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CHANGES IN GRAIN MARKETING, MARKET STRUCTURE,
AND PERFORMANCE IN THE 1980's

by

Reynold P. Dahl

Department of Agricultural and Applied Economics

University of Minnesota
Institute of Agriculture, Forestry and Home Economics
St. Paul, Minnesota 55108

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* This paper was prepared for NC-186 Grain Marketing Symposium, Minneapolis, Minnesota, October 19-20, 1989.

** Reynold P. Dahl is Professor, Department of Agricultural and Applied Economics, University of Minnesota.

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The U.S. grain marketing system is a dynamic system that changes in response to market forces. This is an important strength of a private enterprise system in contrast to government-owned and operated grain marketing systems that characterize many countries. But, changes in demand placed upon the U.S. grain marketing system resulting from changes in economic variables such as grain production, exports, transportation, and government farm programs are frequently abrupt and difficult to predict. Hence, investments in marketing infra-structure are often risky and sometimes painful. The grain marketing system can move from under capacity to excess capacity in a short time span. The grain marketing system has undergone many structural changes in the 1980's. The purpose of this paper is to describe and analyze these changes in grain marketing and the causal economic factors. To understand the changes in the 1980's one has to look back briefly at the 1970's.

After more than 25 years when surplus grain stocks and government price support operations dominated grain markets and marketing, the 1972-73 marketing year ushered in a new era. Grain production shortfalls, notably in the Soviet Union, but in other countries as well, increased the export demand for American grain. U.S. grain exports increased a whopping

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67 percent to a record 3 billion bushels in 1973. Grain prices more than doubled in 1973 as market prices rose above price support levels. Grain exports continued to increase for the remainder of the decade reaching an all-time record of nearly 5.0 billion bushels in 1980. The U.S. share of the world grain export market also rose to a peak of 60 percent in the same year.

Increased grain exports and prices in the 1970's enabled the Commodity Credit Corporation (CCC), the price supporting agency of the U.S. government to dispose of its grain stocks that had been accumulated in the post World War II period under price support operations. Hence, CCC stocks no longer served as a lid on market prices so grain price variability increased. Greater price volatility also increased hedging needs which pushed the volume of futures trading in grain to a record level of 39.5 million futures contracts in 1980 (Table 1).

Marketing decisions in volatile grain markets emerged as new and complex problems for farmers as well as marketing firms in 1970's. Farmers discovered that decisions such as to when to sell and when to store grain were difficult and such decisions could make a big difference in their incomes. Economists in our Land Grant Universities were bombarded with requests for information and training programs in marketing and price risk management. Marketing became a sub-discipline in agricultural economics with a new found sense of respectability.

PERFORMANCE DURING THE 1970's

In the wake of increased grain exports, world grain shortages, and ensuing food price increases in the early 1970's, public criticism was focused on grain exports and the firms that moved them. Since a

Table 1. Futures Contracts Traded on U.S. Grain Futures Markets, by Commodity, Selected Years

Exchange and Commodity	Contract Unit	Thousands Contracts 1973	1980	1987	1988
Chicago Board of Trade					
Wheat	5,000 bu.	1,567	5,428	1,929	3,378
Corn	5,000 bu.	4,075	11,947	7,253	11,106
Oats	5,000 bu.	183	321	291	355
Soybeans	5,000 bu.	2,743	11,768	7,379	12,497
Soybean oil	60,000 lb.	1,763	3,168	3,912	4,896
Soybean meal	100 tons	660	3,219	3,798	5,313
Total		10,991	35,851	24,562	37,545
Kansas City Board of Trade					
Wheat	5,000 bu.	346	1,298	971	1,339
Minneapolis Grain Exchange					
Spring wheat	5,000 bu.	172	334	311	424
White wheat	5,000 bu.	0	0	1	*
High fructose corn syrup	48,000 lb.	0	0	6	*
Oats		0	0	0	2
Total		172	334	318	426
Mid-America Commodity Exchange					
Wheat	1,000 bu.	75	551	190	294
Corn	1,000 bu.	103	441	312	429
Oats	1,000 bu.	9	2	7	13
Soybeans	1,000 bu.	56	1,053	418	864
Soybean meal	20 tons	0	0	3	9
Total		243	2,047	930	1,609
Total all markets		11,752	39,530	26,781	40,919

*Less than 1,000 contracts.

Source: Futures Industry Association.

substantial share of U.S. grain exports is traded by a small number of large multinational corporations, skepticism was voiced concerning the degree of competition within the export system and the efficiency with which grain prices reflected changes in supply and demand information. Many feared that the large exporting firms have power to manipulate the market and profit from "inside" information at the expense of producers and consumers. Several research studies analyzing the structure and performance of the U.S. grain marketing system could not find evidence to support these public perceptions (see Caves, 1978) Conklin and Dahl, 1982; GAO Staff Study, 1982; and Thompson and Dahl, 1978. The research indicated that the U.S. grain export system is more competitive than commonly believed. It is not a static industry that one would expect of an oligopoly as the industry is frequently characterized. Economic analysis of pricing efficiency also indicated that grain futures prices efficiently reflected grain export sales information. In fact, evidence supported the conclusion that the U.S. grain marketing system performed in a remarkably efficient manner considering the heavy demands placed upon the system with the expansion in grain exports in the 1970's.

EXPORTS DECLINE, EXCESS CAPACITY EMERGES

The decade of the 1980's got off to an inauspicious start with President Carter's embargo on grain exports to the Soviet Union. Also, the world begin a slide into a prolonged recession in which world grain trade would decline. U.S. grain exports bore the brunt of this painful adjustment. Aided by a strong U.S. dollar and the price umbrella provided by our government programs, other grain exporting countries increased their production and provided stiffer competition for U.S. grain exports.

Our grain exports declined to a low of 3.0 billion bushels in 1986 and the U.S. share of world grain trade also slide to 35 percent. Despite sizeable acreage idled under federal farm programs, inventories of grain, most of which was stored under the farmer-owned reserve, regular price support loan, and CCC ownership, increased to a record 204 million metric tons at the end of the 1986/87 marketing year. The grain marketing system was again back in the business of storing and handling grain for the government in a big way. The income from such operations increased offsetting declines in income, in part at least, from grain merchandising associated with reduced exports and marketing margins. Harvest States Cooperatives, our nation's largest grain marketing cooperative, reported a record gross income from storage and handling of $24.6 million in 1987. This was a substantial contributor to their net earnings from all operations of $11 million in the same year (Harvest States Cooperatives, 1988 Annual Report). This was probably typical of the operation of many grain merchandising firms in this period.

The world grain situation has changed again in the last two years resulting in an increase of U.S. grain exports to 4.4 billion bushels in 1988, but this is still 550 million bushels below their record level in 1980. The drought of 1988 dramatically reduced U.S. grain production resulting in an unprecedented reduction in ending U.S. grain stocks from their record level of 204 million metric tons in 1986/87 to an estimated 74 million forecast for 1988/89. Ending Stock/Utilization ratios for wheat, corn, and soybeans have declined to levels that are low by historical norms (Appendix Figures 1, 2, and 3).

Futures trading in grain and products varies inversely with government price support loan activity. Volume of futures trading declined from its record level of 39.5 million contracts in 1980 to 26.8 million contracts in 1987 reflecting reduced hedging needs associated with reduced price volatility and accumulation of grain stocks to record levels under government programs. But, futures trading in grain rebounded in 1988 to reach a new record volume of 40.9 million contracts as prices and price volatility increased with the drought and the precipitous draw down in grain stocks (Table 1).

This brief recap of trends in grain production, exports, and futures trading illustrates how quickly the load placed on the grain marketing systems can change. How has the structure of the system changed in response to changes in demand?

GRAIN STORAGE CAPACITY INCREASES

Grain storage is one of the most important functions that must be performed in grain marketing. Grain is seasonally produced, but processing and consumption are more evenly spread over the year. So, grain must be stored from the time it is produced to the time it is processed and consumed. Grain also must be stored until quantities can be accumulated for efficient transportation, and sometimes storage is necessary when marketings exceed available transportation capacity such as at harvest. Finally, grain storage is an integral part of government price support operations. Grain is stored for varying lengths of time under regular price support loan, the farmer-owned reserve, and CCC ownership.

The first national survey of grain storage facilities in the U.S. was made in 1978. It showed aggregate farm and off-farm storage capacity at nearly 17 billion bushels made up of 10 billion bushels of storage on farms (59 percent of the total) and 7 billion in off-farm facilities (41 percent of the total). This was equivalent to a full year and one-half of grain production in the U.S. which was about 12 billion bushels per year in 1978 (Table 2).

Grain storage capacity increased during the 1980's as export demand declined and stocks accumulated under government programs. Total capacity reached 22.9 billion bushels on December 1, 1988, an increase of 36 percent from 10 years earlier. The total of on-farm capacity of 13.3 billion bushels (58 percent of the total) and off-farm capacity of 9.6 billion bushels (42 percent of the total) now approaches two years of grain production.

The reality, surprising to some, that nearly six of ten bushels in U.S. grain storage capacity represents farm storage, reflects steady expansion in these facilities in recent decades under the influence of farm program incentives. For many years, farmers could obtain storage facility loans from the government at below market interest rates. Farmers found it advantageous to have farm storage to participate in the regular nine-month farm price support loan program. The farmer-owned reserve, a three-year loan program provided by Congress in the 1977 Farm Bill, also provided a big boost to new farm storage. Finally, having their own storage gives farmers more flexibility in grain marketing.

Eight states now have over one billion bushels in total grain storage capacity. Iowa ranks first in grain storage capacity with 3.108 billion

Table 2. Grain Storage Capacity in the U.S., On-Farm and Off-Farm, by State, April 1, 1978 and December 1, 1988.*

State	On-Farm	Off-Farm (commerical)	Total	On-Farm	Off-Farm (commerical)	Total
	April 1, 1978			December 1, 1988		
	(millions bu.)			(millions bu.)		
Iowa	1,492	635	2,127	1,980	1,128	3,108
Illinois	1,154	787	1,941	1,280	1,202	2,482
Minnesota	1,192	368	1,560	1,590	634	2,224
Nebraska	833	488	1,321	1,260	879	2,139
Kansas	370	831	1,201	450	944	1,394
Texas	264	838	1,102	230	942	1,172
North Dakota	691	142	833	910	249	1,159
Indiana	507	283	790	725	385	1,110
Wisconsin	437	130	567	475	196	671
Missouri	347	210	557	440	292	732
Others	2,637	2,275	4,912	3,960	2,764	6,724
Total	9,924	6,987	16,911	13,300	9,615	22,915

Source: Grain Stocks, National Agricultural Statistics Service, USDA, January 13, 1989.

bushels followed by Illinois, 2.482 billion; Minnesota, 2.224 billion; Nebraska, 2.139 billion, and Kansas, 1.394 billion (Table 2). The precipitous drop in grain stocks as a result of the 1988 drought will result in excess storage capacity. But, some grain storage space used during the last few was temporary and may be retired. Also, much terminal storage capacity is sound but not "state-of-the art" (Milling and Baking News, March 14, 1989 p. 7). Such facilities are suitable only for long-term storage.

