Local Insight, Global Impact

# Integrated Report 2026

Ishihara Sangyo Kaisha, Ltd.

# ISK Brand Renewal

In 2026, the ISK Group revamped its brand communications and adopted a new corporate slogan: “Local Insight, Global Impact.” While preserving the ISK mark, which is a symbol cherished since the Company’s earliest days, we remain committed to anticipating the needs of the times, delivering the value and products society seeks, and creating things that have never existed before.
We will share this enduring commitment with the world through a new brand story.



Ideas have no borders, no limits.

An idea from anyone, anywhere in the world, can spread and grow to change the future. That’s why we value listening to each and every voice around the world and gaining a deep understanding of people’s lives in their local communities.

That’s why we look ahead and envision a better future for people and the planet, and passionately pursue ways to turn it into reality together. Nurture the seeds of originality that give rise to new ideas, drive innovation across boundaries, and open up new possibilities.

Build new bonds and become a catalyst of positive change.
Turn insights into impact, inspiration into better choices, and unlock the power of chemistry to create more meaningful value for people, society, and the planet.

ISK Local Insight, Global Impact

# Listening to People's Voices to Turn Untapped Insights into Impact

"Local Insight, Global Impact"—these words embody the ISK Group's enduring strengths and our unwavering commitment.
From dialogue with farmers and R&D activities to manufacturing processes and environmental conservation efforts,
we bring together the insights gained in different regions and at different operational sites, combining them into the collective strength of the ISK Group.
We then transform these insights into value that benefits society worldwide, such as improving living environments and ensuring stable food production.
Moving forward, we will continue to listen to voices from around the world, transforming untapped insights into impactful solutions as we strive to realize a better future.

# Local Insight, Global Impact

Insights and ideas born from operations around the globe.
The activities cultivated in each region and at every operational site serve as the starting point for value creation by the ISK Group.

Drawing on the knowledge and expertise gained worldwide, we generate social impact, such as improving living environments and stabilizing food production, to create indispensable value for people, society, and the planet.





# Contents

**ISK Brand Renewal**
01 Brand Story
02 Introduction
03 Contents
04 Message from the President
08 Special Feature: Biosciences Business Local Insight, Global Impact

**Sustainable Growth Strategy**
12 Purpose and Corporate Philosophy
13 Vision 2030 Management Targets
14 Business in Brief
16 Financial Highlights
17 Non-Financial Highlights
18 Value Creation Process
19 Six Types of Capital Supporting Our Business Activities
21 Vision 2030 Stage Ⅱ – Progress
22 Message from the CFO
25 Research and Development Activities
29 Organic Chemicals Business (Biosciences)
32 Organic Chemicals Business (Healthcare)
34 Inorganic Chemicals Business
37 Special Feature: Inorganic Chemicals Business Local Insight, Global Impact
39 Intellectual Property Management
40 Improving Productivity and Strengthening Business Competitiveness Through DX
41 Human Capital
46 Message from the Executive Director of the Office of Sustainability Promotion
47 Materiality

**Management Foundation**
49 Environment
57 Responsible Care Activities
58 Social
60 Stakeholder Engagement
62 Outside Director Roundtable
64 Board of Directors and Executive Officers
66 Corporate Governance
71 Risk Management
73 Compliance

**Corporate Data**
74 Financial Summary
75 Non-Financial Summary
76 History of ISK
77 Company Profile/ Group Bases
78 Stock Information
79 Editorial Policy

P04

## Message from the President

## Pursuing Business Portfolio Transformation to Achieve Vision 2030 Goals

Executive Director and President
**Hiroshi Okubo**




P08

## Expanding Sales of the Corn Herbicide Tolpyralate in the Major Market of North America by Extending Its Application to Wheat



Central Research Institute
Bioscience Research Laboratory,
Development Group Leader
**Taketo Suganuma**

# Local Insight

**Complementary Benefits of Tank-Mixing with a Product from Another Company**

# Global Impact

**Global Impact: Exploring a New Business Model**



Central Research Institute,
Deputy Director
**Hiroshi Kikukawa**

P37

## Addressing Latent Needs Abroad with Black Heat-Shielding Pigment Born from an In-House Insight



Central Research Institute
New Business Development Laboratory
Senior Manager
**Norihiko Sanefuji**

