Kumiai Chemical Industry / 4996

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How to read a Shared Research report: This report begins with the trends and outlook section, which discusses the company's most recent earnings. First-time readers should start at the business section later in the report.

Executive summary

Business overview

- Kumiai Chemical Industry is a R&D-focused agrochemical manufacturing and marketing company, with a large proportion of herbicides in sales. The company develops active ingredients for agrochemicals in-house, which it formulates and markets. It is Japan's fifth-largest producer of formulations by shipment value (February 2016 announcement, "Agricultural Chemicals Situation," by the Ministry of Agriculture, Forestry and Fisheries, or "MAFF"). From 2010 through 2018, Kumiai Chemical developed five active ingredients for agrochemicals, which in general, take around 10 years to bring to market, and registered products containing them. It also plans to register products containing one more active ingredient it has developed by 2020. The company is one of the largest agrochemical producers affiliated with Japan's National Federation of Agricultural Co-operative Associations (Zen-Noh). This and other agricultural cooperatives provide a strong sales route and access to farmers. In May 2017, Kumiai Chemical merged with Ihara Chemical, then an equity-method affiliate that developed and produced active ingredients. Through the merger, the company aims to strengthen its management foundation, and in its core agrochemical business, speed up the development of new agrochemicals by integrating processes from discovery through active ingredient procurement, product formulation, and marketing.
- The company has three business segments: Agricultural Chemicals and Agriculture-Related (78% of sales), Fine Chemicals (14%), and Other (8%). (Figures are based on the company's post-merger results for full-year FY10/17.) Within agrochemicals, sales of herbicides (parent only) account for around 60% and fungicides for 14%, with exports making up approximately 54% of shipments. Kumiai Chemical sells agrochemical ingredients and formulations using local distributors via local K-I Chemical subsidiaries in Europe and the US, equity-method affiliate, T.J.C. Chemical Co., Ltd. in Asia (Thailand), and equity-method affiliate Iharabras S.A. Industrias Quimicas in Brazil. In other regions it uses trading companies and local distributors. Core products in Japan and other parts of Asia are herbicides for paddy rice; in North America, herbicides for field crops are the focus.
- In the Fine Chemicals segment, the company manufactures and sells pharmaceutical and agrochemical intermediates, electronic materials, and polymer raw materials, by leveraging its organic synthesis technologies developed in agrochemical active ingredient manufacture. Regarding amine-based curing agents which are raw materials for urethane resin industrial products widely used across various industries, the company is engaged in new product development, manufacturing, and sales. The Other Businesses segment includes real estate leasing and the sale of electricity produced via mega solar generation.

Trends and outlook

- For FY10/18, the company reported sales of JPY96.8bn (+24.5% YoY), an operating profit of JPY5.6bn (+48.3% YoY), recurring profit of JPY8.1bn (+8.5% YoY), and net income of JPY4.7bn (-35.1% YoY).
- For FY10/19, the company is forecasting full-year sales of JPY107.0bn (+10.5% YoY), an operating profit of JPY6.1bn (+9.3% YoY), recurring profit of JPY8.1bn (+0.3% YoY), and net income of JPY5.6bn (+19.0% YoY). The company sees growth being underpinned by further expansion of its mainstay Agricultural Chemicals and Agriculture-Related Businesses, where it will be stepping up domestic marketing with the aim of establishing closer ties with the end user (i.e., farming households) and maximizing early sales of the new herbicide for rice paddies (Effeeda) that it will be rolling out in 2019. Overseas, the company will focus on increasing sales of its herbicide for field crops (Axeev), core product of the Agricultural Chemicals business, by both increasing the number of countries in which it is sold and the number of crops to which it is applied. Likewise, at its Fine Chemicals Business, the company is looking to develop new customers and expand business domains.
- Kumiai Chemical has announced a 2018 medium-term management plan calling for FY10/20 sales of JPY116.0bn, operating profit of JPY9.0bn, and ROE of 7.5% or more. The company's long-term vision targets sales of JPY140.0bn in 2022. Growth strategies center on the North American, Asian and South American markets, which Kumiai Chemical believes will expand. North America, where the company continues to launch new mixture products, should drive growth, based on expanding sales of herbicides for field crops. The company also plans to ramp up these products in Brazil and India following their launch

on the Argentinian market. Further, Kumiai Chemical is establishing a joint venture in India to drive its mainstay business, herbicides for paddy rice, where it competes with generic agrochemicals. In Japan, where the market remains flat, Kumiai Chemical plans to introduce new products effective on weeds that are resistant to some herbicides and also suitable for rice that can be used as livestock feed, a growing market. For rice, the company has active ingredients in the pipeline, which it anticipates to be strategic products after registration. In the Fine Chemicals segment, the company plans to leverage agrochemical active ingredient production technologies to strengthen its capabilities in fine chemicals. To this end it is boosting output capacity with subsidiary K-I Chemical's new plant in Japan and a new production facility at Iharanikkei Chemical Industry in Thailand.

Strengths and weaknesses

Shared Research considers Kumiai Chemical's strengths to be its initiative in agrochemicals, and a broad business strategy for in-house development and manufacturing of active ingredients; experience with field crop herbicides that can be sold worldwide and effective paddy rice herbicides in other parts of Asia; and a solid sales network in Japan, based on relationships with Zen-Noh and agricultural cooperatives. We believe its weaknesses to be that the advantages of being affiliated with Zen-Noh are not effective outside Japan; the company's lack of experience in key emerging markets (China, Latin America) that are expected to drive global agrochemical demand; and a widening gap in capital scale between Kumiai Chemical and the world's largest companies.

Key financial data

Income statement (JPYmn)	FY10/10 Cons.	FY10/11 Cons.	FY10/12 Cons.	FY10/13 Cons.	FY10/14 Cons.	FY10/15 Cons.	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.	FY10/19 Est.
Total sales	**38,252**	**42,095**	**44,072**	**49,283**	**55,360**	**61,124**	**62,549**	**77,817**	**96,846**	**107,000**
YoY	-2.5%	10.0%	4.7%	11.8%	12.3%	10.4%	2.3%	24.4%	24.5%	10.5%
Gross profit	9,297	9,989	10,403	10,986	11,886	13,243	12,369	18,863	23,611	
YoY	1.3%	7.4%	4.1%	5.6%	8.2%	11.4%	-6.6%	52.5%	25.2%	
GPM	24.3%	23.7%	23.6%	22.3%	21.5%	21.7%	19.8%	24.2%	24.4%	
Operating profit	**990**	**1,446**	**1,657**	**2,105**	**2,629**	**3,723**	**2,267**	**3,764**	**5,582**	**6,100**
YoY	48.4%	46.1%	14.6%	27.0%	24.9%	41.6%	-39.1%	66.0%	48.3%	9.3%
OPM	2.6%	3.4%	3.8%	4.3%	4.7%	6.1%	3.6%	4.8%	5.8%	5.7%
Non-operating income	813	719	1,266	1,397	1,768	4,459	2,634	3,857	2,634	
Non-operating expenses	97	107	113	131	107	118	423	180	142	
Recurring profit	**1,706**	**2,059**	**2,810**	**3,371**	**4,290**	**8,064**	**4,478**	**7,441**	**8,074**	**8,100**
YoY	82.9%	20.7%	36.5%	20.0%	27.3%	88.0%	-44.5%	66.2%	8.5%	0.3%
RPM	4.5%	4.9%	6.4%	6.8%	7.7%	13.2%	7.2%	9.6%	8.3%	7.6%
Net income	**1,292**	**1,360**	**2,137**	**2,384**	**3,051**	**6,563**	**3,423**	**7,252**	**4,706**	**5,600**
YoY	375.0%	5.3%	57.1%	11.6%	28.0%	115.1%	-47.8%	111.9%	-35.1%	19.0%
Net margin	3.4%	3.2%	4.8%	4.8%	5.5%	10.7%	5.5%	9.3%	4.9%	5.2%
Per share data (JPY)										
Shares issued (year-end; '000)	86,978	86,978	86,978	86,978	86,978	86,978	86,978	133,185	133,185	
EPS	16.0	16.9	26.9	29.9	38.2	82.1	43.1	70.4	37.5	44.7
EPS (fully diluted)	-	-	-	-	-	-	-	-	-	
Dividend per share	3.0	5.0	6.0	6.0	7.0	8.0	8.0	8.0	10.0	
Book value per share	466.7	481.5	514.0	572.8	586.6	671.9	677.5	734.7	718.7	
Balance sheet (JPYmn)										
Cash and cash equivalents	12,753	7,802	7,639	11,003	12,372	9,742	5,789	14,283	17,729	
Accounts receivable	5,732	7,883	9,395	8,199	8,731	10,014	10,666	21,006	21,769	
Inventories	9,055	10,266	12,224	11,799	11,162	12,867	13,604	33,268	32,931	
Total current assets	28,566	27,680	30,343	34,466	34,427	34,918	34,060	71,733	75,700	
Tangible fixed assets	11,280	11,229	11,532	12,184	12,828	12,839	12,878	27,306	30,438	
Investments and other assets	11,611	14,017	16,410	20,984	22,759	37,060	36,369	39,743	27,015	
Intangible fixed assets	247	221	291	255	262	272	301	386	603	
Total assets	**51,704**	**53,146**	**58,576**	**67,888**	**70,277**	**85,089**	**83,608**	**139,168**	**133,756**	
Accounts payable	6,020	6,606	8,452	7,297	8,349	10,296	9,026	12,772	15,052	
Short-term debt	11	11	6	2,200	2,500	3,580	5,570	3,627	2,759	
Total current liabilities	8,768	9,089	11,677	12,432	14,394	17,712	17,521	24,384	25,175	
Long-term debt	17	6	0	1,700	1,500	5,650	4,250	2,828	970	
Total fixed liabilities	3,410	3,281	3,584	6,855	6,214	10,590	8,822	15,419	10,842	
Total liabilities	**12,179**	**12,370**	**15,261**	**19,287**	**20,609**	**28,302**	**26,344**	**39,803**	**36,017**	
Total net assets and liabilities	**51,704**	**53,146**	**58,576**	**67,888**	**70,277**	**85,089**	**83,608**	**139,168**	**133,756**	
Total interest-bearing debt	28	17	6	3,900	4,000	9,230	9,820	6,455	3,729	
R&D expenses (JPYmn)										
Ihara Chemical Industry	1,690	1,674	1,723	1,687	1,970	1,823	2,041	-	-	
Kumiai Chemical Industry	2,232	2,198	2,099	2,249	2,370	2,418	2,728	3,932	-	
Cash flow statement (JPYmn)										
Cash flows from operating activities	1,318	-1,390	1,298	1,676	5,191	2,226	-2,551	5,660	5,660	
Cash flows from investing activities	72	-2,405	-1,532	-1,788	-3,538	-10,418	-1,089	-1,092	-1,092	
Cash flows from financing activities	-360	-414	-888	3,550	-546	4,965	-231	-10,329	-10,329	
Financial ratios										
ROA (RP-based)	3.3%	3.9%	5.0%	5.3%	6.2%	10.4%	5.3%	6.7%	5.9%	
ROE	3.4%	3.5%	5.4%	5.5%	6.6%	13.1%	6.4%	9.9%	5.1%	
Equity ratio	72.7%	73.0%	69.7%	67.4%	66.7%	62.8%	64.4%	66.7%	67.7%	

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

Recent updates

Highlights

On **June 7, 2019**, Kumiai Chemical Industry Co., Ltd. announced earnings results for 1H FY10/19; see the results section for details.

On **the same day**, the company announced that it made Rikengreen Co., Ltd. a wholly owned subsidiary through a simplified share exchange.

Along with its 1H FY10/19 earnings release, the company announced that it made its consolidated subsidiary Rikengreen (JASDAQ: 9992) a wholly owned subsidiary. Rikengreen is planned to be delisted on August 29th.

The company and Rikengreen aim to further strengthen ties in the field of agrochemicals for non-cultivated land. Additionally, the two companies will work together to maximize in-house agents and collaborate within the Kumiai Group in the field of fine chemicals.

Reasons for making Rikengreen a wholly owned subsidiary include the following:

1. With Rikengreen remaining listed and having minority shareholders, taking advantage of synergies in expertise, human resources, development strategies, and finances between the two companies may be challenging. Moreover, there may be limitations regarding quick decision making in creating business strategies and executing collaborative projects that give the highest priority to improving corporate value of the consolidated group.
2. There may be limitations in rolling out the Kumiai Chemical Group's governance and compliance measures.
3. A conflict of interest with dividend seeking minority shareholders may arise as Rikengreen invests its internal reserves for future growth with a medium to long term perspective.

On **May 10, 2019**, Shared Research updated the report following interviews with the company.

On **March 8, 2019**, the company announced earnings results for Q1 FY10/19.

For previous releases and developments, please refer to the News and topics section.

Trends and outlook

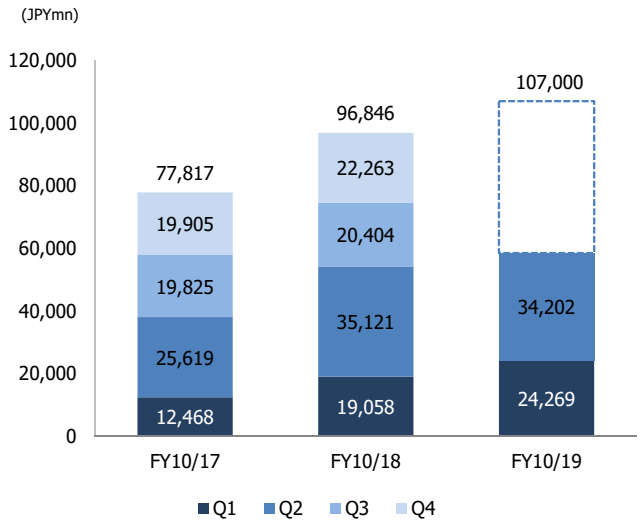
Quarterly trends and results

Cumulative (JPYmn)	FY10/17 Q1	Q2	Q3	Q4	FY10/18 Q1	Q2	Q3	Q4	FY10/19 Q1	Q2	FY10/19 % of 1H	1H Est.	FY10/19 % of FY	FY Est.
Sales	12,468	38,087	57,912	77,817	19,058	54,179	74,583	96,846	24,269	58,471	97.9%	59,700	54.6%	107,000
YoY	-24.0%	-7.6%	15.7%	24.4%	52.9%	42.3%	28.8%	24.5%	27.3%	7.9%		-23.3%		97.5%
Gross profit	2,681	8,479	13,646	18,863	5,109	13,631	18,299	23,611	6,321	14,777				
YoY	-23.3%	-2.4%	36.3%	52.5%	90.6%	60.8%	34.1%	25.2%	23.7%	8.4%				
GPM	21.5%	22.3%	23.6%	24.2%	26.8%	25.2%	24.5%	24.4%	26.0%	25.3%				
SG&A expenses	2,514	5,564	10,082	15,099	4,236	8,840	13,253	18,030	4,195	9,171				
YoY	9.1%	5.3%	32.0%	49.5%	68.5%	58.9%	31.5%	19.4%	-1.0%	3.7%				
SG&A ratio	20.2%	14.6%	17.4%	19.4%	22.2%	16.3%	17.8%	18.6%	17.3%	15.7%				
Operating profit	167	2,915	3,565	3,764	872	4,792	5,046	5,582	2,127	5,607	112.1%	5,000	91.9%	6,100
YoY	-86.0%	-14.3%	50.2%	66.0%	422.2%	64.4%	41.5%	48.3%	143.9%	17.0%		32.8%		27.3%
OPM	1.3%	7.7%	6.2%	4.8%	4.6%	8.8%	6.8%	5.8%	8.8%	9.6%		8.4%		5.7%
Recurring profit	1,332	4,523	6,402	7,441	1,371	5,604	6,612	8,074	2,480	6,479	115.7%	5,600	80.0%	8,100
YoY	-21.2%	3.8%	66.1%	66.2%	2.9%	23.9%	3.3%	8.5%	80.9%	15.6%		-24.7%		44.5%
RPM	10.7%	11.9%	11.1%	9.6%	7.2%	10.3%	8.9%	8.3%	10.2%	11.1%		9.4%		7.6%
Net income	1,017	3,345	6,752	7,252	1,125	4,454	5,302	4,706	1,839	4,663	122.7%	3,800	83.3%	5,600
YoY	-16.9%	8.9%	145.6%	111.9%	10.6%	33.2%	-21.5%	-35.1%	63.5%	4.7%		-47.6%		25.7%
Net margin	8.2%	8.8%	11.7%	9.3%	5.9%	8.2%	7.1%	4.9%	7.6%	8.0%		6.4%		5.2%

Quarterly (JPYmn)	FY10/17 Q1	Q2	Q3	Q4	FY10/18 Q1	Q2	Q3	Q4	FY10/19 Q1	Q2
Sales	12,468	25,619	19,825	19,905	19,058	35,121	20,404	22,263	24,269	34,202
YoY	-24.0%	3.3%	123.8%	59.5%	52.9%	37.1%	2.9%	11.8%	27.3%	-2.6%
Gross profit	2,681	5,798	5,167	5,217	5,109	8,522	4,668	5,312	6,321	8,456
YoY	-23.3%	11.7%	290.0%	121.2%	90.6%	47.0%	-9.7%	1.8%	23.7%	-0.8%
GPM	21.5%	22.6%	26.1%	26.2%	26.8%	24.3%	22.9%	23.9%	26.0%	24.7%
SG&A expenses	2,514	3,050	4,518	5,017	4,236	4,604	4,413	4,777	4,195	4,976
YoY	9.1%	2.3%	92.1%	103.5%	68.5%	51.0%	-2.3%	-4.8%	-1.0%	8.1%
SG&A ratio	20.2%	11.9%	22.8%	25.2%	22.2%	13.1%	21.6%	21.5%	17.3%	14.5%
Operating profit	167	2,748	650	199	872	3,920	254	536	2,127	3,480
YoY	-86.0%	24.3%	-	-	422.2%	42.6%	-60.9%	169.3%	143.9%	-11.2%
OPM	1.3%	10.7%	3.3%	1.0%	4.6%	11.2%	1.2%	2.4%	8.8%	10.2%
Recurring profit	1,332	3,191	1,879	1,039	1,371	4,233	1,008	1,462	2,480	3,999
YoY	-21.2%	19.6%	-	66.8%	2.9%	32.7%	-46.4%	40.7%	80.9%	-5.5%
RPM	10.7%	12.5%	9.5%	5.2%	7.2%	12.1%	4.9%	6.6%	10.2%	11.7%
Net income	1,017	2,328	3,407	500	1,125	3,329	848	-596	1,839	2,824
YoY	-16.9%	25.9%	-	-25.8%	10.6%	43.0%	-75.1%	-	63.5%	-15.2%
Net margin	8.2%	9.1%	17.2%	2.5%	5.9%	9.5%	4.2%	-	7.6%	8.3%

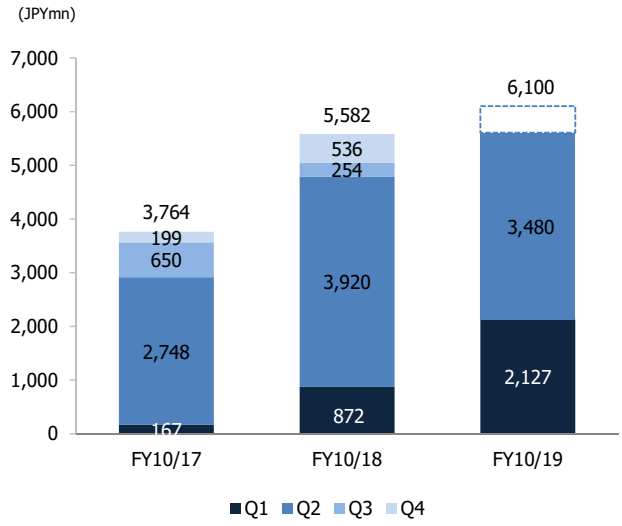
Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

Sales (quarterly)



Source: Shared Research based on company data

Operating profit (quarterly)



Source: Shared Research based on company data

Cumulative	FY10/17				FY10/18				FY10/19	
(JPYmn)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Total sales	12,468	38,087	57,912	77,817	19,058	54,179	74,583	96,846	24,269	58,471
YoY	-24.0%	-7.6%	15.7%	24.4%	52.9%	42.3%	28.8%	24.5%	27.3%	7.9%
Agricultural Chemicals	10,810	34,703	47,879	60,636	13,268	40,608	54,131	68,147	17,450	44,088
YoY	-	-	7.2%	8.6%	22.7%	17.0%	13.1%	12.4%	31.5%	8.6%
% of total	86.7%	91.1%	82.7%	77.9%	69.6%	75.0%	72.6%	70.4%	71.9%	75.4%
Fine Chemical	556	1,094	5,648	10,937	4,119	9,200	14,370	19,466	5,136	10,180
YoY	-	-	182.5%	387.6%	640.8%	741.0%	154.4%	78.0%	24.7%	10.7%
% of total	4.5%	2.9%	9.8%	14.1%	21.6%	17.0%	19.3%	20.1%	21.2%	17.4%
Others	1,102	2,290	4,385	6,243	1,671	4,370	6,082	9,233	1,683	4,204
YoY	-	-	28.5%	39.4%	51.6%	90.8%	38.7%	47.9%	0.7%	-3.8%
% of total	8.8%	6.0%	7.6%	8.0%	8.8%	8.1%	8.2%	9.5%	6.9%	7.2%
Operating profit	167	2,915	3,565	3,764	872	4,792	5,046	5,582	2,127	5,607
YoY	-86.0%	-14.3%	50.2%	66.0%	422.2%	64.4%	41.5%	48.3%	143.9%	17.0%
OPM	1.3%	7.7%	6.2%	4.8%	4.6%	8.8%	6.8%	5.8%	8.8%	9.6%
Agricultural Chemicals	401	3,094	3,652	3,554	836	4,452	4,415	4,992	1,900	5,122
YoY	-	-	-	46.8%	108.5%	43.9%	20.9%	40.5%	127.3%	15.0%
% of total	75.2%	88.1%	82.5%	71.6%	72.3%	82.1%	73.9%	73.0%	78.2%	82.1%
Fine Chemical	21	40	327	858	319	681	1,117	1,249	411	690
YoY	-	-	-	2157.9%	1419.0%	1602.5%	241.6%	45.6%	28.8%	1.3%
% of total	3.9%	1.1%	7.4%	17.3%	27.6%	12.6%	18.7%	18.3%	16.9%	11.1%
Others	111	377	447	552	2	292	444	599	119	426
YoY	-	-	-	-7.1%	-98.2%	-22.5%	-0.7%	8.5%	5850.0%	45.9%
% of total	20.8%	10.7%	10.1%	11.1%	0.2%	5.4%	7.4%	8.8%	4.9%	6.8%
Company-wide expenses	-366	-596	-862	-1,200	-285	-633	-930	-1,259	-303	-631

Quarterly	FY10/17				FY10/18				FY10/19	
(JPYmn)	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Total sales	12,468	25,619	19,825	19,905	19,058	35,121	20,404	22,263	24,269	34,202
YoY	-24.0%	3.3%	123.8%	59.5%	52.9%	37.1%	2.9%	11.8%	27.3%	-2.6%
Agricultural Chemicals	10,810	23,893	13,176	60,636	13,268	27,340	13,523	14,016	17,450	26,638
YoY	-	-	-	-	22.7%	14.4%	2.6%	-76.9%	31.5%	-2.6%
% of total	87%	93%	66%	305%	70%	77.8%	66.3%	63.0%	72%	77.9%
Fine Chemical	556	538	4,554	10,937	4,119	5,081	5,170	5,096	5,136	5,044
YoY	-	-	-	-	640.8%	844.4%	13.5%	-53.4%	24.7%	-0.7%
% of total	4%	2%	23%	55%	22%	14.5%	25.3%	22.9%	21%	14.7%
Others	1,102	1,188	2,095	6,243	1,671	2,699	1,712	3,151	1,683	2,521
YoY	-	-	-	-	51.6%	127.2%	-18.3%	-49.5%	0.7%	-6.6%
% of total	9%	5%	11%	31%	9%	7.7%	8.4%	14.2%	7%	7.4%
Operating profit	167	2,748	650	199	872	3,920	254	536	2,127	3,480
YoY	-86.0%	24.3%	-	-	422.2%	42.6%	-60.9%	169.3%	143.9%	-11.2%
OPM	1.3%	10.7%	3.3%	1.0%	4.6%	11.2%	1.2%	2.4%	8.8%	10.2%
Agricultural Chemicals	401	2,693	558	3,554	836	3,616	-37	577	1,900	3,222
YoY	-	-	-	-	108.5%	34.3%	-	-83.8%	127.3%	-10.9%
% of total	75.2%	90.4%	61.0%	71.6%	72.3%	84.7%	-	66.8%	78.2%	84.6%
Fine Chemical	21	19	287	858	319	362	436	132	411	279
YoY	-	-	-	-	1419.0%	1805.3%	51.9%	-84.6%	28.8%	-22.9%
% of total	3.9%	0.6%	31.4%	17.3%	27.6%	8.5%	79.1%	15.3%	16.9%	7.3%
Others	111	266	70	552	2	290	152	155	119	307
YoY	-	-	-	-	-98.2%	9.0%	117.1%	-71.9%	5850.0%	5.9%
% of total	20.8%	8.9%	7.7%	11.1%	0.2%	6.8%	27.6%	17.9%	4.9%	8.1%
Company-wide expenses	-366	-230	-265	-4,765	-285	-348	-297	-328	-303	-328

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

1H FY10/19 results (out June 7, 2019)

Results for 1H FY10/19 (November 2018–April 2019)

- Sales: JPY58.5bn (+7.9% YoY)
- Operating profit: JPY5.6bn (+17.0% YoY)
- Recurring profit: JPY6.5bn (+15.6% YoY)
- Net income*: JPY4.7bn (+4.7% YoY)

*Net income attributable to owners of parent

- Sales rose YoY with expanded sales of core product Axeev
- Overseas sales ratio: 38.2%

Agricultural Chemicals and Agriculture-Related Businesses

Results for1H FY10/19 (November 2018–April 2019)

- Sales: JPY44.1bn (+8.6% YoY)
- Operating profit: JPY5.1bn (+15.0% YoY)

Domestic sales:

- For herbicides for rice paddies, full-scale sales of Effeeda started, but was unable to make up for the sales decline in existing products like Topgun, resulting in a YoY sales decline.
- Rice pest insecticides sales were up YoY with the launch of Pyraxalto agent and growth in mixture products like Isotianil.
- Sales of products for gardening, including insecticides like Cyazypyr, also logged strong YoY gains.
- In corporate marketing, sales of Fantasista, a self-developed germicide for gardening held steady. Sales for contract processing and products used on golf courses and other areas beside farmland logged strong gains, leading to overall sales growth YoY.

