

Sumitomo Chemical's Regenerative Agriculture

Achieving Sustainable Agriculture through Chemical and Biorational Solution

As the movement towards a sustainable society accelerates across various sectors, the agricultural field is rapidly advancing in building a value chain based on regenerative agriculture. Our company believes that the appropriate use of crop protection chemicals and biorational products is essential to achieving "regenerative agriculture," which aims to ensure agricultural productivity, food safety and security, while also preserving biodiversity and achieving carbon neutrality. We are actively promoting various initiatives utilizing a wide range of technologies to support this vision.

Biorationals

Providing naturally-derived microorganism-based protection products, plant growth regulators, and rhizosphere microbial materials, as well as to the solutions that use them to protect crops from pests or improve the quality or yield of crops

The Emerging Mainstream of Regenerative Agriculture

Modern society faces a wide range of challenges, including climate change, loss of biodiversity, and food security issues driven by the rapid increase in the global population. Regenerative agriculture, which seeks to restore and improve soil health while maintaining agricultural productivity, reducing GHG emissions, and preserving biodiversity, is gaining attention as an approach to addressing these challenges.

Our company is committed to promoting regenerative agriculture through a multifaceted approach that combines the crop protection chemicals technologies we have developed over many years with world-leading biorational products derived from natural sources.



Societal Issues to be Addressed

- Carbon neutrality
- Biodiversity
- Food



Our AgroSolutions

- Chemical solutions**
Leveraging our strong crop protection discovery capabilities, we provide solutions to address challenges in crop protection, such as pesticide resistance.
- Biorational solutions**
We offer unique solutions that harness the power of nature, including biorational crop protections, biorational crop enhancements, and biostimulants.

Contribution through Chemical Solutions

Support for No-Till Farming

No-till farming is an agricultural method where crops are grown without tilling the field before planting. This approach offers various benefits, such as reducing fuel consumption through labor-saving practices and preserving aquatic biodiversity by preventing topsoil erosion. Additionally, by minimizing soil disturbance, it helps reduce the emission of carbon dioxide caused by the oxidation of organic matter in the soil, which is why this method has rapidly gained popularity, particularly in the U.S. and Brazil. Our company contributes to the promotion of no-till farming by providing suitable crop protection materials that fit the no-till farming system.

Representative example

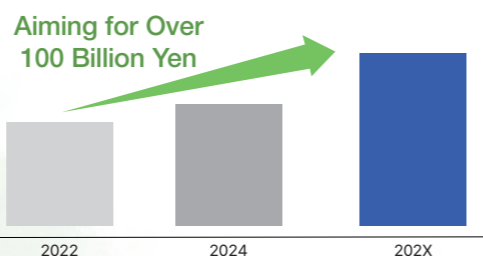
- Rapidilic®**
 - Fast-acting and plenty efficacious on low doses
 - Planned for market launch in the U.S. and South America from 2024 onward.

→ Next-generation Herbicides for Weed Control Solutions (Investors' Handbook)

- Flumioxazin**
 - Effective against herbicide-resistant and hard-to-control weeds
 - Excellent residual effect, reducing the number of applications

→ Collaboration with Bayer (Investors' Handbook)

Consolidated net sales of herbicides for no-till farming



Adaptable to Seed Treatment

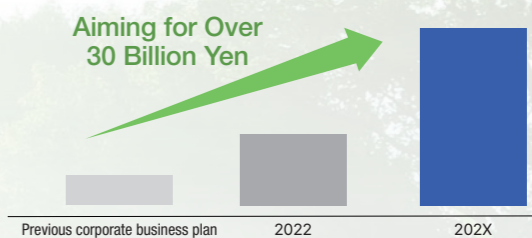
Seed treatment is a method of applying crop protection products directly to seeds before sowing. By applying these products precisely to the seeds, the required amount of crop protection products is minimized, contributing to reduced environmental impact. Additionally, this method eliminates the need for tractor operations in the field for spraying, further reducing fuel consumption. As a result, seed treatment is gaining attention as a technology that contributes to regenerative agriculture. Our company is committed to promoting the adoption of seed treatment by providing a wide range of insecticides, fungicides, and nematicides tailored to crop by crop.