# Local Insight

**New Value Gleaned from Sales Staff Input**

# Global Impact

**Recognizing a Latent Need and Deciding to Expand Overseas**




ISHIHARA CORPORATION (U.S.A.)
General Manager, Marketing and Administration
**Satoshi Shimomura**

# Message from the President



## Pursuing Business Portfolio Transformation to Achieve Vision 2030 Goals

Executive Director and President
**Hiroshi Okubo**

### Our Aims

- Building brand awareness
- Human resources system and business portfolio transformation
- Solid shareholder returns
- Formulation of the next medium-term business plan Vision 2030 Stage Ⅲ and conceptualization of our Vision for 2040

### Our Message

#### Fostering a New Sense of Unity Through Our Brand

To lay the groundwork for our next medium-term business plan, Vision 2030 Stage Ⅲ (spanning from the fiscal year ending March 2028 through the fiscal year ending March 2031), we revamped the Group's branding in April 2026 and adopted a new corporate slogan: "Local Insight, Global Impact."
We chose an English slogan to ensure that our shared values resonate not only with employees in Japan but also with those at our overseas Group companies. The slogan was developed through a project led primarily by mid-level employees, involving internal surveys and interviews with overseas offices, as well as vigorous, wide-ranging discussions among personnel at all levels, from executives to junior staff.
This slogan encapsulates the corporate stance we have cherished since our founding. It is my hope that our employees will embody this spirit in their daily work and that it will serve as an opportunity for stakeholders to better understand us as a company that provides products essential to society.

# Message from the President

Furthermore, the approach I have championed since taking office has gradually taken hold. A particularly crucial concept is that of “deprioritization.”
Rather than striving for perfection in every aspect, I encourage employees to clearly distinguish between tasks to prioritize and those to defer, while emphasizing speed and the PDCA (Plan-Do-Check-Act) cycle. As part of this, we have strictly implemented such practices as distributing meeting materials in advance and limiting presentation times to a maximum of 20 minutes. These measures are now firmly established, leading to greater efficiency in how we conduct meetings. At the same time, however, we insist on 100% compliance in areas where no compromise is possible, such as safety, quality, contract verification, and compliance.

### Business Environment and Performance

## Pressing Ahead Toward Stage Ⅱ Goals Despite Challenges

In the fiscal year ended March 2026, we achieved record-high profits (operating income of ¥19.0 billion) driven by a surge in demand for agrochemicals in the European market due to climate-related factors, particularly within our biosciences business. However, our forecast for the fiscal year ending March 2027, which is the final year of our Medium-Term Management Plan “Vision 2030 Stage Ⅱ”, projects operating income of ¥14.2 billion, representing a decline from the previous fiscal year.
To achieve the final Stage Ⅱ targets of an operating income of ¥19.0 billion or more and an ROE of 10% or higher, we must first expand earnings in our core biosciences business within the major markets of Europe and India. While demand remains solid, Europe has been hit by heatwaves, and the Americas market is less buoyant than in the previous fiscal year. The Americas, led by the massive Brazilian market, are seeing a significant influx of low-cost, generic agrochemicals from Chinese manufacturers; consequently, we face the challenge of securing a competitive edge through agrochemical registrations in each country while simultaneously minimizing production costs. With regard to our healthcare business, we aim to move closer to eliminating losses from the next fiscal year onward by completing U.S. clinical trials and securing full approval for PANOQUELL™, an anti-inflammatory agent for acute canine pancreatitis.
In our inorganic chemicals business, the operating environment for general-purpose titanium dioxide remains harsh, so we are asking customers to accept pricing that reflects fair market value. Conversely, the electronic materials segment has made a strong start, though success in the second half of the year will depend on the effectiveness of our strategic initiatives. High-purity titanium dioxide, which is used in barium titanate for multilayer ceramic capacitors (MLCCs) in AI servers, is performing well, and we anticipate better-than-expected results for barium titanate produced by MF MATERIAL CO., LTD. our joint venture with Murata Manufacturing Co., Ltd.
As discussed later, we are working, through our operating performance, to recover losses stemming from factors such as the voluntary early retirement program and fixed asset impairment associated with Fuji Titanium Industry’s business withdrawal. We remain committed to achieving our Stage Ⅱ targets without giving up.