Overseas sales:

- Overall, overseas sales were up sharply YoY.
- Shipments of the core product Axeev grew dramatically in North America. Shipments for Argentina grew steadily as well.
- Shipments of Nominee declined in regions including India due to the influence of generics, however, its growing use in Brazil as a ripening accelerator for sugarcane resulted in strong shipments.

Fine Chemicals Business

Results for 1H FY10/19 (November 2018–April 2019)

- Sales: JPY10.2bn (+10.7% YoY)
- Operating profit: JPY690mn (+1.3% YoY)

Kumiai Chemical acquired most of the Fine Chemicals operations from Ihara Chemical and its consolidated subsidiaries. In this segment the company mainly develops and sells chlorotoluene- and chloroxylene-based chemical products; fine chemicals, including various bismaleimides used in electronic materials and high-heat-resistant resins; polyurethane curing agents, which are raw materials for waterproof materials; fungicides and anti-mold agents; industrial chemicals such as cleaning agents; and Styrofoam.

- The company saw strong demand for its chloroxylene-based chemical products used in the production of high-performance resins and aramid fibers like those being produced by Iharanikkei Chemical (Thailand), a joint venture between Kumiai Chemical and consolidated subsidiary Iharanikkei Chemical Industry.
- In the area of fine chemicals, the company saw strong sales of bismaleimides used in electronic materials and heat-resistant resins thanks to growing market demand. Sales of polyurethane curing agents, used in waterproof materials, were up. The company's contract processing business also performed strong as the processing volume increased thanks to winning processing contracts for new products. Sales of industrial chemicals (including cleaning agents and chemicals used in paper manufacturing) lagged slightly YoY. Sales of styrene foam (used in packaging, consumer electronic parts, and insulation materials used in construction) were bolstered by both rising demand and higher unit selling prices.

Other Businesses

Results for 1H FY10/19 (November 2018–April 2019)

- Sales: JPY4.2bn (-3.8% YoY)
- Operating profit: JPY426mn (+45.9% YoY)

- Other Businesses comprise mainly leasing, electricity generation and sales, construction, printing, logistics, and information services.
- Leasing business sales were in line with Q1 FY10/18 as the company continued to effectively utilize owned properties.
- The electric power generation and sales business logged higher sales, due to the completion of repairs to electric power facilities that were damaged by last year's typhoons.
- Sales in the construction business and printing business were basically flat.
- Sales in the printing business and logistics business were in line with the same period last year.

Shared Research intends to update this report following our upcoming interview with the company.

For details on previous quarterly and annual results, see the Historical performance section.

Company forecast for FY10/19

	FY10/16			FY10/17			FY10/18			FY10/19		
(JPYmn)	1H Act.	2H Act.	FY Act.	1H Act.	2H Act.	FY Act.	1H Act.	2H Act.	FY Act.	1H Est.	2H Est.	FY Est.
Sales	**41,213**	**21,336**	**62,549**	**38,087**	**39,730**	**77,817**	**54,179**	**42,667**	**96,846**	**59,700**	**47,300**	**107,000**
YoY	6.5%	-4.9%	2.3%	-7.6%	86.2%	24.4%	42.3%	7.4%	24.5%	10.2%	10.9%	10.5%
CoGS	32,527	17,653	50,180	29,608	29,346	58,954	40,548	32,687	73,235	43,694	-	-
Gross profit	**8,686**	**3,683**	**12,369**	**8,479**	**10,384**	**18,863**	**13,631**	**9,980**	**23,611**	**14,777**	**-**	**-**
GPM	21.1%	17.3%	19.8%	22.3%	26.1%	24.2%	25.2%	23.4%	24.4%	24.8%	-	-
SG&A expenses	5,285	4,817	10,102	5,564	9,535	15,099	8,840	9,190	18,030	9,171	-	-
SG&A ratio	12.8%	22.6%	16.2%	14.6%	24.0%	19.4%	16.3%	21.5%	18.6%	15.4%	-	-
Operating profit	**3,401**	**-1,134**	**2,267**	**2,915**	**849**	**3,764**	**4,792**	**790**	**5,582**	**5,607**	**493**	**6,100**
YoY	-3.8%	-	-39.1%	-14.3%	-	66.0%	64.4%	-6.9%	48.3%	17.0%	-37.6%	9.3%
OPM	8.3%	-	3.6%	7.7%	2.1%	4.8%	8.8%	1.9%	5.8%	9.4%	1.0%	5.7%
Recurring profit	**4,359**	**119**	**4,478**	**4,523**	**2,918**	**7,441**	**5,604**	**2,470**	**8,074**	**6,479**	**1,621**	**8,100**
YoY	-2.4%	-96.7%	-44.5%	3.8%	2352.1%	66.2%	23.9%	-15.4%	8.5%	15.6%	-34.4%	0.3%
RPM	10.6%	0.6%	7.2%	11.9%	7.3%	9.6%	10.3%	5.8%	8.3%	10.9%	3.4%	7.6%
Net income	**3,073**	**350**	**3,423**	**3,345**	**3,907**	**7,252**	**4,454**	**252**	**4,706**	**4,663**	**937**	**5,600**
YoY	-4.2%	-89.6%	-47.8%	8.9%	1016.3%	111.9%	33.2%	-93.6%	-35.1%	4.7%	271.8%	19.0%
Net margin	7.5%	1.6%	5.5%	8.8%	9.8%	9.3%	8.2%	0.6%	4.9%	7.8%	2.0%	5.2%

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

For FY10/19, the company forecasts full-year sales of JPY107.0bn (+10.5% YoY), an operating profit of JPY6.1bn (+9.3% YoY), recurring profit of JPY8.1bn (+0.3% YoY), and net income of JPY5.6bn (+19.0% YoY). There are no changes to the forecast as of 1H FY10/19 earnings release.

In the mainstay Agricultural Chemicals and Agriculture-Related Businesses, Kumiai Chemical will step up marketing in the domestic market (which is essentially trending sideways) to establish closer ties with the end user (i.e., farming households), and maximize early sales of the new herbicide for rice paddies (Effeeda) that it will be rolling out in 2019. To strengthen marketing activities, the company has established the Core-Farmers Promotion Section under its Marketing Department, and signaled its intention to collaborate with Zen-Noh on a support structure for domestic farmers, who manage increasingly large acreages. Overseas, the company will focus on increasing sales of its herbicide for field crops (Axeev) by both increasing the number of countries in which it is sold and the number of crops to which it is applied. Likewise, at its Fine Chemical Business, the company is looking to develop new customers and expand business domains.

Factors affecting sales growth: Axeev remains the driver

Kumiai Chemical forecasts a JPY10.2bn YoY increase in sales in FY10/19, breaking down into increases of roughly JPY6.2bn in the Agricultural Chemicals and Agriculture-Related Businesses and about JPY3.6bn in the Fine Chemicals Business.

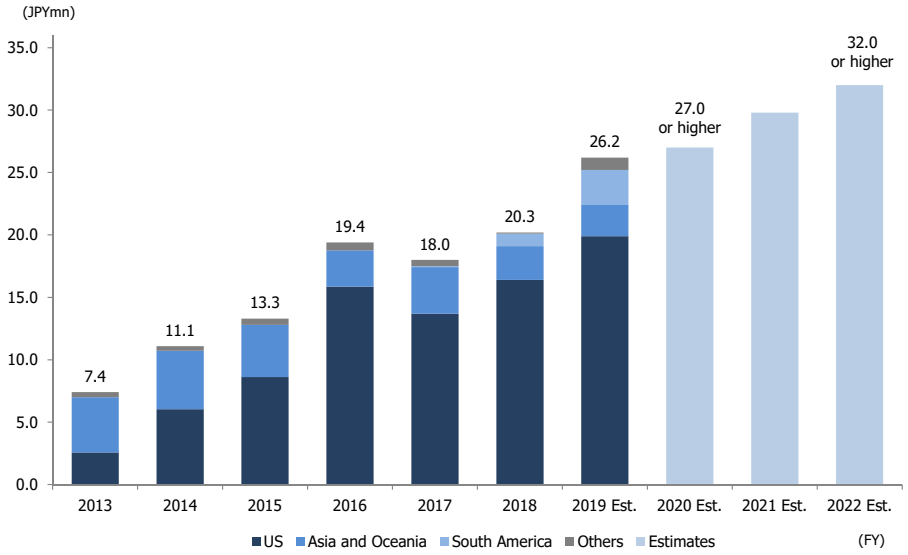
The company expects sales growth in the Agricultural Chemicals and Agriculture-Related Businesses to be driven in large part by an expansion in sales of Axeev on a projected rise in demand, primarily in North America. In FY10/19, sales continue to be driven by North America and Argentina, but the company also looks to expand sales into countries such as India and Brazil. In addition, it expects the domestic launch of Effeeda (paddy rice herbicide developed in-house) in FY10/19 to contribute to sales growth. On the downside, it forecasts a decline in Axeev sales in Australia owing to inventory reductions accompanying a new formulation of the product, and anticipates sales of Nominee falling in Asia on competition from generic agrochemicals. On the whole, however, the company expects these negatives to be outweighed by Axeev sales growth mainly in North and South America markets.

Factors affecting profit growth: Despite expansion in Axeev sales, operating profit growth to remain in single digits on higher SG&A expenses stemming from an increase in consolidated subsidiaries

Kumiai Chemical forecasts a JPY500mn YoY increase in operating profit in FY10/19. Although it expects gross profit to rise roughly JPY1.8bn in tandem with sales expansion in the Agricultural Chemicals and Agriculture-Related Businesses driven by Axeev sales growth, it anticipates SG&A expenses climbing roughly JPY1.3bn on higher R&D expenses and an increase for expenses of newly consolidated subsidiaries. Consequently, the company expects operating profit to increase only around JPY500mn. It is focused on rapidly starting up Iharanikkei Chemical (Thailand) to take advantage of a market environment characterized by robust aramid fiber demand, and it expects related upfront spending to weigh down earnings in FY10/19. As the FY10/19 forecasts are the first forecasts compiled by the company since it merged with Ihara Chemical to integrate manufacturing and sales, Shared Research

believes that Kumiai Chemical has adopted conservative targets across the board for new subsidiaries in the Fine Chemicals Business.

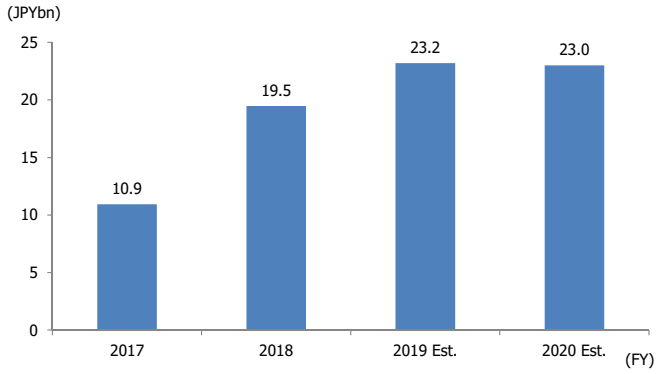
Consolidated sales of Axeev and trends in markets where Axeev is sold



2013	2014	2015	2016	2017	2018	2019 Est.	2020 Est.
US	Saudi Arabia		Turkey	Mexico	New Zealand	India	Chile
						China	
Australia	Canada			Argentina		South Korea	
South Africa	Japan					Brazil	
						Bolivia	

Source: Shared Research based on company data

Sales of Fine Chemicals Business



Source: Shared Research based on company data

Medium-term management plan

Medium-term plan: By FY10/20, sales of JPY116bn, operating profit of JPY9bn, ROE of 7.5% or higher

Kumiai Chemical's medium-term plan, announced on September 13, 2017, calls for FY10/20 sales of JPY116.0bn, operating profit of JPY9.0bn, and ROE of 7.5% or higher. To achieve its targets, the company aims to generate synergies quickly, and grow sustainably as an original, R&D focused company. In its core Agricultural Chemicals and Agriculture-Related Businesses, the company aims to accelerate decision-making and technological innovation by integrating processes end-to-end. Simultaneously, the company announced a long-term vision: sales of JPY140.0bn by 2022.

Business process integration after merger

Business process		Before consolidation	After consolidation	Expected benefits
Research and development	Screening of candidate compounds Biological evaluation Considerations on formulation	Kumiai Chemical	Kumiai Chemical	Accelerate innovation of technologies
	Considerations on processes	Ihara Chemical		
Active ingredients manufacturing	Safety Low cost	Ihara Chemical	Kumiai Chemical	Establish structure for stable supply with safe operation
Formulations manufacturing	Stable production	Kumiai Chemical		Establish efficient supply chain
Marketing	Sales channels in Japan	Kumiai Chemical	Kumiai Chemical	Strengthen sales channels in Japan
	Tie-up sales channels overseas			Expand sales channels overseas

Source: Shared Research based on company data

North America, where the company continues to launch new mixture products, should drive growth, based on expanding sales of herbicides for field crops. The company also plans to ramp up these products in Brazil and India following their launch on the Argentinian market. Another growth strategy is to expand in India sales of herbicides for paddy rice, a core competency, through a joint venture there. In the domestic market the company also plans to develop and introduce new paddy rice herbicides effective on weeds that are resistant to some herbicides, which can also be used in feed rice production. As well as proposing new agricultural methods that fuse the company's proprietary safe, laborsaving formulations and new technologies such as drones, Kumiai Chemical intends to take advantage of its organic synthesis technologies developed in the production of active ingredients used in agrochemicals to expand into non-agriculture fields such as electronic materials and other fine chemicals.

Long-term vision: Sales of JPY140bn by FY10/22

Kumiai Chemical's long-term vision is to generate sales of JPY140.0bn by FY10/22 by achieving four objectives (as of September 13, 2017):

- ▷ Expand the sales area for Axeev (herbicide for field crops: common name, Pyroxasulfone)
- ▷ Launch Effeeda (herbicide for paddy rice: common name, Fenquinotrione)
- ▷ Build a foundation for growth in the Fine Chemicals segment
- ▷ Engage in M&A and business alliances

Axeev (Pyroxasulfone) is an active ingredient, which the company developed in 2011 as an herbicide for field crops. It can be used on virtually all cereals other than rice (soybeans, corn, and wheat) so there is a global market. It is also effective on a wide range of weeds, from grasses to small broadleaf varieties, and highly effective on those that are resistant to some herbicides such as glyphosate. Kumiai Chemical therefore believes that boosting sales of herbicides containing Axeev will increase its access to a world market.

Effeeda (Fenquinotrione) is a paddy rice herbicide. The company received registration for two paddy rice herbicides containing it as the active ingredient in March 2018, and plans a full-scale sales launch from FY10/19. Effeeda can be used as a paddy rice herbicide to eradicate a wide weed species from broadleaf through *Cyperaceae* (sedge) weeds and is very effective on weeds

resistant to sulfonylurea (used in existing agrochemicals), while being considered highly selective for rice, and can be used in various cultivation including direct seeding. It can also be used on rice used as feed, for which planted acreage is increasing, as well as high-yield varieties.

The Fine Chemicals segment has been taken over, essentially as is, from Ihara Chemical. Kumiai Chemical is expanding production capacity at relevant subsidiaries (expanding and building new facilities), and says it has plans to nurture the Fine Chemicals business as part of its growth strategy.

Regarding M&A activity and alliances, immediately after the merger with Ihara Chemical, the company established a joint venture in India involved in the manufacture and marketing of paddy rice herbicides, but has made no further announcements. However, it has used active ingredients from other companies to expand its lineup, so Shared Research thinks the company may continue pursuing alliances of this nature.

For details on previous quarterly and annual results, please refer to the Historical financial statements section.

Business

Business model

Overview: Sells products developed in-house via Zen-Noh and agricultural cooperatives

Products developed in-house

Kumiai Chemical develops own active ingredients through R&D and sells these active ingredients and formulated products. In Japan, Kumiai Chemical sells products via the National Federation of Agricultural Co-operative Associations (Zen-Noh), agricultural cooperatives, and sells active ingredients and products to other companies. The company exports active ingredients and its products mainly in bulk and sell them via subsidiaries. Agrochemical products include herbicides, fungicides, insecticides, and others.

> Active ingredients for agrochemicals: The active ingredients are liquid or solid chemical substances which promote certain plant growth, or protect crops from some diseases, pests or weeds. To produce agrochemical products, active ingredients are combined with various secondary material, such as emulsifiers, solvents, stabilizing agents, and spreading agents (to help cover crops and pests uniformly).
> Bulk: The contents are the same as the final product, but before packaging in smaller amounts.

Distribution routes

In Japan, Kumiai Chemical sells agrochemicals manufactured by itself for farmland use via Zen-Noh. The company negotiates individual product pricing with Zen-Noh every year based on the previous year's price and agricultural conditions at the time of negotiations. It uses subsidiaries to sell products for uses other than farmland. Overseas, Kumiai Chemical distributes via trading companies, local distributors, and its subsidiaries, which set pricing according to local markets. Prices are affected by local agricultural conditions and exchange rates.

Advantages of being a Zen-Noh-affiliated manufacturer

Two main distribution channels exist for agrochemicals in Japan: cooperative route (a catch-all term for Zen-Noh, prefectural Economic Federations of Agricultural Cooperatives [Keizairen], and agricultural cooperatives) and commercial routes. Cooperative organizations sell products directly to farmers, whereas commercial routes use general wholesalers and retailers.

Kumiai Chemical is affiliated with Zen-Noh, its largest shareholder, so in Japan it sells agrochemicals to farmers mainly through the cooperative route. Zen-Noh has two other affiliated agrochemical manufacturers, but Kumiai Chemical is the largest.

Manufacturers and Zen-Noh determine pricing on individual products based on the previous year's price, agricultural conditions, and production costs through negotiations each year. Farmers purchase from agricultural cooperatives the agrochemicals distributed by Zen-Noh and Keizairen. In Japan, which is characterized by numerous small-scale farmers, agricultural cooperatives have a major role in procuring and paying for agricultural materials. The split between cooperative and commercial routes is 4 versus 6. For manufacturers, the cooperative route provides better access to farmers than the commercial route in some categories.

> National Federation of Agricultural Co-operative Associations (Zen-Noh or JA Zen-Noh): Zen-Noh is made up of JA agricultural co-op members, and is in charge of economic business of marketing and supply at the national level. Formed through the Agricultural Cooperatives Act, Zen-Noh's main activities are the sales of rice, vegetables, fruit, and livestock products under consignment from farmers, and the collective purchase of fertilizer, agrochemicals, feed, farm equipment, oil, and lifestyle goods.
> Economic Federation of Agricultural Cooperatives (Keizairen): Keizairen is in charge of economic business of the JA Group, similar to Zen-Noh, at the prefectural level. Individual agricultural cooperatives are members of this prefectural-level federation. Keizairen and the individual cooperatives have the same aims, but Keizairen's larger scale enables it to distribute and sell agricultural products more efficiently. In recent years, Keizairen has been merging with Zen-Noh or prefectural-level agricultural cooperatives, so the remaining Keizairen organizations now exist largely in areas where agricultural output is relatively high. The merged entities serve as Zen-Noh's prefectural HQ. One of the key remaining Keizairen organizations is in Hokkaido, named the Hokuren Federation of Agricultural Cooperatives.

Kumiai Chemical's distinctive development and distribution channels

Kumiai Chemical's development capabilities and distribution channels are distinctive. The Ministry of Agriculture, Forestry and Fisheries (MAFF) explains that getting agrochemicals to market typically requires around 10 years, including the time from the

development of active ingredients through approval by MAFF (the regulatory authority). As of end-March 2018, Kumiai Chemical brought to market products containing five active ingredients it has developed in the last ten years. Through its distribution channels in Japan, the company has strong access to end-users (farmers) because it uses Zen-Noh and agricultural cooperatives rather than general wholesalers and retailers.

Merger in May 2017

Combined manufacturing and sales

The company was formed in 1928 as a citrus cooperative in Ihara-gun (former name, currently Shizuoka City), Shizuoka Prefecture. In 1949, it changed format to a joint stock company renamed Ihara Agrochemical and subsequently strengthened collaboration with Zenkoren (currently Zen-Noh). In 1965, Ihara Chemical was jointly established by Ihara Agrochemical (company name changed in Japanese [from Chinese characters to katakana] in1962; English name remained the same) and Nippon Soda (TSE1: 4041). Ihara Chemical's role was to industrialize and produce the active ingredients for agrochemicals sold by Ihara Agrochemical, which was renamed Kumiai Chemical in 1968.

In May 2017, Kumiai Chemical merged with Ihara Chemical, which at the time was an equity-method affiliate. The merger created vertical integration in agrochemicals by combining active ingredient industrialization and production (under Ihara), agrochemical formulation, and sales. The objectives of the merger were to consolidate the two companies' management resources and integrate processes from new agrochemical discovery through research, development, active ingredient manufacture , product formulation, and marketing; minimize business risk by speedier, more accurate decision making; boost business efficiency by effective utilization of the merged entity's management resources; strengthen management foundation; and aim at sustainable growth as a unique, R&D focused company.

Background to the merger

From the start, the former Kumiai Chemical and Ihara Chemical had a close business and capital relationship. Ihara Chemical's main business was industrializing and producing active ingredients for the agrochemicals Kumiai Chemical sold. Kumiai Chemical owned around 25% of Ihara Chemical's shares.

The impetus for the merger was Kumiai Chemical's core business, the agrochemical business. Shared Research attributes the decision to an increasing need for overseas development in light of a changing market in Japan and the growing importance of agrochemicals in sustaining farm productivity amid burgeoning food demand due to global population growth and economic development in emerging markets. We think another underlying aim was a growing realization of the need for closer coordination between the companies given the changing operating environment.

Post-merger, Kumiai Chemical is facing challenges on many fronts, both in Japan and overseas. In Japan, agricultural policies are changing, as is the direction of the cooperative business and farm management. Overseas, markets are growing more oligopolistic, as repeated mergers have created four giant groups (See the Comparable companies section for details). As well as such an oligopolistic environment, the company has to respond to generic agrochemicals and seeds, areas building a new position in crop pest control. Kumiai Chemical thinks it can better address these issues with a structure that integrates R&D, production, and sales.

