



Bayer AG
Communications
51368 Leverkusen
Germany
Phone +49 214 30-1
www.bayer.com/en/media

News Release

Crop Science Innovation Update 2024:

Bayer to deliver ten blockbusters in ten years

- Unparalleled R&D pipeline with over 32 billion euros peak sales potential includes transformative technologies like the new broad-acre herbicide Icafolin, the biotech version of the Preceon Smart Corn System, fourth-generation corn rootworm technology, fourth- and fifth-generation soybean herbicide tolerance traits as well as third- and fourth-generation insect protection traits
- Promoting and scaling regenerative agricultural practices are key to producing more while restoring nature – with R&D and digital technologies being key enablers
- As the global innovation leader for agriculture, Bayer is demonstrating how its solutions can support food security and mitigation of climate change

Chicago, USA, June 17, 2024 – Bayer aims to launch ten blockbuster products in the next ten years to support farmers worldwide, the company announced at its 2024 Crop Science innovation update in Chicago. Each blockbuster is expected to contribute more than 500 million euros of the over 32-billion-euros peak sales potential in the R&D pipeline – unparalleled across the global agricultural industry. Farmers will benefit from new technologies that will help them produce more while restoring nature through innovations that power regenerative agriculture.

Bayer is on its way to scale regenerative agriculture on more than 400 million acres globally by the middle of the next decade. The company considers regenerative agriculture as an outcome-based production model, with improving soil health as a key component, leading to increased resilience. Other key aspects include increased productivity; adaption and mitigation of climate change through reductions in greenhouse gas emissions; increased carbon sequestration in the soil; maintaining, preserving or restoring on-farm biodiversity; conserving water resources through improved water

retention, reduction in water run-off, as well as improved social and economic well-being of farmers and their communities. In addition, Bayer is capitalizing on the opportunity to double its [accessible market](#) to more than 200 billion euros, driven by global market growth and investments into ag-adjacent spaces like biofuels, crop fertility, as well as digital platforms and marketplaces.

“Agriculture needs to change for the better, there’s no relying on what has been working in the past. We deliver a combination of unmatched innovation that goes hand in hand with key regenerative practices to help address two of the biggest challenges of our time: ensuring food security for a growing population and fighting climate change,” said Frank Terhorst, Head of Strategy and Sustainability at Bayer’s Crop Science Division.

Bob Reiter, Head of R&D, added: “The age of single and isolated technologies is over. We are focusing on closely connected agricultural systems that combine seeds, traits, crop protection and digital solutions in a smart way to benefit the farmers and the environment. To this end, we are leveraging key technology platforms like gene editing, precision breeding, small molecules and biologicals to deliver products that farmers need to make agriculture more productive while reducing the carbon footprint and fostering biodiversity at a global scale.”

Unparalleled R&D pipeline as a basis for a systems approach to solutions

Bayer’s R&D pipeline is driving the transformation to regenerative agriculture through three pillars. The first is through an annual portfolio refresh of new germplasm and new crop protection formulations that help farmers compete in a changing environment, which contributes over half the value of the portfolio to fuel core business growth. “This includes the deployment of 400 to 500 seed hybrids and varieties annually. For crop protection, we expect to introduce 90 to 100 new formulations over the next decade,” said Bob Reiter.

The second pillar refers to completely new products like seed and trait technologies or novel crop protection solutions with blockbuster potential, fueling stable long-term growth. By building on Bayer’s established leading germplasm, market positions, and innovation expertise the company will bring the next generations of solutions that will power step-changes of capability and progress on farms around the world.

The third pillar consists of key collaborations on technologies like gene editing and biological solutions with strategic partners that are complementing Bayer's in-house R&D efforts. With its unique genomic library, know-how from scientists, broad regulatory expertise and the ability to scale, Bayer brings important assets to the table that help bring innovation into the market fast. Leveraging this open innovation approach, Bayer has over 50 assets under evaluation for new collaborations or in-licensing.

