The Evolution of Fertilizer Trading in the Meiji and Taishō Eras

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As agricultural production expanded from the middle of the Edo period, the commercial fertilizer, fish meal, came to be traded extensively, mainly in the large cities of Edo and Osaka. Sardine and herring fertilizers produced in the Kantō and Tōhoku regions and in Hokkaidō were important products in support of agricultural development in Japan. This was especially true of Hokkaidō marine-product fertilizer, which was shipped in large quantities to Osaka and Tokyo after the Meiji Restoration in 1868; it was the typical fertilizer, used throughout the whole country.¹ In this paper I shall try to show, while tracing the trends in Hokkaidō fertilizer trading, how the Japanese fertilizer market developed further through the trading of soybean meal and chemical fertilizers, both of which were increasingly produced in the Meiji period.

Some research has already been done on fertilizer trading in the Meiji period. There are Toshiyuki Toya’s classic study and Satoru Nakanishi’s discussion of the structure of the Hokkaidō fish fertil-

¹ The classic work of research on Hokkaidō herring fertilizer trading is Satoru Nakanishi’s Kinsei-kindai no shijō közō: Matsumae nishin hiryō torihiki no kenkyū [The market structure in the early modern and modern eras in Japan: The study of business connection with “Matsumae herring” fertilizer] (Tokyo: University of Tokyo Press, 1998).
izer market; also, the works of Hatsu Murakami, Makoto Sakaguchi, Daisuke Ichikawa, Tomoharu Sakai, Yoshihiro Tsuji, and others on market transactions in sardine and herring fertilizers, vegetable oil meal, and calcium superphosphate. All of them represent fresh, empirical studies of the process by which fertilizer trading developed in the Meiji period. Despite all this work, more research is needed on the role that fertilizers played in the industrialization of Japan.

In this paper I start out with the development of the Osaka fertilizer market in the latter half of the nineteenth century. From there I focus attention on changes that occurred in the way Osaka fertilizer merchants dealt in fertilizer from the beginning of the twentieth century, when soybean meal appeared on the market and the production of chemical fertilizers increased. In this way I hope to shed light on the process by which fertilizer trading developed in the Meiji and Taishō periods.

Past research has tended to embrace the idea that fish fertilizer trading atrophied rapidly after sales of the more expensive fish fertilizers suffered a severe blow by the importation of the cheaper soy-


3 The spadework for this paper was carried out in 1995 and 1996 and first published in 1997 as “Kindai Nihon no hiryo shijō to Hiroumi-ke no gyoji shiire katsudō” [The fertilizer market in modern Japan and the fish fertilizer purchasing activities of the Hiroumi family], in *Shōnin no katsudō karu mita senkoku shijō to ikinai shijō* [The nationwide market and intraregional market as seen from the activities of merchants], ed. Kanji Ishii (1997). My research covered the Tanaka fertilizer merchant family in Osaka and the Hiroumi fertilizer merchant family in Kaizuka.
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FIGURE 1. Principal Fertilizer Production/Import Totals in the 1900s (Unit: 1,000 yen)


bean meal. Yet, in fact, from the beginning of the twentieth century Hokkaidō fish fertilizers retained their position as important fertilizers, especially in western Japan, and they were used to good advantage by farmers who combined them with rapeseed meal, soybean meal, and other vegetable fertilizers, or with chemical fertilizers. This is borne out by Figure 1, which shows the amounts of production (or imports) of the principal fertilizers used in the years 1903–1907. It shows how, once the Sino-Japanese War (1894–1895) was over and soybean meal began to flow into the country in large volumes, Hokkaidō fish fertilizer production remained steady while the production/import of rapeseed meal, calcium superphosphate, and mixed fertilizers shot up. Hokkaidō fish fertilizer continued to be one of the major fertilizers in use despite the large variety of vegetable and animal fertilizers being used.
In the first section of this study I shall give background information on the transactions in Hokkaidō fish fertilizers carried out by Osaka fertilizer merchants in the Meiji period. In the second section I shall discuss the development of Mitsui & Co.’s soybean meal trading in the Meiji-Taishō period, and the consequent reorganization of the fish fertilizer market. Finally, in the third section I plan to discuss the growth of Taki Fertilizer Mfg. Co., Ltd. and other chemical fertilizer manufacturers, and the changes made to fertilizer transactions by the Osaka merchants as a result of investment in chemical fertilizers. After we analyze the business activities of fertilizer merchants in large cities like Osaka, Tokyo, and Nagoya (and those of similar merchants in regional Japan), as well as the relationship between the two groups, and after we trace the trading of fish fertilizers, soybean meal, and chemical fertilizers from the perspective of the business strategies of the fertilizer merchants, it should be possible for us to obtain an understanding of how the fertilizer market developed in the Meiji and Taishō periods.