Types of agrochemical manufacturers in Japan defined by development and manufacturing

Agrochemical manufacturers process active ingredients (whether developed in-house or by third parties) in order to formulate products and sell the products to farmers. MAFF groups Japan's agrochemical producers according to four business patterns.

- Foreign manufacturers: Multinationals' Japanese entities
- R&D-type manufacturers: Japanese companies that develop and manufacture raw materials for agrochemicals and sell those active ingredients to other companies. Kumiai Chemical falls into this category.
- Formulation manufacturers: Companies that mainly use purchased active ingredients to produce formulations
- Manufacturers handling only specialized agrochemicals: Companies handling items such as lime and soil fumigants

Foreign manufacturers operating in Japan primarily procure active ingredients, either from Japan or overseas, for manufacture and sale to Japanese farmers. Japanese R&D-type manufacturers, on the other hand, produce active ingredients for domestic and overseas sale, and for use in formulating agrochemicals which they sell to farmers in Japan. Japanese companies that do not produce active ingredients themselves purchase active ingredients and sell formulations. Manufacturers that only handle specialty agrochemicals mostly develop their active ingredients in-house.

Kumiai Chemical mixes active ingredients it has developed and registered with other active ingredients and secondary active ingredients to manufacture agrochemicals, which it ships to Zen-Noh prefectural HQ (or Keizairen and prefectural agricultural cooperatives). In general, products Japanese manufacturers sell to Zen-Noh pass through regional agricultural cooperatives before sale to farmers. Products sold through wholesalers are typically purchased by end customers at home improvement stores or other retailers. Kumiai Chemical is affiliated with Zen-Noh, so it basically distributes its farmland products to farmers via Zen-Noh and agricultural cooperatives.

Business by segment

Segment sales and profit (JPYmn)	FY10/09 Act.	FY10/10 Act.	FY10/11 Act.	FY10/12 Act.	FY10/13 Act.	FY10/14 Act.	FY10/15 Act.	FY10/16 Act.		FY10/16 Act.	FY10/17 Act.	FY10/18 Act.
Sales	**39,227**	**38,252**	**42,095**	**44,072**	**49,283**	**55,360**	**61,124**	**62,549**	**Sales**	**62,549**	**77,817**	**96,846**
YoY	-	-2.5%	10.0%	4.7%	11.8%	12.3%	10.4%	2.3%		2.3%	24.4%	24.5%
Chemicals	36,047	34,949	38,275	39,958	45,251	51,222	56,747	58,167	Agricultural Chemicals	55,828	60,636	68,147
YoY	-	-3.0%	9.5%	4.4%	13.2%	13.2%	10.8%	2.5%		-	8.6%	12.4%
% of total sales	88.8%	88.1%	87.8%	87.6%	88.9%	90.0%	90.2%	90.7%		87.1%	75.7%	68.2%
Leasing	377	377	387	458	415	419	422	419	Fine Chemicals	2,243	10,937	19,466
YoY	-	0.0%	2.7%	18.3%	-9.4%	1.0%	0.7%	-0.7%		-	387.6%	78.0%
% of total sales	0.9%	1.0%	0.9%	1.0%	0.8%	0.7%	0.7%	0.7%		3.5%	13.6%	19.5%
Other	4,192	4,345	4,923	5,190	5,207	5,282	5,760	5,546	Other	6,060	8,574	12,338
YoY	-	3.6%	13.3%	5.4%	0.3%	1.4%	9.0%	-3.7%		-	41.5%	43.9%
% of total sales	10.3%	11.0%	11.3%	11.4%	10.2%	9.3%	9.2%	8.6%		9.4%	10.7%	12.3%
Adjustments	-1,388	-1,419	-1,490	-1,534	-1,590	-1,563	-1,804	-1,582	Adjustments	-1,582	-2,332	-3,105
Operating profit	**667**	**990**	**1,446**	**1,657**	**2,105**	**2,629**	**3,723**	**2,267**	**Sales**	**2,267**	**3,764**	**5,582**
YoY	-	48.4%	46.1%	14.6%	27.0%	24.9%	41.6%	-39.1%		-39.1%	66.0%	48.3%
Chemicals	885	1,115	1,541	1,676	2,289	2,844	3,868	2,566	Agricultural Chemicals	2,421	3,554	4,992
YoY	-	26.0%	38.2%	8.8%	36.6%	24.2%	36.0%	-33.7%		-	46.8%	40.5%
% of total segment profit	72.5%	73.3%	77.8%	75.0%	85.4%	87.2%	87.7%	84.0%		79.3%	71.6%	73.0%
Leasing	231	236	247	291	255	259	258	261	Fine Chemicals	38	858	1,249
YoY	-	2.2%	4.7%	17.8%	-12.4%	1.6%	-0.4%	1.2%		-	2177.8%	45.6%
% of total segment profit	18.9%	15.5%	12.5%	13.0%	9.5%	7.9%	5.8%	8.5%		1.2%	17.3%	18.3%
Other	105	171	192	268	137	159	287	226	Other	594	552	599
YoY	-	62.9%	12.3%	39.6%	-48.9%	16.1%	80.5%	-21.3%		-	-7.2%	8.5%
% of total segment profit	8.6%	11.2%	9.7%	12.0%	5.1%	4.9%	6.5%	7.4%		19.5%	11.1%	8.8%
Adjustments	-554	-532	-534	-578	-575	-632	-690	-786	Adjustments	-786	-1,200	-1,259

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.
Note: Kumiai Chemical reclassified its segments due to its merger with Ihara Chemical on May 1, 2017.

Segment changes in FY10/17

Kumiai Chemical changed its segments in FY10/17 to Agricultural Chemicals and Agriculture-Related Businesses, Fine Chemicals Business, and Other Businesses (previously the Chemicals, Leasing, and Other segments), due to the merger with Ihara Chemical. For comparison, the changes are retroactively applied to FY10/16 results.

In sales, the former Chemicals segment, which was mostly agrochemicals and agrochemical-related, was moved to Agricultural Chemicals and Agriculture-Related Businesses. Most of the operations in the newly established Fine Chemicals Business were acquired from Ihara Chemical in the merger. The business of producing and selling chemicals other than those sold by Ihara Chemical to Kumiai Chemical before the merger is now in Fine Chemicals. Business from the former Other and Leasing segments was moved to Other Businesses.

Reporting segment changes: As with sales, operating profit for the former Chemicals segment was transferred to the new Agricultural Chemicals and Agriculture-Related Businesses. The change boosts operating profit because part of the previous cost of sales (Kumiai Chemical's cost of buying agrochemical ingredients from Ihara Chemical, which generated profit for Ihara Chemical) became profit for Kumiai Chemical after the merger. The new Fine Chemicals Business corresponds to new profit for the consolidated entity. In the new Other Businesses, profit is in line with the amount of sales moved to that segment.

Agricultural Chemicals and Agriculture-Related Businesses

Segment details and earnings trends

In the Agricultural Chemicals and Agriculture-Related segment the company manufactures and sells agrochemicals. Following the reclassification accompanying the May 2017 merger, non-agricultural products and items manufactured under consignment are included to this segment.

Agrochemical business

Sales of mainstay herbicide Axeev in the agrochemical business have grown dramatically since it was launched in 2011. However, the Japanese agrochemical market remains flat on a monetary basis, so the company has posted a solid domestic sales performance. Kumiai Chemical's principal agrochemicals in the domestic market are paddy rice herbicides, box granules, insecticides and fungicides for upland crops, and lawn herbicides. This business is further categorized into product sales in the

Japanese market, corporate marketing (non-crop land such as golf courses and agrochemical materials), and sales to markets outside Japan.

Segment earnings

The following chart shows sales and operating profit for Kumiai Chemical's former Chemicals segment and Ihara Chemical's former "Agrochemical" segment. Because of the segment change in FY10/17, the data are discontinuous, but profit margin was high in the former Ihara Chemical segment that manufactured active ingredients, mostly for sale to Kumiai Chemical. Kumiai Chemical's cost of procuring active ingredients (posted as cost of sales) accounted for the majority of sales at the former Ihara Chemical.

Agrochemical-related segments

(JPYmn)		FY10/11 Act.	FY10/12 Act.	FY10/13 Act.	FY10/14 Act.	FY10/15 Act.	FY10/16 Act.	FY10/17 Act.	FY10/18 Act.
Former Kumiai Chemical Industry	Sales	38,275	39,958	45,251	51,222	56,747	58,167	60,636	68,147
	YoY	9.5%	4.4%	13.2%	13.2%	10.8%	2.5%	4.2%	12.4%
	Operating profit	1,541	1,676	2,289	2,844	3,868	2,566	3,554	4,992
	YoY	38.2%	8.8%	36.6%	24.2%	36.0%	-33.7%	38.5%	40.5%
	OPM	4.0%	4.2%	5.1%	5.6%	6.8%	4.4%	5.9%	7.3%
Former Ihara Chemical Industry	Sales	13,679	14,085	18,142	22,817	26,887	31,474	-	-
	YoY	-	3.0%	28.8%	25.8%	17.8%	17.1%	-	-
	Operating profit	2,275	1,835	2,157	3,386	4,857	4,077	-	-
	YoY	-	-19.3%	17.5%	57.0%	43.4%	-16.1%	-	-
	OPM	16.6%	13.0%	11.9%	14.8%	18.1%	13.0%	-	-

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.
Note: FY10/17 results represent Kumiai Chemical's earnings after the merger in May 2017.

Kumiai Chemical's operating profit for FY10/17 incorporates six months' worth (May–October 2017) of active ingredient manufacture by Ihara Chemical. By looking at a full twelve months of production by Ihara Chemical and accounting for the lower costs post-merger, Shared Research estimates that the agrochemical-related business should be able to deliver an OPM of between 5% and 10%. This level is essentially the same as for Hokko Chemical Industry Co., Ltd. (TSE1: 4992), another agrochemical company that distributes via cooperatives. Hokko's OPM is around 6%. (The average is 5.9% for the three years from FY11/15 through FY11/17).

Main agrochemical offerings (Japan)

Herbicides for paddy rice

This type of herbicide to control weeds in rice paddies differs from those used on upland crops, because the rice is mainly cultivated in standing water. The method of dissemination and timing depend on what weeds are being targeted, and a variety of dosage forms exist to suit these conditions. The company's main products have Pyriminobac-methyl, Pyrimisulfan, Fenoxasulfone, and Fenquinotrione developed by the company as active ingredients and come in various type of formulations and package units.

Box granules

Rice plants are usually cultivated in seeding boxes before being transplanted into paddies for cultivation. Chemicals in this category are applied in the seeding boxes before planting to control pests that emerge while rice is being cultivated and after planting in the paddy. Kumiai Chemical's main products have Clothianidin, Imidacloprid, or Isotianil developed by other companies as active ingredients.

Fungicides

These chemicals are used to eradicate disease on various types of horticultural crops, including apples, pears, grapes, citrus and other tree fruits, soybeans, adzuki, cabbage, cucumbers, tomatoes, and other vegetables. Kumiai Chemical's lineup includes products which contain active ingredients include Pyribencarb, Benthiavalicarb-isopropyl, and Mepanipyrim it has developed.

Insecticides

These chemicals are used to eradicate pests that damage fruit trees and vegetables. The company's main products are agrochemicals that contain active ingredients developed by others such as Imidacloprid, Cyazypyr, and Methidathion.

The following table outlines Kumiai Chemical's main products for the Japanese market. Characteristically, products for paddy rice (by crop) and herbicides (by type) make up the core of Kumiai Chemical's products, and many of these are made from active ingredients it has developed.

Main products

Product	Application	Category	Applicable diseases	Active ingredients
Emperor	Paddy rice	Herbicide	Broad-leaf weeds (Monochoria vaginalis, Monochoria korsakowii, other), Cyperaceae family weeds (Scirpus hotarui, Bolboschoenus fluviatilis, other), sulfonylurea-resistant weeds	Fenquinotrione (Effeeda), Pyraclonil, Pyriminobac-methil
Beluga	Paddy rice	Herbicide	Broad-leaf weeds (Monochoria vaginalis, Monochoria korsakowii, other), Cyperaceae family weeds (Scirpus hotarui, other), Murdannia keisak that invade rice field from ridges, sulfonylurea-resistant weeds	Fenquinotrione (Effeeda), Pyriminobac-methil
Avanti	Paddy rice	Herbicide	Broad-leaf weeds (Monochoria vaginalis, Monochoria korsakowii, other), Cyperaceae family weeds (Scirpus hotarui, other), perennial weeds, sulfonylurea-resistant weeds	Fenquinotrione (Effeeda), Triafamone, Fentrazamide
Gun-Gun	Paddy rice	Herbicide	Long-residual effect on Echinochloa and annual broad-leaf weeds (Monochoria, Lindernia)	Fenoxasulfone Pyrimisulfan
Benkei	Paddy rice	Herbicide	Echinochloa, Lindernia, Monochoria and other annual broadleaf weeds, and Scirpus on pre-emergence to two leaf stage	Fenoxasulfone Pyrimisulfan Benzobi-cyclon
Topgun	Paddy rice	Herbicide	Echinochloa, procumbens, monochoria and other annual broadleaf weeds, and two leaf stages before scirpus germination	Pyriminobac-methyl Bromubutide Bensulfuron-methyl Pentoxazone
Atotori	Paddy rice	Herbicide	Echinochloa, three-leaf arrowhead, spikerush, Scirpus, Schoenoplectus	Pyrimisulfan
Starkle	Paddy rice	Insecticide	Hemiptera	Dinotefuran
Coratop	Paddy rice	Fungicide	Rice blast fungus	Pyroquilon
Fantasista	Fruit trees, fruit & vegetable	Fungicide	Various diseases	Pyribencarb
Propose	Vegetables	Fungicide	Downy mildew, late blight, etc.	Benthiavalicarb-isopropyl, TPN
Colt	Fruit trees, fruit & vegetable	Insecticide	Aphids, whiteflies, scale insects, yellow tea thrips, and other pests	Pyrifluquinazon

Source: Shared Research based on company materials and websites

Main agrochemical offerings (overseas)

As of end-October 2018, overseas sales accounted for roughly 42% of total sales. Herbicides for paddy rice and upland crops make up the majority. Herbicides for paddy rice are sold mainly in other parts of Asia, while those for upland crops are primarily sold in North America, and Oceania.

When exporting agrochemicals, Kumiai Chemical exports active ingredients to its overseas sales subsidiaries, which formulate and market them as agrochemicals, although it sometimes manufactures formulations in Japan (e.g., paddy rice herbicide Nominee).

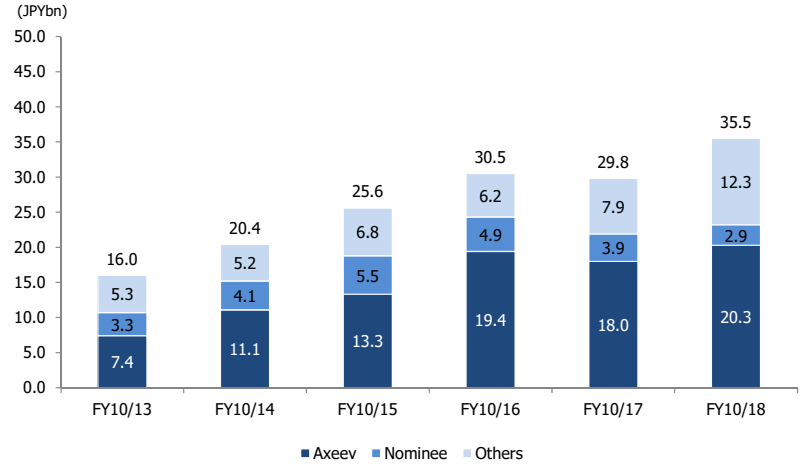
Herbicide for paddy rice: Nominee

The active ingredient in Nominee is Bispyribac-sodium, which Kumiai Chemical was granted registration approval for in 1997. Regarding soil applied herbicides, their effect deteriorates unless used shortly after weeds germinate. Nominee, on the other hand, is a foliage treatment product highly selective between rice and weeds, so is highly effective after weeds grow, and on both transplanted rice (plants are first raised in seeding boxes before being transplanted to paddies) and directly seeded rice (seeds are sown directly into dry or wet paddies for cultivation). The product is also effective in low doses.

Herbicide for field crops: Axeev (brand name)

Axeev is a brand name for Pyroxasulfone, which Kumiai Chemical was granted registration for in 2011. It can be used with major world crops such as corn, soybeans, and wheat. The chemical is also effective on a wide range of grasses and small seed broadleaf weeds. Being highly selective, Axeev is effective on weeds while having only a limited phytotoxicity on crops. Kumiai Chemical says Axeev is effective even on the herbicide-resistant weeds that have begun spreading around the world in recent years.

Overseas sales (consolidated) by product



Source: Shared Research based on company data

R&D structure

As an R&D-oriented manufacturer, costs are high

Kumiai Chemical currently has two research institutes (five research centers) that span research into new product development, formulation, and processes through market launch. Before the merger, R&D was divided between Kumiai Chemical, Ihara Chemical, and K-I Chemical Research Institute, which both companies had invested in.

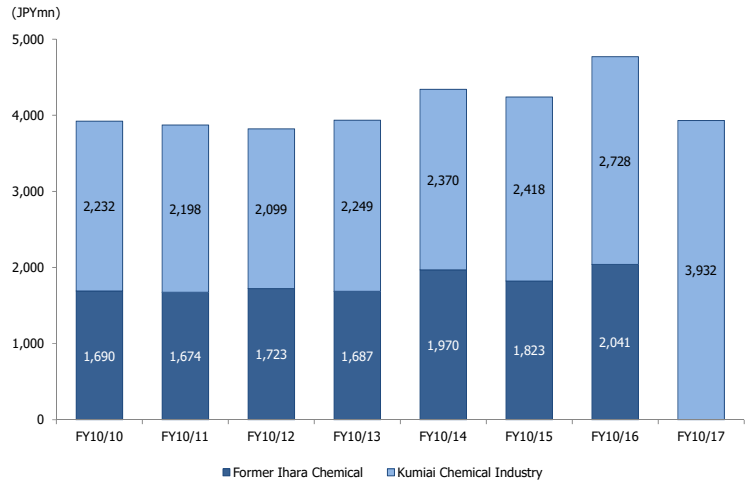
- ▷ Chemical Research Institute:
  - ➢ New Molecule Research Center (Iwata, Shizuoka Prefecture)
    - ✧ Conducts research on the structure and synthesis of new bioactive chemical compounds, and studies their physiochemical properties
  - ➢ Formulation Technology Research Center (Shizuoka, Shizuoka Prefecture)
    - ✧ Verifies the effectiveness of promising compounds and establishes new formulation technologies to maximize effectiveness
  - ➢ Process Chemistry Research Center (Fuji, Shizuoka Prefecture)
    - ✧ Conducts research on synthesis processes toward the industrial manufacture of promising compounds
- ▷ Life Science Research Institute:
  - ➢ Agrochemical Research Center (Kikugawa, Shizuoka Prefecture)

- Life & Environment Research Center (Kakegawa, Shizuoka Prefecture)
  - ✧ Conducts biological evaluation of new compounds, practical research on promising compounds, as well as research on mode of action, toxicity, metabolism, and residue

R&D expenses rising

The following graph shows R&D expenses for the two companies before the merger, and for the combined entity in FY10/17. Before the merger, both companies were incurring expenses on products developed jointly, and R&D expenses were rising from 2013 onward. This trend of rising R&D expenses highlights the extent to which Kumiai Chemical was active in R&D aimed at developing new formulations and expanding applications for existing ones.

R&D expenses



Source: Shared Research based on company data
Note: For Kumiai Chemical, R&D expenses from FY10/10 though FY10/16 are pre-merger and the figure for FY10/17 is post-merger.
Note: Figures for FY10/17 do not include R&D expenses for Ihara Chemical from November 2016 through April 2017.

Collaboration between research institutes

The company explains that the New Molecule Research Center designs and synthesizes new agrochemical candidate compounds based on information it gathers from several sources and theoretical structures developed in-house. The Life Science Research Institute's team then screens the synthesized compounds for crops and animals safety and functionality as active ingredients in terms of effectiveness against weeds, diseases, and pests. The New Molecule Research Center uses this information to improve the target compounds, and the process repeats. Meanwhile, the New Molecule Research Center also measures and analyzes the physio-chemical properties of target compounds, investigating the relationship of these properties to bioactivity. In this way, the New Molecule Research Center and the Life Science Research Institute work closely with each other, optimizing compounds through a repeated process of synthesis and bioassay testing as they work to create promising compounds.

The promising compounds ultimately selected through this iterative process proceed to field testing and initial toxicity tests to determine practical utility. If judged to have practical use, the Agrochemical Research Center evaluates them with a view to commercialization, and the Life & Environment Research Center evaluates, toxicity, metabolic, and environmental dynamics. At the same time, the Formulation Technology Research Center considers formulation processes, while the Process Chemistry Research Center studies active ingredient industrial production processes. Based on the results of these tests and considerations, if decided a product can be commercialized, they register an agrochemical application. Agrochemicals containing the new active ingredient can be launched on the market only after registration.

For active agrochemical ingredients, it typically takes around ten years from the start of new compound development until a product goes to market. From 2010 through 2018, Kumiai Chemical gained registration for products containing five active ingredients it developed, and plans to develop two more active ingredients and register products containing them by 2021. To date, the company has a track record of developing and bringing to market 18 active ingredients, centering on herbicides for paddy rice. Shared Research believes these results are one reason the company's development expertise is highly regarded.

New products developed since 1997

Initial registration	Active ingredients	Use
1994	Prohexadione-calcium	Plant growth regulator
1997	Bispyribac-sodium (Brand name: Nominee)	Herbicide for paddy rice
2010	Pyrimisulfan	Herbicide for paddy rice
2011	Pyroxasulfone (Brand name: Axeev)	Herbicide for crops and lawn
2012	Pyribencarb	Fungicide for garden products
2014	Fenoxasulfone	Herbicide for paddy rice and lawn
2018	Fenquinotrione (Brand name: Effeeda)	Herbicide for paddy rice
2020 (planned)	Dichlobentiazox	Fungicide for paddy rice
2021 (planned)	Undisclosed (to be applied for registration)	Miticide

Source: Shared Research based on company data

Fields other than agriculture and subcontract production

Kumiai Chemical's agrochemicals are sometimes used for purposes other than agriculture, but these are included in the Agricultural Chemicals and Agriculture-Related segment. For example, the company's herbicides are used on golf courses, and its agrochemicals are used to control weeds in parks and along roads. The company's lawn herbicides use the same active substances as crop herbicides: Bispyribac-sodium and Pyroxasulfone are sold via consolidated subsidiary Rikengreen (TSE JASDAQ Standard: 9992). Other companies that sell agrochemicals outsource active ingredient and formulation production to Kumiai Chemical for processing.

Fine Chemicals Business

Segment details and earnings trends

This segment is essentially Ihara Chemical's former Fine Chemicals segment. The business is based on organic synthesis technologies the company has developed in agrochemical active ingredient manufacture. The core of this business uses chlorination technology to manufacture and market pharmaceuticals, intermediates for agrochemicals, electronics materials, and polymer raw materials.

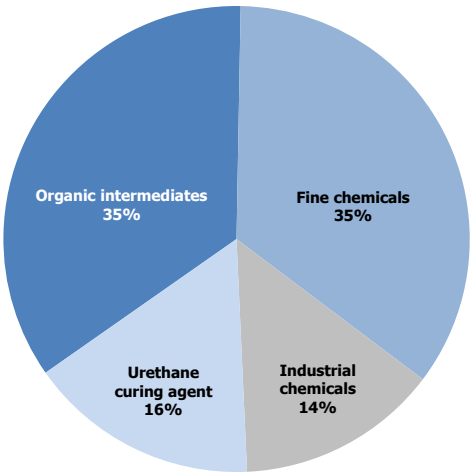
> Chlorination: A reaction using chlorine or hydrogen chloride to manufacture chlorine derivatives, important intermediates in the organic chemical industry. (Intermediates are substances manufactured in the chemical reaction process, between the starting material and end substance).

Chemical business

This business comprises four main sub-segments. The post-merger share of these four fields is as yet undisclosed, but their arrangement within Ihara Chemical's Fine Chemicals segment (which Kumiai Chemical took over) was as follows.