Smart technologies for corn production

The Preceon Smart Corn System will transform global corn production. With its improved standability in high winds and challenging weather conditions due to its shorter height, Preceon has the potential to attain more than 1.5 billion euros in peak sales and the opportunity to reach more than 220 million acres globally. Farmers benefit from better protection of their crops, better access during the season and higher yields. Bayer's 2023 Groundbreaker trials in the U.S., which included 365 growers, resulted in more than 80 percent reporting they would plant Preceon Smart Corn again. The targeted commercial launch of the conventional breeding short-stature corn approach earlier this year is also paralleled with progress on the biotech version which has now advanced to R&D phase 4. Bayer expects the biotech version to be available in 2027. Furthermore, the company is working on a gene-edited version of Preceon in partnership with Pairwise to appeal to various global markets. Gene editing will also enable faster innovation and development cycles going forward.

To protect corn against devastating pests, Bayer's pipeline will deliver next-generation insect control traits with a combined peak sales potential of over 1 billion euros. This includes the fourth and fifth generation of Lepidoptera control as well as the new fourth-generation trait against corn rootworm – a pest that can cause up to 45 percent of yield loss to U.S. farmers when present. Two new modes of action, coupled with RNAi technology highlights the fourth-generation corn rootworm trait (CRW4). It is currently in R&D phase 4 and will be included in several corn systems, including in the SmartStax and the VT4Pro system. Also featured in SmartStax PRO, RNAi technology blocks a specific gene in the pest's genome, inhibiting its growth and eventually destroying the pest. CRW4 is expected to effectively help manage corn rootworm with built-in protection, potentially reducing insecticide application, reducing the impact on non-target organisms and contributing to increased biodiversity. The launch for the new insect control traits is expected for late this decade and early next decade.

Soybean systems with improved resistance mechanisms

Bayer's leading soybean systems for Latin America and for North America are delivering excellent productivity and quality that is combined with various pest control traits and herbicide tolerance options. With these systems, farmers are not only able to reduce insecticide application but also perform no-till farming at a large scale, which is beneficial for soil health, helps sequester carbon and prevents soil erosion.

The new traits from Bayer's R&D pipeline provide further resistance mechanisms for farmers going forward. The third-generation insect protection trait IP3 (currently in phase 4) is delivering multiple modes of action for insect control to be launched in 2028. The fourth-generation insect protection trait IP4 (phase 2), with a focus on the Brazilian market, will use multiple modes of action to further enhance the leading Intacta franchise. The fourth-generation herbicide tolerance trait HT4 (phase 4) will add additional herbicide tolerant traits to give growers enhanced flexibility with more choices than ever in their weed management. The fifth-generation herbicide tolerance trait HT5 (phase 3) adds an additional herbicide tolerance trait to give growers a total of six options for weed management that will also help them prevent resistance. All these traits are expected to generate a peak sales potential of more than 3 billion euros.

Transforming the cultivation of the world's most important food crops

In October 2023, Bayer [announced](#) the introduction of its direct-seeded rice (DSR) system at the 6th International Rice Congress in Manila. Moving from transplanted puddled rice cultivation to direct-seeded rice can help farmers reduce water use by up to 40 percent, greenhouse gas emissions by up to 45 percent and reduce farmers' dependence on scarce and costly manual labor by up to 50 percent. Driven by these advantages, DSR has the potential to be transformational, with 75 percent of total rice fields in India expected to switch to this cultivation method by 2040, in comparison to roughly 11 percent today. By 2030, Bayer plans to bring the DSR system to nearly 2.5 million acres in India, supporting over two million early-adopter smallholder rice farmers through its DirectAcres program.

Bayer is also working on transforming wheat, the world's largest crop. The development of Hybrid Wheat represents a major opportunity to secure and drive sustainable

production as well as support global food security. To address this significant opportunity for the business and humanity, Bayer is successfully progressing with its internal Hybrid Wheat breeding program for the U.S. and – since April 2021 – for European markets with a strategic R&D partnership with RAGT, a leading European player in varietal wheat. RAGT's best-in-class germplasm and rich portfolio of native traits, combined with Bayer's wide array of R&D assets, leading crop protection portfolio, and seed production expertise is a superior strategic fit. First launches are targeted for the end of this decade.

