



## Agricultural Chemicals and Agriculture-Related Business (Japan)

Kumiai got its start in 1928 when the Citrus Industry Association began manufacturing agricultural chemicals. Since that time, we have been providing safe and secure agricultural chemical products based on integrated processes; from chemical discovery through to manufacturing and sales. The Japanese agriculture market is facing issues such as a labor shortage due to aging farmers and lack of successors, as well as an increase in the number of abandoned fields. By developing and spreading new products and technologies for resolving these issues, it is our desire to support stable food production and sustainable agriculture.

IWATA Kouichi Managing Executive Officer, Head of Domestic Sales Division

Opportunity	Strength
<ul style="list-style-type: none"> <li>Labor shortage due to declining population in Japan, aging farmers, and lack of workers</li> <li>Increasing demand for agricultural chemicals that are gentler on the environment and physical pest control</li> </ul>	<ul style="list-style-type: none"> <li>Inhouse development of active ingredients and products</li> <li>Strong sales network in Japan</li> </ul>

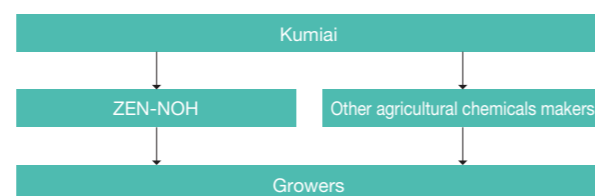
### Japan's Agricultural Chemicals Market

Although there is a slow decline in the area of cropland in Japan, since the demand for feed rice is increasing and farmers are aging, there is a growing need for agricultural chemicals to help reduce the agricultural workload, and to improve production efficiency as cropland is consolidated and streamlined. Therefore, the market remains around at around 340 billion yen. The Ministry of Agriculture, Forestry and Fisheries also formulated the "Strategy for Sustainable Food Systems, MeaDRI" in 2021 to improve both the productivity and sustainability of food, agriculture, forestry, and fishing industries. They set targets such as achieving zero CO<sub>2</sub> emissions in the agriculture, forestry, and fishing industries, and a reduction in the dosage of chemical pesticides by 50% in regards to risk, requiring the development and spread of new agricultural chemicals and technologies.

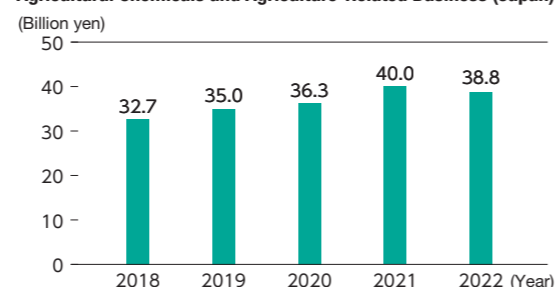
### Business Contents

Our product portfolio includes hundreds of various herbicides, fungicides, and insecticides for meeting the different needs in the market, which change according to region. We also have expert sales persons and engineers spread across our seven bases in Japan who can propose agricultural chemicals according to the region, and provide follow-up care. We sell products that we develop and manufacture to the National Federation of Agricultural Cooperative Associations (ZEN-NOH), and these products are provided to growers by JA throughout Japan. We also sell our proprietary active ingredients to other manufacturers for agricultural chemicals, and are endeavoring to maximize sales and profits not just from our own products, but also by having our active ingredients adopted into other companies' products. In addition to our products for cropland, Kumiai Group also sells products for non-cropland such as golf courses, highways, and railroad tracks. Although the market environment has become strict, net sales from our agricultural chemicals business

in Japan is trending upwards centering on our new products. Net sales for FY2022 reached 38.8 billion yen.



Agricultural Chemicals and Agriculture-Related Business (Japan)



### Business Strategy

#### ① Expansion of existing business

##### ● EFFEEDA®

Our herbicide for paddy rice EFFEEDA® is our proprietary active ingredient and have an efficacy to a wide range of weeds including resistant weed against conventional herbicides, was which we began from 2019. EFFEEDA® enabled us to take back the top share of one-shot herbicides for paddy rice in 2021, which had been taken over by our competitors in recent years. In 2022, we launched a new product on the market (SHINZUI Z), and expanded our shipping area to 340,000 ha, strengthening our position at the top of the market. We will continue our



efforts to increase its sales as an active ingredient capable of leading our business in Japan.