- Intermediates for agrochemicals and pharmaceuticals, dyes, and chlorotoluene- and chloroxylene-based chemical products for polymer materials
  - Examples: Intermediates for agrochemical active ingredients, pharmaceutical intermediates
- Bismaleimides and other fine chemicals used in electronic materials and high-heat-resistant resins
  - Examples: Carbon fiber composite materials, laminates, motor varnishes
- Urethane products such as amine-based curing agents
  - Examples: Ihara Cuamine MT (top share of the industry for amine-based curing agents used in urethane resin manufactured products and waterproofing materials)
- Fungicides, anti-mold agents, cleaning agents and other industrial chemicals
  - Examples: Disinfectants for spas and baths, antibacterials for disposable towels

Composition of the Fine Chemicals Business



Source: Shared Research based on company website
Note: Materials from Ihara Chemical

Kumiai Chemical plans to expand the polyurethane curing agent and high-performance resin businesses it took over from Ihara Chemical, but Shared Research understands that the segment will remain largely unchanged. The company's main aim is to boost capacity in the fine chemicals field. The medium-term management plan calls for the new plant at another consolidated subsidiary, K-I Chemical, to be fully operational and a new production base at Ihara Nikkei Chemical Industry in Thailand.

Segment earnings

Fine Chemicals Business earnings

(JPYmn)		FY10/11 Act.	FY10/12 Act.	FY10/13 Act.	FY10/14 Act.	FY10/15 Act.	FY10/16 Act.	FY10/17 Act.	FY10/18 Act.
Former Kumiai Chemical Industry	Sales	38,275	39,958	45,251	51,222	56,747	58,167	60,636	68,147
	YoY	9.5%	4.4%	13.2%	13.2%	10.8%	2.5%	4.2%	12.4%
	Operating profit	1,541	1,676	2,289	2,844	3,868	2,566	3,554	4,992
	YoY	38.2%	8.8%	36.6%	24.2%	36.0%	-33.7%	38.5%	40.5%
	OPM	4.0%	4.2%	5.1%	5.6%	6.8%	4.4%	5.9%	7.3%
Former Ihara Chemical Industry	Sales	13,679	14,085	18,142	22,817	26,887	31,474	-	-
	YoY	-	3.0%	28.8%	25.8%	17.8%	17.1%	-	-
	Operating profit	2,275	1,835	2,157	3,386	4,857	4,077	-	-
	YoY	-	-19.3%	17.5%	57.0%	43.4%	-16.1%	-	-
	OPM	16.6%	13.0%	11.9%	14.8%	18.1%	13.0%	-	-

Source: Shared Research based on company data
Note: The FY10/17 figures for Kumiai Chemical are post-merger. They therefore contain six months (May to October 2017) of results from Ihara Chemical.

As Kumiai Chemical essentially took over this business as is from Ihara Chemical, Kumiai Chemical's FY10/17 post-merger figures for this segment correspond to those of Ihara Chemical's pre-merger Fine Chemicals segment. Segment OPM has been between 7% and 10%, comparable with large Japanese chemical manufacturers: OPM of 8.4% for Mitsubishi Chemical Holdings Corp. (TSE1: 4188) and 7.2% for Mitsui Chemicals (TSE1: 4183). (Both figures are averages for the three years ending in FY03/18).

Other Businesses

This segment contains the following core businesses.

- ▷ Leasing: The company
- ▷ Electricity sales from mega solar generation: Company-owned power plant in Iwata, Shizuoka Prefecture
- ▷ Construction: Handled by Ihara Construction Industry Co., Ltd. (consolidated subsidiary)
- ▷ Printing: Handled by Nihon Printing Industry Co., Ltd. (consolidated subsidiary)
- ▷ Logistics: Handled by Kumika Logistics Co., Ltd. (consolidated subsidiary)
- ▷ Information services: Provided by K-I Information System Co., Ltd. (consolidated subsidiary)

Rikengreen Co., Ltd., one of its consolidated subsidiaries, provides herbicides, insecticides, and other materials to manage non-agricultural greenery, such as golf courses and areas along expressways. This company also sells chemicals for paper manufacturing and industrial use and handles gardening and landscaping projects. In the latter category, Rikengreen fills orders by national and regional government bodies to build parks and handle other public projects.

The following table outlines Kumiai Chemical's subsidiaries and equity-method affiliates. Many company names begin with K-I ("Kumiai Chemical" and "Ihara"), suggesting a long-standing pre-merger relationship between the two companies.

Group companies

	Company	Agrochemicals	Fine chemicals	Other	Main businesses
Parent	Kumiai Chemical Industry				Agrochemicals; fine chemicals; leasing; electric power supply
Consolidated subsidiaries	Rikengreen	○	○	○	Agrochemicals and fertilizers; greening materials; golf course management; construction work
	Iharanikkei Chemical Industry	○	○		Agrochemicals; fine chemicals
	K.I Chemical Industry	○	○		Agrochemicals; fine chemicals; industrial chemicals; biotech-related business
	Ihara Construction Industry		○	○	Construction; styrene foam manufacturing; real estate business
	Onomichi Kumika Industry	○	○		Agrochemicals; fine chemicals
	Ryochi Sangyo	○	○		Agrochemicals and fertilizers; food additives
	Nihon Printing Industry			○	Printing
	Kumika Logistics			○	Logistics
	K-I Information System			○	Information services
	Asada Shoji	○		○	Agrochemicals and fertilizers; golf course management
	K-I Chemical U.S.A.	○	○		Agrochemicals; fine chemicals
	K-I Chemical Europe	○		○	Agrochemicals; commission business
	K-I Chemical do Brasil			○	Outsourcing business
Equity-method affiliates	ICK		○		Fine chemicals
	Iharabras S.A. Industrias Quimicas	○			Agrochemicals
	T.J.C. Chemical	○			Agrochemicals
	Shanghai Qunli Chemical	○			Agrochemicals

Source: Shared Research based on company data

Market and value chain

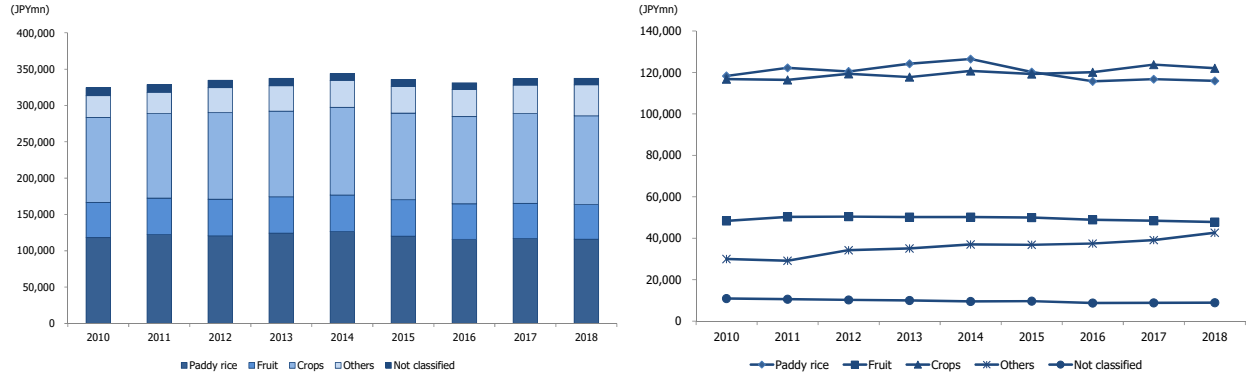
Japan's agrochemical market: Remains essentially flat

Gradual decline in agrochemical volume, monetary value flat

Japan's agrochemical market

The area of land under cultivation in Japan is trending gradually downward. That said, the overall use of agrochemicals is essentially flat in value terms, because of higher use of agrochemicals per area in response to new demand for rice and farmers' increasing focus on productivity.

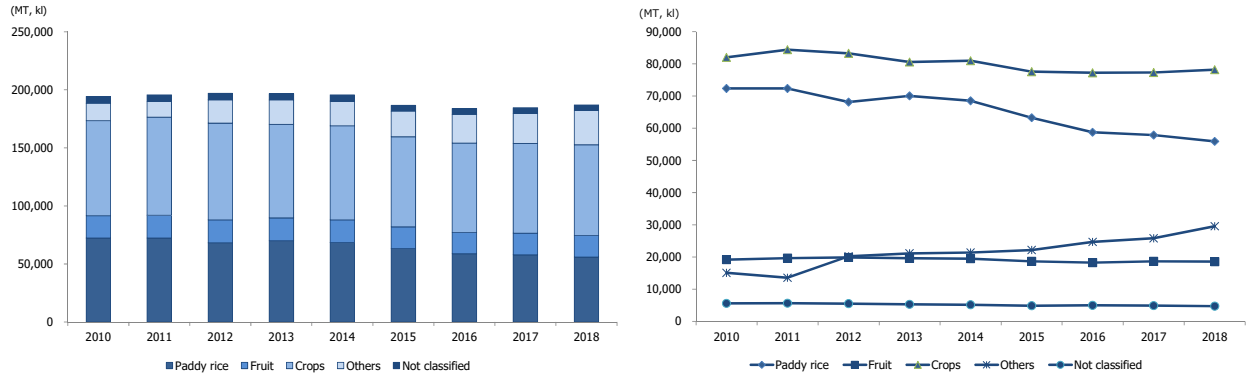
Shipments of agrochemicals in Japan, by use (value basis)



Source: Shared Research based on data from the Japan Crop Protection Association

The volume of agrochemicals used on paddy rice is falling gradually. Shipment volumes seem to be declining due to more effective new formulations and the spread of laborsaving formulations (agrochemicals formulated to enable spraying comfortably). Prices are thus on an uptrend. Shared Research attributes these fluctuations mainly to changes in Japan's agricultural industry. Japan experiences high temperatures and humidity levels, which are conducive to weeds and pests. We understand that highly effective agrochemicals are needed to boost crop yields under these conditions. Given a limited amount of arable land, increasing total harvest amounts requires higher productivity. Further, there is an issue with farm work given the aging of the farming workforce. There are also special features of distribution. Nearly 60% of agrochemicals sold in Japan are jointly purchased and distributed via agricultural cooperatives, and recommendations by the cooperatives play a major role in the acceptance of new products by farmers. Under the distribution system, farmers can place advance orders for agrochemicals and fertilizers to the cooperatives and thus get a discount on standard pricing.

Agrochemicals in Japan (volume basis), by use

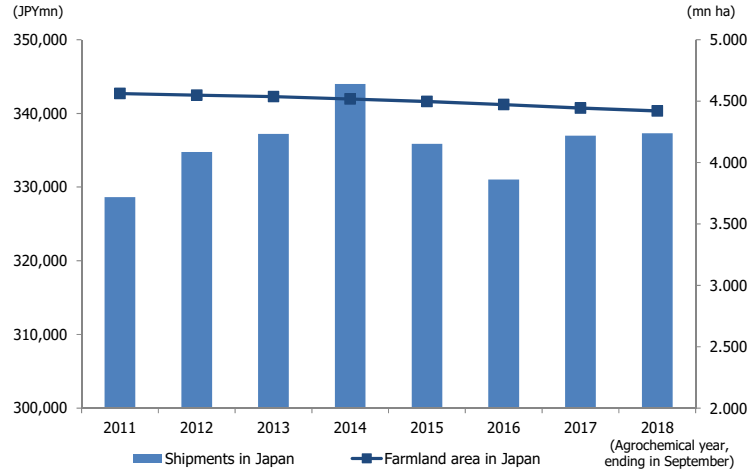


Source: Shared Research based on data from the Japan Crop Protection Association

Japanese agriculture and use of agrochemicals

While demand volume for agrochemicals is falling in Japan, demand is flat on a monetary basis, due to the call for relatively higher price products containing new active ingredients. Within the paddy rice category, cultivation is growing for rice used in feed and to meet other demands. The scope of agrochemical demand is thus broadening, explains the company. Although the area of cultivated land is gradually decreasing, the value of shipments has remained between JPY330.0bn and JPY350.0bn.

Area of cultivated land and shipments in Japan



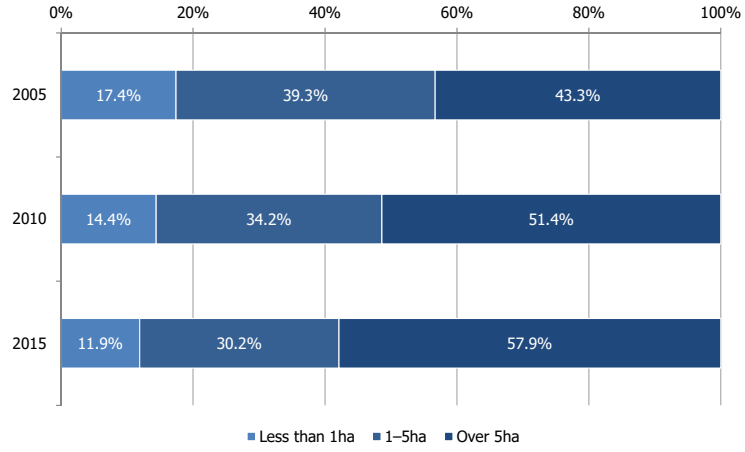
Source: Shared Research based on "The Situation Surrounding Agrochemicals," MAFF, February 2016

Changing Japanese agriculture and agrochemical demand

Demand for new agrochemicals: More large farmers, new sources of demand for rice

Japanese agriculture has two distinguishing characteristics. First, the number of farmers managing greater acreages is increasing. The following graph shows how plot sizes grew during the decade from 2005 to 2015. The percentage of land comprising plots of five hectares or more rose from just over 40% to nearly 60% during this period. The Japanese government is encouraging farm consolidation and aims to see the number of large farmers or farming companies grow from 16,000 at present to 50,000 by 2020.

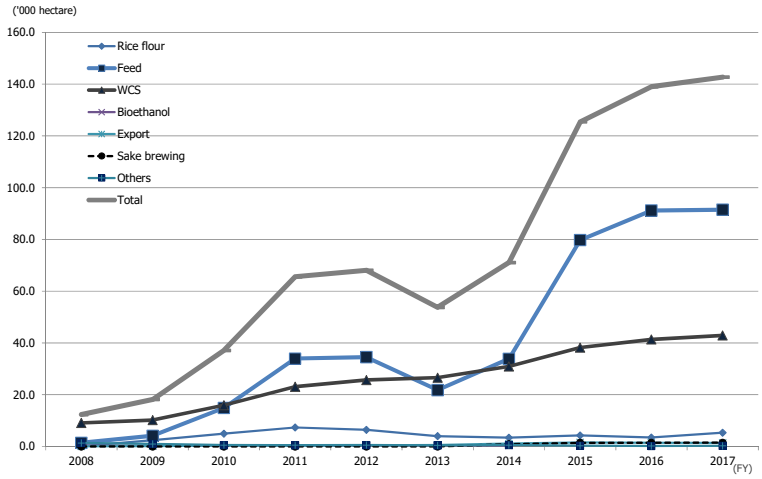
Consolidation of cultivated land under management



Source: Shared Research based on MAFF materials

The second market characteristic is a growing amount of land planted with rice for livestock feed amid a declining trend overall. As the following graph shows, new sources of demand, mainly for livestock feed and whole crop silage (WCS) rice, are fueling an increase in land under cultivation. With WCS, rice grains, leaves, and stems are harvested, fermented in silos, and used for feed. Zen-Noh targets an increase in land planted for rice used in feed, from 100,000 hectares now to 210,000 by 2020.

Planted area growing to meet new sources of demand for rice



Source: Shared Research based on MAFF materials

To encourage these trends, in 2016 the Japanese government announced the Agricultural Competitiveness Reinforcement Program. The program targets reforms to Zen-Noh, which has a major impact on the price of materials for agricultural production in Japan. The government's policies highlight the need for new and lower-priced agrochemicals, such as generics, to help raise production efficiencies.

Japanese agrochemical environment: Agricultural Chemicals Control Act's registration system and agricultural cooperatives

The Japanese agrochemical business is governed by regulations under the Agricultural Chemicals Control Act. Organizations with individual roles in Japanese agriculture include the National Federation of Agricultural Co-operative Associations (Zen-Noh), the Economic Federation of Agricultural Cooperatives (Keizairen), and agricultural cooperatives.

Agrochemicals: definitions and usefulness

Agrochemicals are used to eliminate pests and weeds that affect agricultural crops (rice, vegetables, fruit and other non-crop land plants such as forest trees, grasses on golf courses and in parks, roadside trees). Categories include insecticides, fungicides, herbicides, attractants, and natural enemies and microorganisms used to fight pests. Chemicals used to promote root growth or fruit-bearing or to control the growth of agricultural crops in other ways are also classed as agrochemicals.

Types of agrochemicals (by purpose)

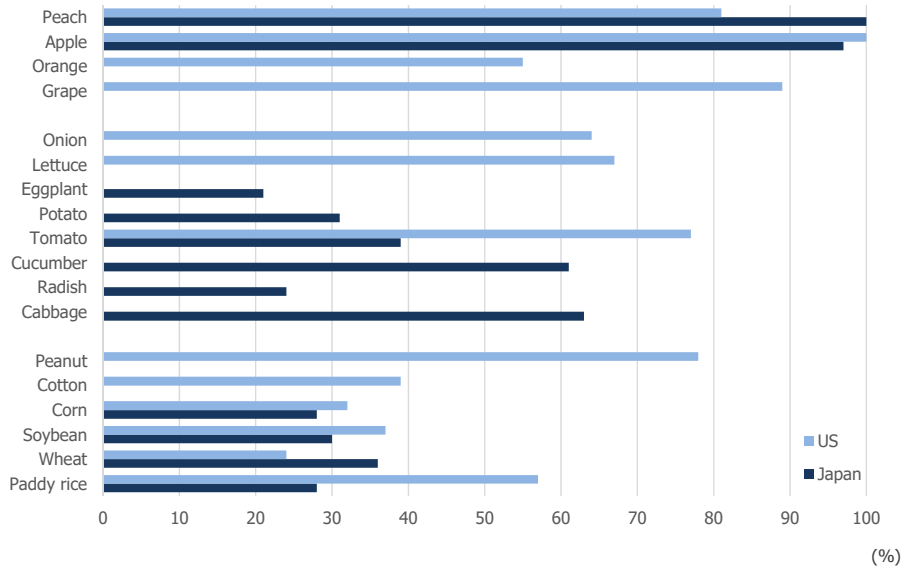
Type	Purpose
Insecticide	To eliminate insects that harm agricultural crops
Fungicide	To eliminate diseases that harm agricultural crops
Insecticide fungicide mixture	To simultaneously eliminate both insects and diseases that harm agricultural crops
Herbicide	To eliminate weeds
Rodenticide	To eliminate rodents and other pests that harm agricultural crops
Plant growth regulator	To promote or curtail the growth of agricultural crops
Attractants	Mainly to attract insects by smell or other decoy
Spreading agents	To improve adhesion of other agrochemicals, when mixed with them
Natural enemies	To eliminate insects that harm agricultural crops through the use of natural enemies
Microbial agents	Using microorganisms to eliminate insects and diseases that harm agricultural crops

Source: Shared Research based on MAFF website

MAFF considers agrochemicals one of the most effective ways of augmenting crop yields. Anti-pest methods other than agrochemicals include planting pest-resistant crops or putting down vinyl or straw sheeting to curtail weed growth. MAFF says these methods have limited effectiveness and that agrochemicals benefit farmers by stabilizing and improving yields at a relatively low level of labor input.

MAFF discloses the effectiveness of agrochemicals, by crop type, in improving yields. The following chart shows the rate of decline in yields if no agrochemicals are used to control pests for major fruit trees, vegetable, and grain crops in Japan and the US. According to this survey, fruit trees yields decline by nearly 90% if no agrochemicals are used. The decline is 30–60% for vegetables and around 40% for grains.

Rate of decline in crop yields if no pest-prevention measures taken



Source: Shared Research based on MAFF website

Agrochemical registration system based on the Agricultural Chemicals Control Act

Japan's agrochemical registration system

In the interest of safety, the Agricultural Chemicals Control Act regulates the production, import, sale, and use of agrochemicals. The agrochemical registration system is central to this act. (In the past, regulations centered on sales, but legal reforms in December 2002 added regulations on the production, import, and use of agrochemicals.) With certain exceptions, agrochemicals must be registered with MAFF before they can be manufactured, imported, or sold.

Agrochemical registration requires agrochemical manufacturers and importers to conduct a variety of tests (effectiveness against pests, safety for crops and animals, residue remaining on crops) to ensure their quality and safety. Companies then apply to MAFF via the Food and Agricultural Materials Inspection Center (FAMIC). According to Japan Crop Protection Association (JCPA), it generally takes around 10 years and JPY25.0bn–JPY30.0bn* to develop a new agrochemical.

***Agrochemical development costs:** MAFF and the Japan Crop Protection Association have different opinions regarding agrochemical development costs. MAFF says development costs are on the order of a few billion yen, while the Japan Crop Protection Association argues that they range from JPY25.0bn to JPY30.0bn. Agrochemical development requires many steps from basic R&D through a variety of evaluation tests, agrochemical registration, and commercialization, so the understanding of development costs may vary according to initial conditions.

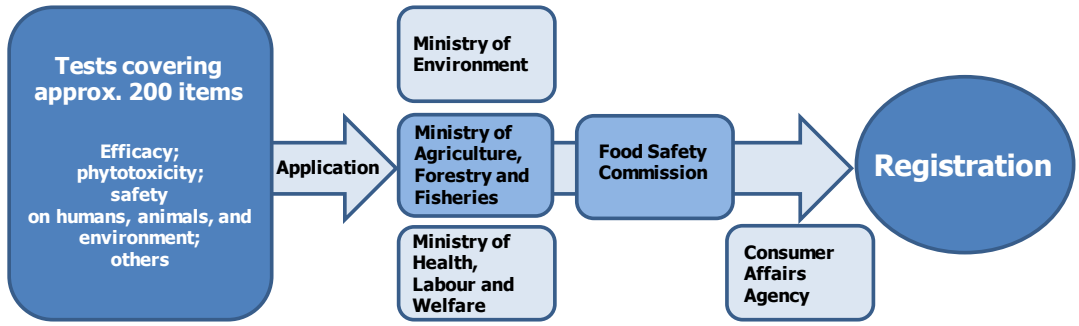
Testing in agrochemical development

Item	Phase	Development										
		Study		Phase 1	Phase 2		Phase 3				Registration	Marketing
	Year	-1	0	1	2	3	4	5	6	7	8	9	10	11
Research		Tests for synthesis and bioactivity; Search for affinity compounds												
Efficacy and phytotoxicity studies					Characteristic tests in pots; small-field trial; commissioned field trial; expansion in the range of application									
Toxicity studies					Acute toxicity (oral, dermal, inhalation); irritation (skin, eye, allergy); mutagenicity; teratogenicity; reproduction toxicity (two generations)									
Metabolism and residue studies					Carcinogenicity (2 animals, 2 years); animals, crops, soil, water: preliminary test, sample preparation, analysis (animals, crops, soil)									
Studies of effects on aquatic and beneficial organisms					Fish toxicity; silkworms, honeybees, birds, and natural enemies									
Formulation studies						Analysis method (TGAI, formulation, residue); TGAI manufacturing; plant designing and manufacturing etc.; formulation research; standards, capital investments							Production	
Patent				Application; claim for examination; publication										
Application for registration										Filing		Approval		Marketing

Source: Shared Research based on MAFF materials

When MAFF receives an application, it instructs FAMIC to screen the agrochemical for registration. Based on the applicant's submitted test results, FAMIC conducts a comprehensive screening for quality and safety, looking at the agrochemical's efficacy, toxicity, and the residue it leaves behind on crops and soil, and reports its results to MAFF, which makes the final decision on registration.

Agrochemical application process



Source: Shared Research based on MAFF materials

Overseas regulations on agrochemicals

The US Environmental Protection Agency has an agrochemical registration system based on regulations. China has an agricultural registration system that is supervised and managed by the Ministry of Agriculture, an institution directly under the State Council. Agrochemicals are regulated as toxic compounds by individual countries, but regulations differ.

Companies involved in agrochemicals in Japan

Types of agrochemical companies, production and R&D

Some agrochemical manufacturers produce active ingredients in-house, while others outsource production. As a result of the merger with Ihara Chemical, Kumiai Chemical has integrated production and sales. Agrochemical manufacturers purchase intermediates from chemical manufacturers and then manufacture active ingredients internally. On April 1, 2017, new arrangements (active ingredient specifications) were introduced for managing key ingredients in agrochemicals. These set the composition of active ingredients and impurities to ensure safety, enabling changes to manufacturing methods for active ingredients used in agrochemicals, which was previously prohibited in principle. Meanwhile, mainstream R&D structures entail research and development of active ingredients in agrochemicals, establishing manufacturing process, and research into formulation.