Representative example

- NipsIt®**
 - Formulating products with active ingredients that possess broad-spectrum insecticidal activity using unique formulation technology

- Zeltra®**
 - Leveraging our latest fungicidal active ingredients for application across a wide range of crops

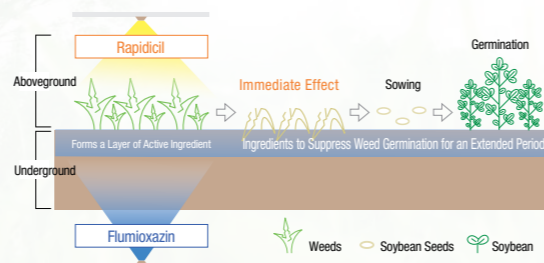
Consolidated net sales of seed treatment-related products



TOPICS

Combination of Foliar and Soil-Applied Herbicides

Herbicides can be categorized into two types: foliar-applied herbicides, which kill growing weeds, and soil-applied herbicides, which prevent weed germination. Among our products, Rapidilic® falls into the former category, while Flumioxazin is classified as the latter. In no-till farming, the use of these two herbicides can be expected to provide both the removal of growing weeds and the suppression of weed germination after sowing. We believe that utilizing both of these herbicides represents a promising strategy.



TOPICS

Biorational Seed Treatment: Aveo® EZ Nematicide

In addition to crop protection chemicals, our company also offers biorational seed treatments. A representative product in this category is Aveo®, a biorational seed treatment that protects crop roots from soil nematodes, which can reduce crop yield and quality. The active ingredient in Aveo® is a microorganism that establishes itself in the root zone of plants, forming a bio-barrier that prevents soil nematodes from parasitizing crop roots. Additionally, Aveo® functions as a biostimulant, promoting healthy root development. Aveo® is compatible with existing seed treatment technologies and is a product that can contribute to regenerative agriculture in the future.

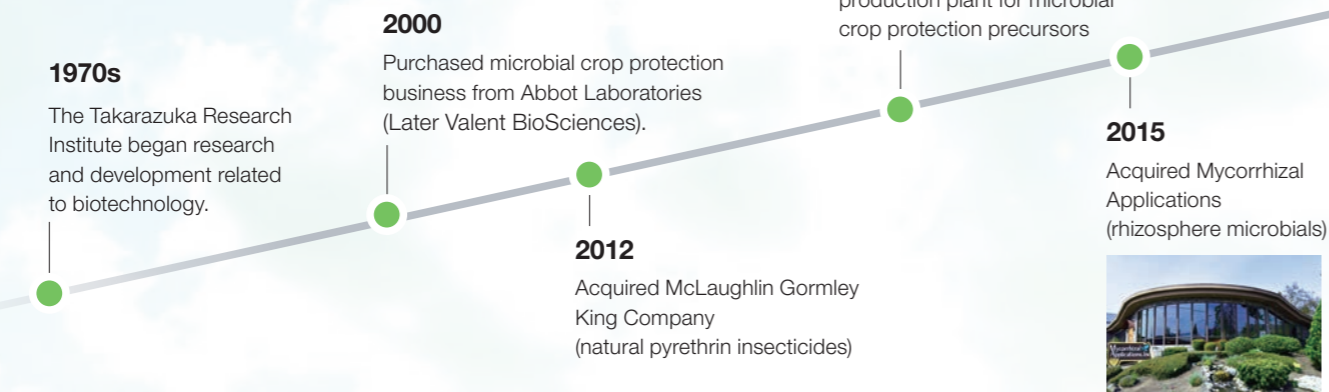
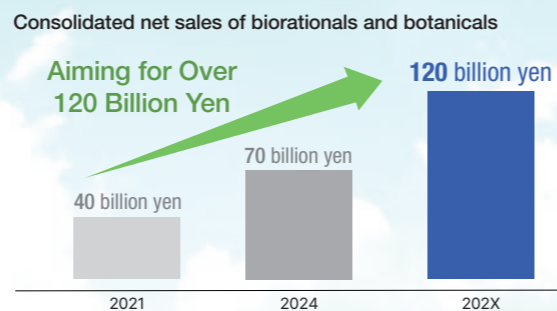


Collaboration with Corteva Agriscience

Since 2017, we have been collaborating with Corteva Agriscience on the development, registration, and commercialization of seed treatment technologies aimed at improving early crop growth and increasing yield. This collaboration leverages the strengths of both companies—our crop protection chemicals and biorational products, and Corteva Agriscience's advanced seed treatment technologies.