##### ● DISARTA®

The fungicide for paddy rice DISARTA® (product name: BOON®) is a proprietary product which acts as a disease resistance inducer that enhances the disease response of plants and makes them less susceptible to disease. It is highly effective in against "rice blast," which is a serious disease with paddy rice. We began selling DISARTA® in 2021, and placed the new mixed formulation BOON® ALLES® (ALLES® is a registered trademark of Sumitomo Chemical Co., Ltd.) on the market in 2022, which is steadily growing. The estimated area of use as our sales of paddy rice seeding box treatment products have reached around 250,000 ha. We will continue to develop and sell new mixed formulations including DISARTA®, focusing on increasing sales and profits in other priority fields in addition to our main herbicide for paddy rice.



##### ● SOLISTE

SOLISTE is an herbicide for turf marketed by RIKENGREEN, which is our group company. It can be used for fairways and roughs at golf courses, and it is highly effective against annual bluegrass, which is a difficult-to-control weed. Kumiai Group also develops and sells various production materials not only for cropland but also for non-cropland. We will proactively develop our proprietary products to expand and strengthen our business.

#### ② Expansion of research and business domains

To overcome issues facing the domestic agriculture market, we have initiatives in place for establishing a sustainable agricultural production system by actively participating in smart agriculture aimed at improving the efficiency of farm work and reducing labor. We are working to promote the use of agricultural machinery (such as drones, radio-controlled boats, and automatic water supply systems) in combination with our proprietary labor-saving formulation, MAMETSUBU. To help reduce the load on the environment in harmony with the "MeaDRI," we are utilizing microbial pesticides and natural chemicals, and are promoting the use of MAMETSUBU for drift reduction as a response to positive listing. We are working on the development of new microbial pesticides, and will make effort to continue predicting the market while again promoting our existing products.

##### ● Flupentiofenox

We are proceeding with the development of Flupentiofenox for new miticides. Mites that are resistant to conventional agricultural chemicals have become an issue in Japan, so this is drawing attention as a miticide with a new mode of action. We are preparing to launch this to expand our business into the horticultural field.

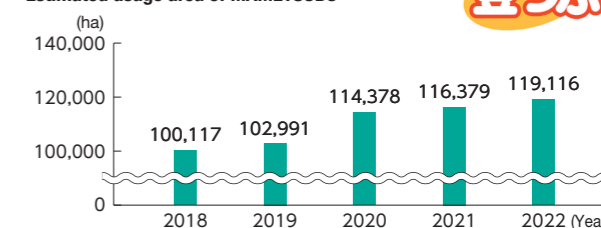
### Looking to the Future

Paddy rice is the core of our domestic agricultural chemicals business. Therefore, we will work to further expand sales by increasing our lineup of mixed formulations with EFFEEDA® and DISARTA®, both of which we developed inhouse.



We will also further expand our market share of one-shot herbicides for paddy rice, which is led by EFFEEDA®. To maintain our position at the top of the market for one-shot herbicides for paddy rice, which we have held for two consecutive years since 2021, we will work to expand sales of products containing proprietary active ingredients, and starting in 2023, we will introduce LAOH and AKATSUKI to the market, which are new mixed formulations of EFFEEDA® to establish a base for making these more popular. For paddy rice seeding box treatment products, we will endeavor to expand our market share, which is led by DISARTA®. In 2023, BOON® BUZZ SC, which is a new mixed formulations of DISARTA®, will be put on the market in Hokkaido to establish a base for its widespread use. In the non-cropland field, we will strive to grasp market trends and respond accurately and promptly to changes in the sales environment so that we can expand sales of products containing proprietary active ingredients such as SOLISTE and SPADA. Moreover, we are striving to raise the overall level of our agricultural chemicals business in Japan by maximizing our other inhouse developed products. In response to the "MeaDRI," not only are we promoting and expanding sales of our proprietary labor-saving formulation, MAMETSUBU, we will continue strengthening cooperation with related organizations like ZEN-NOH and smart agriculture-related manufacturers to develop comprehensive solutions that reduce labor and improve efficiency through a combination of drones for agricultural use, automatic water supply equipment, and radio-controlled boats. In addition, since there is a need to reduce the impact of chemical pesticides on the environment, our IPM efforts include the use of microbial pesticides, remote sensing technology, the spread of low-drift MAMETSUBU formulations, and advanced agricultural production materials (biostimulants and new microbial pesticides), which we will promote for social implementation. We will continue making effort to improve productivity and agricultural sustainability while ensuring harmony with the environment by providing essential products for both cropland and non-cropland.