UNIT TRAIN RAIL RATES CHANGE GRAIN MARKET STRUCTURE

The heavy demand for grain transportation and other marketing infrastructure during the export boom in the 1970's put a severe strain on the marketing system. Marketing margins increased as the demand for railcars, barges, trucks, and port facilities exceeded the available supply. This along with investment tax credits provided incentives for investment in transportation equipment. During the period 1973-1982, the number of covered hopper cars, mostly with a 100 tons capacity, doubled. Several thousand new barges were also built during the same period (Diel and Phillip, 1985). Much of this new equipment came on-line when grain exports begin to decline in the early 1980's. The result was excess capacity in transportation equipment and reduced prices for transportation services (Buschena, 1988).

The advent of multiple-car rail rates on grain in the mid-1970's also changed grain marketing patterns and the structure of the country elevator industry. These unit train rates were considerably lower than single-car rates and provided a powerful incentive for country elevators to modernize their load-out facilities to take advantage of these lower rates. Also,

many cooperative elevators had record earnings during this period, providing equity capital for improvements. The result was a rapid expansion in unit train loading capacity in the corn belt. Appendix Figures 4, 5, and 6 illustrate how quickly elevators with multi-car loading facilities developed in Minnesota in the period 1976, 1981, and 1985. The maps also illustrate that unit-train loading facilities began in the corn and soybean producing area in southern Minnesota where the special rates were first offered (Dahl and Martin, 1975). Later they were extended to the wheat growing area in the Red River Valley in northwestern Minnesota where they attracted investments in unit train facilities (Buschena, 1988).

Excess Capacity in Unit-Train Shipping Emerges

Much of this investment in the late 1970's was built with the expectation that grain export demand would continue to grow at a rapid rate. The increase in capacity occurred all across the corn belt, but was more pronounced in the western corn belt states of Iowa, Nebraska, Minnesota, and South Dakota. But, the entire corn belt was left with excess capacity in storing, drying, and sub-terminal and other unit-train shipping facilities when grain exports declined in the 1980's (Ginder, 1985).

The impact of this excess capacity problem on local grain marketing cooperatives in the Eighth Farm Credit District is analyzed by Ginder who points out that about 20 percent of the firms controlling more than 25 percent of the industry assets were in a financially stressed condition in late 1984. He cautioned that if these firms are forced to liquidate, asset markets for grain origination will be depressed. Buyers, possibly

large multi-nationals or domestic processors, may purchase those assets at below replacement costs and are likely to increase financial problems for nearby local grain cooperatives (Ginder, 1985).

Unit-train rates were not introduced in North Dakota until July 1980, for westbound rail, and July 1981, for eastbound rail. The impact of these new rail rates on the country elevator industry in that state is analyzed in a study by Clow and Wilson. They point out that increased competition forced country elevators to either become larger or merge with other elevators and operate as a multi-plant firm. Many consolidations of cooperative elevators occurred in the 1980's and new sub-terminals were constructed. The consolidated elevators acted as feeder stations for the new cooperative subterminals. This multiple-plant system enabled the cooperative subterminals to obtain sufficient volumes of grain for unit-train shipments. By 1987, there were 22 multiple-plant elevators operating in North Dakota. There were 116 elevators in the state with unit train loading capability in January 1987. A cost analysis in this study showed that a multiple-plant firm must handle up to seven times their grain storage capacity as compared to a single-plant firm to reach their minimum average costs (most efficient scale). At no time has the average been close to the needed 22 million bushels for multiple-plant firms (Clow and Wilson, 1988).

The above studies provide convincing evidence that investments in unit train loading facilities resulting from new multiple-car rail rates have resulted in excess capacity in local grain marketing cooperatives. Mergers of local cooperatives have also been accelerated. The number of grain marketing cooperatives in the U.S. declined from 2,475 with a net

business volume of $12.8 billion in 1978 to 2,065 with a net business volume of $10.7 billion in 1987 (Farmer Cooperative Statistics, 1987). Revisions in the railroad rate structure have also changed grain marketing patterns and the traditional role of grain exchanges and terminal elevators.

CHANGING ROLE OF GRAIN EXCHANGES AND TERMINAL ELEVATORS

While the volume of futures trading on the nation's principal grain exchanges in Chicago, Kansas City, and Minneapolis reached a record high in 1980 and again in 1988, the volume of cash grain traded on these markets has fallen off sharply. An important function of these exchanges in earlier years was the marketing of single railroad cars of grain on the basis of samples consigned from country points to commission firms at the exchanges. But, buying and selling grain on a sample basis has been largely replaced by forward "to arrive" cash contracts between country elevators and grain merchants where grade, premiums and discounts for quality, are agreed to in the contract. The consignment method of marketing grain has virtually disappeared, except in a few grains such a malting barley and durum wheat, where grades only partially reflect quality factors important to buyers. Grain commission firms have also largely disappeared or changed their operations to become grain merchants assuming title to the grain they handle. As the marketing of grain by sample diminished, the cash grain trade at smaller exchanges such as Duluth, Omaha, and Toledo declined even more sharply than at the primary futures exchanges at Chicago, Kansas City and Minneapolis.

Changes in transportation have been even larger dynamic factors in grain marketing accelerating the decline in cash grain trade at grain

exchanges. The increased volume of grain shipped by truck by-passed terminal rail markets and was not traded at the exchanges whatsoever. Grain was trucked directly to river terminals for shipment down the Mississippi River or on other interior waterways by barge. Truck and barge transportation of grain dove-tailed well together. Both took sizeable volumes of business away from the railroads in the shipment of single cars of grain.

The railroads response to increased truck-barge competition was to offer lower rates on multiple-car shipments of 25, 50, or 100 cars. These were point to point rates that did not include the transit privilege. Transit was an integral part of the railroad grain rate structure under which grain could be stopped at intermediate points between origin and final destination for inspection, storage, or processing without additional charge. The thru rate applied under transit billing. As more multiple-car rates were offered by the railroads, the transit privilege was eroded and virtually eliminated.

Railroad Deregulation Reduces Cash Grain Trade at Exchanges and Terminals

The impact of the demise of the transit privilege and deregulation of the railroads on grain marketing channels is well-described by Milling and Baking News as follows:

"As one railroad after another eliminated transit billing privileges, this also effectively eliminated the intermediate stop at a market like Kansas City or Minneapolis for inspection (except at an extremely high cost). Official inspections had been a major function at those exchanges.

But, more important, the more recent deregulation of the railroads which was given legislative sanction in the Staggers Act of 1980, has

meant that the flow of grain from origination points in the country to leading exchanges for resale on the cash market has diminished sharply - to near zero, in fact, at Kansas City. Increasingly, grain moves from origination points in the country, or from gathering points in the country, to its final destination in the U.S. - be it a flour mill or an export elevator-without going through a terminal market for resale. The rail rate structure is no longer set by government regulation and published for information of all interest parties; rather, rates are now negotiated between the railroad and the shipper or between the railroad and the buyer, and in negotiating these contract rates the largest shippers obviously have a major advantage. Large volumes of grain still come to Kansas City and Minneapolis, but they come because the elevators are there or the mills are there or because the route to the final destination takes them there. But those large volumes of grain do not come to Kansas City and Minneapolis any longer to be marketed on the exchange. The trading of individual cars is now much more likely to occur near the origination point or gathering point in the country" (The Changing Face of Breadstuffs, pp. 47-8, 1983).

In addition to diminishing the role of grain exchanges in the marketing of cash grain, railroad deregulation has diminished the role of terminal elevators at these markets. Terminal elevators have become a residual place of storage rather than a primary place as in years gone-by when they served as important gathering points for grain from the country. This is particulary true for terminal elevators built many years ago to handle rail grain. Many of these elevators are now obsolete for grain merchandising and are suitable only for long-term storage, primarily of

government-owned grain. Furthermore, cash grain prices today are no longer established in these terminal markets as much as they are determined in export locations ("Grain Terminals Must Adapt to New Role," Milling and Baking News, 1984). But, this also implies that while cash grain prices at terminal markets are not as representative as they used to be, futures prices become even more important as a "basis" for pricing grain in a marketing system that has increasingly become more decentralized.

Deregulation of the railroads has been the principal force contributing to the decreased role of terminal elevators. Milling and Baking News makes this point very well along with its implications as follows: "Deregulation has shifted the action to subterminal elevators, which are not just taking over the function of the terminal elevators but also are likely to replace country elevators. Putting it another way, the country elevators that are still operating 20 or so years from now will be subterminal elevators" ("Grain Terminals Must Adapt to New Role," Milling and Baking News, 1984).

With the increased importance of sub-terminal elevators in the U.S. grain marketing system, it is important to define what we mean by sub-terminal". A sub-terminal elevator is an elevator located in the grain production area that purchases grain from other elevators and sometimes directly from farmers; and, has loading capability to ship the grain out in multiple-rail car units.

STRUCTURAL CHANGES IN INTERREGIONAL AND REGIONAL GRAIN MARKETING COOPERATIVES

Some of the most significant and far-reaching structural changes in the grain marketing system in the 1980's involved interregional and regional grain marketing cooperatives. Two farmer-owned regional cooperatives were dissolved; two were reduced to joint ventures with investor-owned firms (IOF's); and several mergers involving regional grain marketing cooperatives also occurred in the decade. Two interregional grain marketing cooperatives also failed (Table 3). Sizeable losses in equity capital resulted in a weakening of the competitive posture of farmer-owned cooperatives in the grain marketing system. The economic reasons behind these structural changes and their performance implications deserve more analysis than they have received to date.

