level prices, or as lower export market prices. In either event, the marketing margin between the farm and the export market would be expected to narrow.

The data presented in Table 1 is not conclusive in this regard, but there is evidence that margins have been reduced. In the Pacific Northwest, a narrowing of marketing margins has occurred in the four years since 1980-81, with the exception of 1982-83. Marketing margins in the Northern Plains seem to fluctuate annually, providing no clear indication of higher farm-level price as a result of deregulation. For the Central Plains to the Gulf grain flow, a consistent narrowing of marketing margins in the post-1980 is evident, and may be a better indication of the price impact of deregulation at the farm-level, owing to the larger volume of grain moving through this transportation network.

Where lower transportation costs lead to smaller marketing margins, the savings may be: 1) Passed back to the producer in terms of higher farm prices; 2) passed on to the foreign grain buyer, in terms of lower f.o.b. price; or 3) some combination of both. Lower export prices may also benefit the producer if the lower price increases export demand and sales.

The trends toward lower transportation margins indicated in Table 1 are averages, and may overlook rate savings passed on to producers in specific locations. University of Minnesota research on Midwest grain markets indicates that rate savings are passed along to producers where intermodal competition is the greatest, such as along the Mississippi River system. Conversely, where railroads face little intermodal competition, these rate increases are less likely to be passed along to the grain producer.

Another factor influencing farm prices is the efficiency of the elevator that ships the grain. Capital investment in multi-car loading facilities is substantial and may require greater operating margins by the elevators. Thus, some of the rate savings from lower shipping costs may be diverted to financing the shipping facility required to take advantage of lower multi-car rates.

There is evidence that the cost savings obtained from multi-car and contract rates are also passed on to buyers. For example, corn shipped to Columbia River grain terminals from the Midwest via unit trains has been priced as much as $10 to $15 per ton below corn arriving in single cars. In order to obtain the lower price, however, buyers must be capable of unloading and handling 26- or 52-car unit trains.

Thus, like shippers in the interior, buyers face a sizable capital investment in grain handling facilities if they hope to obtain the cost savings from multi-car rates. Columbia River and Puget Sound grain export terminals are the principal receivers of unit train shipments, and the transportation costs savings are passed on to large volume foreign buyers, such as Japan and South Korea.

There are numerous indications that deregulation has — at least initially — led to direct benefits to grain growers. But not everyone in the grain industry is ready to conclude that transportation deregulation has been an unequivocal success. The ability of railroads to alter rates has been streamlined under deregulation, both in terms of ability to change rate levels as well as the frequency.

Unless an appropriate contract rate was in effect, a grain merchant may not have the certainty of transportation rates six months in the future that would be necessary to make firm commitments on forward delivery prices. Given increased uncertainty about future transport rates, it is possible that marketing margins in the grain merchandising industry will increase in order to underwrite this

Furthermore, the 25% decline in U.S. wheat export tonnage since 1981 has lessened the demand for domestic transportation services. Competition among carriers has intensified, and this competition has helped keep rail rates in line. If U.S. exports were to expand significantly in the near future, the demand for transportation would also increase, and it is possible that rail rates would rise, in turn.

Many of the reservations expressed about the Staggers Rail Act, or deregulation in general, focus on what might happen. Another area of interest in assessing future developments in transportation deregulation concerns the impact on grain production itself.

Land values, agricultural development and ultimately business development have long relied upon the availability of transportation to tie producing regions to consuming regions. The ability of railroads to assess surcharges on low-density lines, or abandon them altogether, is not promising for grain producers in the more remote shipping regions who previously enjoyed service protection under the common carriage clause of the Interstate Commerce Commission. Where branch line abandonment, reduced service or surcharges occur, the adjustment to higher transportation costs will result in lower prices to producers, reducing income in these areas. Although not an altogether promising scenario, this is consistent with market-based transportation rates, and the true costs of competitiveness to produce and market grain.