THE FOUNDATION OF THE HOKKAIDO FISH FERTILIZER MARKET AND THE ROLE OF OSAKA FERTILIZER MERCHANTS

The development of the Osaka fertilizer market in the 19th century

From the eighteenth century, more and more farmers—especially those living in the farming communities of the Kinki region—started to use dried sardines as fertilizer, and this spurred a trend among farmers to increase the amount of farm products they produced by means of greater use of fish fertilizers. In trading centers like Edo and Osaka, fish fertilizers started being handled in large quantities, and the market for fertilizers developed substantially. In Osaka, dried sardines from the Kantō area came to be traded through Edo merchants and other merchants; among those involved in the trading were commission merchants (ton‘ya shōnin) and brokers (nakagai shōnin). The Ōmi merchants were particularly keen on dealing in fish fertilizers, and they brought Hokkaidō

sardine and herring fertilizers to Osaka. The result was that, in the
nineteenth century, Osaka merchants were dealing in Hokkaidō
fish fertilizers as well as the dried sardines from the Kantō area.5

In 1857 the shogunate government set up shopfronts in Edo,
Osaka, Hyōgo, and similar places to showcase Hakodate products
and sell Hokkaidō fish fertilizers; in Osaka, it sold fish fertilizers to
merchants who were called the Matsumae wholesalers because they
dealt exclusively with Hokkaidō products. The Matsumae wholesal-
ers sold the Hokkaidō fish fertilizers purchased from the govern-
tment to Osaka brokers in large quantities. Thus it was that Hokkaidō
fish fertilizers were promoted by the distribution policies of the
shogunate government into being important products ranking
alongside the dried sardines of the Kantō area.

Even after the Meiji Restoration, Hokkaidō fish fertilizers kept
flowing into Osaka in large quantities through the Hokkaidō devel-
opment shopfronts maintained by the new government. Under the
distribution regulation policies of the Commerce Office, the Mat-
sumae wholesalers in Osaka set up a trading company that dealt in
Hokkaidō products; they then sold Hokkaidō fish fertilizers by ten-
ders. Before long, in 1872 they joined forces with the Osaka fertil-
izer brokers to establish the First Hokkaidō Products Trading Com-
pany.

In 1878 the top Osaka wholesalers dealing in Hokkaidō fertilizers
formed the first association of receiver wholesalers. This associa-
tion, which later changed its name to “The Association of Hokkaidō
Products Receiver Wholesalers,” devised a number of different mea-
sures aimed at maintaining a stable supply of Hokkaidō fish fertiliz-
ers. The measures the association came up with included such
things as an agreement on the assessment of grades for the purpose

5 The use of Kantō dried sardines and Hokkaidō fish fertilizers, which had been
used principally in the farming communities of the Ōmi region from the eighteenth
century, spread to farming communities in the Kinki region through the activities of
Osaka fertilizer merchants in the mid-nineteenth century, around the time of the Meiji
Restoration. See Masamichi Mizuhara, “Meiji zenki ryūtsū kikō saibin katei ni okeru
ichirei” [One instance in the process of reorganizing early Meiji distribution mecha-
nisms], Shiga Daigaku Keizai Gakubu Shiryōkan kenkyū kiyō [Research bulletin of the His-
torical Materials Archives, Faculty of Economics, Shiga University,] 15 (1982). The arti-
cle “Marine Transport Management in Early-Modern Japan,” by Masahiro Uemura,
can provide abundant background material on the commercial activities of Osaka mer-
of tariff imposition, the building of a new dock on the Kizu River, and a revision of docking charges. It also improved methods of packing the fertilizers and enacted rules regulating fertilizer storage facilities, in this way ensuring better quality control of the fish fertilizers. It is reasonable to assume that the formation of The Association of Hokkaido Products Receiver Wholesalers played a crucial role in coordinating the expansion of the market for Hokkaido fish fertilizers in Osaka.

Meanwhile, the Osaka fertilizer brokers had formed a Fertilizer Merchants Guild in 1873. At that time the kitamaebune merchants, owners of cargo vessels that were plying back and forth between Hokkaido and the Kansai region, were making profits on buying goods and then reselling them wherever the vessels landed. The Osaka fertilizer brokers, who had been buying large quantities of Hokkaido fish fertilizers that the receiver wholesalers had bought from kitamaebune merchants, went into selling on consignment dried sardines from the Kantō region.

In this way they put into effect a dual-capacity form of trading: acting as brokers for Hokkaido products and acting as wholesalers for Kantō products. These fertilizer brokers also went in for speculative buying and selling on a large scale, selling at high prices fish fertilizer that they had obtained at lower prices. Later the Fertilizer Merchants Guild was renamed the Fertilizer Merchants Association; together with The Association of Hokkaido Products Receiver Wholesalers, it played a leading role in Osaka’s fertilizer market. In addition, in 1894 the Fertilizer Merchants Association made plans to establish the Osaka Fertilizer Exchange; it recommended as the chairman of the board of directors of that exchange Ichibē Tanaka.

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6 "Hokkai-san Niukedon’ya Kumiai enkaku shi" [A history of the development of The Association of Hokkaido Products Receiver Wholesalers], in Osaka shōgyō shiryō shūsei [A compilation of historical materials on Osaka commerce], ed. Heijirō Kuroha, vol. 6. (Osaka: Osaka Shōka University Economic Research Institute, 1940). For more on the various wholesalers who received Hokkaidō products, see Mataji Miyamoto, “Ōsaka ni okeru Hokkai-san niukedon’ya” [The Hokkaido products receiver wholesalers in Osaka], part 1, Keizaishi kenkyū 38 (1932) and “Hakodate Sanbutsu Kaisho” [The Hakodate Products Shopfront], Keizaishi kenkyū 28: 1 (1942).

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(a leading Osaka fertilizer merchant who had made a fortune through speculative trading). In this way it attempted to add vitality to the Osaka fertilizer market.