### Human Resources System Reform

## Recognizing Achievements and Cultivating Motivated Talent

Since assuming the role of president two and a half years ago, I have prioritized “people-centric” reform as a key management issue. An initiative emblematic of this effort is the introduction of a new personnel system for management-level employees starting in April 2027, marking a shift toward a performance-based model. Evaluations will focus on results rather than processes. By establishing a system that fairly rewards those who take on challenges and achieve results, I aim to strengthen each employee’s motivation to grow and the vitality of the organization as a whole.
Of course, a performance-based system requires fair and transparent implementation to ensure employee buy-in. We are currently refining our evaluation criteria and operational rules to meet this standard. Even after the system is launched, we will continuously review and improve it, ensuring it evolves into a framework that supports employee initiative and drives the enhancement of corporate value.
With a non-consolidated workforce of approximately 1,300 employees, which includes about 250 managers, our organization is sized such that the management team is still small enough for us to know each manager individually. I consider it a strength that our executive team can engage directly with each manager to share our management policies and values. We will ensure that management decisions permeate every corner of the organization while boldly re-evaluating low-priority tasks, thereby transforming into a more agile and responsive organization.
Although we achieved record profits in the fiscal year ended March 2026, this is by no means the finish line; it is merely a milestone on the path to further growth. I encourage all employees to constantly question the work right in front of them and keep asking, “Is there a better way?” I want to foster a corporate culture that embraces change and encourages taking on challenges, moving beyond the mindset of simply sticking to “the way things have always been done.”
Securing and developing talent is essential to supporting this growth. However, competition for top talent has intensified in recent years; we face particularly fierce competition from major corporations when it comes to recruiting researchers in the field of electronic materials. Amidst these circumstances, we are implementing multifaceted recruitment initiatives, such as raising starting salaries, improving overall compensation, and strengthening collaboration with universities, to secure the talent essential for our Company’s growth.
Meanwhile, in areas where recruiting personnel who can contribute immediately is challenging, we are adopting a strategy of steadily developing young talent, primarily through the recruitment of new graduates. Although talent development takes time, we believe that cultivating our own workforce is the source of sustainable competitiveness. Guided by the conviction that the growth of each individual employee drives the growth of the Company, we will continue to actively invest in our people.

# Message from the President

### Business Portfolio Transformation

## Inorganic Chemicals Business Structural Reform and Paving the Way for the Future

Another reform initiative I have pursued since becoming president is the structural reform of our inorganic chemicals business. We previously announced the scheduled shutdown of the sulfate process plant at the Yokkaichi Plant (planned for March 2027). As the implementation date approaches, we have decided to introduce a voluntary early retirement program to ensure the business remains competitive and achieves sustainable growth while enhancing capital efficiency. We made this forward-looking decision recognizing that the business environment is becoming increasingly challenging, due to such factors as market conditions, competition, and costs, and that it would be difficult to maintain our current workforce structure through personnel reassignments alone.

We have also decided to withdraw from the titanium dioxide business of our subsidiary, Fuji Titanium Industry, effectively ending sulfate process titanium dioxide production by the Group entirely. Our goal is to rebuild our earnings base and review our fixed-cost structure during Stage Ⅱ, paving the way for a different path to growth in Stage Ⅲ. While short-term financial costs are unavoidable, I believe that building a lean, resilient organization while we have the financial strength to do so is essential for remaining a trusted company of choice beyond 2030. With these measures, I believe the structural reform of our inorganic chemicals business is nearing completion.

However, looking ten years ahead, challenges regarding $CO_2$ emissions and waste management will remain even for titanium dioxide in chloride process production. The process is energy-intensive and generates waste. Anticipating a shift toward high-value-added products accompanying changing market needs, we must remain flexible regarding the Yokkaichi Plant's facility configuration to adapt to the times. In that sense, I view structural reform as an ongoing, perpetual process.

Titanium dioxide remains vital to the Japanese economy, such as its use as a material for electronics, so we will continue production. Determining how to develop this business in the future is the next challenge facing us.