The Collapse of Farmers Export Company

Farmers Export Company (FEC), a federation of regional grain marketing cooperatives, was organized in 1968 for the purpose of marketing farmers' grain for export. For many years, farmer-owned local and regional grain cooperatives had aspired to integrate their operations further up the marketing chain by developing the capability to make direct sales of grain for export. The USDA's Farmer Cooperative Service reported in the mid-1970's that local grain cooperatives received about 40 percent of farmer grain sales, but regional cooperatives handled only half of that amount; and directly exported only 7 to 8 percent of U.S. exports. It recommended that cooperatives strengthen their capability for direct export sales (Improving the Export Capability of Grain Cooperatives, USDA, FCS, Research Report 34, 1978). FEC was to be the major vehicle through

Table 3. Some Structural Changes in Interregional and Regional Grain Marketing Cooperatives in the 1980's.

Cooperative	Action	Year
North Pacific Grain Growers, Inc.	Begins $10 million expansion of export elevator at Kalama, Washington.	1980
Farmers Export Co.	Reopens Galveston, Texas, port elevator extensively damaged in explosion in December 1977.	1980
Farmers Export Co.	Plans to sell export elevators at Galveston and Philadelphia to cooperative owner-members leaving Ama, Louisiana, export elevator as the only facility owned and operated by the company. In April, Far-Mar-Co agrees to purchase the Galveston elevator.	1981
Producers Grain Corp. (Amarillo, Texas)	Closes grain operations, with AGRI Industries, Des Moines, taking over five terminal elevators under a six year lease.	1982
North Pacific Grain Growers, Inc.	Merges with GTA to become Harvest States Cooperatives.	1983
Ohio Farmers Grain and Supply Assn.	Merges with Landmark, Inc. to become Countrymark, Inc.	1985
Countrymark, Inc.	Purchases the assets of Agra Land. (Agra Land was the cooperative that had emerged in 1983 after the Chapter 11 bankruptcy reorganization of Michigan Farm Bureau Services.) Mid-States Terminals, Inc. then becomes wholly-owned grain subsidiary of Countrymark, Inc.	1985
Farmland Industries, Inc.	Sells the wheat and grain sorghum marketing facilities of Far-Mar-Co (its grain marketing subsidiary) to Union Equity Co-op Exchange.	1985
Farmland Industries, Inc.	All of Far-Mar-Co's original elevators remaining after the sale of milo and wheat storage facilities to Union Equity Co-op Exchange have been sold or leased. Efforts continued late this fall to sell three Mississippi River elevators acquired from MFA, Inc. in the spring of 1984.	1985
GROWMARK, Inc.	GROWMARK writes down the value of investments in Farmers Export Company and Agri-Trans Corp. by $15.3 million.	1985
GROWMARK, Inc.	GROWMARK transfers ownership of its seven river terminals to a new ADM subsidiary called ADM/GROWMARK in exchange for ADM common stock.	1985
Farmers Export Co.	Archer Daniels Midland Co. (ADM) acquires all the common stock of Farmers Export Co. with grain export facilities in Ama, Louisiana, and Philadelphia.	1985
Agri-Trans Corporation	This river barge transportation company owned by CF Industries and five regional cooperatives is liquidated.	1985
AGRI Industries, Inc.	Members authorize the sale of all of the cooperative's assets except for four elevators on the Mississippi River and the terminal elevator at Avon, Iowa, near Des Moines. Also, it writes down $10 million in AGRI stock in Farmers Export Co. which was sold last year to A.D.M.	1986
AGRI Industries, Inc.	AGRI will lease its four river elevators to a joint venture with Cargill, Inc. called Agri Grain Marketing. AGRI Industries will continue as an operating holding company, functioning as a cooperative enterprise in supporting member services and other cooperative programs.	1986

Sources:

The Changing Face of Breadstuffs, Milling and Baking News, Sosland Publishing Co. Kansas City, Missouri, 1983.

Benschneider, Donald E. "The Creation of Countrywork, Inc." American Cooperation, 1987, American Institute of Cooperation, Washington, D.C., pp. 243-48.

"AGRI Industries Members Okay Asset Divestiture for Survival," Milling and Baking News, Sosland Publishing Co., Kansas City, Missouri, Jan. 21, 1986, p. 12.

"GROWMARK and ADM Announce Plans for Joint Venture," GROWMARK News Release, Sept. 5, 1985.

"Far-Mar-Co Phaseout Nearing Completion," Farmers Cooperartives, USDA, Agricultural Cooperative Service, December 1985, p. 18.

"GROWMARK's 1985 Consolidated Margins $10.4 Million," Farmer Cooperatives, USDA, Agricultural Cooperative Service, November 1985, p. 19.

Coonrad, Richard A. "Letter to All Member Companies, AGRI Industries, Inc.," West Des Moines, Iowa, February 11, 1986.

which this strategy could be implemented. It expanded rapidly in the 1970's. At the peak of its operations in 1980, it owned two major gulf port terminals in Ama, Louisiana and Galveston, Texas. It also leased a 3 million bushel Philadelphia elevator and another port elevator at Portland in the Pacific northwest. In addition, it had agents and offices in several major foreign cities.

But, by 1981, even before the decline in U.S. grain exports, FEC experienced difficulties and began to downsize through the sale of port facilities. In 1985, it was liquidated through the sale of its remaining assets, which consisted mainly of its export elevator at Ama, Louisiana, its first major investment in the early 1970's, to the Archer Daniels Midland Company.

The collapse of FEC was attributed to several factors, such as the lack of a global trading partner and a commitment to market cooperatively through FEC as a central entity (Hofstead, 1987). Another cooperative leader also emphasized lack of commitment as follows: "One was the failure of members to fully support FEC. In fact, at least one regional acquired Gulf elevator assets in direct competition with grain flowing to FEC, of which it was part owner" (Torgerson, May 1986). The same problem was discussed even more pointedly in Fortune Magazine as follows: "The bitter rivalries among the members kept them fighting about which facilities were needed. They seemed to have Mafia-like designs on one another's territories and business. A couple also had designs on Farmers Export's foreign markets."

"AGRI Industries plunged heavily into the export business on its own, and last year shipped 185 million bushels overseas through other

facilities. In June, the big Iowa co-op leased an export terminal (which it is now trying to buy) in Lake Charles, Louisiana, that can't help but divert business away from the Farmers Export terminal in Ama, 175 miles away. In September, just as Farmers Export's burned-out elevator in Galveston was getting back into operation, AGRI announced plans to acquire a large competing elevator in Houston. The $36 million deal was closed in December." [Rowan, April 20, 1981, p. 156.]

It was also reported that the demise of FEC was hastened by losses on large speculative positions in futures involving old crop-new crop price spreads in soybeans and corn. Operating personnel in FEC were quoted as saying they were forced into such speculative trading to cover substantial overhead incurred from large investments in fixed assets. The magnitude of these losses were reported as follows. "At last years annual meeting Farmers Export's equity stood at $70 million. Today it has shriveled to $35 million - down $32 million from disastrous bean and corn spreads and $3 million from other losses. These losses must be born by the farmers owning stock in the 12 member co-ops." [Rowan, April 20, 1981, p. 160.]

The USDA's Agricultural Cooperative Service reported that the collapse of Farmers Export as "ending another chapter in the continuing saga of grain farmer's efforts to achieve a farmer-controlled grain marketing system through vertical coordination" (Torgerson, May 1986, p. 2). But, it also marked the beginning of structural adjustments in other farmer-owned grain marketing cooperatives which were to follow.

Agri-Trans Corporation Liquidated

Agri-Trans Corporation was organized as a river barge transportation company in the mid 1970's by CF Industries and five regional cooperatives,

several of which also were owners of Farmers Export. Its purpose was to ship grain down river to Gulf export terminals and fertilizer was barged up river. By 1979, it owned 324 barges and seven river towboats. As grain exports declined in the 1980's, barge rates on the river plunged. Many new barges had been built and added to the barge fleet resulting in excess capacity. Agri-Trans could not generate enough income to cover operating expense and debt servicing under the lower barge rate structure so it was liquidated in 1985.

The failure of this interregional cooperative also involved losses in equity capital as was the case of Farmers Export. These losses had to be absorbed by the regional cooperatives that held the equity capital of Agri-Trans.

Two Regionals Dissolved

The Producers Grain Corporation of Amarillo, Texas closed grain operations in 1982 with AGRI industries, Inc. a regional grain marketing cooperative headquartered in Des Moines, Iowa, taking over five terminal elevators under a six year lease.

Far-Mar-Co., a regional grain marketing cooperative headquartered in Hutchinson, Kansas, was also liquidated in 1985. Earlier Far-Mar-Co. had merged with Farmland Industries, Inc. of Kansas City, becoming a subsidiary of this regional farm supply cooperative. Far-Mar-Co. was one of the owners of Farmers Export and had purchased its export elevator in Galveston, Texas, in 1981 when Farmers Export began to downsize its operations. This purchase increased the debt load of Far-Mar-Co. which became increasingly burdensome as grain exports declined and excess export marketing capacity emerged in the early 1980's. Far-Mar-Co.'s wheat and

milo storage facilities, including the Galveston elevator, were sold to the Union Equity Co-op Exchange headquartered in Enid, Oklahoma. The latter is now the nation's largest regional grain exporting cooperative in terms of direct grain exports.

Two Regionals Become Joint Ventures with IOF's

On September 5, 1985, GROWMARK, a regional farm supply and grain marketing cooperative headquartered in Bloomington, Illinois and the Archer Daniels Midland Company (ADM) headquartered in Decatur, Illinois, and one of the world's largest grain processors, announced a plan to consolidate their grain marketing and river operations in a new ADM subsidiary called GROWMARK Grain. GROWMARK transferred ownership of its seven river terminals to the new "ADM subsidiary" in exchange for ADM common stock. Substantially, all ADM and GROWMARK terminals on the Illinois and Mississippi Rivers are now referred to as "ADM/GROWMARK."

According to the plan as described, both firms have equal representation on the GROWMARK Grain board of directors. The Co-op is also represented on ADM's board of directors. Kenneth P. Baer, executive vice president and chief executive officer of GROWMARK described the advantages of the joint venture as follows: "ADM needs and wants our system's grain origination capability, and we need ADM's ability to provide equity capital, their processing capability, and their worldwide marketing expertise." ("GROWMARK and ADM Announce Plans for Joint Grain Venture," Sept. 5, 1985.)

AGRI Industries, Inc. and Cargill, Inc. also formed a joint venture beginning March 15, 1986, called AGRI Grain Marketing. As described in a letter to members, AGRI leased its four river elevators to the joint

venture. Cargill leased one river elevator and assigned a second river elevator, in which it has a lease interest, to the joint venture, which became an independent organization with a joint governing board. Despite Cargill's 51 percent controlling interest, the joint venture was designed to operate on an equal basis including AGRI Industries members and Cargill grain and processing operations. All transactions will be a market prices to insure this equality. The joint venture's staff came from a merger of AGRI staff and some of Cargill's Commodity Marketing Divisions staff in Des Moines. Both of these entities ceased operations as separate independent marketing firms in Iowa.