Most Japanese agrochemical manufacturers fall into one of four categories, depending on their production methods. (See the Business model section for details.)

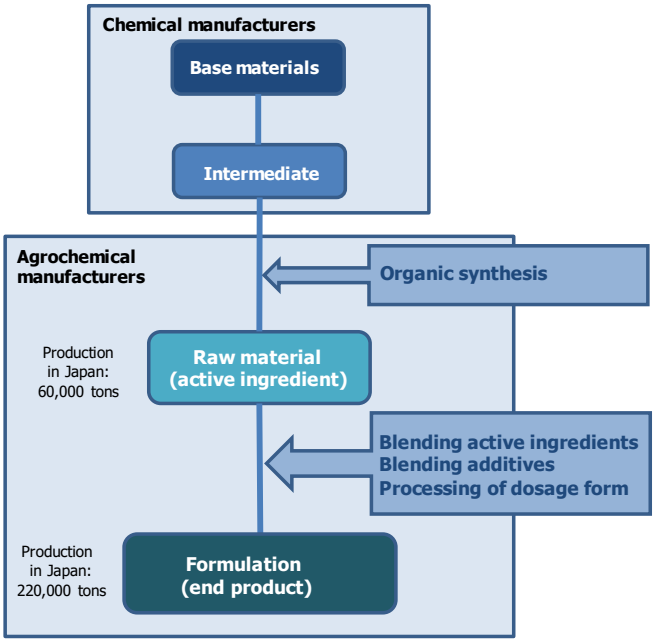
Production of agrochemicals in Japan

(Tons)	Active ingredients		Market in Japan	Formulation		Market in Japan
Foreign manufacturers (5 companies) Syngenta Japan Bayer CropScience Dow Chemical Japan DuPont BASF Japan	Production in Japan	6,000		Production in Japan	34,000	
	Imports	8,000	14,000	Imports	4,000	38,000
	Exports	200		Exports	50	
R&D-type manufacturers (9 companies) Nissan Chemical Industries Kumiai Chemical Industry Nihon Nohyaku Ishihara Sangyo SDS Biotech Sumitomo Chemical Mitsui Chemicals Agro Nippon Soda OAT Agrio	Production in Japan	35,000		Production in Japan	86,000	
	Imports	9,000	17,000	Imports	7,000	80,000
	Exports	27,000		Exports	13,000	
Formulation manufacturers (76 companies) Hokko Chemical Industry Kyoyu Agri Agro-Kanesho Nippon Kayaku Hodogaya Chemical, others	Production in Japan	3,000		Production in Japan	86,000	
	Imports	12,000	15,000	Imports	8,000	93,000
	Exports	700		Exports	1,000	
Specialist manufacturers (79 companies) (Lime and soil fumigant, others) Inoue Calcium Nankai Chemical Hosoi Chemical Industry Sanko Chemical Industry, others	Production in Japan	16,000		Production in Japan	19,000	
	Imports	2,000	18,000	Imports	200	18,000
	Exports	100		Exports	1,000	
Total markets in Japan			64,000			229,000

Source: Shared Research based on MAFF materials

Kumiai Chemical falls into the "R&D-type manufacturer" category, which follows the production process outlined here.

Agrochemical production process



Source: Shared Research based on MAFF's "Cost and Assessment of Materials for Agricultural Production (February 2016)"

Developing a new agrochemical is time-consuming and expensive. According to the Japan Crop Protection Association, more than ten years typically elapse between the discovery of a new compound and a new product launch, with development costs ranging from JPY25.0bn to JPY30.0bn. A survey of major agrochemical manufacturers by Phillips McDougall, a UK company that analyzes the global agrochemical and seed industries, provides the following average costs from new agrochemical synthesis through to launch.

Agrochemical development costs

	1995	2000	2005–2008	2010–2014
Development costs (avg.; USDmn)	152	184	256	286
No. of synthesized compounds	52,500	139,429	140,000	159,574
Development period (years)	8.3	9.1	9.8	11.3

Source: Shared Research based on the Japan Crop Protection Association website

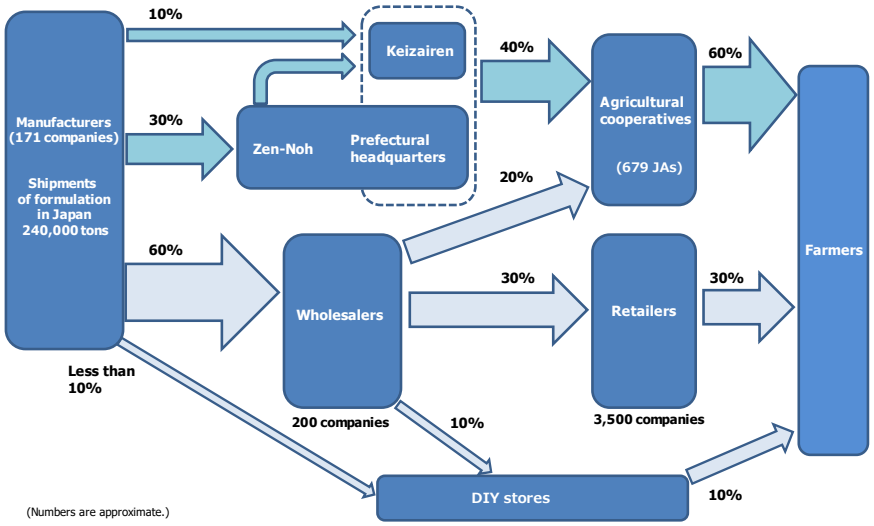
According to this survey, in 1995 about 52,500 compounds were synthesized to bring one product to market. By 2010–2014, that figure had risen to 159,574. Over that same time period, average development time lengthened from 8.3 years to 11.3 years. The survey projects that R&D expenses may continue growing.

Role of agricultural cooperatives in the distribution of agricultural materials

Distinguishing characteristics of agrochemical distribution in Japan

The largest distinguishing factor on agrochemical distribution routes in Japan is the major role that the agricultural cooperatives play in product distribution. When agrochemical manufacturers distribute their products in Japan, around 30% of products distributed are directly sold to Zen-Noh, and another 10% to Keizairen, as the following figure shows. The companies that deliver agrochemicals to these two groups are known as "affiliated" manufacturers and they (including Kumiai Chemical) receive capital from Zen-Noh. The 40% of agrochemicals that go to Zen-Noh and Keizairen then go through agricultural cooperatives' distribution routes. The entire route through sales to farmers is via agricultural cooperatives.

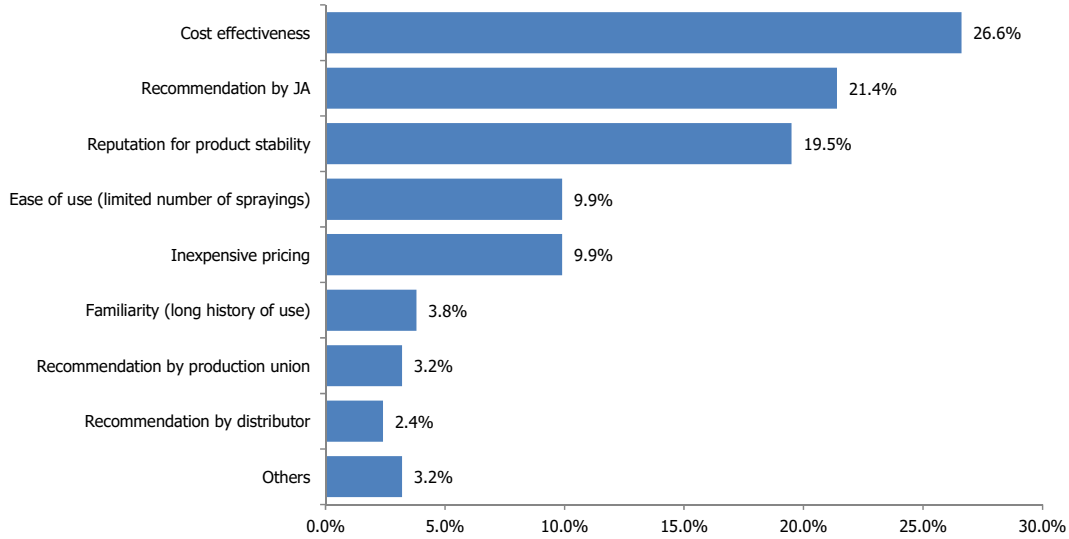
Distribution of agrochemicals in Japan



Source: Shared Research based on "The Situation Surrounding Agrochemicals," MAFF, February 2016

The remaining 60% of products go through wholesalers, DIY stores, and other general distribution routes: the commercial route. One-third of the agrochemicals that pass through wholesalers (20% of total products) are sold to agricultural cooperatives. This means agricultural cooperatives are responsible for around 60% of the total volume sold to farmers. The biggest role agricultural cooperatives play is in the joint purchasing of agricultural materials. They set the prices at which agrochemicals are sold to farmers.

Matters of importance for farmers when buying agrochemicals



Source: Shared Research based on MAFF's "Study of Awareness and Tendencies Related to Falling Costs of Agricultural Materials and Ensuring the Stability of Agricultural Production (August 2013)"

In recent years, some agricultural company managers and farmers able to purchase agricultural materials in cash have begun procuring agrochemicals at lower prices from DIY stores and other locations than cooperatives. However, most farmers in Japan are small in scale and prefer to take advantage of the price-setting role agricultural cooperatives play.

Agricultural policy directions in Japan

Agricultural Competitiveness Reinforcement Program: Agrochemical prices and Zen-Noh reforms

The Japanese government formulated the "Comprehensive TPP-Related Policy Framework" in 2015, proposing measures to strengthen Japanese agriculture and stabilize agriculture management. These measures led to a set of agriculture reforms called the "Agricultural Competitiveness Reinforcement Program" (2016). Most important was to lower the price of production materials. The program introduced the following policy changes that affect the agrochemical business.

- ▷ Aim to lower prices to international levels
- ▷ Promote restructuring in the production material industry
- ▷ Review laws and regulations related to production materials
- ▷ Introduce Zen-Noh reforms (review the method of purchasing production materials)

Response to generic agrochemicals

To meet the objective of lowering prices to international levels, Shared Research thinks regulatory approvals on generic agrochemicals will increase. Generics currently account for just around 5% of agrochemicals used in Japan, compared with almost 60% globally. The table below shows generics with approved registrations in Japan. We think the reasons so few have been approved in Japan so far are twofold: differences in control methods in Japan, based on the Agricultural Chemicals Control Act, and high testing costs, both of which acted as barriers to entry into the Japanese market. In April 2017, criteria for registering generic agrochemicals were loosened, so their presence is likely to increase in the future.

Generic agrochemicals registered in Japan (October 2013–September 2014)

Active ingredient	No. of products	Market share	Price (vs. original)
Acephate (pesticide)	9	16%	Approx. 10–15% lower
Propamocarb hydrochloride (fungicide)	2 (for garden products and lawn)	84% (no shipment for garden product use)	Approx. 3% lower
Mancozeb (fungicide)	7	16%	Approx. 5% lower
Glyphosate, isopropylamine salt (herbicide)	49	Only generics in the market (manufacturers of originals have exited)	

Source: Shared Research based on MAFF materials

International harmonization of agrochemical registration systems

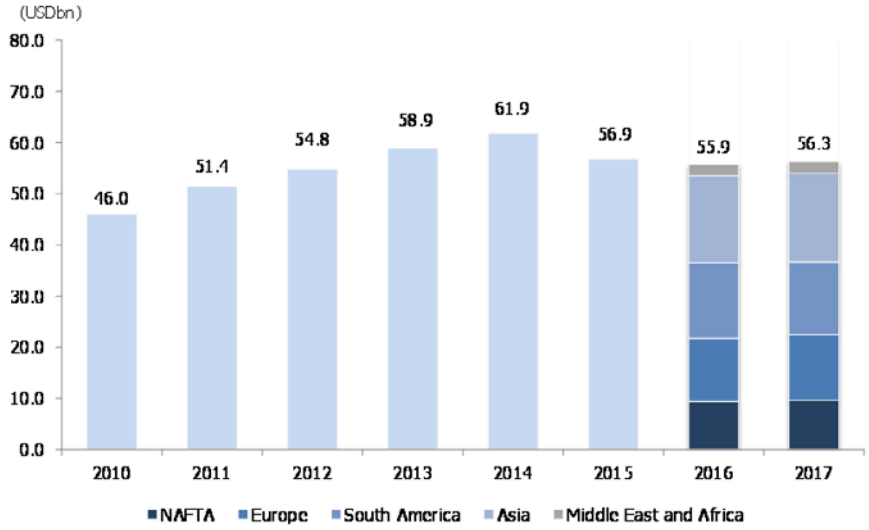
The government is revising a number of regulations on production materials (including agrochemicals) such as bringing Japan's agrochemical registration system into line with international standards via the following initiatives:

- ◤ Revise the testing parameters and methods needed to apply for agrochemical registration in line with international rules
- ◤ Adopt OECD countries' formats for applications, and accept test results in English
- ◤ Begin adopting a common international assessment system, where agrochemical assessments are shared by multiple countries, mostly in the OECD
- ◤ Conduct training on assessing the risk of agrochemical residue in the interest of promoting Asian countries' participation in common international assessments

Global market: Growing demand for agricultural products in emerging markets

Emerging markets driving global demand

Global agrochemical market

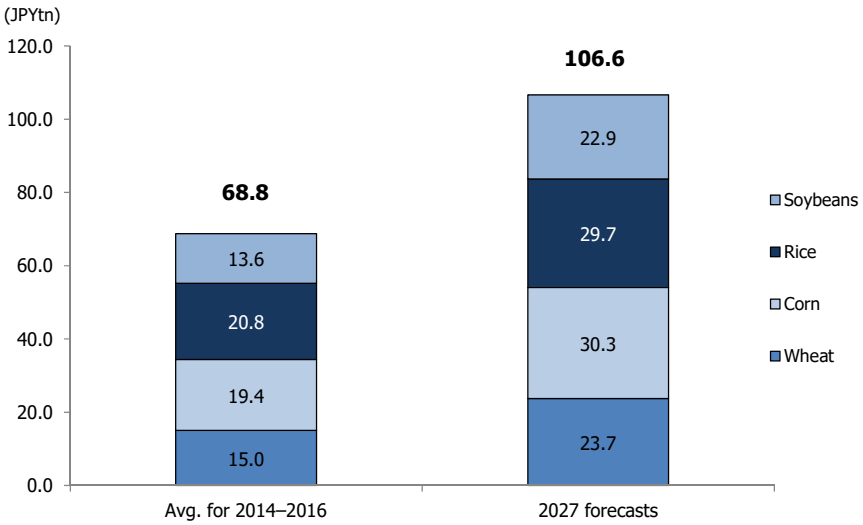


Source: Shared Research based on Kumiai Chemical's IR materials

In recent years, sales of agrochemicals have been falling by value on a global basis, but demand is expanding in emerging markets. In these regions, food demand is expected to grow in line with economic growth, but there is a limit to increasing arable land. Shared Research thinks emerging-market demand for agrochemicals will continue rising, due to efforts to improve production efficiency. Agrochemical manufacturers are including emerging markets in their core strategies, tailoring strategies to areas of large-scale agricultural production and food supply. Regions thought to be key areas of crop production are Europe, North America, Latin America, East Asia, and Southeast Asia.

As the global population continues to grow, demand for food is rising in emerging markets, which are experiencing economic growth. However, arable land worldwide is not keeping pace with increases in population and demand for food, so farmers continue trying to increase yields. Doing so involves improving production technologies and boosting yields in other ways, such as with agrochemicals.

Global market trends, by crop (sales basis)



Source: Shared Research based on data from the Policy Research Institute, MAFF
Note: Calculations use USD1 = JPY110

Global trends: generic agrochemicals, seeds, agricultural management consulting

Generic agrochemicals make up 20–50% of world agrochemical distribution, but just 5% in Japan

Use of generic agrochemicals, or agrochemicals on which active ingredient patents have expired, is increasing given global trends to consider the cost of agrochemicals relative to their performance. In Japan, uptake of generic agrochemicals has been slow, and generics account for only around 5% of the agrochemicals Zen-Noh distributes. Worldwide, the figure is around 20% to 50%.

Seed business is important agrochemical-related business

Other non-agrochemical methods of increasing yields are being explored, such as adopting more disease-resistant, high-yielding crop varieties. These methods include switching to better crop varieties, and adopting other seed varieties improved through radiation, chemical treatment, or genetically modifying technology. Genetic engineering has been used to develop crops resistant to pests and nonselective herbicides. In North and South America, as the fusion of the seed and agrochemical businesses unfolds, the business of selling herbicide resistant seed varieties and herbicides under license from large manufacturers has spread.

Mergers between agrochemical companies

Restructuring efforts are underway in the production materials industry, including mergers between large agrochemical manufacturers overseas. In the past few years, Syngenta (Switzerland) has become part of the China Chemical Group, a Chinese state-owned chemical company. The agricultural divisions of Bayer (Germany) and Monsanto (US) have merged, as have those of US companies Dow Chemical and DuPont. (See the Comparable companies section.)

One catalyst for mergers among the world's large agrochemical manufacturers is to boost scale amid growing R&D expenditures as global agrochemical demand increases. Mergers in light of rising R&D costs are also occurring in Japan, but large-scale mergers such as Kumiai Chemical and Ihara Chemical are still rare. Japanese companies are attracting attention from Western manufacturers for their ability to develop active ingredients, often leading to proposals for joint development and chemical purchasing. For this reason, Shared Research thinks the potential exists for mergers between Japanese and overseas manufacturers.

Comparable companies

Japanese agrochemical manufacturers

According to the Japan Crop Protection Association, Japan has around 50 agrochemical companies that either engage only in the manufacture of active ingredients or that also manufacture formulations by combining active ingredients and secondary raw materials. The chart below outlines key listed companies involved in agrochemical production in Japan.

The top four companies by sales have chemical businesses as well as agrochemical operations. All are commercial manufacturers. The bottom four are mainly involved in agrochemicals: Kumiai Chemical and Hokko Chemical Industry are affiliated with Zen-Noh, and Agro-Kanesho Co., Ltd. (TSE1: 4955) and Nihon Nohyaku Co., Ltd. (TSE1: 4997) are commercial manufacturers (use independent sales routes to distribute via wholesalers and retailers).

Comparable Japanese listed companies

Ticker	Company	Peformance (most recent FY) Sales (JPYmn)	OPM	ROE	Description
4005	Sumitomo Chemical	2,190,509	12.0%	10.8%	A comprehensive chemical manufacturer, second in size to Mitsubishi Chemical. Has petrochemical joint ventures in Singapore and Saudi Arabia. Also one of Japan's largest suppliers of agrochemicals, which contribute substantially to earnings. [% of consolidated sales, by category] Petrochemicals & Plastics: 31; Energy & Functional Materials: 11; IT-Related Chemicals: 17; Health & Agribusiness: 16; Pharmaceuticals: 23; Other: 3.
4183	Mitsui Chemicals	1,328,526	7.8%	14.9%	A comprehensive chemical manufacturer in the Mitsui Group. In 1997, Toyo Koatsu Kougyou (Mitsui Toatsu Chemicals), which got its start in chemical fertilizers in 1933, merged with Mitsui Petrochemicals Industries. From a business centered on general-purpose petrochemicals, shifted into functional materials for the healthcare and automotive sectors. [% of consolidated sales, by category] Mobility: 25; Health Care: 10; Food & Packaging: 15; Basic Materials: 48; Other: 2.
4021	Nissan Chemical	193,389	16.1%	15.1%	Founded in 1887 to manufacture chemical fertilizer. Moved out of petrochemicals in 1988. Manufactures and sells functional materials such as liquid crystal alignment film, as well as agrochemicals, pharmaceuticals, and basic chemicals. [% of consolidated sales, by category] Chemicals: 13; Performance Materials: 27; Agricultural Chemicals: 28; Pharmaceuticals: 4, wholesale: 23; Other 5.
4041	Nippon Soda	141,230	4.5%	4.6%	Began as a manufacturer of caustic soda, developed into a manufacturer of fine chemicals, including industrial chemicals and agrochemicals. Took over DIC's agrochemical business in 2004. [% of consolidated sales, by category] chemicals: 28; agrochemicals: 31; trading: 25; transport and warehousing: 3; construction: 8; other 5.
4996	Kumiai Chemicals	96,846	5.8%	5.1%	The largest company affiliated with Zen-Noh. Domestic business focused on herbicides for paddy rice. Developing businesses in North America, South America, and Asia. In May 2017, merged with Ihara Chemical, a manufacturer of active ingredients. [% of consolidated sales, by category] agrochemicals: 70; fine chemicals: 20; other: 10.
4997	Nihon Nohyaku	61,213	6.8%	4.5%	Formed in 1928, when the agrochemical business of Asahi Denka Kogyo (ADEKA), a Furukawa group company, merged with Fujii Seiyaku. Distinctive for developing its own products and having independent sales routes other than Zen-Noh. In 2002, took over Mitsubishi Chemical's agrochemicals business and has grown to become a leading Japanese specialist in agrochemicals. [% of consolidated sales, by category] agrochemicals: 91; other chemicals: 6; other: 3.
4992	Hokko Chemical Industry	39,826	5.7%	9.8%	A Zen-Noh affiliate and a leader in agrochemicals. In 1950, split off from the chemical division of Nomura Kougyo, a member of the Nomura conglomerate. In addition to agrochemicals, manufactures ingredients for electronic materials and other fine chemicals, and pharmaceutical intermediates. [% of consolidated sales, by category] Agrochemicals: 68; fine chemicals: 32; others: 0.
4955	Agro Kanesho	14,588	14.4%	11.5%	Specializes in agrochemicals for fruit trees and vegetables. Got its start in agrochemical and fertilizer sales in 1951, and began production in 1956. Distinctive for a sales approach that involves close contact with farmers. Sales routes centered on trading companies rather than Zen-Noh. Previously had Japanese sales rights to Basamid, a soil fumigant product by BASF of Germany. In 2003, acquired global rights in cooperation with Mitsui & Co. [% of consolidated sales, by category] insect pesticides: 19; fungicides: 6; soil disinfectants: 58; herbicides and others: 11; exports and others: 7.

Source: Shared Research based on individual company materials

In addition to the listed companies indicated above, the Japanese entities of foreign manufacturers have a strong presence in the Japanese market. The table below ranks agrochemical manufacturers by sales in Japan, according to a MAFF survey. Topping the list is Syngenta Japan, the Japanese entity of a Swiss company that joined China's state-run China Chemical Group (ChemChina) in 2016. Bayer CropScience is the Japanese entity of Bayer, a German manufacturer of pharmaceuticals.