Estimated usage area of MAMETSUBU



## Agricultural Chemicals and Agriculture-Related Business (Overseas)

To contribute to improve the productivity of agricultural products on a global scale, Kumiai is promoting the wide use of products, especially our proprietary products, not just in Japan, but around the world.

We will contribute to improve global food security by utilizing our strengths in R&D capabilities and with sales systems in response to changes in the agricultural environment including the growing global population and increased pests as a result of climate change.

UCHIDOI Toshiharū Representative Director, Senior Managing Executive Officer, Head of Overseas Sales Division

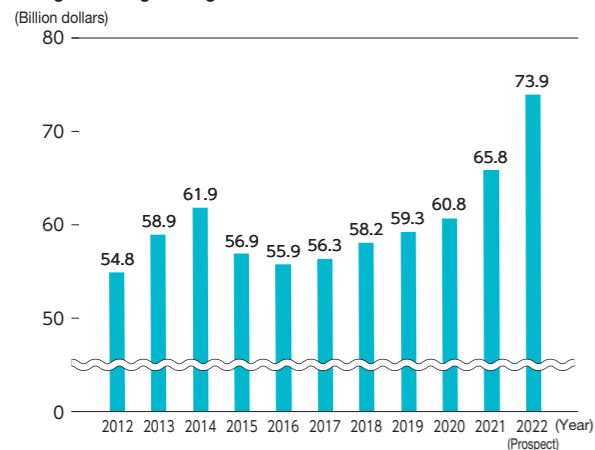


Opportunity	Strength
<ul style="list-style-type: none"> <li>Increasing demand for food as the world population grows</li> <li>Spread of resistant weeds against conventional herbicides</li> <li>Increasing demand for feed grains as dietary habits change</li> <li>Increasing demand for products that are in harmony with the Farm to Fork strategy</li> </ul>	<ul style="list-style-type: none"> <li>In-house development of active ingredients and products</li> <li>System of cooperation with local distributors</li> </ul>

### Global Agricultural Chemicals Market

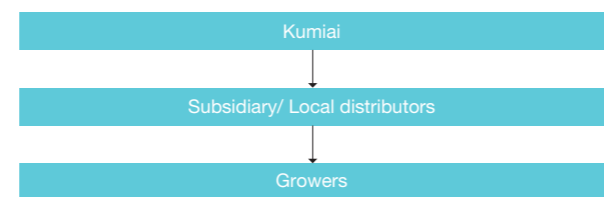
The global agricultural chemicals market continues to grow on the back of a growing world population. In recent years, the market has expanded mainly in South America and Asia. This growth trend is expected to continue, backed by increasing demand for grains due to population growth and changes in dietary habits. According to AgbiInvestor, in 2022, the agricultural chemicals market expected to see significant growth on a monetary basis over the previous year as a result of higher agricultural chemical prices caused by higher grain prices and soaring raw material costs. Although the growth rate in 2023 is not expected to be the same as in 2022, the market is expected to continue growing over the medium to long term.

#### Changes in the global agricultural chemicals market

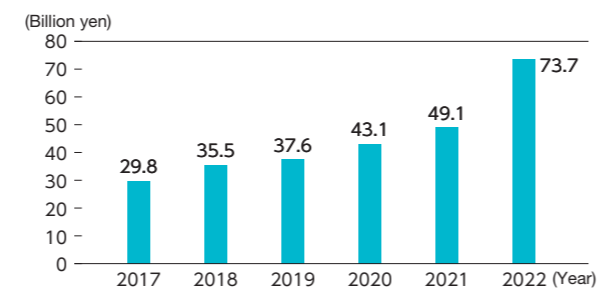


Source: AgbiInvestor

We sell to growers in collaboration with subsidiaries, affiliates, and distributors that have strong sales networks in each market. Active ingredients that we sell are commercialized by distributors, which are then sold to local retailers and growers. In addition to selling single formulation, we also develop and sell mixed formulations that combine other ingredients, such as active ingredients from distributors. We also sell products that are based on our unique technologies to growers through distributors, and we are actively working to increase added value by differentiating our products from our competitors. In terms of sales, employees of Kumiai and overseas subsidiaries visit local markets in order to conduct surveys, identify customer needs, and propose effective usage suited to the region, leading to develop new markets.