Now, to see how the Osaka fertilizer merchants succeeded in instilling life into fertilizer trading, let us approach the matter from the innovative business operations of the Ichibē Tanaka family in the latter half of the nineteenth century. We can find, recorded in detail in such family documents as the "Hoshika uri nikki" [Diary of dried sardine selling], an account of how the Tanaka family, operating for generations under the name "Ōmiya," had followed the successful method of Ōmi merchants by selling a large variety of goods over a wide area. We can see how, from the nineteenth century, the family had dealt in Kantō dried sardines and Hokkaidō fish fertilizers, pursuing an honest business by taking the fertilizers out into farming communities (especially those in the Kinki region). In addition, through trades with brokers, the family acquired a considerable variety of fertilizers, so that at all times it had in stock numerous kinds of fertilizers for sale to farming communities.

At the beginning of the Meiji period the Tanaka family began reselling to another Osaka fertilizer merchant, under advantageous conditions, both Hokkaidō herring fertilizer that they purchased in large quantities from a Hokkaidō products receiver wholesaler and other fish fertilizer that they bought from fertilizer brokers. Because the Tanaka family bought fertilizer that they expected would rise in value, their activities served as an inducement for attracting good-quality fish fertilizer to the Osaka market. According to the "Kantō chō" [Ledger of trade with Kantō merchants] produced by the Tanaka family, the family took on a sort of wholesaler's role in early Meiji times, selling Kantō dried sardines that had been consigned to them by Kantō dried sardine wholesalers. These activities can be confirmed from the family's "Kaitsuke uritsuke shikirichō" [Account ledger of purchases and sales]. Even when the supply of Hokkaidō fish fertilizers was on the increase, the family was still dealing in Kantō dried sardines in a big way.

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8 All the documents relating to the Tanaka family that are cited below are contained in Tanaka Ichibē monjo [Ichibē Tanaka documents], in the possession of the Osaka University Institute of Economic History and Business History.

9 Enlisting the aid of Osaka fertilizer merchants, who had made profits through the
The development of fish fertilizer trade in areas surrounding Osaka

As the Hokkaido fertilizer market advanced in Osaka and demand for fish fertilizers expanded to other places in the Kinki region, fertilizer merchants appeared who carried out an aggressive trade in fertilizers in the regions around Osaka. Let us examine fertilizer transactions in the areas surrounding Osaka, using as a case study the business operations of the Sōtarō Hiroumi family from Kaizuka, who had embarked on a *kitamaebune* business while selling Hokkaido fish fertilizer to farming communities in the Izumi area.

The Hiroumi family had started out in the first half of the nineteenth century dealing in rice and fertilizers in Kaizuka. Directly from the *kitamaebune* merchants who sailed to Kaizuka they bought Hokkaido herring and sardine fertilizers, gradually expanding the amount of these transactions. The *kitamaebune* merchants, aiming to increase profits by selling their goods in places other than Osaka, had begun bringing their rice and fertilizers to Kaizuka with greater frequency. What prompted this was a rapid growth in demand for these two items as a result of greater buying power in the farming communities in Izumi, where cotton fabric production had developed as a secondary industry. Sizing up the situation, the Hiroumi family decided to go into *kitamaebune* operations. It linked up with *kitamaebune* merchants in the Tōhoku and Hokuriku regions of Honshū (see Figure 2, which shows the trading routes for Hokkaido fish fertilizers in early Meiji era), and at the same time it expanded its activities as a wholesaler of Hokkaido fish fertilizers.

In the "Shikiricho" [Account ledger] of the Hiroumi family, a record of its wholesale operations, we find a clear list of the types and quantities of herring meals and sardine meals consigned to the Hiroumi family for sale by *kitamaebune* merchants. As well, we can see the amounts of money involved in the transactions.10 From the

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10 There remain in the Hiroumi family's possession a number of documents record-
Figure 2: Principal Transaction Routes for Commercial Fertilizers in the 1890s.
1870s the amount of fertilizer transactions suddenly increases, so much so that fertilizer trading becomes the family’s principal business. Now, the family had been receiving sales commissions from *kitamaebune* merchants for brokering deals between Kaizuka fertilizer merchants and other customers and the *kitamaebune* merchants. But gradually the Hiroumi family itself started to buy up the larger part of the Hokkaidō fish fertilizer consigned to it for sale by the *kitamaebune* merchants, and to sell it to Kaizuka fertilizer merchants and to towns and farming communities in the Kaizuka area. This is clear from the records found in the “Yorozukaichō” [Ledger of All Purchases]. In addition, from the mid-nineteenth century the Hiroumi family purchased Hokkaidō fish fertilizers and Kantō dried sardines from fertilizer merchants in Osaka and Hyōgo and sold them in turn to Kaizuka fertilizer merchants and neighboring farming communities at a neat profit. By combining the wholesaler operations of receiving fish fertilizer from *kitamaebune* merchants for sale on consignment and the broker operations of reselling fish fertilizer that they themselves had purchased from Osaka and Hyōgo fertilizer merchants as well as fish fertilizer that they had bought and shipped on their own ships, they turned the family business into a very thriving operation centered upon Hokkaidō fish fertilizers.