Financial summary of comparable companies

(JPYmn)	Kumiai Chemical Industry (4996)			Nihon Nohyaku (4997)		
	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.	FY09/16 Cons.	FY09/17 Cons.	FY09/18 Cons.
Sales	62,549	77,817	96,846	50,641	60,033	61,213
Gross profit	12,369	18,863	23,611	20,144	21,052	21,909
SG&A expenses	10,102	15,099	18,030	15,718	17,556	17,736
Operating profit	2,267	3,764	5,582	4,426	3,496	4,172
Recurring profit	4,478	7,441	8,074	3,864	3,597	3,651
Net income	3,423	7,252	4,706	1,035	1,717	2,507
ROE	6.0%	7.3%	4.8%	2.1%	3.6%	4.5%
ROA (RP-based)	5.4%	5.3%	6.0%	4.4%	4.1%	3.7%
OPM	3.6%	4.8%	5.8%	8.7%	5.8%	6.8%
Total assets	83,608	139,168	133,756	88,791	88,713	98,463
Net assets	57,264	99,365	97,739	48,697	48,867	57,576
Equity ratio	68.5%	71.4%	73.1%	55.0%	52.8%	56.5%
Operating CF	-2,551	5,660	8,458	3,968	2,515	-819
Investing CF	-1,089	-1,092	-1,584	-958	-441	767
Financing CF	-231	-10,329	-5,016	2,069	-5,932	7,785
Cash and deposits	4,368	12,656	12,656	13,629	10,128	17,534
Interest-bearing debt	9,820	6,455	3,729	17,864	16,257	16,610
Net debt	5,452	-6,201	-8,927	4,235	6,129	-924
.	Hokko Chemical Industry (4992)			Agro-Kanesho (4955)		
	FY11/15 Cons.	FY11/16 Cons.	FY11/17 Cons.	FY12/15 Cons.	FY12/16 Cons.	FY12/17 Cons.
Sales	42,251	40,117	39,826	14,597	14,315	14,588
Gross profit	10,546	10,206	10,032	6,338	6,271	6,327
SG&A expenses	8,049	7,742	7,746	3,916	4,208	4,231
Operating profit	2,497	2,464	2,286	2,422	2,063	2,097
Recurring profit	2,956	2,777	3,541	2,643	2,102	2,094
Net income	1,900	1,965	1,989	1,454	1,285	1,922
ROE	12.3%	11.5%	10.7%	9.4%	8.2%	12.3%
ROA (RP-based)	6.7%	6.9%	8.8%	10.3%	8.7%	7.9%
OPM	5.9%	6.1%	5.7%	16.6%	14.4%	14.4%
Total assets	44,204	39,974	40,438	25,699	24,226	26,494
Net assets	17,528	18,877	21,926	18,527	18,633	21,209
Equity ratio	34.9%	42.8%	45.8%	60.2%	64.5%	59.0%
Operating CF	1,189	3,628	5,161	1,889	1,895	2,427
Investing CF	-816	-1,694	-1,294	-10	-312	-313
Financing CF	-372	-2,353	-3,397	-735	-1,264	-605
Cash and deposits	1,612	961	1,454	13,426	13,206	15,552
Interest-bearing debt	8,057	5,912	3,114	423	136	0
Net debt	6,445	4,951	1,660	-13,004	-13,071	-15,552

Source: Shared Research based on each company data

Major agrochemical companies in the Japanese market

Rank	Company	Shipment value (JPYmn)	Market share
1	Syngenta Japan	33,795	8.8%
2	Nissan Chemical Industry	33,344	8.7%
3	Bayer CropScience	30,329	7.9%
4	Sumitomo Chemical	29,836	7.8%
5	Kumiai Chemical Industry	24,588	6.4%
6	Hokko Chemical Industry	22,596	5.9%
7	Mitsui Chemicals Agro	19,907	5.2%
8	Nihon Nohyaku	17,906	4.7%
9	Nippon Soda	12,807	3.4%
10	Kyoyu Agri	12,718	3.3%
	Others	144,240	37.8%
Total		382,065	100.0%

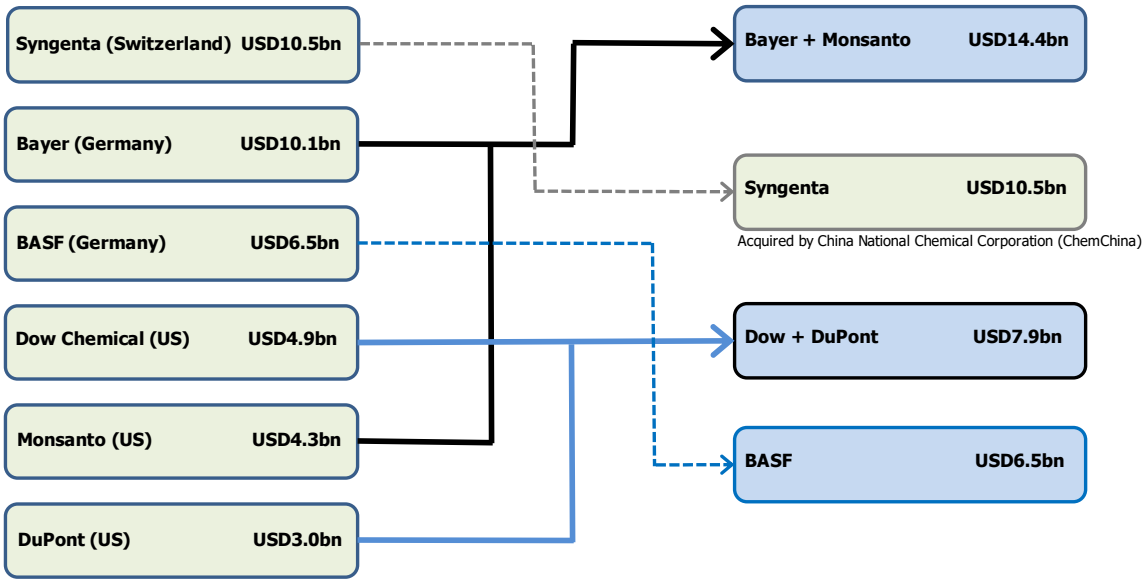
Source: Shared Research based on data from the MAFF Food Safety and Consumer Affairs Bureau

The leading manufacturers by sales in the Japanese market are foreign manufacturers and R&D-type manufacturers (which develop and manufacture active ingredients in-house). This survey ranks Kumiai Chemical fifth manufacturer.

Global agrochemical manufacturers

The global agrochemical market has grown more oligopolistic, due to restructuring in 2016 and 2017. In addition to agrochemical production and sales, the largest companies are expanding into the seed business and agricultural consulting.

Mergers between world agrochemical companies



Source: Shared Research based on company materials and "Mergers between Agro Multinationals: Bulking up of World's Agrochemical Companies" on Japan agricultural communications (JAcom) website.

Increasingly oligopolistic: From six top companies to top four

Major restructuring among agrochemical manufacturers in 2015 and 2016 concentrated a six-company oligopoly into just four. Bayer became the largest agrochemical manufacturer by sales after acquiring Monsanto, making the combined entity larger than Syngenta. Bayer, which also manufactures pharmaceuticals, has its strength in an agrochemical business with a long history. Monsanto, on the other hand, was strong in the seed business, due to seeding techniques employing biotechnology, so the merger was complementary. Syngenta, with strengths in the agrochemical and seed business and itself the product of a 2000 merger between the agriculture divisions of Novartis and Zeneca, became part of the China Chemical Group (ChemChina) in 2016.

Third largest is DowDuPont, formed through the 2017 merger of Dow Chemical and DuPont. DowDuPont is a holding company with businesses in agriculture, materials science, and specialty chemicals. The holding company encompasses DuPont Pioneer, the DuPont Company's agricultural product business, and Dow AgroSciences. The combined entity plans to integrate the strengths of these three units.

Manufacturers of generic agrochemicals (larger than Japanese manufacturers)

Ranking fourth is BASF, the German chemical manufacturer. Smaller companies include FMC Corporation, which in 2014 acquired Danish fungicide manufacturer Cheminova and in 2017 purchased herbicide and insecticide businesses from DuPont. FMC is strong in generic agrochemicals. Other major manufacturers of generics are ADAMA Agricultural Solutions Ltd. (Israel), which is in the China Chemical Group; Nufarm Limited (Australia), which is strong in generics; and United Phosphorus Limited (India). Next in line is Sumitomo Chemical (TSE1: 4005), the largest Japanese manufacturer.

Strengths and weaknesses

Strengths

Initiative in agrochemicals, pursuing a broad strategy of in-house development and production of active ingredients: Kumiai Chemical developed five active ingredients for agrochemicals and has registered products containing them from 2010 through 2018. It also plans to register products containing one more active ingredients it has developed by 2020. Agrochemical active ingredient development typically requires around 10 years (from development to launch). It leads the industry in number of agrochemical ingredients developed and short development period. For development, Kumiai Chemical uses a proprietary process to accumulate data in-house and winnow down development targets. Patents on the active ingredients for agrochemicals last up to 25 years (20 years for the substance, extendable up to five years depending on the country). This gives the company first mover advantage during the patent period in terms of active ingredient production and formulation expertise, and sales channels development.

Experience with field crop herbicides that can be sold worldwide and effective paddy rice herbicides that can be sold in other parts of Asia: The company sells field crop herbicides that can be used on major crops such as corn, soybeans, and wheat globally, and has experience mainly in North America. These are effective on herbicide resistant weeds, which have become a global issue in recent years. Global rice production, which accounts for around 30% of global crop production, mostly occurs in East Asia and Southeast Asia. Kumiai Chemical is developing a track record of herbicides for paddy rice primarily in Asia. Its brand of herbicides for paddy rice has a leading share of the Indian market. This track record is an advantage as Kumiai Chemical possesses products it can roll out in other Asian markets.

A solid sales network in Japan, based on relationships with Zen-Noh and agricultural cooperatives: Kumiai Chemical is affiliated with Zen-Noh, a cooperative association that holds major sway with Japanese farmers, and therefore distributes its products via Zen-Noh and agricultural cooperatives. According to a 2016 MAFF survey, roughly 60% of agrochemicals sold in Japan are directly sold by the agricultural cooperatives. A MAFF survey of farmers gives the top two reasons farmers select agrochemicals as cost effectiveness (26.6%) and recommendation by agricultural cooperatives (21.4%). Shared Research thinks the Zen-Noh/agricultural cooperative sales route is advantageous for Kumiai Chemical.

Weaknesses

Advantages of Zen-Noh affiliation not effective outside Japan: When developing its business overseas, Kumiai Chemical has to bear all the costs of marketing locally, formulating sales plans and building sales teams, cultivating sales networks, and selling directly and indirectly to farmers. Also, because Kumiai Chemical's approach when developing business overseas is to export the active ingredients in bulk and formulate final products locally, it has to negotiate partnerships and alliances with local distributors that manufacture and sell its products in many cases. In Japan, Kumiai Chemical can rely on its affiliation with Zen-Noh, which has the structure to directly sell products to farmers, but no analog exists overseas.

Lack of experience in key emerging markets (China, Latin America) that are expected to drive global agrochemical demand: Kumiai Chemical sells herbicides for paddy rice in Japan and herbicides for field crops, mainly in North America. The company has little experience, however, in emerging markets where agricultural production is expected to increase, such as China and Latin America. Reducing the cost of producing agricultural products is a pillar of Japan's agricultural policy, and agrochemicals fall under that umbrella. Thus, Kumiai Chemical is compelled to look overseas to continue growing. In addition to strengthening business targeting India and Argentina, the company also plans to develop operations in China. However, the company does not have direct sales networks in these regions, so the most important factor in business growth is cooperation with reputable local companies. In China, Kumiai Chemical's main competitors are two companies owned by ChemChina, a state-run group (Syngenta, the largest European company in agrochemicals, and Adama, the largest in generics). DowDuPont and the Bayer–Monsanto alliance are already securing footholds in South America and Southeast Asia.

A widening gap in capital scale between Kumiai Chemical and the world's largest companies: Mergers in the global agrochemical industry have resulted in a four-company oligopoly. By contrast, the Japanese market is populated by some 50

companies, with Kumiai Chemical at mid-range in terms of capital, even though it holds substantial intellectual property related to active ingredients. Looking at the global market, as of 2017 both the largest agrochemical company (Syngenta, of Switzerland) and the largest generics company (Adama, of Israel) are part of ChemChina, a Chinese state-run company. Other agrochemical mergers have taken place between Dow and DuPont (both US) and Bayer (Germany) and Monsanto (US), concentrating around 70% of the agrochemical market into four groups. These companies are entering the Japanese market by establishing subsidiaries, and the larger Japanese manufacturers are forming capital alliances with large overseas companies that are strong in generics. With this global industry restructuring spreading to Japanese manufacturers, we think the likelihood of Kumiai Chemical taking the initiative is small, given its scale of capital.

Historical performance and financial statements

Income statement

Income statement (JPYmn)	FY10/09 Cons.	FY10/10 Cons.	FY10/11 Cons.	FY10/12 Cons.	FY10/13 Cons.	FY10/14 Cons.	FY10/15 Cons.	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.
Sales	**39,227**	**38,252**	**42,095**	**44,072**	**49,283**	**55,360**	**61,124**	**62,549**	**77,817**	**96,846**
YoY	-2.0%	-2.5%	10.0%	4.7%	11.8%	12.3%	10.4%	2.3%	24.4%	24.5%
Cost of sales	30,048	28,955	32,105	33,669	38,296	43,474	47,881	50,180	58,954	73,234
Gross profit	**9,179**	**9,297**	**9,989**	**10,403**	**10,986**	**11,886**	**13,243**	**12,369**	**18,863**	**23,611**
YoY	-4.4%	1.3%	7.4%	4.1%	5.6%	8.2%	11.4%	-6.6%	52.5%	25.2%
GPM	23.4%	24.3%	23.7%	23.6%	22.3%	21.5%	21.7%	19.8%	24.2%	24.4%
SG&A expenses	8,512	8,307	8,543	8,745	8,882	9,256	9,521	10,102	15,099	18,030
SG&A ratio	21.7%	21.7%	20.3%	19.8%	18.0%	16.7%	15.6%	16.2%	19.4%	18.6%
Operating profit	**667**	**990**	**1,446**	**1,657**	**2,105**	**2,629**	**3,723**	**2,267**	**3,764**	**5,582**
YoY	-14.0%	48.4%	46.1%	14.6%	27.0%	24.9%	41.6%	-39.1%	66.0%	48.3%
OPM	1.7%	2.6%	3.4%	3.8%	4.3%	4.7%	6.1%	3.6%	4.8%	5.8%
Non-operating income (expenses)	512	813	719	1,266	1,397	1,768	4,459	2,634	3,857	2,634
Non-operating expenses	246	97	107	113	131	107	118	423	180	142
Recurring profit	**933**	**1,706**	**2,059**	**2,810**	**3,371**	**4,290**	**8,064**	**4,478**	**7,441**	**8,074**
YoY	7.2%	82.9%	20.7%	36.5%	20.0%	27.3%	88.0%	-44.5%	66.2%	8.5%
RPM	2.4%	4.5%	4.9%	6.4%	6.8%	7.7%	13.2%	7.2%	9.6%	8.3%
Extraordinary gains	145	432	233	388	364	41	996	1	2,883	140
Extraordinary losses	574	106	211	53	154	58	826	107	1,283	2,409
Income taxes	187	660	622	863	1,070	1,084	1,455	775	1,330	1,887
Implied tax rate	37.1%	32.5%	29.9%	27.4%	29.9%	25.4%	17.7%	17.7%	14.7%	32.5%
Minority interests	46	80	100	145	126	138	216	174	458	433
Net income	**272**	**1,292**	**1,360**	**2,137**	**2,384**	**3,051**	**6,563**	**3,423**	**7,252**	**4,706**
YoY	-10.2%	375.0%	5.3%	57.1%	11.6%	28.0%	115.1%	-47.8%	111.9%	-35.1%
Net margin	0.7%	3.4%	3.2%	4.8%	4.8%	5.5%	10.7%	5.5%	9.3%	4.9%

Source: Shared Research based on company data

SG&A expenses

HR expenses account for 30% of SG&A expenses, with research and development expenses next at 10–11%. Kumiai Chemical says the full-year booking of expenses following the merger with Ihara Chemical is likely to boost research and development expenses YoY in FY10/18. Shared Research thinks overall research and development expenses will continue to rise, due to the company's aggressive stance toward developing new active ingredients.

Breakdown of SG&A expenses

SG&A expenses (JPYmn)	FY10/16 Act.	FY10/17 Act.	FY10/18 Act.	% of total SG&A expenses FY10/16	FY10/17	FY10/18
Personnel expenses	3,281	4,767	6,586	32.5%	31.6%	36.5%
Salaries and allowances	2,531	3,742	5,242	25.1%	24.8%	29.1%
Provision for bonuses	487	780	993	4.8%	5.2%	5.5%
Retirement benefit expenses	263	245	351	2.6%	1.6%	1.9%
Provision for directors' retirement benefits	61	116	126	0.6%	0.8%	0.7%
Welfare expenses	585	875	-	5.8%	5.8%	-
Promotion expenses	799	797	-	7.9%	5.3%	-
Commission fee	743	1,149	-	7.4%	7.6%	-
Transportation and warehousing expenses	980	1,701	1,566	9.7%	11.3%	8.7%
R&D expenses	1,164	1,665	1,610	11.5%	11.0%	8.9%
Depreciation	329	517	-	3.3%	3.4%	-
Others	2,160	3,512	8,142	21.4%	23.3%	45.2%
Total	10,102	15,099	18,030	100.0%	100.0%	100.0%

Source: Shared Research based on company data

Kumiai Chemical books equity method investment profits (JPY3.0bn in FY10/17) under non-operating income so the non-operating item tends to remain in the black. The company's equity-method affiliates were the following four companies as of FY10/17:

- I.C.K. Co., Ltd. (manufactures and markets synthetic resin products; Kumiai Chemical's stake: 34.0%, Location: Tokyo)

- IHARABRAS S.A. INDUSTRIAS QUIMICAS (manufactures and markets agrochemicals; Kumiai Chemical's stake: 22.6%, Location: Sao Paulo, Brazil)
- T.J.C. Chemical Co., Ltd. (manufactures and markets agrochemicals; Kumiai Chemical's stake: 24.5%, Location: Bangkok, Thailand)
- Shanghai Qunli Chemical Co., Ltd. (manufactures and markets agrochemicals and raw materials; Kumiai Chemical's stake: 20.2%, Location: Shanghai, China)

There was a change in the scope of Kumiai Chemical's equity-method affiliates in FY10/17, following the company's merger with Ihara Chemical in May 2017. While I.C.K. and Shanghai Qunli newly became equity-method affiliates, Riken Green, K-I Chemical Industry, and Ihara Construction Industry were consolidated and excluded from the scope of equity-method affiliates.

Comparison with past company forecasts

Variance between company forecasts and results

Results vs. Initial Est. (JPYmn)	FY10/09 Cons.	FY10/10 Cons.	FY10/11 Cons.	FY10/12 Cons.	FY10/13 Cons.	FY10/14 Cons.	FY10/15 Cons.	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.
Sales (Initial Est.)	41,200	38,500	39,100	45,500	48,500	54,000	61,000	74,300	63,000	95,000
Sales (Results)	39,227	38,252	42,095	44,072	49,283	55,360	61,124	62,549	77,817	96,846
Results vs. Initial Est.	**-4.8%**	**-0.6%**	**7.7%**	**-3.1%**	**1.6%**	**2.5%**	**0.2%**	**-15.8%**	**23.5%**	**1.9%**
Operating profit (Initial Est.)	550	550	1,000	1,700	1,800	2,600	3,400	4,500	2,000	4,600
Operating profit (Results)	667	990	1,446	1,657	2,105	2,629	3,723	2,267	3,764	5,582
Results vs. Initial Est.	**21.3%**	**80.0%**	**44.6%**	**-2.5%**	**16.9%**	**1.1%**	**9.5%**	**-49.6%**	**88.2%**	**21.3%**
Recurring profit (Initial Est.)	800	1,100	1,500	2,500	3,000	3,800	4,900	7,000	4,100	6,400
Recurring profit (Results)	933	1,706	2,059	2,810	3,371	4,290	8,064	4,478	7,441	8,074
Results vs. Initial Est.	**16.6%**	**55.1%**	**37.3%**	**12.4%**	**12.4%**	**12.9%**	**64.6%**	**-36.0%**	**81.5%**	**26.2%**
Net income (Initial Est.)	350	550	900	1,700	2,200	2,600	3,400	5,200	3,100	4,500
Net income (Results)	272	1,292	1,360	2,137	2,384	3,051	6,563	3,423	7,252	4,706
Results vs. Initial Est.	**-22.3%**	**134.9%**	**51.1%**	**25.7%**	**8.4%**	**17.3%**	**93.0%**	**-34.2%**	**133.9%**	**4.6%**

Source: Shared Research based on company data

Kumiai Chemical's sales forecasts have been largely accurate, except for FY10/16–FY10/17, when results were affected by the merger. Its profit forecasts have tended to be conservative. Shared Research thinks this is because the company can forecast cooperative-related business with some accuracy but overseas business is less predictable, being affected by exchange rates, local weather, and other uncertainties.

Balance sheet

Balance sheet (JPYmn)	FY10/09 Cons.	FY10/10 Cons.	FY10/11 Cons.	FY10/12 Cons.	FY10/13 Cons.	FY10/14 Cons.	FY10/15 Cons.	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.
ASSETS										
Cash and deposits	11,664	12,753	7,802	7,639	11,003	12,372	9,742	5,789	14,283	17,729
Accounts receivable	5,501	5,732	7,883	9,395	8,199	8,731	10,014	10,666	21,006	21,769
Inventories	9,197	9,055	10,266	12,224	11,799	11,162	12,867	13,604	33,268	32,931
Others	1,168	436	1,059	429	2,750	1,324	1,505	3,323	1,820	1,972
Allowance for doubtful accounts	-3	-2	-2	-3	-3	-2	-3	-3	-73	-67
Total current assets	**28,327**	**28,566**	**27,680**	**30,343**	**34,466**	**34,427**	**34,918**	**34,060**	**71,733**	**75,700**
Total tangible fixed assets	**11,439**	**11,280**	**11,229**	**11,532**	**12,184**	**12,828**	**12,839**	**12,878**	**27,306**	**30,438**
Total intangible fixed assets	**213**	**247**	**221**	**291**	**255**	**262**	**272**	**301**	**386**	**603**
Investment securities	10,669	10,479	12,913	15,603	20,067	21,574	36,151	35,413	35,484	24,377
Long-term loans receivable								2	2,082	309
Others	1,363	1,133	1,104	807	917	1,185	909	954	2,322	2,483
Allowance for doubtful accounts	-1	-1							-145	-154
Investments and other assets	**12,031**	**11,611**	**14,017**	**16,410**	**20,984**	**22,759**	**37,060**	**36,369**	**39,743**	**27,015**
Total fixed assets	**23,683**	**23,138**	**25,467**	**28,234**	**33,423**	**35,850**	**50,171**	**49,548**	**67,435**	**58,056**
Total assets	**52,010**	**51,704**	**53,146**	**58,576**	**67,888**	**70,277**	**85,089**	**83,608**	**139,168**	**133,756**
LIABILITIES										
Notes and accounts receivable	6,789	6,020	6,606	8,452	7,297	8,349	10,296	9,026	12,772	15,052
Short-term interest-bearing debt	11	11	11	6	2,200	2,500	3,580	5,570	3,627	2,759
Income taxes payable	53	406	322	563	337	829	846	98	772	788
Others	2,456	2,331	2,150	2,656	2,598	2,716	2,990	2,827	7,213	6,576
Total current liabilities	**9,309**	**8,768**	**9,089**	**11,677**	**12,432**	**14,394**	**17,712**	**17,521**	**24,384**	**25,175**
Long-term interest-bearing debt	28	17	6	0	1,700	1,500	5,650	4,250	2,828	970
Deferred tax assets	936	552	695	1,054	2,769	1,834	1,686	1,487	7,456	4,548
Others	2,708	2,841	2,580	2,530	2,386	2,880	3,254	3,085	5,135	5,324
Total fixed liabilities	**3,672**	**3,410**	**3,281**	**3,584**	**6,855**	**6,214**	**10,590**	**8,822**	**15,419**	**10,842**
Total liabilities	**12,982**	**12,179**	**12,370**	**15,261**	**19,287**	**20,609**	**28,302**	**26,344**	**39,803**	**36,017**
Net assets										
Capital stock	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534	4,534
Capital surplus	4,833	4,833	4,843	4,843	5,033	5,033	5,033	5,029	35,907	35,735
Retained earnings	27,606	28,656	29,773	31,735	33,641	36,210	42,024	44,805	51,502	54,660
Treasury stock	-1,221	-1,226	-1,228	-1,553	-1,451	-1,459	-1,565	-1,566	-2,653	-4,113
Total shareholders' equity	35,752	36,797	37,922	39,559	41,757	44,318	50,026	52,802	89,290	90,817
Valuation differences on securities	1,693	1,166	1,248	2,218	4,771	3,201	3,770	3,407	4,808	795
Foreign currency translation adjustments	-362	-374	-379	-954	-745	-321	-89	-2,034	-1,094	-1,438
Others	1,332	791	861	1,265	4,026	2,564	3,375	1,043	3,569	-794
Minority Interests	1,945	1,937	1,994	2,491	2,818	2,786	3,386	3,419	6,506	7,717
Total liabilities and net assets	**52,010**	**51,704**	**53,146**	**58,576**	**67,888**	**70,277**	**85,089**	**83,608**	**139,168**	**133,756**
Working capital	7,909	8,767	11,543	13,167	12,701	11,544	12,585	15,244	41,502	39,648
Total interest-bearing debt	39	28	17	6	3,900	4,000	9,230	9,820	6,455	3,729
Net debt	-10,994	-11,943	-7,725	-6,743	-6,566	-7,843	349	5,452	-6,201	-8,927

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

Assets

Historically, asset levels had been stable but have shifted to higher levels since FY10/17 due to the merger. Accounts receivable have expanded somewhat since FY10/15. Shared Research attributes this increase to the rise in sales. The rate of sales growth has picked up since FY10/13, with cash and deposits and other aspects of working capital growing in tandem.

