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The Changed Face of the U.S. Farm Machinery Industry

by Dean E. McKee

The effects of adverse economic conditions in U.S. agriculture upon the structure of farming have been given wide publicity. At the same time but less widely noted, a quiet revolution has taken hold of the ancillary industries supporting agriculture as they struggle to adapt to the changed economic environment within which they must operate now and for the foreseeable future.

Gone are the boom conditions of the past decade when demand was so strong that rising labor and material costs could be readily passed on in the form of higher product prices. No longer is production capacity being constantly stretched to the limit to provide for what seemed an almost insatiable demand.

Many agribusiness managers—like many farmers—became swept up in the euphoria of the seventies and expanded too rapidly, took on too much debt, and did not exercise sufficient control over costs. Management errors, in agribusinesses as in farming, were easily masked by the inflationary boom conditions of the times. From the standpoint of both farmers and agribusiness managers, the agricultural market of the seventies was a seller's market.

As we entered the eighties, the economic tides reversed. Farmers, by their actions, effectively conveyed to agribusinesses their inability to absorb the rising prices of production



John Deere produces 24 tractor models. Nine models—from 14 h.p. to 62.2 h.p.—are manufactured in Japan under the joint venture Deere & Company formed with Yanmar.

pete in what had become an intensely price competitive market. These economic and market forces were in turn reflected through the production chain to the suppliers of raw materials and components. Many raw material and component suppliers who themselves had little direct contact with agriculture seemed a bit shocked and bewildered by the change of attitude and the resistance they now encountered from their long-standing customers.

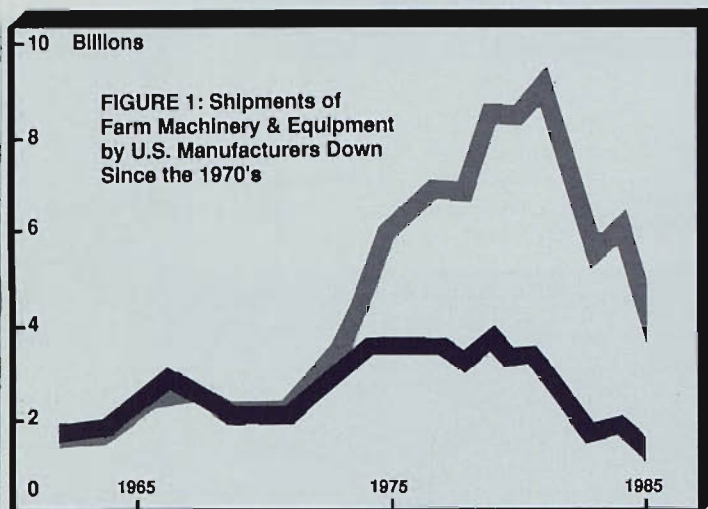
Some suppliers adapted while others chose instead to turn their attention to other markets where they encountered less resistance. Often agribusiness firms found themselves competing with other, less hard-hit sectors of the economy, limiting their ability to resist price increases of purchased materials. As far as the agricultural sector of the economy was concerned, the eighties had suddenly become a buyer's market.

The impact of the convergence of these economic forces has been particularly intense in the farm machinery industry. The purchase of capital goods like farm machinery can be readily deferred in periods of economic adversity. This is especially true when a downturn is preceded by an extended period of exceptionally heavy investment in new machinery, as was the case during the seventies. American agriculture, therefore, entered the present period of retrenchment with the stock of machinery on farms that was relatively new and that probably represented considerable excess capacity.

A Boom and Bust Market

Developments in the U.S. farm machinery industry mirror farm economic conditions.

Industry shipments of farm machinery, in constant 1967 dollars, grew at a compound annual rate of 4 percent during the period from 1960 to 1969 (figure 1). The rate of growth accelerated to 6.4 percent during the seventies, peaking in 1979 at

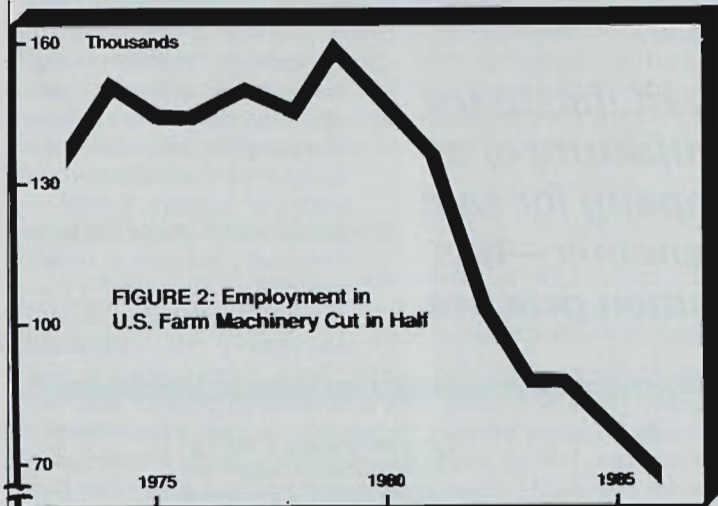


inputs and services. Neither did they require the products and services of agribusiness in the vast quantities they once had. When they did purchase, farmers, out of necessity, shopped carefully to find where they could get the best value for their dollar.