#### Agricultural Chemicals and Agriculture-Related Business Sales (Global)



### Business Contents

Kumiai sells our proprietary products to more than 50 countries around the world. Net sales with our Agricultural Chemicals and Agriculture-related Business for FY2022 reached 73.7 billion yen outside Japan as growth continues due to a favorable market environment.

### Business Strategy

#### ① Expanding sales of proprietary products

##### ● AXEEV®

AXEEV® is field crop herbicide that we launched in 2011 mainly for use with soybeans, corn, wheat, and sugar cane. In addition to the favorable market environment including soaring grain prices, it is positioned as an essential product for controlling conventional herbicides resistant weeds on croplands. As a result, sales have been strong, which is driving Kumiai's performance. In FY2022, net sales reached 54.4 billion yen, well beyond the expected sales of 35 billion yen set in the Mid-Term Business Plan. We expect demand for gains to continue increasing in the future. We will take advantage of this increasing demand to contribute to improve food productivity for maximizing our business.

##### ● EFFEEDA®

EFFEEDA® is currently marketed mainly for paddy rice in Japan, so we will strengthen its development in other countries. In addition to the launch of new mixed formulations and further expansion of sales in South Korea, where we are already marketing the product, we will promote development in other regions, including Europe.

##### ● DISARTA®

The fungicide for paddy rice DISARTA® has been sold in Japan since 2021, and will be launched in Korea in 2023. The method for paddy rice cultivation in Korea is similar to in Japan, so demand for fungicides that can control diseases such as rice blast has been on the rise. We will proceed with production and procurement adjustments to ensure vertical start-up from the first year of sales.

##### ● Prohexadione-calcium

Prohexadione-calcium is a plant growth regulator that was launched in 1994. It is one of our long-sellers, and sales continue increasing over 20 years due to its excellent performance and safety. We will continue to expand sales, mainly in the European wheat market and fruit market in Brazil.



One of our products in Europe REGALIS®  
Picture provided by BASF : REGALIS® is a registered trademark of BASF

#### ② Ensuring diversity of sales routes

##### ● Asiatic Agricultural Industries (AAI)

In February 2021, we acquired AAI, which was a manufacturer and distributor of agricultural chemicals in Singapore, as a subsidiary. By strengthening and integrating our and AAI's sales network in Asia and Africa, we will strengthen sales capabilities of our Group in countries outside Japan. We are aiming to further develop both companies through synergy effects such as promotion of product development based on an understanding of local market information and needs, cooperation in performance evaluation in product development, and mutual outsourcing of formulations.



##### ● PI Kumiai Private Ltd.

In June 2017, PI Kumiai Private Ltd. was established as a joint venture company with PI Industries Limited in India, and established a local manufacturing and distribution system for herbicide for paddy rice NOMINEE® in India. We will make continuous effort to maintain and expand NOMINEE® sales by maintaining product quality as original product and also strengthening competitiveness against generic products.

### Looking to the Future

Since its launch in 2011, sales of the field crop herbicide AXEEV® have steadily increased, becoming a significant pillar of our business with net sales reaching 54.4 billion yen in FY2022. We will ensure to capture the increase in demand based on a favorable market environment, which is expected to continue in the future, and will implement measures against generic products in order to maximize sales and profits. As for the herbicide EFFEEDA® that had mainly been sold on the market in Japan, in 2021, we applied to register it for use in the European wheat market as an initiative for further growth. Registration will be completed sometime in the future, but we will promote its development and establish a distribution system to maximize global sales of EFFEEDA®. We will also expand sales and proceed with development of the fungicide DISARTA® and the plant growth regulator prohexadione-calcium in order to grow our overall business in overseas market. In addition to utilize AAI which became our subsidiary in 2021, to strengthen our sales capabilities especially in Asia and Africa, we will also continue to consider acquiring other companies' products as a discontinuous measure.