Fixed assets rose roughly JPY5.0bn in FY10/13, mainly due to higher investment securities, with shares in non-consolidated subsidiaries and affiliated companies growing by JPY1.0bn.

Kumiai Chemical launched three mainstay active ingredients between 2010 and 2012 (Pyrimisulfan in 2010, Pyroxasulfone in 2011, and Pyribencarb in 2012), helping drive up sales in later years.

Although Kumiai Chemical maintained sales levels in FY10/16, operating profit fell due to higher cost of sales and research and development expenses, and assets decreased (primarily a JPY4.0bn drop in cash and deposits).

Liabilities

Short-term interest-bearing debt has expanded JPY2.2bn since FY10/13, with long-term loans payable rising JPY1.7bn. The increase in liabilities is explained mostly by increases in short- and long-term debt.

Net assets

Sales and profits have been rising since FY10/13, and net assets have grown accordingly. Capital has trended upward, mainly due to retained earnings. Although sales were largely unchanged in FY10/16, the company recorded double-digit profit declines. Nevertheless, assets remained essentially flat.

Cash flow statement

Cash flow statement (JPYmn)	FY10/09 Cons.	FY10/10 Cons.	FY10/11 Cons.	FY10/12 Cons.	FY10/13 Cons.	FY10/14 Cons.	FY10/15 Cons.	FY10/16 Cons.	FY10/17 Cons.	FY10/18 Cons.
Cash flows from operating activities (1)	1,740	1,318	-1,390	1,298	1,676	5,191	2,226	-2,551	5,660	8,458
Cash flows from investing activities (2)	-1,069	72	-2,405	-1,532	-1,788	-3,538	-10,418	-1,089	-1,092	-1,584
Free cash flow (1+2)	**671**	**1,390**	**-3,795**	**-234**	**-112**	**1,653**	**-8,192**	**-3,640**	**4,568**	**6,874**
Cash flows from financing activities	-351	-360	-414	-888	3,550	-546	4,965	-231	-10,329	-5,016
Depreciation and amortization (A)	759	720	733	748	815	876	928	917	2,024	2,943
Capital expenditures (B)	-540	-373	-730	-602	-1,541	-1,418	-675	-958	-1,391	-2,757
Working capital changes (C)	-985	858	2,776	1,624	-466	-1,157	1,041	2,659	26,258	-1,854
Simple FCF (NI + A + B - C)	**1,476**	**781**	**-1,413**	**659**	**2,124**	**3,666**	**5,775**	**723**	**-18,373**	**6,746**

Source: Shared Research based on company data
Note: Figures may differ from company materials due to differences in rounding methods.

Cash flows from operating activities

In most years, cash flows from operating activities have been affected by income before taxes. However, in FY10/11 operating cash flows were negative, despite double-digit sales (+10.0%) and profit gains. The negative cash flow was due to a JPY2.0bn rise in receivables and a JPY1.2bn increase in inventories.

Operating cash flow was also negative in FY10/16. Although net income dropped 47.9% YoY, sales increased, pushing up receivables JPY1.2bn. Advance payments also rose JPY2.3bn YoY.

FY10/17 results include six months' worth of performance at Ihara Chemical, due to the merger, so income before taxes rose. A rise in inventories had a JPY1.6bn impact on cash, but the rise in profits turned cash flows from operating income positive.

Cash flows from investing activities

Investing activities have used cash in every year from FY10/11 to FY10/17. The negative amount was between JPY1.0bn and JPY3.0bn every year except FY10/15. The main reasons for negative cash flows from investing activities were the acquisition of investment securities (FY10/11), purchases of PP&E (FY10/13), and acquisitions of intangible fixed assets (JPY10/14). In FY10/13, Kumiai Chemical made a number of overseas investments, also investing in the establishment of overseas wholly owned subsidiaries in the US in November 2012 and South Korea in 2013.

Behind the cash flows used in investing activities in FY10/15 were JPY1.3bn in payments for the acquisition of investment securities and JPY10.1bn in payments for the acquisition of shares in affiliated companies. Principal investments during the period include the purchase of shares in Ihara Chemical, converting the company to an equity-method affiliate in September 2015. Also, in October 2015 Kumiai Chemical increased its investment in Iharabras, an affiliate in Brazil.

Cash flows from financing activities

Prior to FY10/12, the company took on little interest-bearing debt to raise funds. Accordingly, until then cash flows from financing activities were affected mainly by dividend payments. In FY10/12, Kumiai Chemical acquired JPY315mn in treasury stock.

The company began taking on substantial amounts of interest-bearing debt since FY10/13. In that year, Kumiai Chemical raised JPY2.0bn each in short- and long-term loans payable. (However, the balance sheet for end-FY10/13 indicates short-term loans payable of JPY2.2bn and long-term loans payable of JPY1.7bn.)

Again in FY10/15, Kumiai Chemical raised JPY5.8bn in long-term loans payable. This year corresponded with Kumiai Chemical's conversion of Ihara Chemical to an equity-method affiliate and increased investment in Iharabras, an equity-method affiliate in Brazil. (Refer to the Cash flows from investing activities section.) Shared Research assumes Kumiai Chemical took more loans due to increased demand for cash.

Cash flows from financing activities were substantially negative in FY10/17, due to the repayment of borrowings: JPY7.7bn in short-term loans payable and JPY1.8bn in long-term loans payable. As of end-FY10/18, short-term loans payable had risen slightly while long-term loans payable continued to decline.

Historical Results

Q1 FY10/19 results (out March 8, 2019)

Results for Q1 FY10/19 (November 2018–January 2019)

- ▷ Sales: JPY24.3bn (+27.3% YoY)
- ▷ Operating profit: JPY2.1bn (+143.9% YoY)
- ▷ Recurring profit: JPY2.5bn (+80.9% YoY)
- ▷ Net income*: JPY1.8bn (+63.5% YoY)

*Net income attributable to owners of parent

- ▷ Sales rose YoY on expanded sales of mainstay product Axeev
- ▷ Overseas sales ratio: 48.6%

Agricultural Chemicals and Agriculture-Related Businesses

- ▷ Sales: JPY17.5bn (+31.5% YoY)
- ▷ Operating profit: JPY1.9bn (+127.3% YoY)

Domestic sales were ahead of sales in Q1 FY10/18, bolstered by the full-scale launch of Effeeda, a new herbicide for rice paddies, and strong growth in shipments of an herbicide compound made with Fenoxasulfone and Pyrimisulfan; together this was enough to offset the decline in sales of the existing Topgun line and other products. Shipments of herbicides for dry field farming grew YoY, thanks to strong growth in sales of a herbicide compound containing Isotianil and another compound containing Cyazypyr. Sales of products for gardening, including insecticides, germicides, and herbicides, also posted strong YoY gains.

In corporate marketing, overall sales came in ahead of sales in Q1 FY10/18. Sales of self-developed germicides for gardening saw solid gains, but revenues from contract processing work of formulated products for other companies were down. Sales of products used on golf courses and other areas beside farmland also saw strong gains.

Overseas, demand for Axeev, one of its core herbicide products for field crops, grew YoY mainly in North America, with shipments rising significantly from JPY2.8bn in Q1 FY10/18 to JPY6.6bn in Q1 FY10/19. Sales of Axeev were roughly in line with the company's forecast of JPY26.2bn for full-year FY10/19. Outside of North America, sales grew particularly in Argentina, Australia, and South Africa. Shipments were robust for Nominee, an herbicide for paddy rice, thanks to its growing use in Brazil to speed the ripening of sugarcane (by reducing growth of foliage and raising the sugar content of the stem). As a result, overall overseas sales grew significantly YoY, with the sales weighting of the Agricultural Chemicals and Agriculture-Related Businesses in overseas sales rising from 50% in Q1 FY10/18 to 59% in Q1 FY10/19.

Operating profit rose YoY, mainly driven by strong growth in overseas sales. Shared Research understands the majority of the rise in operating profit was attributable to the robust growth of Axeev sales.

Fine Chemicals Business

- ▷ Sales: JPY5.1bn (+24.7% YoY)
- ▷ Operating profit: JPY411mn (+28.8% YoY)

Kumiai Chemical acquired most of the Fine Chemicals operations from Ihara Chemical and its consolidated subsidiaries. The main developments in this segment are described below. The company has not disclosed the weightings of each business within the segment.

In the chlorination business, consisting of the core chlorotoluene- and chloroxylene-based chemicals products, sales of chlorotoluene-based chemical products rose YoY as the impact from customers who had worked down their inventory levels in Q1 FY10/18 dropped out. Sales of its chloroxylene-based chemical products used in the production of high-performance resins and aramid fibers, which are produced by Iharanikkei Chemical (Thailand), a joint venture between Kumiai Chemical and consolidated subsidiary Iharanikkei Chemical Industry Co., Ltd., ran roughly in line with company forecasts.

In the area of fine chemicals, including bismaleimides used in electronic materials and heat-resistant resins, the company saw strong sales of bismaleimides used in electronic materials and heat-resistant resins thanks to growing market demand.

Sales of polyurethane curing agents, used in waterproof materials, were ahead of company forecasts both in Japan and overseas (exports) in Q1 FY10/19. The company's contract processing business also increased its processing volume thanks to processing contracts for new products. The company looks to focus on this area, as it would be an area where it could leverage its R&D capabilities, but it has not disclosed details of the contract processing work. Sales in the industrial chemicals business, in which the main subsidiaries are Riken Green Co., Ltd. (JASDAQ: 9992) and K.I Chemical Industry Co., Ltd. (not listed), also posted solid gains primarily for environmental sanitation and papermaking applications.

Sales of styrene foam (used in packaging, consumer electronic parts, and insulation materials used in construction) also rose YoY, bolstered by both rising demand and higher unit selling prices.

Other Businesses

- ▷ Sales: JPY1.7bn (+0.7% YoY)
- ▷ Operating profit: JPY119mn (59.5x YoY)

Other Businesses comprise mainly leasing, electricity generation and sales, construction, printing, logistics, and information services. Leasing business sales in Q1 FY10/19 remained flat YoY as the company continued to effectively utilize owned properties. The electric power generation and sales business logged higher sales, due to the completion of repairs to electric power facilities that were damaged by typhoons. Sales in the construction business and printing business were basically flat YoY. Sales in the logistics business were higher, thanks to persistent marketing efforts that brought in new customers.

Financial condition

As of the end of Q1 FY10/19, the company's balance sheet showed total assets of JPY137.1bn, up JPY4.4bn versus the end of Q1 FY10/18. The YoY increase was the product of a JPY5.4bn increase in current assets and a JPY970mn decrease in fixed assets. Behind the change in current assets was a JPY2.0bn decline in cash and deposits, a JPY4.3bn increase in trade notes and accounts receivable, and a JPY3.4bn increase in inventories of merchandise and manufactured goods. The decline in fixed assets was due in large part to a JPY779mn decline in holdings of investment securities.

Liabilities of JPY39.5bn were up JPY4.6bn YoY. The increase reflected a JPY4.7bn increase in current liabilities and a modest JPY145mn decrease in fixed liabilities. The increase in current liabilities was due principally to a JPY6.2bn rise in short-term loans payable. The decline in fixed liabilities was due in large part to decreases in long-term loans payable and deferred tax liabilities. This left the company with net assets of JPY97.6bn and an equity ratio of 65.6%.

Full-year FY10/18 results

Kumiai Chemical reported full-year results for FY10/18 on December 14, 2018.

Reflecting the expansion of its business following the absorption-type merger with Ihara Chemical, FY10/18 sales rose 24.5% YoY to JPY96.9bn while operating profit jumped 48.3% YoY to JPY5.6bn. Recurring profit of JPY8.1bn was up only 8.5%, as the merger with Ihara Chemical also had the effect of reducing the amount of earnings the company reported from equity-method affiliates. Net income attributable to owners of parent of JPY4.7bn was down 35.1% YoY, hurt by the dropout of extraordinary gains

reported last year, an extraordinary loss of JPY1.0bn booked on the sale of investment securities, and JPY966mn in valuation loss on investment securities that the company still holds. For the full year, overseas sales accounted for 42.2% of total sales.

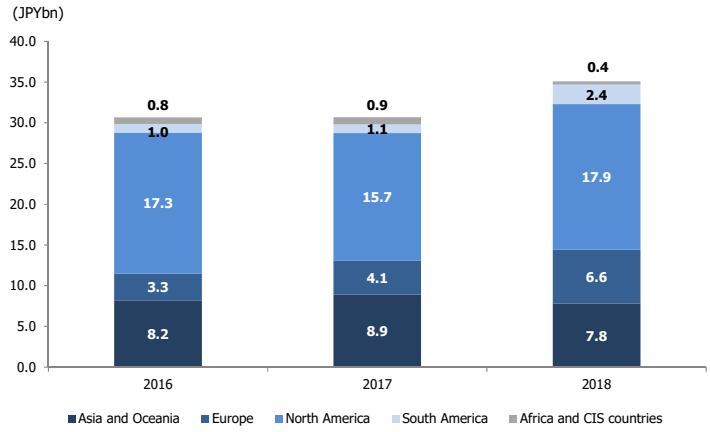
Agricultural Chemicals and Agriculture-Related Businesses

Segment sales of JPY68.1bn were up 12.4% YoY and operating profit of JPY5.0bn was up 40.5%. Domestic sales were unchanged YoY, but sales growth was driven by overseas sales, especially Axeev sales in North America.

In the domestic market, sales of paddy rice herbicides came in slightly lower YoY, but shipments of box granules expanded, and sales of overall paddy rice agrochemicals were flat YoY. Sales of horticulture products were largely on par with FY10/17 level as sales of fungicides were strong while sales of insecticides declined YoY. In corporate marketing channel, sales to golf courses and other non-agricultural facilities were basically flat, but overall sales still finished the year higher thanks to the merger with Ihara Chemical, which added sales from subcontracted production of active ingredients.

Overseas, sales of Nominee, an herbicide for direct-seeded rice, dropped YoY amid competition from low-cost generic products, but the company saw a sharp rise in shipments of its core product Axeev, an active ingredient in herbicides for dry-field crops. By market, continued strong growth in shipments of new compounds to North America and the start-up of full-scale commercial sales of Axeev in Argentina in FY10/18 delivered contributions. Growth in sales of prohexadione-calcium (a plant growth regulator) in Europe also supported strong momentum and contributed sharply to the increase in overall segment sales.

Sales by overseas region



Source: Shared Research based on company data

Fine Chemicals Business

Kumiai Chemical acquired most of the Fine Chemicals operations from Ihara Chemical and its consolidated subsidiaries. For the full year, segment sales of JPY19.5bn were up 78.0% YoY and operating profit of JPY1.2bn was up 45.6% YoY.

In this segment the company mainly develops and sells chlorotoluene- and chloroxylene-based chemical products; fine chemicals, including various bismaleimides used in electronic materials and high-heat-resistant resins; polyurethane curing agents, which are raw materials for waterproof materials; fungicides and anti-mold agents; industrial chemicals such as cleaning agents; and Styrofoam.

The company's chlorotoluene-based chemical products faced growing competition, leading to a decline in both sales volumes and unit prices. In contrast, the company saw strong demand for its chloroxylene-based chemical products, used in the production of aramid fibers (strong, heat-resistant synthetic fibers) and high-function resins. In the chloroxylene-based chemical product business, Kumiai Chemical is also expecting Iharanikkei Chemical (Thailand), a joint venture with consolidated subsidiary Iharanikkei Chemical Industry, to start making contributions from FY10/19. In FY10/18 the company also saw solid growth in other major business areas including fine chemicals (bismaleimides used in electronic materials and high-heat-resistant resins), industrial chemicals (cleaning agents, chemicals used in paper manufacturing), and Styrofoam (used for packaging, consumer electronic parts, insulation materials used in construction).

Other Businesses

At the Other Business segment, the company saw a 47.9% jump in full-year sales to JPY9.2bn while segment operating profit increased 8.5% YoY to JPY599mn.

Other Businesses comprise mainly leasing, electricity generation and sales, construction, printing, logistics, and information services. Leasing business sales and profit were in line with FY10/17 as the company continued to effectively utilize owned properties. Sales and profit were down YoY in the electricity generation and sales business as solar generation equipment suffered typhoon damage and power generation was suspended. The construction business was added to the segment due to the merger. Sales at the printing business were flat but earnings were down, hurt by an increase in the proportion of total costs accounted for by variable costs. The logistics business saw increases in sales and earnings rise on the addition of new customers.

Financial condition

As of the end of FY10/18, the company's balance sheet showed total assets of JPY133.8bn, down JPY5.4bn versus the end of FY10/17. The decline reflected a JPY9.4bn decrease in fixed assets, due in large part to a decline in holdings of investment securities. Current assets increased by JPY4.0bn, driven primarily by increases in cash and deposits.

Liabilities of JPY36.0bn were down JPY3.8bn versus the end of FY10/17. The decline reflected a JPY4.6bn decrease in fixed liabilities, due in large part to decreases in long-term loans payable and deferred tax liabilities. Current liabilities increased by JPY791mn on an increase in notes and accounts payable. This left the company with net assets of JPY97.7bn, an equity ratio of 67.3%, and net assets per share of JPY718.67.

Along with the release of FY10/18 results on December 14, the company also announced that it would be paying a dividend out of retained earnings of JPY7.0 per share (consisting of a regular dividend of JPY5.0 per share and a commemorative dividend of JPY2.0 per share). This represents an increase over the planned dividend of JPY5.0 per share, announced on September 7, 2018. The increase reflects the company's decision, made after taking into consideration earnings during the past year and its financial position, to pay a special commemorate dividend in advance of the 70-year anniversary of its founding on June 20, 2019.

Q3 FY10/18 results

Kumiai Chemical released Q3 FY10/18 results on September 7, 2018.

Sales were JPY74.6bn (+28.8% YoY) and operating profit JPY5.0bn (+41.5% YoY), as the business expanded under the merger. There was a sharp rise in operating profit due to a fall in the CoGS ratio accompanying the merger with its equity-method affiliate Ihara Chemical, the active ingredient manufacturer to the company. Recurring profit rose 3.3% YoY to JPY6.6bn mainly on a fall in equity in earnings of affiliates due to the merger. Net income attributable to owners of parent fell 21.5% YoY to JPY5.3bn on factors including the absence of extraordinary income booked in FY10/17. In consolidated Q3 FY10/18, the share of overseas sales was approximately 40.2%.

Agricultural Chemicals and Agriculture-Related Businesses

Segment sales were JPY54.1bn (+13.1% YoY) and operating profit JPY4.4bn (+20.9% YoY).

Among products for the Japanese market, paddy rice agrochemical sales overall were flat YoY. Sales of horticulture products grew YoY as sales of fungicides were strong while sales of insecticides declined YoY. Sales to golf courses and other non-agricultural facilities and sales of raw materials developed in-house were down YoY due to lower shipment to distributors. In addition, cumulative Q3 (November 2018–July 2019) sales for consolidated subsidiary Rikengreen were JPY8.5bn (no YoY comparison available due to a change in fiscal year-end) while operating profit was JPY203mn (no YoY comparison).

In markets outside Japan, while sales of Nominee, an herbicide for direct-seeded rice, dropped YoY amid competition from low-cost generic products, shipment of Axeev (herbicidal active ingredient for field crops) significantly increased YoY. The large growth in shipment of Axeev was owing to the continued brisk shipment of new mixture products in North America and beginning of full-scale sales of Axeev in Argentina.

The strong showing in North America stems from the dire need for alternative herbicides that are effective against weeds that have gained resistance to conventional products, which have spread in the region due to increased planting of genetically modified organism (GMO) crops and continual use of the same herbicide. While the control of herbicide-resistant weeds traditionally entailed a spraying program that combined several herbicides in accordance with the crop's growth cycle (blending herbicides, systematic application of herbicides according to crop growth stages), in place of conventionally affordable generic agrochemicals, the use of Axeev, with its long residual activity and superior effectiveness against weeds resistant to herbicides, has been increasingly widespread. Conditions in Argentina are similar to the North American market, with greater use of Axeev as an herbicide in the cultivation of GMO crops such as soybeans to control against weeds that have gained resistance. On the sales front, one of the most influential vendors in the North American market, BASF Corporation, is a new Axeev vendor. Currently, Axeev is sold both as a single product and in the form of a mixture product which contains other herbicides. According to the company, FY10/18 sales targets for the region have essentially been met by Q3.

> Herbicide-resistant weeds: Weeds that were previously controlled by chemical herbicides, but have developed a resistance to them. As a result of selective pressure, weed species that are not killed by herbicides increase after years of applying the same herbicide product. GMO crops resistant to glyphosate isopropylamine herbicides (e.g., Monsanto's Roundup; many generics also on sale) are widely planted in the US. It is believed that weeds such as amaranthus that are resistant to the active ingredient of Roundup have become widespread in soybean and cotton cultivation area as a result. Control methods for herbicide-resistant weeds include blending herbicides with different modes of action or systematic application of these herbicides according to crop growth stages, and using mixture products that contain a couple of active ingredients.

Fine Chemicals Business

Kumiai Chemical acquired most of the Fine Chemicals operations from Ihara Chemical and its consolidated subsidiaries. Segment sales were JPY14.4bn (+154.4% YoY) and operating profit JPY1.1bn (+241.6% YoY).

In this segment the company mainly develops and sells chlorotoluene- and chloroxylene-based chemical products; fine chemicals, including various bismaleimides used in electronic materials and high-heat-resistant resins; polyurethane curing agents, which are raw materials for waterproof materials; fungicides and anti-mold agents; industrial chemicals such as cleaning agents; and Styrofoam.

Other Businesses

Segment sales were JPY6.1bn (+38.7% YoY) and operating profit JPY444mn (-0.7% YoY).

Other Businesses comprise mainly leasing, electricity generation and sales, construction, printing, logistics, and information services. Leasing business sales and profit were in line with Q1 FY10/17 as the company continued to effectively utilize owned properties. Sales and profit were down YoY in the mega solar business as solar generation equipment suffered typhoon damage and power generation was suspended from November 2017 to February 2018. Sales in the construction business (included due to the merger) increased, but operating profit grew just slightly due to few building completions. The leasing business has been in this segment from FY10/17 following a review of segment classifications.

Financial condition

As of end-Q3, total assets were JPY135.7bn, down JPY3.5bn from end-FY10/17. Declines in products and investment securities due to decreases in value outpaced growth in cash and deposits, notes receivable, and accounts receivable.

Liabilities were JPY37.2bn, down JPY2.6bn from end-FY10/17. Decreases in notes and accounts payable, other payables, and deferred tax liabilities outstripped an increase in short-term loans payable, which occurred in step with seasonal factors and a brisk increase in sales. Net assets were JPY98.5bn, the equity ratio was 67.2%, and net assets per share were JPY727.49.

FY10/17 results

Kumiai Chemical revised its business segments following the merger with Ihara Chemical on May 1, 2017. The pre-merger segments were Chemicals, Leasing, and Other. The new segments are Agricultural Chemicals and Agriculture-Related, Fine Chemicals, and Other.

Agricultural Chemicals and Agriculture-Related Businesses

Kumiai Chemical explains that in its core Agricultural Chemicals and Agriculture-Related Businesses, it is concentrating resources by integrating all processes from discovery of new agricultural chemicals through R&D, active ingredient procurement, product formulation, and marketing, while minimizing risks by ensuring prompt and accurate decision-making. The company says it is aiming to grow sustainably as an R&D-driven company by making effective use of operational resources following the merger to increase efficiency and strengthen its operational platform. Furthermore, Kumiai Chemical intends to achieve continuous growth in its Fine Chemicals Business and develop it into a core business alongside the Agricultural Chemicals and Agriculture-Related segment by applying organic chemical technologies to expand its business domains, maximizing the value it offers to customers.

In the Japanese market, sales were solid for mixture products made from herbicides for rice paddy fields, Fenoxasulfone and Pyrimisulfan. On the whole, however, sales of herbicides for paddy rice were down slightly YoY, as sales of mainstay products fell due to intensified competition. Sales of box granules were in line with FY10/16 results, as sales of Isotianil and other mixture products expanded. However, sales of established mixture products declined. As a result, overall sales of products for paddy rice were essentially unchanged YoY.

Sales of fruit & vegetable products increased YoY as sales of mainstay products remained robust, including the fungicide Fantasista, and the insecticides Supracide and Cyazypyr. Meanwhile, sales to golf courses and other non-crop land were up YoY, as were sales of active ingredients developed in-house and subcontracted production.