### Stage Ⅲ Conceptualization

## Boosting Operating Margin Through a Shift Toward High Value-Added Offerings

We are approaching a crucial stage in formulating the plan for Stage Ⅲ. We are currently consolidating the earnings plans submitted by each business headquarters, using operating income as the basis. We intend to eventually transition to management based on ROIC, and, to that end, we have bolstered the staff in our Corporate Strategy Division.

Our primary goal is to achieve operating income of 24 billion yen, a target set out in our long-term vision, Vision 2030. While this is a challenging hurdle, we believe it is fully attainable by turning our healthcare business profitable and improving the earnings capacity of our inorganic chemicals business following its structural reforms.

Although our Group's consolidated operating margin for the fiscal year ended March 2026 stands at 12.3%, we aim to exceed 20% in the near future. In both our bioscience and inorganic chemicals businesses, increasing our lineup of high-demand, high-performance products will enable us to raise prices and manage profit margins effectively. This strategy is essential not only for Stage Ⅲ but also for the period beyond. I will now outline the measures currently being taken in each business segment.

In biosciences business, we are accelerating globalization. We are rejuvenating the leadership of the business headquarters and revamping our personnel structure; we also aim to keep pace with global trends by expanding joint development efforts to launch new agents . As our proprietary new agents have not yet reached the stage for market launch, we are considering, among other things, in-licensing products from other companies, though it will likely take some time before these efforts yield results. Notably, at the Technology Research Center, Hyogo-Ono (TREC), we are on track to achieve the world's lowest manufacturing costs. By running R&D and production technology development in parallel, we expect this facility to contribute significantly to a brighter future for the business.

With regard to our healthcare business, while it is projected to lead the way in terms of profitability during Stage Ⅲ, progress is running one year behind the original schedule from Stage Ⅱ, and the business remains in the upfront investment phase. A key factor moving forward is securing global approvals for PANOQUELL™, an anti-inflammatory agent for acute canine pancreatitis. In particular, obtaining full approval from the U.S. Food and Drug Administration (FDA) has entailed significant clinical trial costs. We must secure approval as soon as possible to begin contributing to earnings.

Sales in Japan have grown steadily, and we anticipate substantial growth if we can secure approval in the U.S., a market with ten times the dog population of Japan. Research into expanding the drug's indications is also underway, offering the prospect of further growth should that approval be granted.

In our inorganic chemicals business, the weak yen has driven up procurement costs for raw materials, such as titanium ore, and energy. On the sales front, despite the weak yen, we have struggled against the low-price offensive of Chinese manufacturers regarding general-purpose titanium dioxide. These conditions have caused a divergence from the plans originally established for Stage Ⅱ. Given this situation, the decision to discontinue titanium dioxide production in sulfate process across the Group was unavoidable. Although the Fuji Titanium Industry Kobe Plant suspended operations following a fire in April, the entire team is currently working at full capacity to restart operations by next March, prioritizing safety while fulfilling our supply obligations to long-standing customers.

Growth in functional color materials, such as conductive materials, has been slower than anticipated; however, the electronic materials segment is seeing strong momentum in high-purity titanium dioxide for MLCCs. We are currently investing 3.9 billion yen to install production-expansion equipment at the Yokkaichi Plant, and we expect this to make a significant contribution to our financial performance once the second phase of construction is completed next year.

# Message from the President

### Beyond Vision 2030

## Aiming for a Compact and Agile Organizational Structure

We are simultaneously considering our vision for the stages beyond Vision 2030, looking toward 2040, 2050, and further into the future. Given that our Group is an R&D-driven enterprise, a shift toward a fabless model may be the right direction. Outsourcing production is a viable option for manufacturing high-value products while minimizing environmental impact. As we strive for carbon neutrality, we envision the Yokkaichi Plant evolving into a compact, disaster-resilient, and carbon-neutral facility that focuses on R&D while retaining a certain level of production capacity. Furthermore, we believe there would be significant value in recovering rare metals and other materials from the waste generated during titanium dioxide production. Our bioscience and healthcare businesses have always operated on a fabless model. Ideally, we would also transition our inorganic chemicals business toward an intellectual property-centric model, even if not becoming fully fabless.
Achieving such a production structure requires substantial capital. With this ideal in mind, we will steadily strengthen our financial position as we move toward 2040.