During the last decade of the nineteenth century, the Hiroumi family formed especially close business ties with two *kitamaebune* merchants who had established bases in Hokkaidō and were buying up Hokkaidō fish fertilizers: the Kumata family and the Ōie family. This newer type of *kitamaebune* merchants had close relations with the fishermen living where the fish were taken, and they were able to buy fish fertilizer directly from them. This enabled the Hiroumi family to gather information from the merchants on fish catches and to make sure the family would acquire good-quality fertilizer. In addition, the family managed to purchase new types of fertilizer such as dried sardines from Korea, and to secure for itself a stable
supply of all kinds of fish fertilizer. Later it became interested in artificial fertilizers and soybean meal, thus retaining its position as the leading fertilizer wholesaler in the Kaizuka region.

EXPANSION OF THE SOYBEAN MEAL MARKET AND RESTRUCTURING OF THE FISH FERTILIZER MARKET

The establishment of Manchurian oil refineries and soybean meal transactions

We shall next examine the influx of large quantities of soybean meal into Japan from northeastern parts of China from the 1900s. At that time soybean meal was produced in China as the by-product of the production of soybean oil in an oil refinery, and it was being used for consumption in farming families. A Chinese merchant based in Yokohama had some sent to Japan when the production of soybean meal took off, and this prompted Mitsui & Co. to set up agencies in Yingkou (Newchwang), whence they shipped the meal to Japan and began selling it in large quantities throughout the country.\(^\text{11}\)

A report out in 1899 tells us that fertilizer prices skyrocketed in Japan, leading Hyōgo fertilizer merchants and Mitsui & Co. to import large quantities of fish fertilizer from Korea and soybean meal from China, for sale in Japan.\(^\text{12}\) In 1896 the imports of soybean meal climbed to approximately 3,220,000 yen; in 1898 approximately 2,990,000 yen worth of soybean meal was landed at Kōbe, about 1,090,000 yen worth at Nagasaki, and about 430,000 yen worth at Yokohama.\(^\text{13}\) Fertilizer transactions were booming. As we

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\(^{11}\) Yoshitsugu Sato, Sangyō shiryō 21—daizu no kakō [Industrial data 21: The processing of soybeans] (South Manchuria Railway Company, 1924), describes the making of soybean meal.


\(^{13}\) Kenzaburō Sonoda, "Nagoya chihō shingaku ryokō hōkokusho" [A report on school excursions in the Nagoya region] (Higher Commercial School, 1899), pp. 50 and 59. The soybean meal that arrived in Kōbe was sold by Chinese merchants to Nagoya fertilizer merchants as fertilizer for barley crops. Because demand for soybean meal spread in the Bisei region, Mitsui & Co.'s Nagoya branch consigned the sales of soybean meal purchased in Yingkou to brokers, who sold it in large quantities to Nagoya fertilizer merchants.
FIGURE 3. Principal Transaction Routes for Commercial Fertilizers in the 1900s

- **Soybeans** → Manchurian oil refineries → Chinese merchants → Japanese trading companies (Mitsui & Co.) → Overseas fertilizer companies
- **Rapeseed** → Rapeseed oil manufacturers → Tokyo, Nagoya, Osaka Hyōgo fertilizer merchants → Local fertilizer merchants → Farmers
- **Sardines and Herring** → Production center fishermen → Production center merchants (Hakodate, Otaru) → Cargo vessel (kitamaebune) merchants → Tokyo, Nagoya, Osaka Hyōgo fertilizer merchants
- **Phosphate rock** → Chemical fertilizer companies

- **Flow of fish fertilizers**
- **Flow of rapeseed meal**
- **Flow of chemical fertilizers**
- **Flow of soybean meal**
see in Figure 3, which shows the trade routes for fertilizer in the 1900s, the fertilizer merchants that had previously handled Hokkaidō fish fertilizer were now also dealing in soybean meal.

Back in northeastern China, where the amount of soybean meal being produced increased rapidly, a merchant from Kōbe named Sōkichi Kodera set up a hydraulic pressure oil refinery in Yingkou, and from 1886 many oil refineries were built there, starting with \textit{screw-type} oil refineries. Even in Dairen (present-day Dalian), where soybeans were transported via the South Manchuria Railway, the Santai Oil Refinery financed by Mitsui & Co. and the Nisshin Oil Refinery financed by Ōkura & Co. were among those constructing large-scale mechanical oil refineries.\textsuperscript{14} Chinese merchants and Japanese trading companies started bringing large quantities of soybeans from inner northeast China to such distribution centers as Dairen and Harbin, and the principal location of soybean oil refineries shifted from Yingkou to Dairen and Harbin. With this shift, the production of soybean meal increased even more rapidly than before.

In the early years of Meiji Mitsui & Co. took on the role of a fertilizer wholesaler dealing in good-quality Hokkaidō fish fertilizer that its Hakodate and Otaru branch offices enthusiastically bought up for sale in such distribution centers in Japan as Tokyo, Osaka, Hyōgo, and Nagoya. In the 1890s it established the Yingkou branch office and began importing soybeans on a large scale; in 1901, acting on a decision by the assistant head of the Kōbe branch office, Yūnosuke Yasukawa, the company succeeded in bringing in soybean meal at a cheap price by tieing up with a Chinese merchant.\textsuperscript{15} In 1904 the company, already solidly established in its soybean meal dealings, set up a Fertilizer and Miscellaneous Cereals Division (which it later renamed the Rice and Fertilizer Division) and reopened its Newchwang branch office.\textsuperscript{16} Because large amounts of