Many agribusinesses, having expanded too rapidly in the seventies, were now faced with chronic over capacity. Managements were forced to shift priorities and reduce costs to com-

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a level about twice that at the decade's beginning. Over the next seven years, industry shipments of farm machinery plummeted as manufacturers rapidly cut production in response to falling retail demand in an effort to avoid an accumulation of



unsold machines. By 1986, U.S. manufacturers shipments of farm machinery, in real terms, had dropped to their lowest level since 1960. Over the period from 1979 to 1986, industry shipments of farm machinery fell at a compound annual rate of over 14 percent, more than double the rate it had risen during the preceding decade.

As manufacturers cut production, employment dropped as well. Employment in the farm machinery industry peaked in 1979 at about 159,000 employees. By 1986, employment had been cut by more than half, to 66,000 employees.

Despite these massive changes, the industry was unable to adjust quickly enough to avoid a burdensome inventory buildup. Interest rates were rising to record high levels and the charges manufacturers incurred in financing exceptionally large inventories further weakened an industry already suffering the impact of sharply reduced sales.

The financial deterioration among the firms within the industry was compounded by tactics adopted to promote sales and reduce inventories. The market became intensely price competitive in a struggle to gain market share. There ensued wave after wave of sales promotion programs in a variety of forms which were, in effect, price reductions as manufacturers attempted to provide incentives to move aging inventories. The marketplace had now become a battleground for survival to the benefit of purchasers of new farm machinery.

With the mounting farm financial crisis of the early eighties, farmers had little interest in purchasing new machinery. In fact, manufacturers found their most intense competition in good quality used machinery now available at the rising number of farm auctions. The excess machinery capacity on farms was redistributed among surviving farmers needing to replace equipment as those facing severe financial problems withdrew from farming.

The Industry Regroups Nationally

The severe and prolonged agricultural contraction led to a restructuring of the farm machinery industry. The most visible characteristic of the restructuring has been the mergers and acquisitions. International Harvester, Allis-Chalmers, New Idea,

and New Holland—names long associated with agriculture—have passed from the scene. New names have emerged to replace them, among them are Case-International, Deutz-Allis, Ford New Holland, and Allied Farm Products.

International Harvester's long struggle to survive culminated in the sale of their farm equipment division's assets to Tenneco who then merged these assets with their J. I. Case subsidiary to form Case-International. In the process, International Harvester's Farmall Works was closed since only the tooling in that facility was included in the transaction. As a result, U.S. manufacturing capacity of farm wheel tractors was reduced by an estimated 30,000 units. International Harvester had already closed a cotton picker manufacturing facility in Memphis, transferring production to another of its other plants. And by combining the distribution systems of both companies, a number of overlapping dealerships scattered throughout the nation were also forced to close.

Tenneco later acquired the assets of Steiger Tractor, Inc., manufacturer of a well-accepted line of four-wheel drive tractors, thereby filling out the line of farm wheel tractors produced by the newly formed company. Case-International has just introduced a new line of tractors, a product of the combined engineering of J. I. Case and International Harvester.

Allis-Chalmers, another manufacturer with growing financial difficulties, also found it necessary to divest itself of its farm equipment division. Deutz, a leading German manufacturer of farm wheel tractors, saw in this divestiture an opportunity to gain a larger share of the U.S. market and thus the business entity of Deutz-Allis was formed (a subsidiary of Klockner-Humboldt-Deutz of Germany). Deutz had long sought a solid marketing strategy in the U.S. and this acquisition brought access to an established dealer system, a key benefit in addition to its newly acquired U.S. manufacturing facilities.

In a similar manner, Fiat, a leading Italian equipment and automobile manufacturer, enhanced its position in the North American market by acquiring a majority interest in Hesston Corporation. This merger combined the Fiat farm wheel tractor line with the Hesston hay tool and harvesting equipment line.

Deteriorating returns from the farm machinery market

The market became intensely price competitive in a struggle to gain market share.