### New Central Research Institute

## Accelerating Research in an Open Research Environment

While we have not introduced a new product in over a decade, we aim to accelerate agrochemical development and establish a pipeline capable of delivering one new agent every three years. Achieving this will require research DX and more active communication.
With regard to research DX, we are steadily building a research platform that enables AI-driven analysis and simulations using experimental logs and historical data, alongside the implementation of an electronic lab notebook system.
As for enhancing communication, we have brought our patent specialists together near the research departments to strengthen inter-organizational collaboration. By uniting the business, technical, intellectual property, and research management departments, we will ensure timely and reliable patent filings aligned with research progress, thereby boosting product added value and sustaining or expanding sales.
In addition, regarding our “New Central Research Institute” concept, i.e., the planned reconstruction of our Central Research Institute in Kusatsu City, Shiga Prefecture, we are currently reviewing specifications and costs in response to soaring prices for construction materials and labor, but we aim to complete the project by the end of the fiscal year ending March 2030. As an R&D-driven company, this facility will serve as a hub for talent development. We are designing a layout that fosters open innovation, bringing together diverse researchers from fields such as agrochemicals, healthcare, and materials chemistry on a single, expansive floor without walls or partitions to encourage active interaction. We also aim to create new value by actively facilitating personnel exchanges with other research facilities, such as TREC and Yokkaichi.
At the New Central Research Institute, we will minimize constraints on the research environment and create a setting where researchers can efficiently focus on their experiments, all to achieve our goal of developing one new agent every three years. For example, we will accelerate compound discovery by establishing a system for efficient synthesis through the introduction of parallel synthesis equipment, while simultaneously strengthening our synthesis capabilities by exploring new technologies such as flow synthesis.

### Shareholder Returns

## Towards Achieving Growth That Lives Up to the Trust Placed in Us

Since reinstating dividends in the fiscal year ended March 2019, we have consistently increased our dividend payouts. Furthermore, at the start of Stage II, we set a target for a consolidated dividend payout ratio of 40% or higher, and from the fiscal year ended March 2025, introduced a new target for a minimum DOE of 3%; we have successfully met our commitments regarding the DOE.
Regarding PBR, a key indicator of stock valuation, the figure once rose to 1.25 but has recently hovered around 1.0. We intend to attract new investor segments, including individual investors, by strengthening our IR activities, such as by establishing an Investor Relations Division and introducing interim dividends starting in the fiscal year ended March 2026. Given our high dividend yield, it is crucial that we articulate a growth strategy centered on portfolio transformation. Realizing this strategy is the responsibility of our management team.
We may face challenging business conditions in the future. Nevertheless, it is my hope that our shareholders will place their trust in the Group, based on our track record since reinstating dividends. We are committed to achieving our targets and dividend forecasts for fiscal 2026. We will not betray your trust. We plan to unveil a new growth strategy under Stage Ⅲ in May 2027, and I hope you will continue to support the Group with a long-term perspective.



Special Feature

# Local Insight × Global Impact

Corn Herbicide Tolpyralate

## Expanding Sales of the Corn Herbicide Tolpyralate in the Major Market of North America by Extending Its Application to Wheat

Our proprietary herbicide, Tolpyralate, is enjoying remarkable success in the major market of North America. This achievement, which has far exceeded initial projections, stemmed from a strategic insight to expand the application of an herbicide originally intended for corn to include wheat, combined with the impact of expanding sales channels through a partnership with a multinational corporation specializing in the wheat sector.
We spoke with the researcher who turned this insight into reality and the product manager who spearheaded the initiative to drive this impact, asking them to share the story behind the product's success.



Central Research Institute
Bioscience Research Laboratory,
Development Group Leader
**Taketo Suganuma**

### Local Insight: Complementary Benefits of Tank-Mixing with a Product from Another Company

Tolpyralate is a "foliar-applied" herbicide, meaning its active ingredient is absorbed through the leaves and stems of weeds. By inhibiting a specific part of the photosynthesis process, it causes new leaves to bleach, stunts growth, and ultimately kills the plant. It is highly effective against summer-growing annual grasses and broadleaf weeds, and it is particularly notable for its strong performance against foxtail species among annual grasses.
Since joining the company in 2002, Taketo Suganuma has been engaged in herbicide research and development, including work on Tolpyralate. Initially, development focused on forage corn; Suganuma handled tasks such as optimizing the formulation, expanding data to support the dissemination of application techniques across different regions, and conducting trials required for product registration. Even at that early stage, he was already envisioning its future application to wheat.