With the integration of AGRI's grain merchandising and related functions into the new joint venture, AGRI Industries, Inc. became a holding company "functioning as a cooperative enterprise in supporting member services and other cooperative programs" (Coonrod, Richard A., Feb. 11, 1986).

The downsizing or dismantling of AGRI Industries as an active regional grain marketing cooperative reportedly was necessitated by a record loss of $21.3 million in the fiscal year ending August 31, 1985; and a $9.8 million loss in the previous fiscal year. These losses were probably attributable, in large part, to the sizeable investments in export marketing infrastructure at the Gulf, and, terminal wheat marketing facilities in Texas. These fixed assets became redundant with the decline in grain exports and could not generate enough income to cover their carrying costs. ("AGRI Industries members okay asset divestiture for survival," 1986.)

Two Mergers of Regional Grain Marketing Cooperatives

The Grain Terminal Association, St. Paul, Minnesota, and North Pacific Grain Growers, Inc., Portland, Oregon, merged to form Harvest States Cooperatives on June 1, 1983. The new cooperative headquartered in St. Paul, Minnesota, became the nation's largest grain marketing cooperative with revenues of $2.4 billion in the fiscal year ending May 31, 1988. Harvest States has grain export facilities on the Great Lakes at Duluth/Superior and the Pacific Northwest at Kalama, Washington. It serves farmers in the Upper Midwest, Pacific Northwest and adjoining areas. Besides grain marketing, Harvest States Cooperatives has sizeable investments in value-added grain processing operations including soybean and sunflower seed processing; consumer food products distributing salad dressing and other vegetable-oil-based products to supermarkets; durum milling producing semolina for pasta products; barley malting; and livestock feed manufacturing.

Ohio Farmers Grain and Supply Association merged with Landmark, Inc. to become Countrymark, Inc. in 1985. Countrymark then purchased the assets of Agra Land, the cooperative that had emerged in 1983 after the Chapter 11 bankruptcy reorganization of Michigan Farm Bureau Services. Mid-States Terminals, Inc. then became a wholly-owned grain subsidiary of Countrymark, Inc.

A Changed Cooperative Grain Marketing System

The cooperative grain marketing system in 1989 is vastly different from that of a decade earlier when grain exports had peaked. The re-structuring of regional grain marketing cooperatives that occurred during

the decade was necessitated by over-capacity created by heavy investments in grain export marketing infrastructure during the boom period.

Most knowledgeable students could hardly conclude that the U.S. system of regional grain marketing cooperatives has become stronger over the past decade. But, the strongest part of the farmer-owned grain marketing system has traditionally been in grain origination through local cooperatives. Many local grain marketing cooperatives have grown in size and scope of operations as they have expanded through internal growth, mergers, and consolidations. Their larger operations and capabilities of handling unit train shipments indicate that they have taken on more of the characteristics of sub-terminals shipping directly to domestic users or ports for export. Hence, many are not as dependent upon the services of a regional cooperative in marketing single cars of grain as in years past. But, excess capacity in unit train loading facilities may result in further re-structuring in local grain marketing cooperatives.

U.S. LARGEST MULTIPLE FACILITY GRAIN FIRMS

The 10 largest U.S. grain companies operated 703 grain facilities with aggregate storage capacity of 1.363 billion bushels in 1989 (Table 4). The facilities included 40 port, 102 river, 91 terminal, 60 sub-terminal, and 452 country elevators. The distinction between the latter two facilities is often difficult so the numbers can vary with interpretation. Cargill, Inc., for example, the nation's largest grain company, lists 179 country elevators and no sub-terminals. Some of their country elevators would undoubtedly be classified as sub-terminals if the latter is defined as an elevator located in the grain producing area that receives grain from other elevators, and sometimes directly from farmers,

Table 4. U.S. Largest Multiple Facility Grain Companies According to Grain Storage Facilities and Capacity, 1989.

	Company	Number of Grain Storage Facilities						Total Licensed Capacity
		Port	River	Terminal Elevators	Sub-Terminal Elevators	Country Elevators	Total Number	(million bu.)
				(Ten Largest)				
1.	Cargill, Inc.	15	23	17	--	179	234	340.0
2.	Continental Grain Co.	11	25	16	18	10	80	188.5
3.	Union Equity Co-op Exchange	2	1	14	--	--	17	166.5
4.	Bunge Corp.	3	34	8	10	--	55*	163.6
5.	The Pillsbury Co.	1	7	9	8	29	54	113.1
6.	Riceland Foods, Inc.	--	2	3	--	30	35	93.4
7.	Scoular Grain Co.	--	--	6	3	32	41	90.8
8.	Peavey Co. (Susidiary of ConAgra, Inc.)	5	5	7	10	46	73	81.6
9.	Elders Grain, Inc.	1	--	9	--	11	21	63.7
10.	Harvest States Cooperatives	2	5	2	--	105	114	61.7
	Total	40	102	91	60	452	703	1,362.8
				(Second Ten Largest)				
11.	The Anderson's	1	--	5	3	2	11	60.0
12.	Twomey Co.	--	--	--	--	6	6	59.0
13.	Central Soya Co., Inc. (Division of Gruppo Ferruzzi)	1	3	6	1	--	11	58.0
14.	Louis Dreyfus Corp.	3	8	5	1	--	17	54.0
15.	Demeter, Inc.	--	--	--	6	17	23	49.3
16.	Collingwood Grain, Inc.	--	--	4	--	32	36	42.3
17.	General Mills, Inc.	1	1	10	1	29	42	40.2
18.	Garvey International, Inc. (Subsidiary of Garvey Industries)	--	1	1	2	6	10	38.3
19.	Mid-States Terminals, Inc. (Subsidiary of Countrymark, Inc.)	2	1	10	--	--	13	38.0
20.	Merchants Grain & Transportation	--	3	2	3	9	17	36.4
	Total	8	17	43	17	101	186	475.5
	Total	48	119	134	77	553	889	1,838.3

*Does not include country elevators

Source: 1989 Grain Guide, North American Grain Yearbook, Milling and Baking News, Sosland Publishing Co., pp. 8-20.

and has capability for loading and shipping the grain out in unit trains. Such elevators have increased in both numbers and importance. This trend will likely continue as more grain moves directly from country gathering points to ports or to domestic processors without moving through terminal markets.

The recent acquisition of the grain operations of the Pillsbury Company by ConAgra, Inc., resulted in the latter becoming the nation's third largest grain company following Cargill, Inc. and Continental Grain Company. ConAgra, Inc. is listed in Table 4 as Peavey Company which was an earlier acquisition of ConAgra. Union Equity Co-op Exchange and Bunge Corporation complete the list of the nation's five largest companies.

Three of the top ten companies are cooperatives. In addition to the Union Equity Co-op Exchange, which increased in size after acquiring the wheat and milo facilities Far-Mar-Co., Riceland Foods, Inc. and Harvest States Cooperatives, rank sixth and tenth, respectively. One cooperative is also included in the nation's second ten largest. Mid-States Terminals, Inc., a subsidiary of Countrymark, Inc. of Ohio ranks nineteenth.

The data in the detail as shown in Table 4 are not available for previous years. The first and second ten largest grain elevator companies in 1981 are shown in Table 5, but country elevators are excluded. Only data for sub-terminal, terminal, river, and port elevators are included in the number of elevators and storage capacity. Nevertheless, one can compare the two tables and note that many changes have occurred. Several companies on the 1981 list of the top 20 companies were not on the list for 1989, notably, several regional grain marketing cooperatives such as

Table 5. U.S. Largest Grain Elevator Companies, 1981.

Company	Number of Elevators 1/	Total Storage Capacity (million bu.)
	(Ten Largest)	
1. Cargill, Inc.	21	148.0
2. Far-Mar-Co., Inc.	17	122.1
3. Continental Grain Co.	39	110.3
4. Union Equity Co-op Exchange	3	67.0
5. The Pillsbury Co.	44	54.3
6. Central Soya Co.	9	51.3
7. Bunge Corp.	51	47.0
8. The Andersons	7	43.0
9. Lincoln Grain, Inc.	3	39.3
10. Indiana Grain Division (Indian Farm Bureau Co-op Assn.)	12	38.7
Total	206	721.0
	(Second Ten Largest)	
11. Producers Grain Corp.	6	37.9
12. C-G-F Grain Co., Inc.	1	32.0
13. Farmers Union GTA	7	30.0
14. Riceland Foods, Inc.	2	27.3
15. General Mills, Inc.	12	27.2
16. Con Agra, Inc.	16	26.5
17. Louis F. Dreyfus Corp.	9	25.5
18. Garvey Elevators, Inc.	5	24.8
19. Bartlett and Co. Grain	5	20.3
20. Agri-Industries, Inc.	8	20.2
Total	71	271.7
Total Twenty Largest	277	992.7

1/ Sub-Terminal, Terminal, River, and Port Elevators.

Source: "Grain Elevator Storage Capacity Grows," Milling and Baking News, Sosland Publishing Co., Kansas City, MO, Oct. 13, 1981.

Far-Mar-Co., Producers Grain Corp., Agri-Industries, and Indiana Grain Division (Indiana Farm Bureau Co-op Assn.). The latter is still in the grain business, but was not large enough to make the list in 1989.

Several companies were included in the top 20 for 1989 that did not make the 1981 list. Several of the new names were Scoular Grain Co., Elders Grain, Inc., Twomey Co., Demeter, Inc., Collingwood Grain, Inc., and Merchants Grain and Transportation. One new cooperative made the list in 1989, namely Mid-States Terminals, Inc.

The changing structure of the U.S. grain industry provides evidence that the industry is not static. New firms have entered while others have exited as marketing margins were squeezed due to excess capacity in the 1980's.

STRUCTURE OF THE U.S. GRAIN EXPORT SYSTEM

The market structure of the U.S. grain export system may be categorized into four groups: (1) major multinational corporations, (2) Japanese-owned or affiliated firms, (3) farmer-owned cooperatives, and (4) all other grain exporting firms. Table 6 shows these four groups ranked by market share in 1980-81 and their increase or decrease in market share since 1974-75. Japanese-owned or affiliated firms and farmer-owned cooperatives increased their shares of grain exports. Their increases came largely at the expense of the multinationals (GAO/CED-82-61 June 15, 1982).