## Fine Chemicals Business

Kumiai Group has positioned Fine Chemicals Business as the second pillar following Agricultural Chemicals and Agriculture-related Business. Fine Chemicals Business includes four segments, which are the Chlorination Business, Advanced Chemicals Business, Expanded Polystyrene Business, and Specialty Chemicals Business, and we develop a wide range of businesses in different fields. To ensure a safe and prosperous life for people, we are contributing toward achieving SDGs and a recycling-based society through the development and supply of chemical products used in infrastructure and advanced technologies.

URUSHIBATA Ikumi Managing Executive Officer, Head of Chemical & Specialty Products Sales Division

Opportunity	Strength
<ul style="list-style-type: none"> <li>Increasing demand in advanced fields such as pharmaceuticals, fine chemicals, and semiconductors (Chlorination / Advanced chemicals)</li> </ul>	<ul style="list-style-type: none"> <li>Organic synthesis technologies cultivated through the manufacturing of active ingredients in agricultural chemicals</li> <li>Integrated research and development system from compound discovery to development of new products</li> </ul>

### Business Contents

Kumiai is engaged in R&D, manufacturing and sales on Fine Chemicals used in various aspects of daily life by applying organic synthesis technology that we have cultivated over many years. Many of our fine chemical products are highly recognized in upstream industries. Although our company name does not appear on the market, they are used in everyday items such as smartphones circuit boards, aircraft and automobile parts, and waterproof materials in roads and buildings.

#### ① Chlorination Business (IHARANIKKEI CHEMICAL INDUSTRY)

Intermediates for agricultural chemicals and pharmaceuticals, dyes, chlorotoluene and chloroxylene derivatives for high-polymer materials.



#### ② Advanced Chemicals Business (K-I CHEMICAL INDUSTRY and Kumiai)

Bismaleimides as raw materials for resins with high heat resistance used in electronic materials and urethane-related products.



#### ③ Expanded Polystyrene Business (Ihara Construction Industry)

Packaging materials for agricultural and fishery products, and electrical appliances, home appliance parts, building materials, land settlement prevention measures.

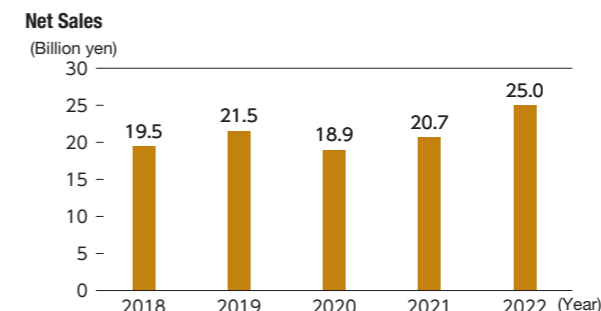


#### ④ Specialty Chemicals Business (K-I CHEMICAL INDUSTRY and RIKENGREEN)

Raw materials used in disinfectants for medical equipment, environmental hygiene agents used in wet wipes and for disinfecting hot spring baths, and stripping and coating agents used to manufacture toilet paper.



Net sales with Fine Chemicals Business decreased in FY2020 due to the impact of COVID-19, but has been trending toward recovery since that time. In FY2022, there was strong demand for raw materials for aramid fiber in the Chlorination Business, and for bismaleimides and urethane-related products in the Advanced Chemicals Business, with the Fine Chemicals Business as a whole reaching a record high of 25 billion yen.



### Business Strategy

#### Expanding Existing Business by Investing Management Resources to Growing Business

Demand for Chloroxylene derivatives, which is our main product for the Chlorination Business, has tightened due to a global increase in demand for raw materials for aramid fiber. Therefore, we viewed this as a business opportunity to establish a manufacturing base in Thailand in 2018 for increasing production. Later, the second phase of our investment got underway with the aim of expanding product lines. A second plant began operating in January 2021, which completed expansion of our production system.

The COVID-19 crisis that started near the end of 2019 impacted customers such as the automobile industry, resulting in production adjustments, which lead to less demand for aramid fiber raw materials than expected in recent years. However, demand has increased worldwide, and recovery from the COVID-19 pandemic is moving forward, shifting completely to a growth trend.



Iharanikkei Chemical (Thailand)

#### Expanding Business Domains

##### 1. Cultivating new business and expanding contracted manufacturing business

Through our unique technologies based on organic synthesis cultivated from manufacturing agricultural chemicals, we develop new products utilizing our advanced technologies, discovering new demands, and expanding our contracted manufacturing business.