**Suganuma:** "We had discovered from the beginning stages of development that it could also be applied to wheat. While Tolpyralate is highly effective against foxtail grasses, a problem in North American wheat cultivation, its efficacy against winter annual weeds is limited. Because the range of target weeds was limited, it was difficult to launch Tolpyralate as a standalone product for wheat; consequently, development proceeded first with corn, which offered greater promise. Nevertheless, the North American wheat market is massive, with a cultivation area of approximately 13 million hectares for spring wheat alone. We viewed it as a major market opportunity in which Tolpyralate's performance could be fully leveraged."

It was while evaluating the performance of products from other companies that Suganuma became convinced of Tolpyralate's potential for use on wheat.

Special Feature

# Local Insight × Global Impact

Corn Herbicide Tolpyralate

**Suganuma:** "We routinely conduct performance evaluations to verify the efficacy of products from other companies. As part of this process, We re-evaluated an herbicide marketed by a major U.S. agrochemical company and found it to be less effective against foxtail grasses. The prevalence of foxtail grasses in North American wheat fields may well be the result of long-term reliance on herbicides with poor efficacy against these weeds. We realized that tank-mixing this product with Tolpyralate, which is highly effective against foxtail grasses, would allow the two to compensate for each other's weaknesses. This insight marked a turning point in our efforts to expand the product's application to wheat."

## A Safener Makes the Difference

Expanding the application to wheat involved numerous tasks. One of them was ensuring crop selectivity.

**Suganuma:** "Causing even the new leaves of the wheat to bleach would defeat the purpose; therefore, it was necessary to determine an application rate that is safe for the crop while killing only the weeds. This is known as 'crop selectivity'; however wheat exhibits lower selectivity than corn and is more prone to herbicide injury. We investigated the safety threshold for wheat by gradually reducing the application rate from the 30 - 50 grams per hectare effective for corn.

**Suganuma:** "We faced particular challenges regarding the tendency for phytotoxicity symptoms in wheat to intensify when high temperatures persisted after application, as this caused excessive absorption of the chemical. We ultimately overcame this issue by using an active ingredient known as a 'safener,' which specifically mitigates crop injury. While this ingredient has no effect on either wheat or weeds when used alone, combining it with an herbicide enhances crop safety without compromising weed control efficacy. The herbicide used in the mixture also contained the same safener, thereby ensuring crop safety.

Tolpyralate, which was launched following regulatory approvals in various countries, is now sold in 12 nations, including across the Americas and Asia, and has grown into a key product generating 4.9 billion yen in sales in fiscal 2025. Its performance in the wheat market has been particularly strong; it is highly valued for its superior efficacy against foxtail grasses, which is a capability lacking in conventional products, and is seeing sales growth that exceeds initial projections.

**Suganuma:** "Working on the application of Tolpyralate to wheat taught me not to give up when facing difficult challenges. While new obstacles inevitably arise when shifting to a different application area, they can be overcome by persevering and methodically testing potential solutions one by one.
Currently, many of our proprietary products have seen their patents expire and are facing competition from generics. Differentiation is key. I aim to unlock new potential for our products by identifying areas where market penetration has stalled due to specific challenges, analyzing them from various angles, and developing new tank-mix technologies or application methods to expand their scope of use."

## Making TREC a Motivating Workplace for Everyone

The Technology Research Center, Hyogo-Ono (TREC; Ono City, Hyogo Prefecture), is engaged in developing technologies to produce agrochemicals more efficiently and cost-effectively. It was Kengou Kizu who succeeded in reducing the production cost of Tolpyralate by approximately 15% at this facility. We spoke with Kizu about how he achieved this result and his future goals.