Data on changes in market shares during the decade of the 1980's are not available. However, they would probably show that the share of U.S. grain exports handled by farmer-owned cooperatives has declined for reasons previously discussed in this paper.

Table 6. Change in Market Share of U.S. Grain Exports by Exporter Group 1974-75 to 1980-81.

Exporter Group (Ranked by Market share)	1980-82 Market Share Minus 1974-75 Market Share (percent)
5 Largest Multinationals	-5.3
Japanese-Owned or -Affiliated Firms	+4.7
Other Firms	-.5
Farmer-Owned Cooperatives	+1.1

Source: GAO Staff Study, "Market Structure and Pricing Efficiency of U.S. Grain Export System," GAO/CED-82-61. To be issued May or June 1982.

Major multinational corporations are large firms which operate globally and handle much of the grain that is bought and sold in the world today. The five largest multinationals are widely recognized as being Cargill, Inc.; Continental Grain Company; Bunge Corp.; Louis Dreyfus Corp., and Garnac Grain Co., Inc.. The first four of the above are also among the largest multiple facility grain companies in the U.S. and shown in Table 4. Garnac Grain Co., Inc. is listed in the 1989 Grain Guide as the 73rd largest U.S. multiple faculty grain firm with 11.0 million bushels of licensed grain storage capacity consisting of 2 port elevators, 8 river elevators, and 3 country elevators.

Japanese trading houses such as Marubeni, Mitsui, Mitsubishi, and C-Itoh play an important role in exporting U.S. grain to Japan and other countries. Some of these firms have also acquired U.S. facilities, including country elevators, sub-terminals, terminals, and port elevators.

The Japanese National Federation of Agricultural Cooperative Associations (Zen-Noh) also established Zen-Noh Grain Corp., a U.S. subsidiary, which constructed a modern grain export terminal at Covenant, La., in 1982. Its purpose is to purchase corn, soybeans, and milo from American farmers and ship these grains to Japan ("Zen-Noh's U.S. Elevator," Milling and Baking News, July 5, 1983).

A grain export firm in typically defined as a firm that sells grain directly to a foreign buyer. It does not necessarily have to load the grain on an ocean-going vessel, because this is sometimes done by another company. The 1988 Grain Guide listed 61 U.S. grain exporting companies (Table 7). Included are the large multinationals, referred to above, and other U.S. corporations, cooperative and non-cooperative, well-known in the grain business. But, the number of firms with Japanese names is striking. Other firms listed are not widely known in the U.S. grain business and provide evidence that small as well as large firms can participate in the U.S. grain export business. This is contrary to the popular view that heavy capital requirements are barriers to entry in grain exporting.

Export Elevator Control

The control of export elevator facilities at the ports does undoubtedly increase the flexibility and power of some firms in the grain export system. Trends in the control of port elevator storage capacity in the 1980's do not show increases in concentration. The five major multinationals controlled 50 percent of the storage capacity in 1981; this share shrank to 46 percent in 1989 (Table 8). The share held by farmer-owned cooperations also declined during the same period from 21 percent to

Table 7. U.S. Grain Exporting Companies, 1988.

AGREX, INC.: 7007 College Blvd., Suite 500, Overland Park, Kas. 66211. Phone (913) 345-5400. TLX: 417020. TWX: 9103417656.

AGRI-INDUSTRIES: P.O. Box 4887, Des Moines, Iowa 50306. Phone (515) 225-3203.

AGRO CO. OF CANADA LTD.: 450 Bridge St., Montreal, Quebec H3K 2C6 Canada. Phone (514) 937-4241. TLX: 05560623.

ALLIANCE GRAIN, INC.: Suite 312, 4300 Haddonfield Rd., N.J. 08109. Phone (609) 663-0505. Cable: ALGRAIN. TLX: 834269.

THE ANDERSONS: 1200 Dussel Dr., P.O. Box 119, Maumee, Ohio 43537. Phone (419) 893-5050. TWX: 8104492692.

ARCHER DANIELS MIDLAND: P.O. Box 1470, Decatur, Ill. 62525. Phone (217) 424-5496. TLX: 250127.

ARTPER, INC.: P.O. Box 53227, New Orleans, La. 70153-3227. Phone (504) 582-2200. TLX: RCA 71-285289.

BARTLETT & CO., GRAIN: 4800 Main St., Suite 600, Kansas City, Mo. 64112. Phone (816) 753-6300. TLX: 434021. TWX: 9107712021.

BUCCELLATO VACCARO & CO.: (Division of David S. Van Vort, Inc.): 2050 Center Ave., Suite 303, Fort Lee, N.J. 07024. Phone (201) 585-8777. TWX: 7109919727.

BUNGE CORP.: One Chase Manhattan Plaza, New York, N.Y. 10005. Phone (212) 943-6600. Cable: BUNGUSA. TLX: 141405.

CARGILL, INC.: 15407 McGinty Rd. W., P.O. Box 9300, Minneapolis, Minn. 55440. Phone (612) 475-7575. Cable: CARGILL. TLX: 276170.

CENTRAL SOYA CO., INC.: P.O. Box 1400., Fort Wayne, Ind. 46801-1400. Phone (219) 425-5100. TLX: 232410.

CHLEWICH CORP.: 120 Wall St., 21st floor, New York, N.Y. 10005. Phone (212) 344-3400. TLX: RCA 71-232088.

COLUMBIA GRAIN, INC.: 121 S.W. Salmon, Suite 900, Portland, Ore. 97204. Phone (503) 286-8624. TLX: 360592.

CONAGRA, INC.: One Central Park Plaza, Omaha, Neb. 68102. Phone (402) 978-4000. TLX: 484556.

CONTINENTAL GRAIN CO.: 277 Park Ave., New York, N.Y. 10172. Phone (212) 207-5100. Cable: FRIBRENE. TLX: 125708.

COPROSTATES, INC.: 111 Broadway, Room 802, New York, N.Y. 10006. Phone (212) 285-2010. TRT: 177867.

EARLY & DANIEL INDUSTRIES, INC.: 525 Carr St., Cincinnati, Ohio 45203. Phone (513) 621-0662. TLX: EARLYDAN CIN 214500.

ELDERS GRAIN, INC.: Suite 180, 9200 Indian Creek Parkway, Overland Park, Kas. 66210. Phone: (913) 451-4400. TLX: 5106001612.

FERRUZZI U.S.A.: P.O. Box 53227, New Orleans, La. 70153. Phone (504) 582-2200. TLX: 285289 ARTNOUR.

C.B. FOX CO.: 220 Camp St., 4th floor, New Orleans, La. 70130. Phone (504) 588-9211. Cable: FOX. TLX: 58216.

GARNAC GRAIN CO., INC.: 8000 W. 110th St., Overland Park, Kas. 66210. Phone (913) 661-6100. TWX: 9107436844.

GENERAL MILLS, INC.: P.O. Box 15003, Commerce Station, Minneapolis, Minn. 55415. Phone (612) 540-2311. TLX: 29-0597 (GENMIL GRN MPS).

GULF COAST GRAIN, INC.: 965 Ridge Lake Blvd., Suite 103, Memphis, Tenn. 38119. Phone (901) 685-3750. TLX: 533355.

HARVEST STATES COOPERATIVES: P.O. Box 64594, 1667 N. Snelling Ave., St. Paul, Minn. 55164. Phone (612) 646-9433. TLX: 297094.

INTERNATIONAL MULTIFOODS CORP.: Multifoods Tower, Box 2942, Minneapolis, Minn. 55402. Phone (612) 340-3300. Cable: IMPEX. TLX: 290602.

INTERNOR TRADE, INC.: 30 Rockerfeller Plaza, New York, N.Y. 10112. Phone (212) 397-3650.

INTERSTATE GRAIN CORP.: 1800 W. Loop S., Suite 1550, Houston, Texas. 77027. Phone (713) 871-8908. TLX: 792015.

ITALGRANI U.S.A., INC.: 7900 Van Buren, St. Louis, Mo. 63111. Phone (314) 638-1447. TLX: 6974546.

C. ITOH & CO. (AMERICA), INC.: 335 Madison Ave., New York, N.Y. 10017. Phone (212) 818-8000. TWX: 7105815554. TLX: 8188361 or 62.

KANEMATSU-GOSHO (U.S.A.) INC.: 1133 Ave. of the Americas, 27th floor, New York, N.Y. 10036. Phone (212) 704-9400. ITT 420289.

LINCOLN GRAIN, INC.: P.O. Box 80269, Lincoln, Neb. 68501. Phone (402) 467-4481. TLX: 42-4144 (LWCOLNGR ATCH).

LOUIS DREYFUS CORP.: 24 Richmond Hill Ave., P.O. Box 10117, Stamford, Conn. 06904-2117. Phone: (203) 357-8444. Cable: SESOSTRIS. TLX: 996315.

MAPLE LEAF MILLS, INC.: 310 Fourth Ave. S., Suite 618, Minneapolis, Minn. 55415. Phone (612) 333-6044. TLX: 290614.

MARTRADE LTD.: 789 Grain Exchange Building, Minneapolis, Minn. 55415. Phone (612) 338-8431. Cable: MARTRADE MPS. TRT: 192120.

MARUBENI AMERICA CORP.: 200 Park Ave., New York, N.Y. 10166. Phone (212) 599-3753. TLX: 232185.

MITSUBISHI INTERNATIONAL CORP.: 520 Madison Ave., New York, N.Y. 10022. Phone (212) 605-2570. TLX: 968647. TWX: 7105816762.

MITSUI GRAIN CORP.: 965 Ridge Lake Blvd., Suite 101, Memphis, Tenn. 38119. Phone (901) 685-3700. TLX: 533154.

NICHIMEN CO.: 1185 Ave. of the Americas, New York, N.Y. 10036. Phone (212) 719-1000.

NISSHO IWAI AMERICAN CORP.: 1211 Ave. of the Americas, New York, N.Y. 10036. Phone (212) 704-6500. TLX: 127090.

NOGA COMMODITIES (OVERSEAS), INC.: One World Trade Center, Suite 8041, New York, N.Y. 10048. Phone (212) 938-8800. TLX: 423239.

OVERSEAS COMMODITIES CORP.: 6465 Wayzata Blvd., Park Place West Office Center, Suite 750, Minneapolis, Minn. 55426. (612) 542-1840. TLX: 290156.

PEAVEY COMPANY: 730 Second Ave., Minneapolis, Minn. 55402. Phone (612) 370-7558. TLX: 290620.