\textsuperscript{16} Mitsui & Co., \textquotedblleft Meiji sanjū-nana-nendo jigyō hōkoku\textquotedblright{} [Report on operations in fiscal 1904], p. 22; Mitsui & Co., \textit{Kohon Mitsui Bussan Kabushiki Kaisha hyakunen shi}
goods could now be transported by the South Manchuria Railway, and the amount of transactions in Dairen, where most of the soybeans were assembled, increased enormously, Mitsui & Co. set up the Santai Oil Refinery (6,000 of whose ten thousand 50-yen shares Mitsui and Co. owned, with the Chinese merchant owning 4,000). By doing this Mitsui attempted to bring stability into soybean meal transactions.17

In one consultative meeting of Mitsui’s Rice and Fertilizer Division held in 1907, as we can read in its minutes, it was argued that “unless we buy the products directly in the place where they are produced, transport them to Dairen ourselves, and then move them to the mainland of Japan, it will be impossible to maintain a position of superiority over rival companies.”18 By purchasing soybean meal directly from the hinterlands of northeastern China, where it was produced, the company was able to import soybean meal more cheaply than other fertiliser merchants.

In 1909 Mitsui & Co. changed its legal structure from that of an unlimited partnership to that of a joint-stock company, and it established an agency in Dairen. Then it pushed more actively into soybean meal transactions through agencies in Dairen, Newchwang, and Harbin and even pushed for the establishment of a Dairen exchange with a view to speeding up its soybean transactions.19 To facilitate sales of the product in Japan, the company sold soybean meal in large quantities to merchants like Mansan Shōten in Chita, Aichi Prefecture, through the company’s Nagoya branch office. In this way it expanded its outlets for the fertilizer product by relying on the sales capacities of leading fertilizer merchants.20 Beginning with places like Aichi Prefecture and Hyōgo Prefecture and fanning out to regions that had a demand for large amounts of soybean meal because it was cheaper than fish fertilizer, fertilizer merchants who had close contacts with farming families in those regions

17 Mitsui & Co., “Beikoku hiryō uchiawasekai gijiroku” [Minutes of the Rice and Fertilizer Division’s consultative meetings], 1907, p. 141.
18 Ibid., p. 4.
19 The Life of Yūnosuke Yasukawa, Top Managing Director of Mitsui & Co., pp. 80–82.
20 “Minutes of the Rice and Fertilizer Division’s Consultative Meetings,” p. 154.
pushed ahead with sales of soybean meal by combining its sale with the sale of other types of fertilizers.

Reorganization of the trading structure in fish-fertilizer production centers

In the 1900s, then, when soybean meal was flowing into the country in large quantities, how did the fertilizer merchants deal with Hokkaidō fish fertilizers? In Hyōgo in the 1890s the kitamaebune merchants started to use steamships, and this allowed them to make more frequent trips. This in turn led to a rapid development of the fertilizer market. In the year 1896 the value of fish fertilizer transactions between Otaru (the principal port for shipments of Hokkaidō fish fertilizer to other parts of Japan) and Hyōgo surpassed the value of such transactions between Otaru and Osaka.\footnote{According to Unosuke Maeda, "A Report on Wool, Woolen Fabrics, Fish Fertilizers, and Soybean Meal in the Osaka-Kōbe Region," p. 51, the value of the trade in Hokkaidō fish fertilizers going out from Otaru in 1896 was (in round numbers) 700,000 yen to Osaka, 720,000 yen to Hyōgo, 440,000 yen to Mie, 150,000 yen to Aichi, 140,000 yen to Tokyo, 130,000 yen to Hiroshima, and 50,000 yen to Toyama.}

Fertilizer merchants in Otaru and Hakodate had been entrusting sales of Hokkaidō fish fertilizers to receiver wholesalers in Osaka and Hyōgo. But as the communications network improved and the marine insurance system came into force, fishermen and fertilizer merchants in the producing regions started transporting Hokkaidō fish fertilizers directly to Osaka and Hyōgo and entrusting the sales of their products to others.\footnote{Zui Wada, "Nishin shimekasu oyobi konbu no omonaru seisanchi to no sōba no kankei" [Market price relationships among the principal centers producing herring oil cakes and kelp] (Higher Commercial School, 1900). For more information about Hakodate fertilizer merchants' consignment of sales to Mitsui & Co., see the work by Satoru Nakanishi cited in note 1 above, p. 258.}

When unchinzumi (common carrier, or the practice of a cargo owner to pay a vessel owner to transport the cargo) became more common as a result of the use of steamships, kitamaebune merchants no longer held a monopoly over the sales of Hokkaidō fish fertilizers, and their trading activities declined. New sales routes organized by the production region merchants and the producers themselves were gradually being developed.

Because the types of transactions in the producing regions were changing, local fertilizer merchants sent employees to Hokkaidō.
There, in order to acquire first-hand the latest news on products and secure different kinds of fertilizer that better suited the requirements of the places in need of fertilizer, the representatives negotiated with fertilizer merchants and fishermen on the spot and bought directly from them. When they made their purchases, they frequently paid to the local merchants an advance deposit (as a guarantee) of 20% of the cost price, placed a direct order with the local fishermen (by telegram or letter), and before the fishermen went out to fish, concluded a purchase contract in which were stipulated the quality of the cargo and the price to be paid. This practice was known as “Aota-gai,” or “green-field buying.”23 The fertilizer merchants in Otaru formed the Otaru Consignment Business Association in 1895, then the Otaru Land and Sea Produce Trading Association in 1900. Because these associations decided on the methods of buying and selling land and sea produce and regulations governing imports, taking on consignment, and transactions, it became easy for fertilizer merchants around the country to entrust the buying of fish fertilizer to Otaru fertilizer merchants.24

What it all meant was that the supplying region did not merely go out and sell their produce directly to the demanding regions; in addition, the demanding regions went out to the supplying region and engaged in vigorous buying activity. In this way a route was built up that enabled the supplying region to direct a smooth supply of goods that met the requirements of the ultimate users, the farming communities.