### How did you achieve cost reduction?

One method involved providing technical guidance to our contract manufacturing plants. We had been producing the intermediate for Tolpyralate in both India and South Korea, with production costs in India being significantly lower. However, the intermediate suffered from poor storage stability, making it difficult to store. We achieved long-term storage capability by modifying not only the packaging materials but also the packaging procedures to minimize air exposure. This enabled the export of the lower-cost intermediate from India, thereby reducing production costs in South Korea.

Another method was improving the yield by changing the base and catalyst. Recognizing that previous studies had not thoroughly evaluated these components, we explored various combinations to identify the optimal base and catalyst.

### What has changed since TREC was established?

Previously, even when we achieved good results in the lab, the lack of in-house scale-up facilities meant we often had to outsource that stage, resulting in a process that took anywhere from several months to a year to gather the data needed for full-scale production. With TREC's facilities, however, we can handle this in-house, cutting the time required for data acquisition in half. Sample synthesis, as well, was a process that took a full year to produce just a few kilograms using our Central Research Institute's equipment, but it can now be completed in two to three months.

### What are your goals for the future?

My mission is to accelerate R&D and pass on technical expertise to the younger generation, but, beyond that, I also want to make TREC a workplace where everyone feels truly motivated to work. Specifically, I envision an environment where people can quickly put their ideas into action. In the past, there were many things we couldn't do due to equipment or facility limitations, but, here, those hurdles have been significantly lowered. I believe we have created an environment where it is much easier to turn ideas into reality.



Biosciences Business Headquarters
Technology Research Center, Hyogo-Ono
Commercialization Engineering Group Manager

**Kengou Kizu**

Special Feature

# Local Insight × Global Impact

Corn Herbicide Tolpyralate

## Global Impact: Exploring a New Business Model

Tolpyralate moved toward expanded application for wheat crops. However, penetrating international markets, including the major market of North America, presented significant hurdles. The key factor in overcoming these obstacles was collaboration with a multinational corporation specializing in the wheat sector. From the very early stages of development, ISK actively pursued a partnership model in which the Tolpyralate active ingredient was sold to a major agrochemical partner, which then mixed it with another herbicide to create the final commercial product. Hiroshi Kikukawa was the driving force behind this collaboration.

Kikukawa was originally a researcher involved in the discovery and development of Tolpyralate. He later served as an herbicide product manager within the Biosciences Business Headquarters. This was the period when he spearheaded this collaborative effort.

**Kikukawa:** "While Tolpyralate is an excellent herbicide, its spectrum of target weeds in wheat cultivation is too narrow for it to take the lead role. We needed another product to serve as the lead role, one that would allow Tolpyralate to play a stellar supporting role. That was when the other party reached out to us."

ISK already had an established business relationship with them involving the trading of agrochemical active ingredients, intermediates, and finished products and was scheduled to meet their representatives for business discussions at the CAC (China International Agrochemical & Crop Protection Exhibition) in Shanghai. During the 2018 meeting, they also proposed discussing Tolpyralate.

**Kikukawa:** "During the actual meeting, I received a proposal to collaborate in the wheat market by combining Tolpyralate with 'Pyroxsulam,' one of their herbicides. Their explanation, such as regarding the benefits of using the two agents together, was clear and convincing."

While Pyroxsulam is a versatile herbicide, it has a weakness in that it is less effective against certain weeds, such as foxtail species. In contrast, although Tolpyralate cannot control a broad spectrum of weeds in wheat fields, it is highly effective against specific, important weeds like foxtail, thereby compensating for Pyroxsulam's shortcomings.

**Kikukawa:** "Actually, back in 2015, three years prior, we presented findings on the development and performance of Tolpyralate at the Weed Science Society of America conference. I believe that presentation sparked their interest. After evaluating Tolpyralate over the course of several seasons, they likely concluded that it would be a valuable addition to their herbicide portfolio."

However, ISK had hardly any prior experience with a business model in which it would supply a proprietary new compound, in the form of an active ingredient, to another company at an early stage of development for commercialization.

**Kikukawa:** "There were some who argued that selling the product in its final form would yield a higher unit price and greater profit. However, multinational corporations possess powerful sales networks and the capacity to achieve widespread market penetration. We believed that by taking advantage of their sales capabilities, we could significantly increase sales volume and ultimately generate greater overall profits."