PHILIPP BROTHERS EXPORT CORP.: 1221 Ave. of the Americas, New York, N.Y. 10020. Phone (212) 575-5900. Cable: PHIBRO NEWYORK. TWX: 7105815943.

THE PILLSBURY CO.: 200 S. Sixth St., Pillsbury Center, Minneapolis, Minn. 55402. Phone (612) 330-9160. TLX: 290668 PILLS MPS.

RALSTON PURINA CO.: Checkerboard Square, St. Louis, Mo. 63164. Phone (314) 982-1000. TLX: 447620. TWX: 910761192.

JAMES RICHARDSON & SONS LTD.: Grain Division, 25th Floor, One Lombard Place, Winnipeg, Manitoba R3B 0Y1 Canada. Phone: (204) 934-5623. TLX: 0757706.

RICHCO GRAIN LTD.: 650 Fifth Ave., New York, N.Y. 10019. Phone (212) 903-2000. TLX: 968076.

SGS CONTROL SERVICES, INC.: 42 Broadway, New York, N.Y. 10004. Phone (212) 482-8700. TLX: ITT 428974.

SUMITOMO CORP. OF AMERICA: 345 Park Ave., New York, N.Y. 10154. Phone (212) 207-0700. TLX: 12311 SUMITOMO NYK.

TABOR GRAIN CO.: P.O. Box 1470, Decatur, Ill. 62525. Phone (217) 424-5900. Cable: ARDANDEC. TLX: 250127.

TIDEWATER GRAIN CO.: 525 Carr St., P.O. Box 145488, Cincinnati, Ohio 45203. Phone (513) 621-0662. Cable: EARLYDAN-CIM. TLX: 214500.

ALFRED C. TOEPFER INTERNATIONAL, INC.: 52 Duane St., New York, N.Y. 10007. Phone (212) 766-8100. Cable: ELSHANDEL. TWX: 7105814820.

TOSHOKU AMERICA, INC.: 551 Fifth Ave., New York, N.Y. 10176. Phone (212) 661-5400.

TOYOMENKA (AMERICA) INC.: One World Trade Center, Suite 4011, New York, N.Y. 10048. Phone (212) 466-4600.

TRADIGRAIN, INC.: 1064 Laskin Rd., Suite 25C, P.O. Box 1508, Virginia Beach, Va. 23451. Phone (804) 422-8483. TLX: RCA 266055.

UNION EQUITY COOPERATIVE EXCHANGE: 2300 N. 10th, P.O. Box 3408, Enid, Okla. 73702. Phone (405) 233-5100. Cable: UNECO. TLX: 747169.

UNITED GRAIN CORP.: 200 Market St., Portland, Ore. 97201. Phone (503) 228-6424.

VAN STOLK CO., INC.: 30 Bay St., Staten Island, N.Y. 10301. Phone (718) 448-8113. TLX: 420403.

YUASA TRADING CO. (AMERICA) INC.: 42 Broadway, New York, N.Y. 10004. Phone (212) 269-2684.

ZEN-NOH AMERICA CORP.: One World Trade Center, Suite 8823, New York, N.Y. 10048. Phone (212) 432-1080.

Source: 1988 Grain Guide, North American Grain Yearbook, Milling and Baking News, Sosland Publishing Co., p. 23.

15 percent. On the other hand, the share of the port storage capacity held by firms other than major exporters and cooperatives increased from 28 percent to 39 percent. Several of the larger multiple port facility firms in the "other" category include: Archer-Daniels Midland Company, The Andersons, Con Agra, Inc., and Ferruzzi, USA Inc. Also included in this category are six public export elevators operated by port authorities having a total storage capacity of 18.8 million bushels. Floating elevator facilities also increase export loading capacity. The Federal Grain Inspection Service supervises 9 floating rigs, all of which are located at the Mississippi Gulf.

Table 8. Percentage of Total Export Elevator Capacity Controlled by Exporter Group, 1981 and 1989.

Exporter Group	1981[1]	1989[2]
5 Major Multinationals[3]	50.3	46.0
Farmer-owned Cooperatives	21.4	15.3
Others[4]	28.3	38.7
Total	100.0	100.0

1. Neilson C. Conklin and Reynold P. Dahl "Organization and Pricing Efficiency of the U.S. Grain Export System." Minnesota Agricultural Economist, Agric. Ext. Service, University of Minnesota, No. 635 May 1982, p.3.

2. Export Elevator Directory, U.S. Dept. of Agric., Federal Grain Inspection Service, January 1989.

3. Includes Cargill, Continental, Bunge, Dreyfus, and Garnac.

4. Includes public elevators and elevators operated by port authorities.

The returns to port elevator ownership and control probably declined in the 1980's as grain exports declined. Both producers and consumers of grain benefited from reduced grain marketing margins during the decade. Exports have increased in the past two years, but in 1988 they were still over 500 million bushels below their record level in 1980-81.

CONCLUSIONS

The grain export boom of the 1970's put a severe strain on the marketing system. Marketing margins increased as the demand for marketing infrastructure exceeded the available supply. This stimulated investments in rail cars, barges, storage, and port facilities. Much of this new equipment came on-line when exports declined in the 1980's resulting in excess capacity, reduced marketing margins, firm consolidation, and restructuring.

The rapid spread of multiple-car rail rates on grain also changed grain marketing patterns and the structure of the country elevator industry. These rates along with record earnings in the late 1970's stimulated investments in unit train loading facilities; first in the corn belt and later in the wheat production acres of the Great Plains. Many areas now have excess capacity in storing, drying, and unit-train shipping facilities. Mergers of local grain marketing cooperatives have been accelerated and further structural adjustments are likely.

Changes in transportation and railroad de-regulation have accelerated the decline of grain exchanges and terminal grain markets in the marketing of cash grain. Terminal elevators have become a residual place of storage rather than a primary place as in years gone-by. Cash grain prices are no longer established in these terminal markets as much as they are

determined in export locations. Futures prices have become even more important as a "basis" for pricing cash grain in a marketing system that has increasingly become more decentralized.

Sub-terminal elevators have increasingly taken over the function of terminal elevators in the new grain marketing system. They are also replacing country elevators and most country elevators still operating 20 years from now will be subterminal elevators.

The farmer-owned grain marketing system in 1989 is vastly different from that at the beginning of the decade when grain exports peaked. Two interregional grain marketing cooperatives failed; two regionals were dissolved; two regionals were reduced to joint ventures with investor-owned firms; and several mergers involving regional grain marketing cooperatives also occurred in the decade. But, many local grain marketing cooperatives have grown in size as they have expanded through internal growth, mergers, and consolidations. Many have capabilities of shipping unit trains or are a part of multiple-plant firms that own and operate a sub-terminal that ships directly to domestic users or ports for export. They may not be as dependent upon the services of a regional as in years past.

Many changes occurred in the list of the top 20 multiple facility grain companies in the U.S. during the past decade. The changing structure of the U.S. grain industry provides evidence that the industry is not static. New firms have entered while others have exited as marketing margins were squeezed due to excess capacity in the 1980's.

The market structure of the U.S. grain export industry may be categorized into four groups: (1) major multinational corporations, (2)

Japanese-owned or affiliated firms, (3) farmer-owned cooperatives, and (4) all other grain exporting firms. Data on changes in the market shares of these four groups are not available for the 1980's, but they would probably show that the share of farmer-owned cooperatives has declined. Japanese-owned or affiliated firms have expanded their role in the U.S. grain export market since 1974-75. The number of firms with Japanese names appearing on the list of 61 U.S. grain exporting firms is striking. Other firms listed are not well-known in the U.S. grain business. This provides some evidence that small as well as large firms can participate in the U.S. grain export business. This is contrary to the widely-held view that heavy capital requirements are barriers to entry in grain exporting.