Seven John Deere tractor models—from 45 h.p. to 95 h.p.—are manufactured in Manneheim, Germany in their wholly owned subsidiary.

Photos Courtesy Deere & Company

caused Sperry Corporation to rethink their operations and eventually divest themselves of their New Holland Division—freeing them to concentrate on alternatives which offered the potential for higher rates of return. Ford Tractor Operations took advantage of this opportunity by supplementing their line of farm wheel tractors with the hay tools and rotary combines that New Holland had produced. Ford later acquired the agricultural equipment manufacturing assets of Versatile Corporation, a Canadian manufacturer of four wheel drive tractors, pull type combines, and a limited line of tillage tools. The mergers enabled Ford to broaden its equipment line and extend its tractor line into the larger sizes where it had fallen behind the rest of the industry.

Meanwhile, Allied Products Corporation headquartered in Chicago, has acquired a number of short-line farm equipment manufacturers. In the process this company has begun to resemble a full-line farm equipment manufacturer. Their acquisitions include White Farm Equipment (a limited line of farm wheel tractors), New Idea (Uni-System harvesters), Bush Hog (rotary cutters), Lilliston (planting and seeding equipment) and Kewanee (tillage tools). At present, the organization appears to be operating more or less as a loose federation of individual companies rather than as a unified corporate entity. In contrast to most full-line equipment manufacturers, Allied Products lacks a clearly identified dealer system of its own.

Massey-Ferguson, reorganized under the name of Varsity Corporation, has chosen a somewhat different course of action. Unlike many companies within the industry, Massey-Ferguson's financial difficulties surfaced in the mid-seventies, *prior* to the present agricultural recession. A detailed rendering of how it found itself in this predicament is beyond the scope of this article, but suffice it to say that Massey-Ferguson found it necessary to drastically scale back their manufacturing operations both in North America and abroad to avoid bankruptcy. They have chosen a strategy that emphasizes their marketing

capabilities, aggressively seeking outside manufacturers to produce equipment to their specification to be sold under their own label to fill out the line of products they offer through their dealers. Massey-Ferguson (Varsity) has stated that they aim to become the "Sears and Roebuck" of the farm machinery industry.

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Resort to "outside manufacturers"—that is, the manufacture of a product by one company for sale under the label of another—has become a more common practice throughout the farm machinery industry in recent years. The squeeze on corporate profits has made it necessary to eliminate

unprofitable products and product lines. Sometimes a manufacturer (usually smaller, with a specialized product line) will possess a unique product technology or cost advantage but suffers from limited marketing capability. Such a situation is ripe for a mutually advantageous arrangement where one firm becomes an "outside manufacturer" for the other. Specialized tillage tools or harvesting equipment that serve a limited or more regional market lend themselves well to this type of arrangement. Short-line manufacturers with special expertise in a particular product area are in good positions to benefit from arrangements of this type.

Finally, Caterpillar, after a long absence from the farm machinery market, has returned with an innovative crawler tractor using rubber treads specifically designed for the farm market. This vehicle is positioned to compete in the four wheel drive size segment of the farm tractor market. Unfortunately for Caterpillar, this segment of the market shrunk dramatically in volume after they had become heavily committed to the introduction of their product.

The main economic forces driving Caterpillar's move come from outside rather than within agriculture. The recession of the early 1980s led to a worldwide contraction in construction equipment markets. In addition, the exceptionally strong dollar put Caterpillar's products at a distinct price disadvantage in

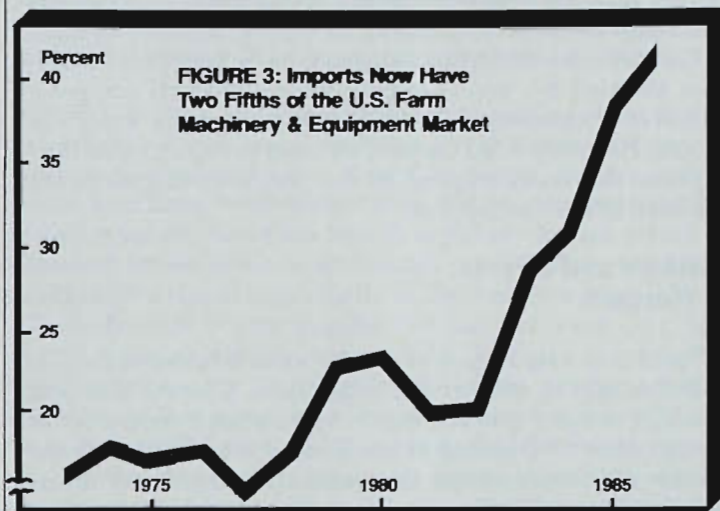


Eight John Deere tractor models—from 105.7 h.p. to 303.99 h.p.—are manufactured in the John Deere facilities in Waterloo, Iowa. Three of these eight are of the four-wheel drive configuration.