##### 2. Strengthening our development base

In addition to promoting the discovery of new themes through joint research with external research institutes including universities and the National Research and Development Agency, as an organizing foundation for strengthening R&D capabilities to support these, we will endeavor to improve research and development systems in each business field while pioneering new markets.

##### 3. Establishment of the New Material Research Laboratory

The New Material Research Laboratory was established at the Chemical Research Institute for maximizing fine chemicals business. We are able to create synergy through cross-sectional Group initiatives based on collaboration among researchers from Kumiai and Group Companies. We are looking forward to launching new original products that incorporate the know-how and technologies of each company.

### Looking to the Future

Our Fine Chemicals Business includes various products in the upstream industries of the value chain. From now, we will expand our business by developing new products including semiconductor-related materials with higher added value as well as high-performance materials that utilize our Group's unique technologies, and by promoting the development of more profitable downstream products. By creating new value for realizing a sustainable society, we will also endeavor to realize our Ultimate Goals of being "Company group that is able to adapt flexibly to support affluent lifestyle through unique technologies and that contributes toward the sustainable development of a society in harmony with nature."

We feel it is necessary for us to establish an organization that allows us to discover fields that are expected to expand in the future and that enables us to respond flexibly.

Based on our R&D capabilities, we will improve our systems so that we can access cutting-edge technologies and respond quickly to customer needs, and make effort to expand our Fine Chemicals Business.

## Production / Procurement

Kumiai owns unique production technologies and production facilities that make it possible for us to produce and supply active ingredient in agricultural chemicals, formulations, and fine chemicals based on our development technologies for agricultural chemicals. The quality management system at each factory handles manufacturing and quality control as they endeavor to improve their quality assurance system.

As the cost of raw materials and fuel are soaring higher, we are making efforts to achieve stable supply and safe operations. In addition to stabilizing our supply chain and CSR procurement, we will implement measures for reducing greenhouse gas emissions by considering and implementing environmentally-friendly materials and equipment.

IKAWA Teruhiko Director, Managing Executive Officer, Head of Production & Procurement Division



### Factories as Manufacturing Capital

#### Shizuoka Factory

The Shizuoka Factory is our production base for chemicals centering mainly on agricultural active ingredients (technical grade). It handles optimization of production for stable supply, and produces and supplies organic compounds according to the needs of various fields including pharmaceuticals, agricultural chemical intermediates, and high-performance chemicals to the world. It has acquired ISO/IEC17025 in addition to ISO9001 and ISO14001, and manufactures and supplies high-quality active ingredients for agricultural chemicals.



#### Kogota Factory

The Kogota Factory started as a dustable powder factory in 1962, and is currently our production base for herbicide granules used for paddy rice and crop field, MAMETSUBU, water-dispersible granules for Eastern Japan, and flowable formulations for insecticides and fungicides. It manufactures high-quality, environmentally-friendly products on the premise of "Safety First" in harmony with the basic policies of ISO9001 and ISO14001.



#### Tatsuno Factory

Tatsuno Factory has been operating safely as our production base in West Japan since 1962. It is a multi-purpose factory capable high-variety and low-volume production that includes production facilities capable of handling various formulations such as flowable formulations, granules, wettable powder, and water-dispersible granules. It has acquired ISO9001 and ISO14001 certification, and is focused on quality assurance and environmental conservation as it creates products that are trusted by customers.



In October 2022, a new plant for water-dispersible granules was completed. We will utilize the capabilities of this new advanced, and environmentally-friendly factory to achieve safe operation and stable supply.



New plant for water-dispersible granules

### Proprietary production technology

#### ① Establishing and improving manufacturing technology in collaboration with research institutes

Thanks to the close cooperation between factories and research institutes that are production sites, we are able to establish manufacturing methods for our factories and quickly perform upscaling at the laboratory level; from discovering new agricultural chemicals to optimizing synthesis methods for industrial manufacturing, through to actual production. This is the key to our production system. Factories and research institutes also collaborate to reduce manufacturing costs and improve/optimize production efficiency.

Moreover, when outsourcing production, engineers from Kumiai visit the actual site to give instructions to ensure the stable supply of high-quality products.