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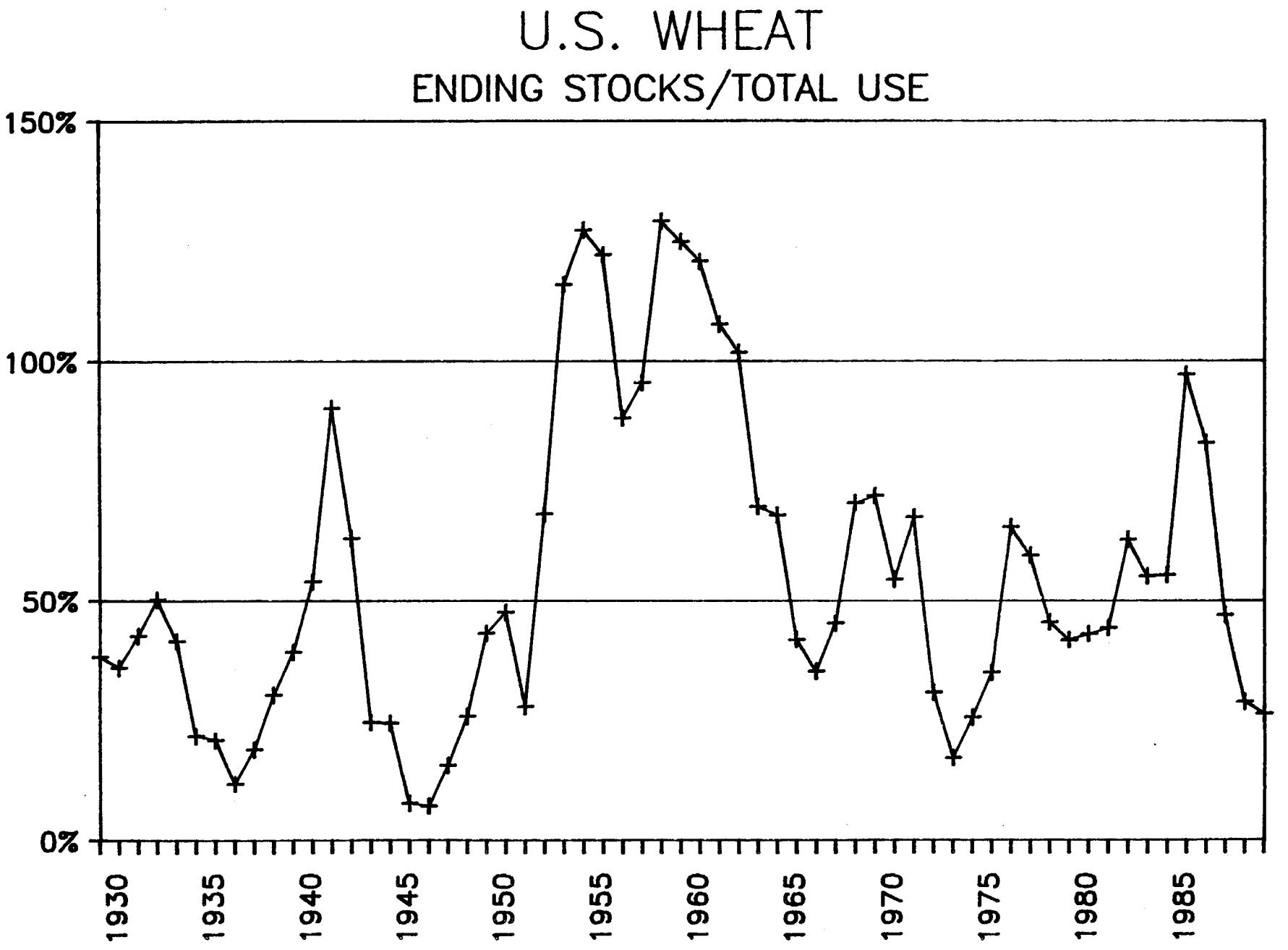
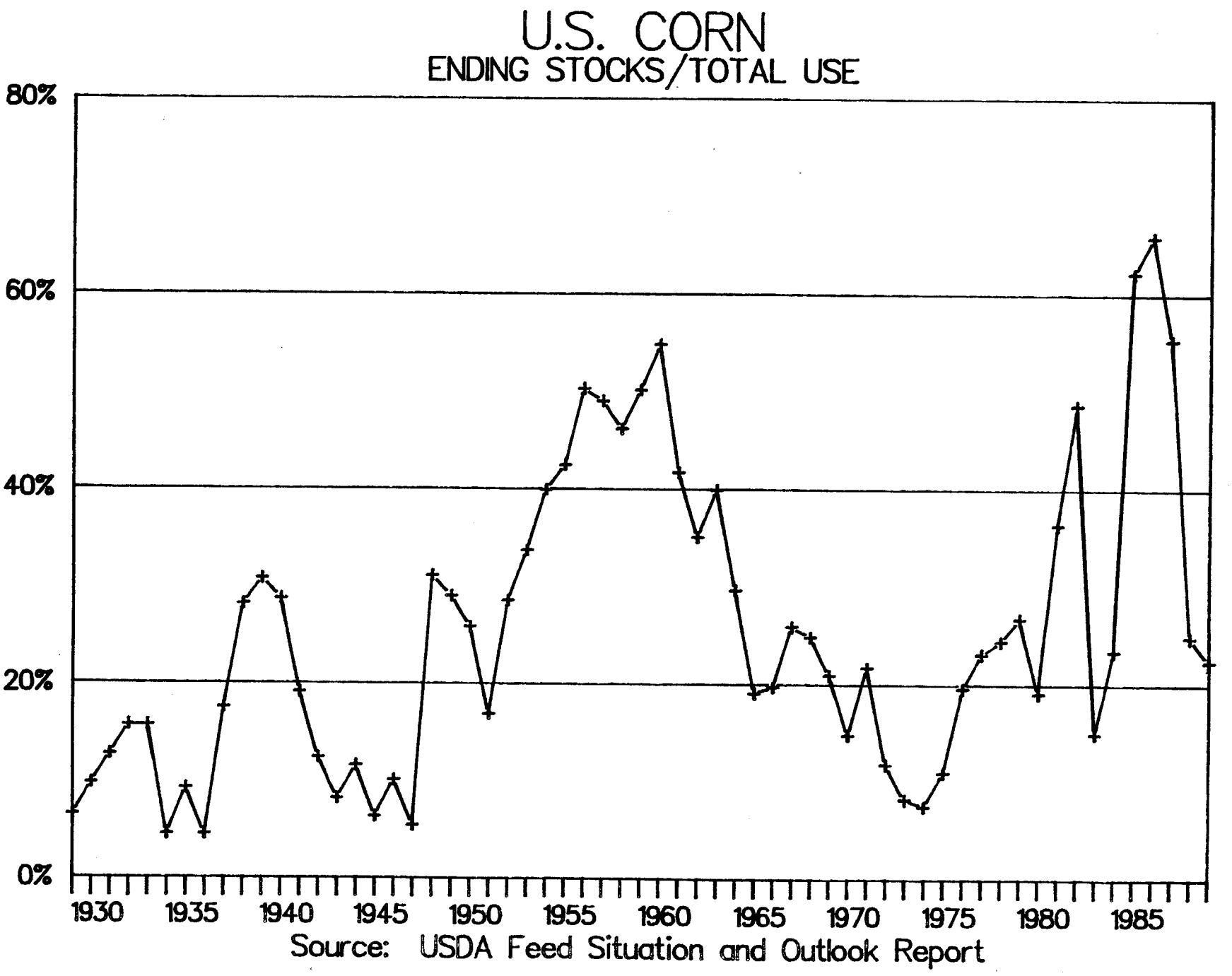
APPENDIX FIGURE 1.