export markets, markets which comprise the bulk of Caterpillar's total sales volume. As a result, the volume of construction equipment sales dropped dramatically. Caterpillar came under strong pressure to seek alternative markets that provided opportunities to more fully utilize their excess manufacturing and engineering capacity. The high horsepower (above 150 h.p.) farm tractor market was one such opportunity, a market where they once enjoyed a significant share with their steel-treaded crawler tractors. The steel-treaded crawler tractor was displaced in the market by the introduction of the rubber tired four-wheel drive tractor.

International Specialization

The second most visible characteristic of the restructuring has been the redistribution of production regionally throughout the world. The manufacture of larger scale agricultural equip-



ment gravitated to North America, medium-sized equipment to Europe, and smaller equipment to Asia, principally Japan. The world market for these products tend to be supplied from these three geographic manufacturing centers.

As a result, imports have been gaining prominence in the U.S. farm equipment market. This is in part a consequence of the internationalization of the farm machinery industry begun in the late fifties and early sixties. As the dominant firms became increasingly multinational in character, farm machinery manufacture worldwide was tailored to meet differences in the farm size structure to take advantage of economies of scale and location.

This international specialization is most pronounced in the farm wheel tractor industry which make up the bulk of world trade in farm machinery. As far as the U.S. market is concerned, farm tractors 100 horsepower and over are almost entirely sourced from North America. U.S. imports predominantly originate from Canada. Farm wheel tractors between 50 and 100 horsepower are predominantly sourced from Europe, supplied either by a European manufacturer or the European subsidiary of a U.S. manufacturer. Small tractors under 50 horsepower are nearly all sourced from Japan.

In the last few years, practically every U.S. farm tractor manufacturer has formed a joint venture with a Japanese manufacturer to supply the small tractors under its own label. At the same time Japanese manufacturers are increasingly seeking to develop their own marketing organizations to serve the U.S. market.

During the 1970's, the import share of the U.S. farm machinery market, on a dollar volume basis, varied between 15 and 23 percent. In the 1980's, the import share of the U.S.

market has risen rapidly to 46 percent by 1986.

The statistics on import market share must be interpreted with caution. The rise in the imports share of market near the close of the seventies was certainly influenced by the exceptionally strong dollar that gave imported products a price advantage over domestic products. There was clear economic incentive to shift production from the U.S. to Europe and Japan. Also, farm machinery and equipment enters the U.S. market free of duties so there are few barriers to this kind of regional reallocation of manufacturing.

However, during the past three years the dollar's value in foreign exchange markets has fallen sharply, reducing the price advantage of imports yet the import share of the U.S. market has continued to rise. The reason is, the agricultural recession has severely impacted sales of the larger farm equipment primarily produced in the United States and Canada while the market for smaller-sized equipment (primarily produced outside the United States), was less affected.

These implications are particularly true for the small farm wheel tractors which find a significant market outside of traditional commercial agriculture but are still included in farm machinery statistics. Sales of the small farm wheel tractors have benefitted from the strong economic expansion that has been taking place elsewhere in the economy. As a result the import share of market is unsustainably high at the present time. As agriculture recovers and the machinery market returns to more normal conditions, the import market share can be expected to decline.

From yet another standpoint, equipment import figures do not fully reflect the extent of import activity. With the squeeze on profitability and the pressure to reduce costs, there has been a growing movement toward worldwide (sourcing) of materials and components by domestic manufacturers. Available data do not lend themselves to estimating the amount of imported parts and materials in domestically assembled products, but there is sufficient anecdotal evidence to indicate that it has become substantial.

The Future

While the restructuring of an industry is an ongoing and never-ending economic process, the more dramatic changes in the farm machinery industry resulting from the eighties agricultural recession are likely nearing conclusion. The industry can be expected to emerge from this process leaner, more efficient, and cost effective—to the purchaser's benefit. The future economic environment dictates that those firms who fail to

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improve their operations with a clear grasp of customers' requirements will simply fall by the wayside as indeed some already have.

The U.S. market for farm machinery remains open and highly competitive. The U.S. market is a large and lucrative market in which foreign manufacturers have a strong desire to participate. For this reason they will be quick to exploit any market opportunities that arise just as the Japanese tractor manufacturers did when U.S. manufacturers began vacating the small tractor market. Come what may, the farm equipment purchaser in the United States is assured of a continued and ample choice of products at competitive prices. □