The Hiroumi family of Kaizuka, which had been selling Hokkaidō fish fertilizer that they had bought from kitamaebune merchants to farming communities in the Izumi area, was another example of those who built up a new route. After they made attempts in 1894 to buy directly from Hokkaidō suppliers, they


started to carry out a thriving business in fish fertilizer transactions in Hokkaidō itself in 1903, by the establishment of a “Seat for Direct Buying in Hokkaidō.” In 1906, in order to secure a stable supply of the fish fertilizers, they sent representatives to the northern island to gather trading information in Hakodate and Otaru, and they concluded direct-purchase contracts not only with merchants in Hakodate and Otaru but also with local fishermen. The Hiroumi family also continued their dealings with the Kumata family, the kitamaebune merchant who had an agency in Otaru, and in 1907 they dispatched an employee to Otaru to engage in direct purchasing of fish fertilizers jointly with the Kumata agency.

In other words, by setting up their “Seat for Direct Buying in Hokkaidō” and sending an employee to Hokkaidō, the Hiroumi family was able to do two things: (1) buy fish fertilizers directly from Otaru merchants who had purchased them from fishermen; and (2) acquire fish fertilizers that fishermen consigned to them for sale through the Hakodate and Otaru merchants.

In addition, by consigning the sale of Hokkaidō fish fertilizers to Hakodate and Otaru merchants, they were able to purchase under favorable conditions the various types of fish fertilizers in the possession of the local fishermen and the Hakodate and Otaru merchants. The Hiroumi family would provide funds for Otaru merchants; it would carry out joint purchases of fish fertilizer with them; enlisting the aid of Hakodate and Otaru merchants, it energetically advanced fish fertilizer buying activities in those two locales. According to their “Account Ledgers,” the family continued

25 For more on direct buying in Hokkaidō, see my article “Meiji-Taishō ki hiryo shō no Hokkaidō jikigai katsudō to jinzo hiryo torihiki.” [Direct buying activities in Hokkaidō and artificial fertilizer transactions on the part of fertilizer merchants in the Meiji and Taishō eras], Keizaishi kenkyū (Osaka University of Economics) 4 (2000).

26 The Osaka and Hyōgo fertilizer merchants from whom the Hiroumi family had purchased various kinds of fertilizers also began buying Hokkaidō fish fertilizers jointly with Hakodate and Otaru merchants in the 1910s and making an effort to secure fish fertilizers there at the source.

27 The Hiroumi family’s “Seat for Direct Buying in Hokkaidō” is described in the “Ledger of All Purchases” (found in the Hiroumi-ke monjo—see note 10 above). The Hakodate and Otaru merchants purchased herring fertilizer from fishermen living in fishing villages scattered along the coast of Hokkaidō and, at the same time, took charge of the sale of fish fertilizers entrusted to them by fishermen. They played the leading role in the sales of Hokkaidō fish fertilizers.
receiving sales consignments from *kitamaebune* merchants named Nisaburō Hiroumi and Shichibē Ōie, both of whom had bases of operations in Hakodate and Otaru. Nisaburō Hiroumi and Shichibē Ōie had a sales outlet in Osaka, switched over to using a steamship, and planned to survive the changes in fish fertilizer sales patterns by making inroads into the Osaka market.

THE DIFFUSION OF FERTILIZERS AND THE EVOLUTION IN FERTILIZER MERCHANTS' BUSINESS MANAGEMENT

Large-volume supplies of artificial fertilizer and soybean meal

In the wake of the flourishing trade in soybean meal, fertilizer merchants in the distribution centers on Honshū started dealing with trading houses like Mitsui & Co. or Suzuki & Co. and with fertilizer manufacturers. They also widened the range of fertilizers they dealt in, enthusiastically embracing chemical and other fertilizers in addition to their stock products of fish fertilizers and soybean meal. While the production amounts of herring and sardine fertilizers stayed on a level keel in the 1900s, soybean meal showed an overwhelming growth in supply. At the same time, on the Japanese mainland the production of mixed fertilizer and calcium superphosphate increased, and in the 1910s the supplies of these two outstripped those of herring and sardine fertilizers. In the eyes of the public, mixed fertilizer and calcium superphosphate became the typical fertilizers. The inexpensive compound fertilizers and calcium superphosphate of Taki Fertilizer Mfg. Co. and Dai Nippon Artificial Fertilizer Co. flowed into farming communities that were unable to get sufficient supplies of fish fertilizers, while inexpensive soybean meal, as well as fish fertilizers imported from British India, Russian territories in Asia, America, and Australia, imported rapeseed meal, and imported ammonium sulphate streamed in one after another.\(^{28}\)

In the farming communities the farmers compared notes on the ingredients and efficacy of the various fertilizers, chose

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those that were cost effective, and used blends of fertilizer that suited the character of the soil and the crop. This enabled them to expand their agricultural production.