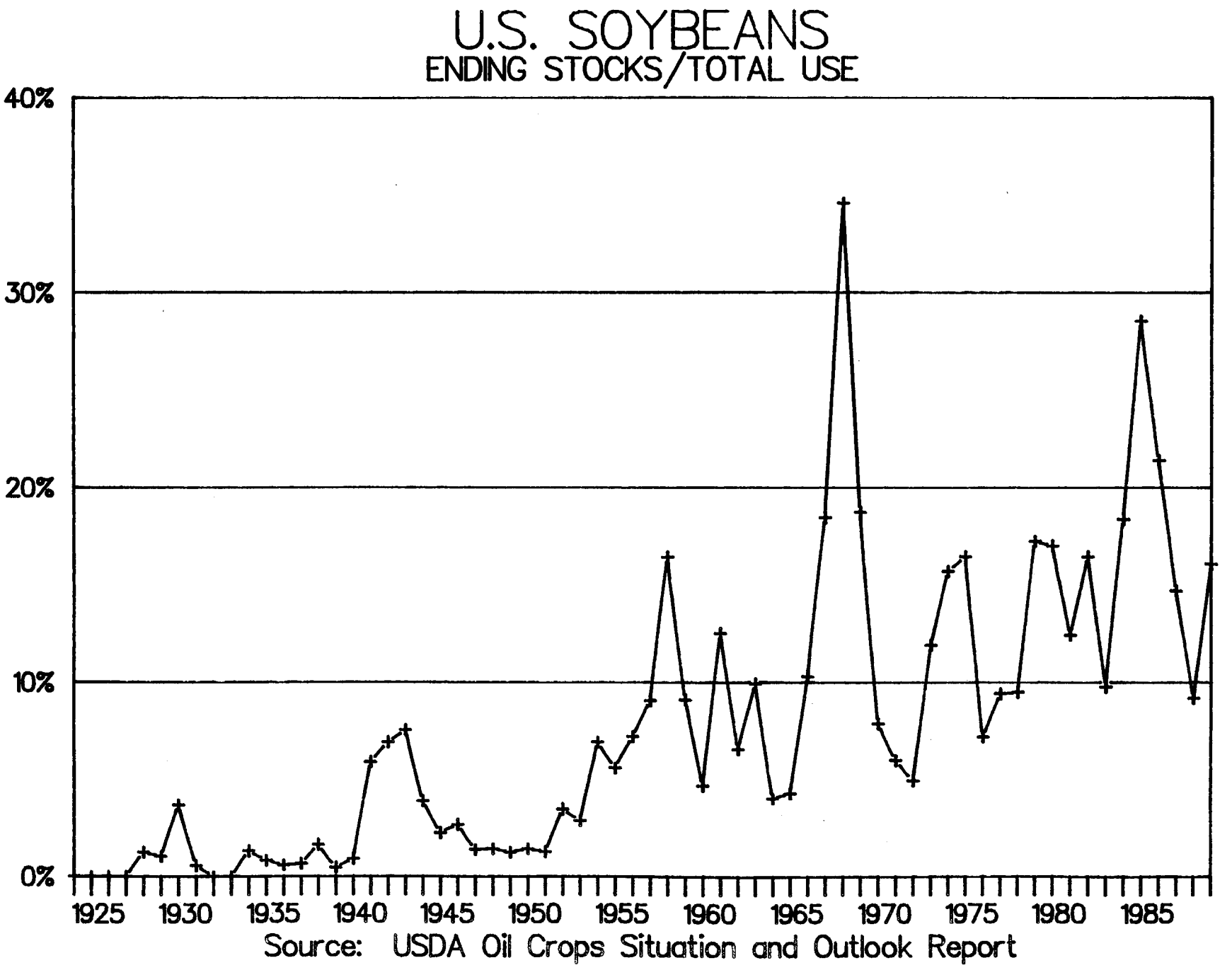


Source: USDA Wheat Situation and Outlook Report

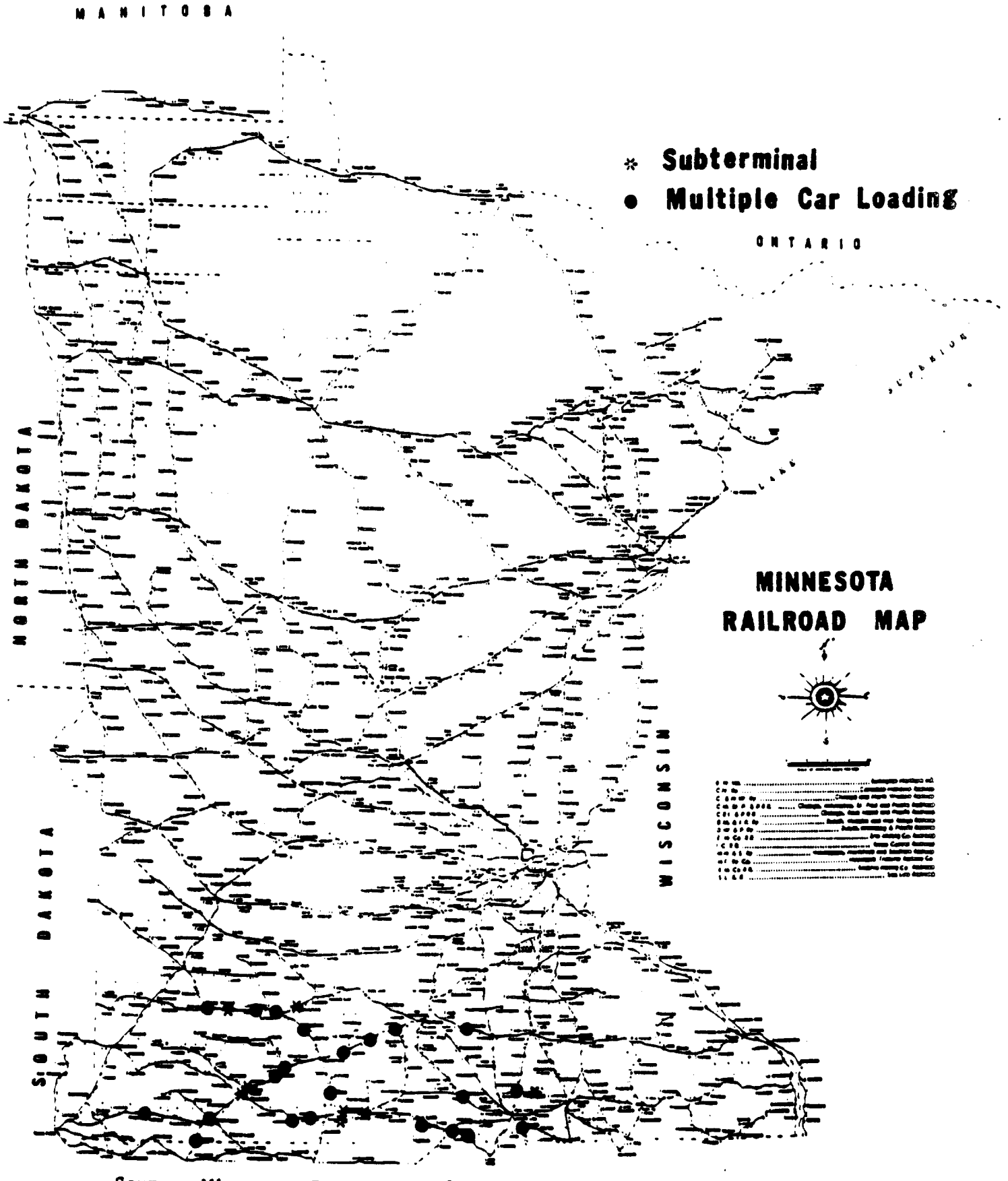
APPENDIX FIGURE 2.



APPENDIX FIGURE 3.

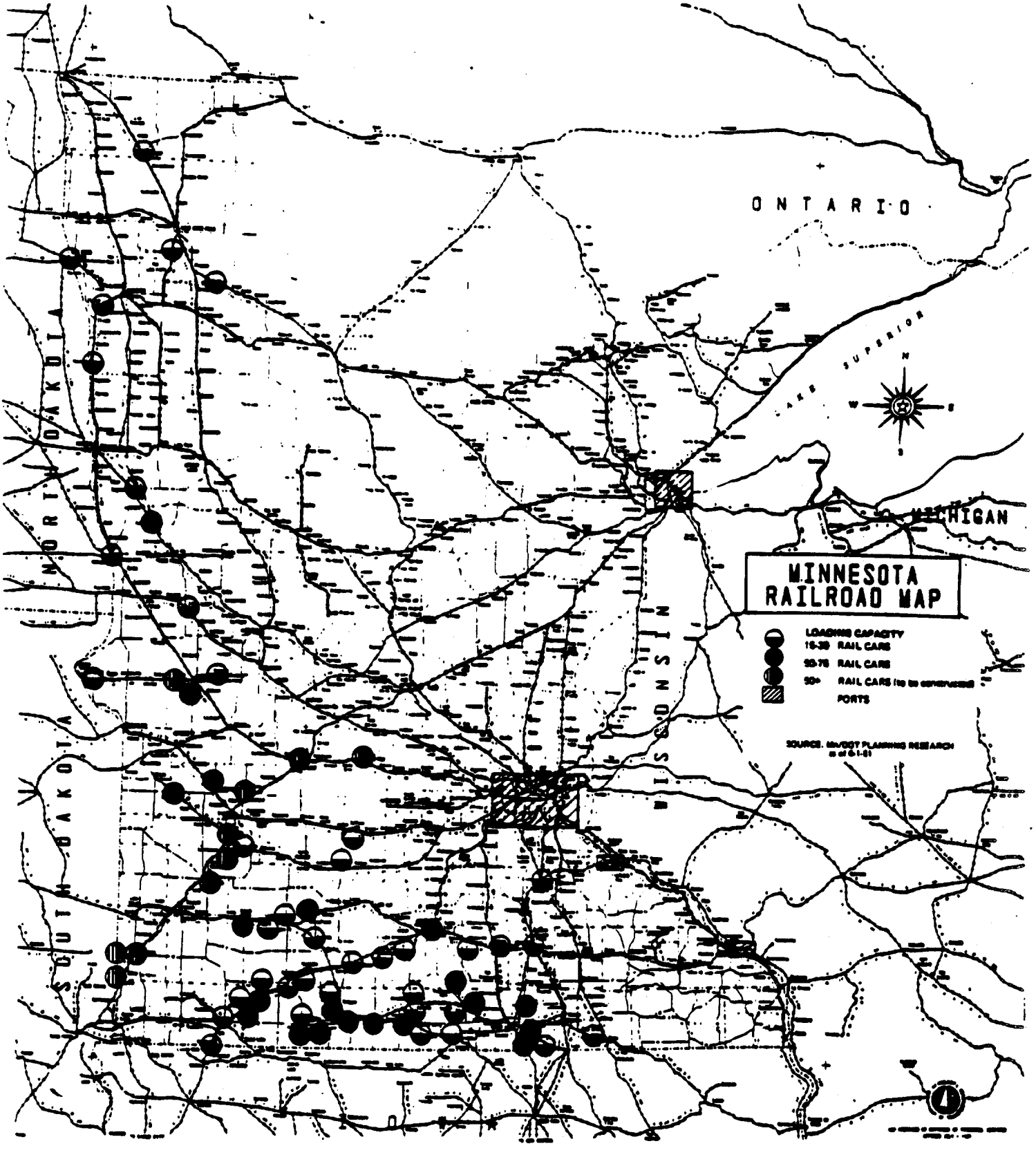


APPENDIX Figure 4. Minnesota County Elevators and Sub-Terminal Elevators with Multi-Car Loading Facilities, 1976.



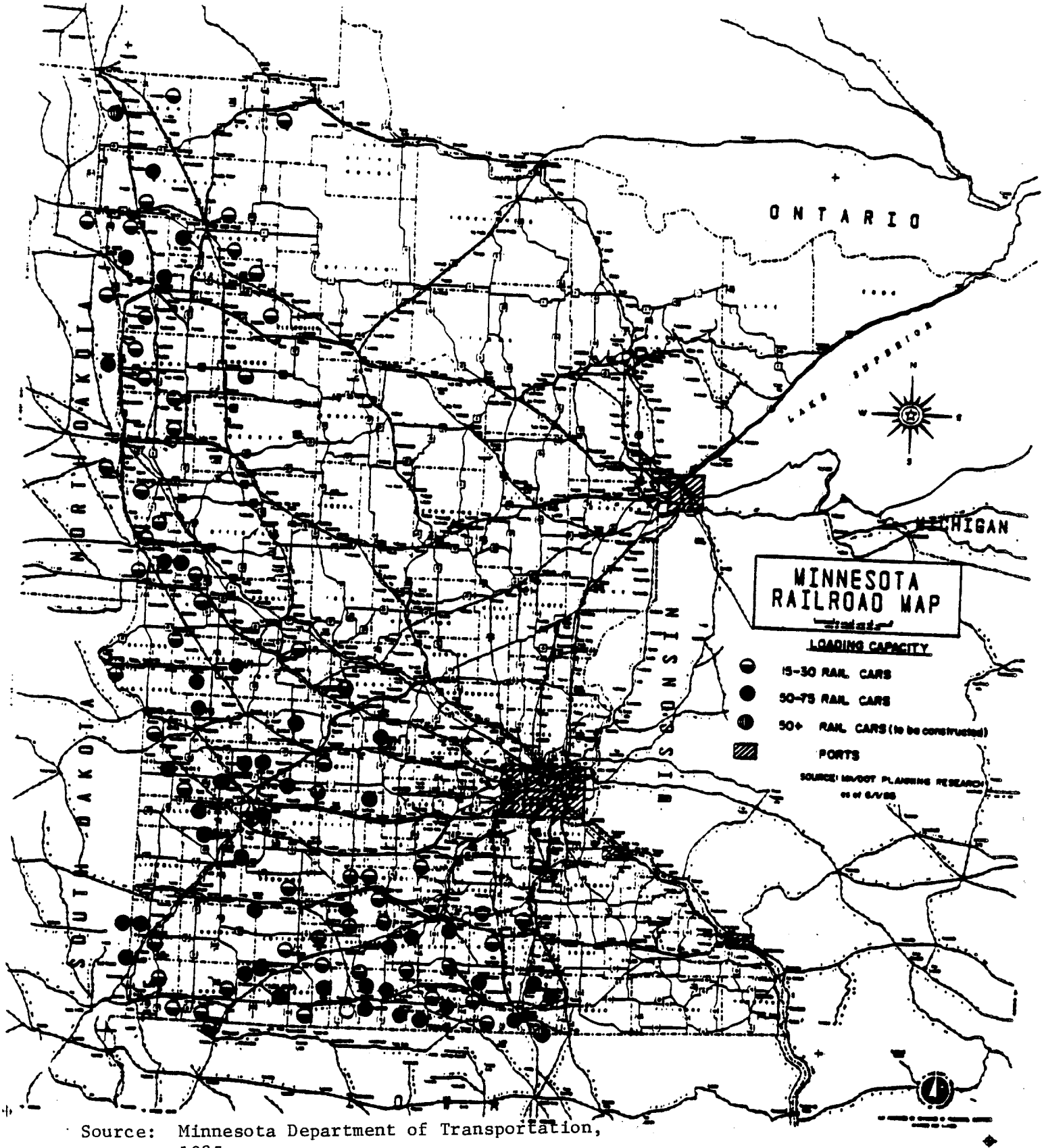
Source: Minnesota Department of Transportation, 1976.

APPENDIX Figure 5. Minnesota County Elevators and Sub-Terminal Elevators with Multi-Car Loading Facilities, 1981.



Source: Minnesota Department of Transportation, 1981.

APPENDIX Figure 6. Minnesota County Elevators and Sub-Terminal Elevators with Multi-Car Loading Facilities, 1985.



Source: Minnesota Department of Transportation, 1985.