Process Chemistry Research Center

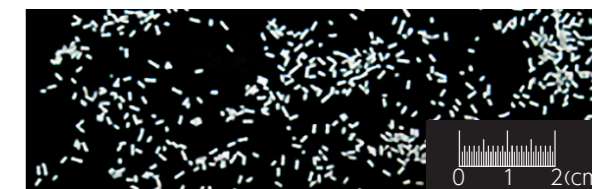
#### ② Organic synthesis technology

At our Shizuoka Factory, there is a multipurpose plant capable of handling small- to large-scale work, as well as a large-scale clean disposal treatment facility for protecting the environment. These facilities allow us to utilize the organic synthesis technologies that we have accumulated over our years of experience based on our manufacturing technology related to agricultural chemical active ingredients so that we can respond flexibly. Through these facilities and technologies, we are handling consigned synthesis of organic compounds in harmony the needs of customers in various fields.

#### ③ Proprietary formulation technology (MAMETSUBU)

Our unique formulation MAMETSUBU is a labor-saving formulation that can be spread manually from paddy field ridge, applied using a package bag, ladders, engine duster, unmanned helicopter, or drones. The application rate per 1 ha of paddy fields is also low at 2.5 kg, which reduces CO<sub>2</sub> emissions during transportation and helps the environment. MAMETSUBU granules are relatively large at 3 to 8 mm compared to conventional granules of 0.8 to 1.2 mm. We utilize our own production technology to produce these, and commercialization is handled using our specialized manufacturing and packaging equipment. For our JUMBO formulation that uses MAMETSUBU,

our latest equipment is used to achieve accurate and high-speed weighing and packaging that allows for stable production supply.



Standard granules



MAMETSUBU

#### ④ Contracted manufacturing based on our formulation technology

We also handle contracted manufacturing for formulations at each factory according to customer requests based on our accumulated formulation techniques and specialized capabilities.

### Supply Chain

Regarding the procurement of raw materials, we are utilizing our Group network including our Group Companies around the world and our bases outside Japan to ensure alternative procurement suppliers for reducing the impact on the ever-changing fine chemical raw material market. We are also strengthening our production system so that it can respond to global development such as decentralizing production bases for organizing stable procurement, production, and supply systems.

We also have established our "Basic Policy on CSR Procurement" and "CSR Procurement Guidelines," and are promoting CSR procurement in harmony with these.

### Future Measures

The costs of raw materials and energy are expected to remain high due to the rising prices of crude oil and naphtha. Kumiai Group will strive to reduce costs and ensure stable supply by efficiently producing active ingredients and formulations and improving production conditions. While maintaining a secure supply system based on safe operation, we will strive to strengthen capital investment and factory capabilities for ensuring efficient production. We will also implement measures for reducing greenhouse gas emissions through the use of environmentally-friendly raw materials and packaging and related equipment. With regard to procurement, Kumiai Group will work to ensure a stable supply chain and practice CSR procurement.

## Research and Development



Since our foundation, Kumiai have grown by using our strength of research and development to create new agricultural chemicals.

Through our integrated research and development system, from exploratory synthesis, biological evaluation, formulation, through to the establishment of industrial manufacturing methods for new compounds, we have been promoting the development of unique products with added value that can contribute to stable food supply. We are also focused on developing fine chemicals such as pharmaceutical intermediates and high-molecular materials using our highly safe agricultural chemical development techniques.

OKAWA Tetsuo Director, Managing Executive Officer, Head of Research & Development Division

### R&D Technology

#### Synthesis of new compounds and discovery techniques

New compounds are the starting point for developing agricultural chemicals. These are synthesized using the organic synthesis techniques we have accumulated over many years. We will also use information obtained from AI to predict the movement of the compounds in the environment by measuring physicochemical properties, and the affinity of the compounds to the location in the pest or weed where the compounds will act, to create innovative new agricultural chemicals by conducting exploration and optimization studies.



#### Biological evaluation

We create highly effective, safe, and easy-to-use agricultural chemical products with high biological evaluation capabilities based on our accumulated data and know-how.

We own testing sites including greenhouses, paddy fields and croplands in Shizuoka Prefecture and other sites in Japan such as in the Tohoku region and Hokkaido as well as sites in other countries, which enables us to conduct trials under different environments for evaluating new compounds and formulation.