As can be seen in Figure 3, Mitsui & Co., which had taken on the importing of soybean meal in the early 1900s, played a crucial role in the delivery of new types of fertilizers to farming communities in Japan. Through its branches in places like London and Shanghai, the company imported one shipment after another of phosphate rock, double superphosphate, animal bone ashes and bone meal, rapeseed meal, ammonium sulphate, and other varieties of fertilizer. It also had exclusive rights to sell calcium superphosphate manufactured by Tokyo Artificial Fertilizer Company. So it actively dealt in many kinds of fertilizers besides soybean meal.

Lime nitrogen, Chile saltpeter, and other quick-acting fertilizers appeared on the market, but people in the farming communities did not have enough understanding of how best to use them. They still managed to raise the production of their farm products by using compound fertilizers, which had comparatively similar quick-acting results. As far as domestic production of lime nitrogen and ammonium sulphate is concerned, Japan Nitrogenous Fertilizer Co., Ltd. (founded in 1908) was successfully producing large quantities of both by-products of carbide production. During World War I, when the price of imported ammonium sulphate skyrocketed, Japan Nitrogenous Fertilizer’s inexpensive ammonium sulphate came to be used all over the country.

Once fertilizer manufacturers became serious about producing large volumes of chemical fertilizers, steps were taken to attempt technological innovations in the production of soybean meal as well. Thanks to epoch-making technology that made it possible to increase the amount of oil taken out of soybeans using a benzine

29 See Draft Manuscript: A Hundred Years of Mitsui & Co. (cited in note 16 above), p. 492. At the time of the company’s reorganization in 1916 rice and fertilizer divisions were set up in branch offices at home and abroad, and the company dealt in large volumes of chemical fertilizers in addition to soybean meal.


extraction method that had been developed at the Central Laboratories of the South Manchuria Railway Company, it was now possible to produce soybean meal that had extremely little oil in it and came in a powder form that was much more convenient for spreading as fertilizer. When Suzuki & Co. took over the facilities of the Central Laboratories, it strengthened and increased the production capacities of the Dairen factory. Then it began producing large quantities of its “Hohnen” brand hand-strewable soybean meal through the benzine extraction method.

Farmers found that a blend of “Hohnen” soybean meal with other fertilizers produced good results, and the product made a good name for itself. During and after World War I the “Hohnen” brand of soybean meal powder produced in the Dairen factory and in other factories of Suzuki & Co. slowly but steadily increased in demand, even in farming communities where soybean meal had not been used before.\(^{32}\) Nisshin Oil Mills, Ltd., as well, introduced into its Dairen factory in 1921 new machines that allowed it to begin mass-producing sheets of meal with very little oil content. This gave added impetus to soybean meal transactions inside Japan.\(^{33}\) (Compare Figure 4 with Figure 3.)

The evolution of transactions in fertilizers of all sorts by the fertilizer merchants

As I have already mentioned, the use of chemical fertilizers spread rapidly in the 1910s. The reader may wonder, however, how people in the farming villages reacted to them. Taki Fertilizer Mfg. Co., which had begun producing bone meal fertilizer in the 1880s, tried its hand at artificial fertilizers in the early 1900s. In 1910 it registered the trademarks of its various fertilizers and began selling calcium superphosphate and compound fertilizers. It issued brochures such as the “Taki Fertilizer Guidebook” (1909), in which in simple language it explained to fertilizer merchants and farmers the differences between different fertilizers and how they should be used. In

\(^{32}\) In 1922, when Suzuki & Co. reorganized itself, the fertilizer production arm was set up as an independent company, the Hohnen Oil Co., Ltd. See the company history: Yoshio Uesugi, ed., Hōnen Seiyū Kabushiki Kaisha yonjūnen shi [Forty years of Hohnen Oil Co., Ltd.] (Tokyo: Hohnen Oil Co., Ltd., 1963), pp. 7–10.

\(^{33}\) Nisshin Soybean Meal Mfg. Co., was renamed Nisshin Oil Mills, Ltd. in 1918. See A Sixty-Year History of Nisshin Oil Mills (cited in note 14 above), pp. 74–76.
FIGURE 4. Principal Transaction Routes for Commercial Fertilizers in the 1910s

- Soybeans to Manchurian oil refineries
- Soybean oil manufacturers
- Production center fishermen
- Sardines and Herring
- Chinese merchants
- Japanese trading companies (Mitsui & Co., Suzuki & Co.)
- Overseas fertilizer companies
- Rapeseed oil manufacturers
- Rapeseed
- Chemical fertilizer companies
- Phosphate rock
- Tokyo, Nagoya, Osaka Hyōgo fertilizer merchants
- Local fertilizer merchants
- Farmers

flow of fish fertilizers
---------- flow of rapeseed meal
------------ flow of chemical fertilizers
----------------- flow of soybean meal
this way they promoted the diffusion of calcium superphosphate and other chemical fertilizers. In the mid-1910s Taki Fertilizer Mfg. Co. developed suitable fertilizers for the production of dry field cereal crops—fertilizers such as “Shikishima Fertilizer” and “New Dry Field Farming Fertilizer.” The company managed to sell artificial and compound fertilizers that were adapted to the uses of farmers in farming villages around the country.