Contribution in the Biorational Solutions

The market size for biorationals is approximately \$7 billion globally, which is about one-tenth the size of the crop protection chemicals market. However, due to the growing demand from producers and consumers for more environmentally friendly agricultural materials, the biorational market is expected to grow by 10-15% annually. Our company has long focused on the biorational and botanical businesses, including naturally-derived microorganism-based crop protection products, and has steadily expanded these businesses through acquisitions and other means. As a result, we have now established a leading position globally. Additionally, since 2023, we have fully entered the biostimulant sector, further strengthening our portfolio. We will continue to expand our business and contribute to the promotion of regenerative agriculture.



Valent BioSciences

Our group company, Valent BioSciences, headquartered in Libertyville, Illinois, U.S., is a global leader in biorational products and technologies in the fields of agriculture, public health, and forest health. The company's expertise in biosciences contributes to achieving sustainable agriculture by maintaining soil health and protecting public health from insect-borne diseases. Their portfolio, which is highly regarded for its innovation, quality, performance, and sustainable solutions, includes bioinsecticides, bionematicides, biofungicides, plant growth regulators, biostimulants, and microbial seed treatments.



Portfolio of the Biorational and Botanical Business

→ Sumitomo Chemical's Biorational Area (Investors' Handbook)

Biorational Crop Protection

Overview

These are products that use naturally occurring microorganisms to control pests and diseases. They have minimal impact on the environment, humans, and crops, contributing to a safe food supply.



Representative Products

Microbial Insecticides such as DiPel

Biostimulant Products

Overview

Agricultural materials that enhance the inherent potential of crops and soil. They induce defenses against abiotic stresses such as high temperatures and promote plant growth and nutrient absorption.



Representative Products

Various Products such as Transit®

Biorational Crop Enhancement

Overview

Products that contribute to improving quality and yield by promoting or regulating crop growth and development, such as increasing fruit size or enhancing flowering.



Representative Products

Plant Growth Regulators such as Accede

Biorational Rhizosphere

Overview

Rhizosphere microbial materials that promote efficient absorption of soil moisture and nutrients by plants, enhance growth, and reduce irrigation and fertilization amounts, while also decreasing phosphorus runoff into the environment.



Representative Products

Mycorrhizal Fungi such as MycoApply

→ Sustainable Use of Natural Capital

Public Health & Forestry Health

Overview

Public health products that control pests like mosquitoes to prevent disease transmission, and forest protection products that manage insects that damage trees to maintain forest health.



Representative Products

Various Products of Valent BioSciences

☑ Valent BioSciences Official Website

Botanical

Overview

Pest control products for agricultural, household, and commercial use, made from plant-derived ingredients.



Representative Products

Various Products of McLaughlin Gormley King Company

☑ McLaughlin Gormley King Company Official Website

Comments from Stakeholders

The growing interest in regenerative agriculture is providing strong momentum for the entire biorational business.

Valent BioSciences
President
Mr. Salman Mir



Biorational products, derived from biological substances, have become increasingly mainstream in recent years due to their minimal environmental impact and the growing focus on sustainability and regenerative agriculture. As the global population surpasses 8 billion and continues to rise, the need to produce more food on the same amount of land is becoming more critical.

This trend provides strong momentum for Valent BioSciences, which has focused on acquiring bioscience expertise, research and development, and technological innovation for over 60 years and holds a broad portfolio of biorational products and technologies. To pursue further growth, the compa-

ny continues to invest in strategic areas. In March 2023, we acquired FBSciences to expand our biostimulant business, which is the fastest-growing segment in the biorational market, alongside our continued focus on R&D and concentrated investments in our manufacturing facilities.

The annual growth rate of our biorational business has reached the high single digits to low double digits, approaching the overall market growth rate. We aim to enhance our overall growth rate by continuing to demonstrate leadership in the biocontrol and crop enhancement sectors, and by fully leveraging the newly acquired biostimulant business, thereby maintaining our position as a leader in the biorational market.