In markets outside Japan, low grain prices and inventory adjustments held back sales of a core brand, Axeev, an herbicide for upland farming. In addition, competition from generic products in India, a core market, drove down sales of Nominee, a mainstay herbicide for directly seeded rice. Accordingly, sales outside Japan as a whole, were down YoY.

As a result, sales in Agricultural Chemicals and Agriculture-Related Businesses were JPY60.6bn (+8.6%, +JPY4.8bn YoY), and operating profit was JPY3.6bn (+46.8%, +JPY1.1bn).

Fine Chemicals Business

Kumiai Chemical acquired most of the Fine Chemicals operations from Ihara Chemical and its consolidated subsidiaries. In this segment the company mainly develops and sells chlorotoluene- and chloroxylene-based chemical products; fine chemicals, including various bismaleimides used in electronic materials and high-heat-resistant resins; polyurethane curing agents, which are raw materials for waterproof materials; fungicides and anti-mold agents; and industrial chemicals, including cleaning agents. In this segment, sales were JPY10.9bn (+387.6%, +JPY8.7bn YoY), and operating profit was JPY858mn (+2,177.8%, +JPY820mn).

Other Businesses

Other Businesses comprise leasing (which became part of this segment when the company adjusted its segments), electricity sales from mega solar generation, construction, printing, logistics, and information services.

In the leasing business, sales and profit were essentially the same as in FY10/16, as the company worked to effectively utilize owned properties. Both sales and profit increased YoY in the electricity service business, as mega solar plants benefited from sunny weather. Sales and profit also rose in the printing business, owing to strong orders from established customers and measures to cut SG&A expenses. In the logistics business, revenue increased due to the acquisition of new customers, but profit fell YoY, affected by a rise in SG&A expenses stemming from higher freight rates. As a result, segment sales were JPY6.2bn (+39.4%, +JPY1.8bn YoY), and operating profit was JPY552mn (-7.2%, -JPY42mn).

Other information

History

Date	Details
1928	Company started business as a trade cooperative for citrus, producing agrochemicals in the city of Shimizu, Shizuoka Prefecture (now Shimizu-ku, in the city of Shizuoka)
Jun. 1949	Became a joint stock company; company name changed to Ihara Agrochemical Co., Ltd.
Feb. 1956	Strengthened ties with the Federation of Purchasing Agricultural Cooperative Organizations (now the National Federation of Agricultural Cooperative Associations)
Apr. 1958	Acquired shares in Nihon Printing Industry Co., Ltd. (now a consolidated subsidiary)
Jan. 1962	Company name changed in Japanese (from Chinese characters to katakana; English name remained the same)
Aug. 1962	Established Ihara Automotive Co., Ltd., to conduct transportation and warehousing (now a consolidated subsidiary, the company name changed to Kumika Logistics Co., Ltd., in February 1987)
Nov. 1962	Listed on the Second Section of the Tokyo Stock Exchange
Oct. 1968	Name changed to Kumiai Chemical Industry Co., Ltd.
Nov. 1968	Conducted absorption-type merger with Toa Agricultural Chemical Co., Ltd. (founded in 1942), added the Tatsuno factory
Dec. 1968	Relocated head office to Chiyoda-ku, Tokyo
Feb. 1969	Set up a research structure, establishing an animal laboratory and a biological laboratory (later Life Science Research Institute) in Kikugawa-cho (now the city of Kikugawa), Ogasa-gun, Shizuoka Prefecture
Oct. 1972	Established Onomichi Kumika Industry Co., Ltd. (now a consolidated subsidiary) to manufacture and sell agrochemicals
Jan. 1974	In Brazil, established Iharabens Industria e Comercio Ltda (now K-I Chemical do Brasil Ltda, a consolidated subsidiary)
Feb. 1976	Head office relocated to Taito-ku, Tokyo (current location)
Apr. 1977	Listed on the First Section of the Tokyo Stock Exchange
Jan. 1978	In the US, established Agro Chemical International Inc. (name changed to K-I Chemical U.S.A. Inc. in April 1982; now a consolidated subsidiary)
Aug. 1991	Set up a metabolism studies wing at the Life Science Research Institute in Kakegawa, Shizuoka Prefecture, reinforcing structure for research related to metabolism and the environment
Mar. 2007	Established K-I Chemical Europe S.A./N.V. in Belgium (now a consolidated subsidiary)
Nov. 2012	Established Kumika International Inc. (wholly owned subsidiary) in the US
Feb. 2013	Established KUMIKA KOREA., Ltd. (wholly owned subsidiary) in South Korea
Dec. 2016	Entered an absorption-type merger agreement with Ihara Chemical Industry Co., Ltd., with Kumiai Chemical being the surviving company and Ihara Chemical the absorbed company (merged in May 2017)
Jun. 2017	Established PI Kumiai Private Ltd. in India for manufacturing and sales of Nominee
Nov. 2017	Conducted absorption-type merger with K-I Chemical Research Institute; name changed to New Molecule Research Center

Source: Shared Research based on company data

News and topics

December 2018

On **December 14, 2018**, the company announced details of the dividend it plans to pay out of retained earnings.

	Decision	Latest forecast (Out Sep. 7, 2018)	FY10/17 Act.
Record date	Oct. 31, 2018	Oct. 31, 2018	Oct. 31, 2017
DPS	JPY7.00 Ordinary JPY5.00 Commemorative JPY2.00	JPY5.00	JPY8.00
Total dividends	JPY877mn	-	JPY1,041mn
Effective data	Jan. 28, 2019	-	Jan. 29, 2018
Source of dividends	Retained earnings	-	Retained earnings

September 2018

On **September 26, 2018**, the company announced that it obtained agrochemical registration for new insecticide Pyraxalt.

The company announced that it has obtained agrochemical registration for seeding box-applied paddy rice insecticides containing a new active ingredient Pyraxalt (chemical name: triflumezopyrim), Zexaron Padeet Insecticide, Encore Insecticide, and Full Throttle Insecticide.

Developed by Zen-Noh and DuPont Production Agriscience, Pyraxalt is a new active ingredient that has shown excellent efficacy against planthoppers. It is highly safe for use on paddy rice, effective in controlling planthoppers that have recently become a problem for rice seedlings sown in seeding boxes, and has long residual activity. Further, it is expected to have preventive effects against rice black streak dwarf disease transmitted by small brown planthoppers. Overall, it is an extremely effective insecticide in controlling planthoppers.

The company has developed Zexaron Padeet Insecticide, Encore Insecticide, and Full Throttle Insecticide in response to regional pest control needs, and plans to launch these products in time for them to be available for rice produced in 2019.

1. Date of registration: September 26, 2018
2. Characteristics of Pyraxalt
   (1) Pyraxalt is highly effective in controlling major pests of paddy rice including white-backed plant hopper (*Sogatella furcifera*), brown plant hopper (*Nilaparvata lugens*), and small brown planthopper (*Laodelphax striatellus*), and has long residual activity.
   (2) Thanks to its new mode of action, it is also effective in controlling planthopper species that have developed resistance to existing insecticides.
   (3) Highly safe for use on paddy rice, it has negligible effects on beneficial insects.
3. Product information
   (1) Zexaron Padeet Insecticide (Ministry of Agriculture, Forestry and Fisheries (MAFF) Registration No. 24133)
      a. Active ingredients: Triflumezopyrim 0.75%, cyantraniliprole 0.75%
      b. Characteristics: In addition to being highly effective in controlling planthoppers thanks to new active ingredient Pyraxalt, it has shown excellent efficacy against pests that damage paddy rice at an early stage of growth and lepidoptera (moth) pests. Can be applied at the time of sowing.
   (2) Encore Insecticide (MAFF Registration No. 24134)
      a. Active ingredients: Triflumezopyrim 0.75%, chlorantraniliprole 0.75%, tricyclazole 4.0%
      b. Characteristics: In addition to being effective in controlling planthoppers thanks to new active ingredient Pyraxalt™, it has shown excellent efficacy against pests that damage paddy rice at an early stage of growth, lepidoptera (moth) pests, and rice blast.
   (3) Full Throttle Insecticide (MAFF Registration No. 24132)

a. Active ingredients: Triflumezopyrim 0.75%, cyantraniliprole 0.75%, isothianyl 2.0%, penflufen 2.0%
b. Characteristics: In addition to being effective in controlling planthoppers thanks to new active ingredient Pyraxalt™, it has shown excellent efficacy against pests that damage paddy rice at an early stage of growth, lepidoptera (moth) pests, rice blast, and rice sheath blight. Can be applied at the time of sowing.

Note: Pyraxalt, Zexaron, and Padeet are trademarks or registered trademarks of DuPont (US) or related companies. Encore and Full Throttle are registered trademarks of Kumiai Chemical.

July 2018

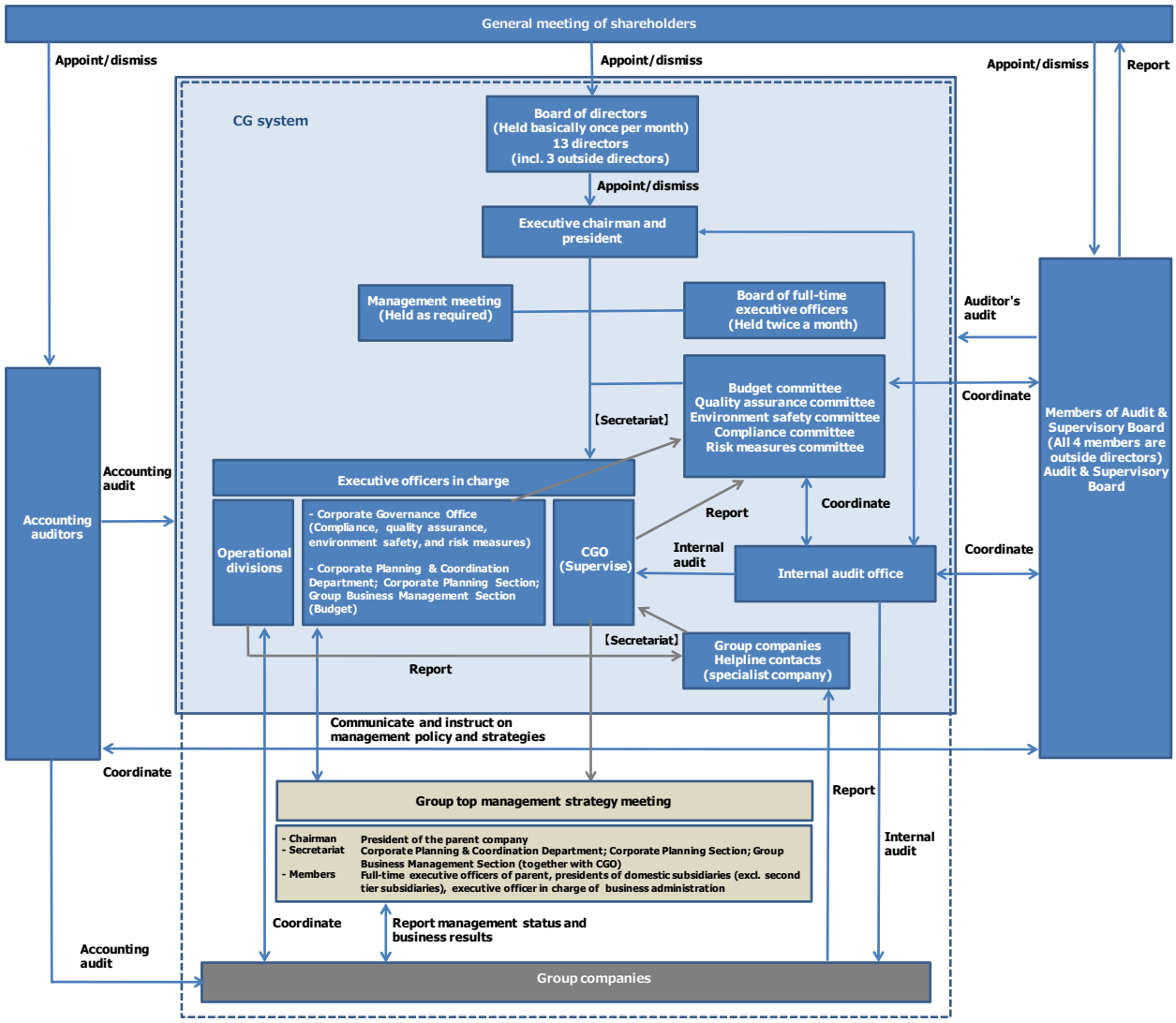
On **July 23, 2018**, the company announced joint development of Effeeda® in Europe.

The company announced that it has concluded a development and sales agreement with Certis Europe B.V. (CEO: Mark Waltham) on the same date with an aim of jointly developing the company's new herbicide Effeeda® (fenquinotrione) for wheat and paddy rice in Europe.

Effeeda®, developed by the company, has shown to have a high level of crop safety for wheat and paddy rice. It is a triketone compound with high herbicidal activity against broadleaf weeds and Cyperaceae (sedge) weeds. Effeeda® is effective in controlling difficult-to-control broadleaf weeds including those resistant to some conventional herbicides. In Japan, Effeeda® is registered as an agricultural chemical for paddy rice in February 2018, and is scheduled to be launched in 2019.

A European agrochemical company Certis sells Kumiai Chemical's Benthiavalicarb-isopropyl fungicide that is proven to be highly effective against downy mildew epidemics in Europe. Through joint development of Effeeda®, Certis aims to further strengthen its relationship with the company. Mitsui AgriScience International S.A./N.V. under the umbrella of Mitsui & Co., Ltd. (TSE 1: 8031) is the majority shareholder of Certis; Kumiai Chemical holds a portion of shares in Certis.

Corporate governance and top management



Source: Shared Research based on company data

Top management

Yoshitomo Koike, president and representative director

Apr. 1978	Joined Kumiai Chemical
Jan. 2003	Head of the Chemical Research Institute
Feb. 2007	Head of the Formulation Technology Research Institute
Jun. 2008	General Manager of the Corporate Planning & Coordination Department
Jan. 2009	Director and General Manager of the Corporate Planning & Coordination Department
Jan. 2013	Managing Director
Jan. 2015	Managing Director and Head of the Research & Development Division
Mar. 2015	President and Representative Director, Head of Research & Development Division
Jan. 2018	President and Representative Director

Corporate governance

The Kumiai Chemical group recognizes the importance of building a structure capable of responding swiftly to changes in the business environment. The group also places a high priority on expanding the management structure in the interest of ensuring legal and ethical compliance from a shareholder-focused perspective, as well as increasing management transparency.

Concerning its relationship with stakeholders, the company's management vision states, "We seek harmony with all stakeholders by practicing transparency in all our corporate activities." The code of conduct emphasizes "sincerity and pride as a Kumiai Chemical employee," "a 'total win' with customers and trading partners," "mutual communication with shareholders," "respect for stakeholders," and "responsibility to society, and earning the trust of society." With these words, the company expresses the behaviors and compliance it expects of its employees and states how it is cultivating a corporate culture that prioritizes the perspective of stakeholders.

- Board of Directors: Composed of 13 directors (of whom three are outside directors)
  - The board meets to decide on important matters of business execution.
- Managing Directors' Meeting: Composed of directors with executive duties
  - The committee meets as necessary to discuss important management strategies and business execution.
- Executive Meeting: Composed of full-time executives
  - The committee typically meets semi-monthly to decide on matters of business execution.
- Audit & Supervisory Board: Composed of four corporate auditors (all of whom are outside auditors)
  - Based on the audit plan formulated by the Board of Corporate Auditors, corporate auditors attend Board of Directors meetings, audit individual departments and offices, share information on the status of audits and management with other auditors, and seek to perform audits based on shared intentions and mutual understanding.

Other committees within the governance structure include the Budget Committee, the Compliance Committee, the Quality Assurance Committee, the Environmental Safety Committee, and the Risk Countermeasures Committee, and hold Group Management Top Strategy Meeting regularly.

Kumiai Chemical has formulated basic rules on the management of group companies, such as regulations on the control of affiliated companies, to ensure appropriate operations of the corporate group. The company has in place a basic policy on corporate governance related to financial reporting to ensure the reliability of this reporting. Kumiai Chemical has created an internal control system related to financial reporting that includes group companies and assesses this system and its state of operations on an ongoing basis.

The Compliance Committee, chaired by the president, discusses important compliance-related matters. As compliance-related efforts that also encompass group companies, Kumiai Chemical has set up an internal reporting system (helpline); formulated a code of conduct, code of behavior, and ethical standards; and built a compliance system.

Dividend policy

(JPY)	FY10/13	FY10/14	FY10/15	FY10/16	FY10/17	FY10/18
Interim dividend	–	–	–	–	–	3.0
Year-end dividend	6.0	7.0	8.0	8.0	8.0	7.0
Annual total	6.0	7.0	8.0	8.0	8.0	10.0
Total dividends (JPYmn)	482	562	642	642	1,041	1,253
Payout ratio (%)	20.0	18.3	9.7	18.6	11.4	26.7
DOE (%)	1.1	1.2	1.3	1.2	1.1	1.4

Source: Shared Research based on company website

When distributing profits to shareholders, Kumiai Chemical's basic policy is to pay stable, ongoing dividends, taking into consideration such factors as strengthening the corporate structure and retaining sufficient funds for future business development. The company has no specific calculation for determining dividends. Dividends from surplus (including interim dividend) are decided at the general meeting of shareholders.

Kumiai Chemical maintains internal reserves for R&D expenses and capital investment. In the five years to FY10/17, the payout ratio has ranged from 10% to 20%, and the dividend on equity rate has been between 1.1% and 1.3%.

Major shareholders

Top shareholders	Shares held ('000)	Shareholding ratio
National Federation of Agricultural Cooperative Associations	26,527	21.17%
Japan Trustee Services Bank, Ltd. (Trust account)	8,212	6.55%
CGML PB CLIENT ACCOUNT/COLLATERAL	7,570	6.04%
The Norinchukin Bank	6,117	4.88%
The Master Trust Bank of Japan, Ltd. (Trust account)	4,787	3.82%
Suruga Bank Ltd.	4,397	3.51%
Kyoei Fire & Marine Insurance Co., Ltd.	4,381	3.49%
JA Shizuoka Keizairen	2,770	2.21%
The Dai-ichi Life Insurance Company, Limited	2,080	1.66%
Nippon Soda Co., Ltd.	1,928	1.53%

Source: Shared Research based on company data
As of October 31, 2018
Note: Shareholding ratios exclude 7,921,000 shares of treasury stock.

Cooperative organizations (Zen-Noh, Norinchukin Bank, and Shizuoka Keizairen) own 26.58% of Kumiai Chemical's shares. In FY10/17, the company set up commitment line agreements (syndication method) worth JPY10.0bn with Norinchukin Bank and Suruga Bank (TSE1:8358). The company's objective is to procure working capital efficiently. During FY10/17, Kumiai Chemical did not draw on these commitment lines.

Employees

		FY10/13	FY10/14	FY10/15	FY10/16	FY10/17	FY10/18
Kumiai Chemical Industry (consolidated)							
	Employees	628	634	652	684	1,533	1,672
	Temporary staff (avg.)	135	139	127	126	207	182
Kumiai Chemical Industry (parent)							
	Employees	369	379	390	418	653	718
	Temporary staff (avg.)	48	50	51	48	49	57
Former Ihara Chemical Industry (cons.)	Employees	594	620	639	630	-	-

Source: Shared Research based on company data

In the May 2017 merger, employees of the former Ihara Chemical transferred to Kumiai Chemical, so we have provided employee numbers for Ihara Chemical (consolidated basis) through FY10/16 for reference.

Profile

Company name	Head office
KUMIAI CHEMICAL INDUSTRY CO., LTD.	4-26, Ikenohata 1-chome, Taito-ku, Tokyo 110-8782 JAPAN
Phone	**Listed on**
+81-3-3822-5036	November 1962
Established	**Exchange listing**
June 20, 1949	First Section of the Tokyo Stock Exchange
Website	**Fiscal year-end**
http://www.kumiai-chem.co.jp/english/index.html	October
IR contact	**IR web**
Public & Investor Relations Section, General & Personnel Affairs Department, Corporate Planning & Coordination Division	http://ir.kumiai-chem.co.jp/en/index.html

We offer corporate clients comprehensive report coverage, a service that allows them to better inform investors and other stakeholders by presenting a continuously updated third-party view of business fundamentals, independent of investment biases. Shared Research can be found on the web at http://www.sharedresearch.jp.

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Anicom Holdings, Inc.
Anritsu Corporation
Apaman Co., Ltd.
Arealink Co.,Ltd.
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AS ONE CORPORATION
Ateam Inc.
Aucfan Co., Ltd.
AVANT CORPORATION
Axell Corporation
Azbil Corporation
AZIA CO., LTD.
AZoom, Co., Ltd.
BEENOS Inc.
Bell-Park Co., Ltd.
Benefit One Inc.
B-lot Co.,Ltd.
Broadleaf Co., Ltd.
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Career Design Center Co., Ltd.
Carna Biosciences, Inc.
CARTA HOLDINGS, INC
CERES INC.
Chiyoda Co., Ltd.
Chugoku Marine Paints, Ltd.
cocokara fine Inc.
COMSYS Holdings Corporation
CRE, Inc.
CREEK & RIVER Co., Ltd.
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Daiseki Co., Ltd.
DIC Corporation
Digital Arts Inc.
Digital Garage Inc.
Dream Incubator Inc.
Earth Corporation
Elecom Co., Ltd.
en-Japan Inc.
euglena Co., Ltd.
Evolable Asia Corp.
FaithNetwork Co., Ltd.
Ferrotec Holdings Corporation
FIELDS CORPORATION
Financial Products Group Co., Ltd.
FreeBit Co., Ltd.
FRONTEO, Inc.
Fujita Kanko Inc.
Gamecard-Joyco Holdings, Inc.
GCA Corporation
Good Com Asset Co., Ltd.
Grandy House Corporation
Hakuto Co., Ltd.
Happinet Corporation
Harmonic Drive Systems Inc.
HOUSEDO Co., Ltd.
IDOM Inc.
IGNIS LTD.
i-mobile Co.,Ltd.
Inabata & Co., Ltd.
Infocom Corporation
Infomart Corporation
Intelligent Wave, Inc.
ipet Insurance CO., Ltd.
istyle Inc.
Itochu Enex Co., Ltd.
JSB Co., Ltd.
JTEC Corporation
J Trust Co., Ltd
Japan Best Rescue System Co., Ltd.
JINS Inc.
JP-HOLDINGS, INC.
KAMEDA SEIKA CO., LTD.
Kenedix, Inc.
KFC Holdings Japan, Ltd.
KI-Star Real Estate Co., Ltd.
Kondotec Inc.
Kumiai Chemical Industry Co., Ltd.
Lasertec Corporation
LUCKLAND CO., LTD.
MATSUI SECURITIES CO., LTD.
Medical System Network Co., Ltd.
MEDINET Co., Ltd.
MedPeer,Inc.
Mercuria Investment Co., Ltd.
Micronics Japan Co., Ltd.
Milbon Co., Ltd.
MIRAIT Holdings Corporation
Monex Goup Inc.
MORINAGA MILK INDUSTRY CO., LTD.
NAGASE & CO., LTD
NAIGAI TRANS LINE LTD.
NanoCarrier Co., Ltd.
Net One Systems Co.,Ltd.
Nichi-Iko Pharmaceutical Co., Ltd.
Nihon Denkei Co., Ltd.
Nippon Koei Co., Ltd.
NIPPON PARKING DEVELOPMENT Co., Ltd.
NIPRO CORPORATION
Nisshinbo Holdings Inc.
NS TOOL CO., LTD.
OHIZUMI MFG. CO., LTD.
Oki Electric Industry Co., Ltd
ONO SOKKI Co., Ltd.
ONWARD HOLDINGS CO.,LTD.
Pan Pacific International Holdings Corporation
PARIS MIKI HOLDINGS Inc.
PIGEON CORPORATION
RACCOON HOLDINGS, Inc.
Raysum Co., Ltd.
RESORTTRUST, INC.
ROUND ONE Corporation
RVH Inc.
RYOHIN KEIKAKU CO., LTD.
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SANIX INCORPORATED
Sanrio Company, Ltd.
SATO HOLDINGS CORPORATION
SBS Holdings, Inc.
Seikagaku Corporation
Seria Co.,Ltd.
SHIP HEALTHCARE HOLDINGS, INC.
SIGMAXYZ Inc.
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YUMESHIN HOLDINGS CO., LTD.
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Yushiro Chemical Industry Co., Ltd.
ZAPPALLAS, INC.

Attention: If you would like to see companies you invest in on this list, ask them to become our client, or sponsor a report yourself.

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