Meanwhile, the Hiroumi family of Kaizuka, which had been active in fish fertilizer trading, began in 1910 to handle superphosphates manufactured by Taki Fertilizer Mfg. Co. Dealing in both fish fertilizers and calcium superphosphate in parallel fashion, it sold both types of fertilizers to its customers in Izumi farming villages. At this time Taki Fertilizer Mfg. was pushing the efficacy of calcium superphosphate to fertilizer merchants throughout the country in an effort to expand its sales outlets nationwide. At the same time the Hiroumi family was also advertising the efficacy of Taki Fertilizer Mfg. Co. fertilizers as it devoted much energy to the diffusion of calcium superphosphate. The Hiroumi family worked hard for an expansion of Taki Fertilizer Mfg. Co. sales outlets, paying for the cost of Taki Fertilizer Mfg. Co. advertisements. In doing so it played a role in the diffusion of calcium superphosphate use in the Izumi region. Gradually Taki Fertilizer Mfg. Co.’s reputation improved, and, on the basis of the sales capability and the credibility that the Hiroumi family had nurtured, farmers were able to take up the use of Taki Fertilizer Mfg. Co.’s artificial fertilizers with greater assurance.

There is evidence to show that in 1919 the Hiroumi family was buying not only fish fertilizer and Taki Fertilizer Mfg. Co. fertilizers but also, from the Osaka and Hyōgo fertilizer merchants, a whole range of other fertilizers: calcium superphosphate from Dai Nippon Artificial Fertilizer Co. and Osaka Chemical Fertilizer Co.; imported ammonium sulphate as well as domestically produced ammonium sulphate from Japan Nitrogenous Fertilizer Co.; and “Hohnen” soybean meal produced by the oil refining division of Suzuki & Co. Reassured by their steady sales of Taki Fertilizer Mfg. Co.’s fertiliz-

34 For more on the purchases of Taki Fertilizer Mfg. Co. fertilizers by the Hiroumi family, see the “Ledger of All Purchases,” the entries for each year.

35 “Ledger of All Purchases,” 1918 (contained in Hiroumi-ke monjo).
ers, the Hiroumi family did not hesitate to venture into the selling of other fertilizers. This variety of products for sale added vigor to their fertilizer trading activities. Now, when the Osaka and Hyōgo fertilizer merchants with whom the family had been dealing for years and years began to sell soybean meal and calcium superphosphate as agents for Suzuki & Co.'s oil refining division and Dai Nippon Artificial Fertilizer Co., the Hiroumi family came to buy a large variety of fertilizers from them. But the family did not stop with purchasing their goods from wholesalers in the major distribution centers. By purchasing calcium superphosphate directly from Taki Fertilizer Mfg. Co. and other manufacturers such as Rasa Island Phosphate and Teikoku Artificial Fertilizer Co., the family rapidly expanded its volume of trading in chemical fertilizers.

CONCLUSION

We have seen how Hokkaidō fish fertilizer trading flourished, and agricultural production in Japan thrived, from the nineteenth century on, and how the forms of fish fertilizer trading carried on by fertilizer merchants have had a large impact on the ways other types of fertilizer have been traded. Fertilizer merchants in and around the large cities, especially Edo and Osaka, carried on a variety of transactions with wholesalers, brokers, and retailers, creating a smooth and dynamic fertilizer distribution system in the Meiji period. Fertilizer merchants who had played leading roles in the mid-nineteenth century financial circles in Osaka put a great deal of effort into establishing a modern fertilizer trading system, even going so far as to try establishing a fertilizer exchange in the Meiji period. When modernization advanced in respect to transportation and communications in the mid-Meiji period, significant changes took place in the business practices of the kitamaebune merchants, who acted as links between production centers and distribution centers. A large variety of transaction arrangements saw the light of day in both production-center markets and distribution-center markets, leading to even greater vitality in fertilizer transactions among wholesalers, brokers, and local fertilizer merchants.

We saw how the Hiroumi family of Kaizuka embarked enthusiastically on fish fertilizer market dealings in the distribution and pro-
duction centers, using deals with *kitamaebune* merchants as the basis of their operations, and how they were able to secure a stable supply of fish fertilizer. Another important fertilizer we saw appearing on the scene was soybean meal. We saw how Mitsui & Co., which had been involved in large-volume fish fertilizer transactions from early Meiji on, bought soybean meal from northeastern China in large quantities in the 1900s and supplied them to merchants on the Japanese mainland at low prices. Merchants throughout the country then set about combining soybean meal with traditional fertilizers such as fish fertilizer or rapeseed meal and selling this to farming communities. Then chemical fertilizers such as calcium superphosphate, lime nitrogen, and ammonium sulphate were supplied, at the discretion of fertilizer merchants, to wherever there was a demand for them, to be used as required by the nature of the soil in the farming communities or by the nature of the crops being produced.

Spurred on by the development of the fish fertilizer market in large cities like Tokyo, Osaka, and Nagoya, fertilizer manufacturers and fertilizer merchants formed their own trading networks as they took part in market transactions. Fertilizer merchants would join up with fertilizer merchants in the production centers to evolve ways of acquiring good-quality fish fertilizer, for example. In this and other ways they sought more tightly knit bonds of transportation and information between production centers and distribution centers—and even with the farming communities. They went on to lower the costs involved in transactions between the places doing the supplying of goods and the places needing those goods, and to form a more efficient trading structure.

An analysis of the trading structure of the fertilizer market is a task I hope to undertake in a future study.