Central Research Institute,
Deputy Director
**Hiroshi Kikukawa**

Special Feature

# Local Insight × Global Impact

Corn Herbicide Tolpyralate

## Net Sales Significantly Exceeding Initial Forecasts

Shortly thereafter, a development agreement was concluded. ISK supplied the active ingredient and entered the development and commercialization phase.

**Kikukawa:** "In major Canadian wheat-growing regions, soil characteristics can cause herbicide residues to persist in the ground. Because such residues can harm subsequent crops, existing herbicides require a rotation restriction' (a waiting period before planting the next crop) of several months or more.
In contrast, Tolpyralate is a 'foliar-applied' herbicide, which is absorbed through the leaves and stems of weeds, that leaves virtually no residue in the soil. Consequently, farmers can plant the next crop immediately after application without issues, eliminating the need for rotation intervals.
This feature made it highly attractive to farmers compared to existing products with rotation restrictions, leading us to believe it could capture a significant share of the market. And, indeed, that is exactly what is happening now. I truly feel that a multinational corporation provided the perfect stage for Tolpyralate to demonstrate its full potential."

Ultimately, the strategy adopted involved selling a product that combined Tolpyralate with Bromoxynil (highly effective against broadleaf weeds) and having farmers mix it with Pyroxsulam during application. Upon launch, net sales far exceeded initial projections.

**Kikukawa:** "To be honest, we initially viewed corn as the primary market for Tolpyralate and wheat as secondary. Since it was intended to be used in combination with another herbicide, playing a supporting role, so to speak, we thought that secondary status was sufficient. However, actual sales vastly outperformed our expectations, and, today, the wheat market now accounts for a portion of Tolpyralate's global sales.

He also discussed his own role and approach, expressing optimism about continuing to collaborate with external partners from the R&D stage onward.

**Kikukawa:** "I have returned to the research institute. Moving forward, I intend to leverage my past experience and knowledge to contribute to agrochemical R&D, specifically, the creation of novel agrochemicals. I also aim to establish an environment that fosters efficient, rapid results through collaboration with external partners from the early stages of research. Furthermore, I will dedicate myself to talent development by thoroughly passing on my experience and knowledge, ensuring that young researchers can develop steadily."

## Leveraging Experience to Support the Coordination of IBA as a Whole

There is still significant room to expand sales of Tolpyralate in the Americas, which is a major market for the product. Hiroyuki Okamoto, who transferred from the Head Office to U.S. subsidiary ISK Biosciences Corporation (IBA) in May of this year, is taking on this challenge. Leveraging his background as a researcher and his extensive knowledge, he aims to drive the expansion of the business in the Americas.

### What is your mission in the Americas?

My mission is to "lay the groundwork" for the sustainable growth of our agrochemical business. Up until now, our sales strategy has focused on transactions with a relatively limited number of customers. To achieve further business growth, I believe it is crucial to broaden our reach to customers who appreciate the value of our products and to create more sales opportunities.

### How is the process of "laying the groundwork" progressing?

We are currently in discussions with several potential partners to initiate business, aiming to establish business relationships by the end of 2026. I want to build relationships of trust, including with existing partners, that foster mutual benefit and long-term, shared growth.
I am placing particular emphasis on expanding our market share in the United States, which is the largest market within IBA's territory. By prioritizing key crops, such as corn, soybeans, and wheat, I aim to further strengthen our business foundation in the U.S. market.

### What do you hope to achieve going forward?

I have been involved in various stages of our business value chain, starting with research lab work and moving into the management of agrochemical product development and commercialization, as well as sales and business development. I intend to leverage this experience to strengthen collaboration across functions, such as R&D, procurement, manufacturing, registration, and sales, between ISK and IBA, thereby supporting IBA's business growth.
My aim is to achieve the targets set out in our Medium-Term Management Plan "Vision 2030 Stage Ⅱ", which represents a vital, shared objective for IBA as well. While it is by no means easy, the entire IBA team is working together to achieve this goal, and I intend to contribute to that effort as a member of the team.



ISK Biosciences Corporation
IBA Strategic Marketing Liaison
**Hiroyuki Okamoto**