#### Formulation technology

We create products that have high performance, are safe, and reasonably priced based on formulation technologies that make it possible for us to design safe agricultural chemical formulations while effectively extracting the performance of the active ingredients. Using our advanced formulation technologies, we have established our unique formulations such as MAMETSUBU and the slow-release of active ingredients.



#### Process chemistry and contracted synthesis technology

Kumiai has advanced engineering technology enabling us to swiftly perform research and development of manufacturing processes for new compounds. In addition to development of manufacturing technologies and industrialization at manufacturing scales according to the development phase, we also study the design of equipment and disposal treatments for achieving safe and low-cost manufacturing. We have also established a research system for fine chemicals such as pharmaceuticals, agricultural chemical intermediates, and high-performance chemicals so that we can perform organic synthesis according to the need.



### Developing and fostering new technology

We will work to accelerate the creation of pipeline active ingredients for creating new agricultural chemicals. In addition, we promote development of “microbial pesticides” and “bio-stimulants” to foster new environmentally-friendly products and technologies that harmonize with “the Strategy for Sustainable Food Systems, MeaDRI,” climate change risks and the EU’s “Farm to Fork Strategy.” We will endeavor to develop technologies for suppressing greenhouse gas generated from paddy fields and new technologies for improving energy efficiency at chemical factories in order to promote research for supporting environmentally-friendly and sustainable companies.

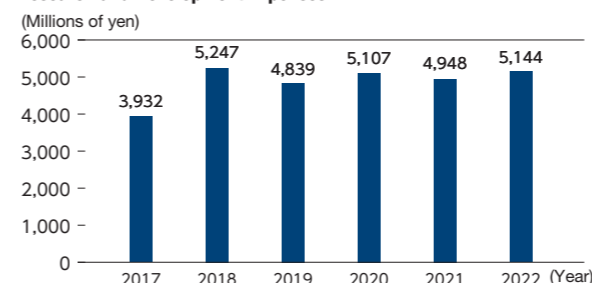


### Strengthening Our Research and Development System

#### Investment in R&D

Research and development is the source of our Company’s growth, and we continue to invest in it. In addition to capital investment, we also proactively make investments in studies needed for development as well as intellectual properties.

#### Research and Development Expenses



### New Chemical Research Institute SHIP

Currently, our New Chemical Research Institute is under construction in the Shimizu Ward of Shizuoka City where Kumiai was founded, which integrates our three Chemical Research Centers in Shizuoka Prefecture (New Molecule Research Center (Iwata City), Formulation Technology Research Center (Shizuoka City), and Process Chemistry Research Center (Fuji City)). It is named the Shimizu Innovation Park (SHIP) based on in-house selection, and full-scale operation is expected to begin in the fall of 2023. We are sure that integrating these research centers will create synergy through enhanced collaboration among different fields.



Shimizu Innovation Park (SHIP) (Conceptual drawing)

### Establishment of the New Material Research Laboratory

In Fine Chemicals Business, we have established the New Material Research Laboratory at the Chemical Research Institute for promoting further developing our core business, which are the Chlorination Business and Advanced Chemicals Business. This laboratory includes researchers from our Group Companies in addition to Kumiai to promote initiatives through the utilization of the knowledge, know-how, and technologies owned by each company. By deepening collaboration within Kumiai Group and with outside institutes, we will develop new fields and move business downstream.

### Human Resource Development

We are working to develop human resources because these are the driving force behind our research and development. Not only have we hired researchers with specialized knowledge, we are implementing measures for improving skills such as supporting studying abroad and the acquiring doctoral degrees. We will continue to develop human resources who will serve as the foundation for future research and development.

### Comment from our researcher

Chemical Research Institute  
Process Chemistry Research Center  
New Material Research Laboratory  
Researcher: MUTO Takashi



In addition to the synergy from integrating our research centers, this laboratory is a place where we can experience synergy through collaboration among Kumiai Group Companies. Sharing information about our technologies and know-how among laboratories, which were

once independent, brings fresh ideas and proposals from various perspectives, which is inspiring.

Creating new raw materials and new technologies is not easy. However, I am determined to continue making effort to overcome various challenges in order to make the Fine Chemicals Business the second pillar for Kumiai while also enjoying the creation process itself.