Introducing CropKey to develop next generation crop protection products like Icafolin

CropKey is Bayer's entirely new breakthrough approach to developing the next generation of crop protection chemistry. "It offers new opportunities in precision, safety and sustainability, and goes above and beyond current standards to set a new benchmark for the industry," said Bob Reiter.

Instead of manually screening for molecules that could be the next crop protection solution, Bayer researchers, using virtual screening and computational modeling, are designing new molecules that fit exactly the target protein of a weed, a fungus or a pest – like a key to a lock. The CropKey approach is leading to an enrichment of the research pipeline across all indications. Bob Reiter: "If we take the example of early research only, we today have at least three times the number of new modes of action compared to ten years ago and CropKey is just in its beginnings. As our AI tools learn alongside us, every generation of solutions will be smarter and come faster than the ones that came before." This pace of breakthrough discovery is unprecedented in the agricultural industry.

The first product that is leveraging the CropKey approach is Icafolin, the first new post-emergent herbicide mode of action for broadacre crops in 30 years with a peak sales potential of over 750 million euros. It is expected to launch in 2028 in Brazil first before expanding to other countries. The active ingredient demonstrates effective broad spectrum weed control including for key resistant grasses, for example, ryegrass, goosegrass and sourgrass and for tough-to-control weeds such as waterhemp. Icafolin will be used in soybeans first but allows for use in various market segments including cotton, corn, and sunflower, as well as horticulture, offering growers new options for integrated weed management.

Another CropKey product is a broad-spectrum fungicide with a new mode of action. It is able to control key leaf spot fungi and offers opportunities to extend beyond horticulture to cereals, oil seed rape and seed treatment. It is currently in R&D phase 2 and is expected to have a peak sales potential of more than 200 million euros. On top, the pipeline also includes a new broad-spectrum fungicide with a proven mode of action for global use in cereals, corn, fruits and vegetables. With the ability to control a multitude of diseases and its favorable regulatory profile, it will be a fit for multiple markets. The fungicide is currently R&D phase 3 and has a peak sales potential of over 1 billion euros.

Regarding new and innovative insecticides with blockbuster potential, Bayer is presenting Plenexos, the first ketoenol insecticide expected to offer both foliar and soil uses, with first launches from 2025 onwards. Plenexos will be suitable for application in arable and horticulture crops, including soybeans, cotton and fruits and vegetables, making for wide use cases and a fit for many operations. This broad set of uses, and flexible application for a highly effective suite of future products, means that Plenexos offers a peak sales potential of approximately 500 million euros and offers farmers effective options to protect their crops.

Bringing all of these options together and helping growers to make the right decisions at the right time will require strong data-driven support and Bayer is also developing technologies and tools to enable informed crop protection applications. Currently in pre-commercial development, the Delaro Showcase is a unique data-science driven solution that projects outcomes and offers field-level recommendations for fungicide use in corn and soy to ensure that growers can confidently decide how to manage their crop against changing disease.

Biologicals are complementing synthetic products

By tapping into a worldwide open innovation ecosystem, Bayer has accelerated its Biologicals R&D pipeline substantially. Through multi-year strategic research and development partnerships with Ginkgo Bioworks, Kimitec, MustGrow and others, Bayer is accelerating the delivery of breakthrough biological innovations in the areas of next-generation nitrogen fixation, crop protection and biostimulant products – all while continuing to deliver innovative new products through leading development platforms.

Ibisio, a biological bird control which uses black pepper oleoresin as its active ingredient, was advanced to Phase 4 and is expected to launch in Europe where it will help to protect freshly sown fields prevent attacks from crows, pigeons, pheasants and other birds. In 2023, about 20 percent of the total corn area in the EU and the UK was protected with a seed treatment solution including bird repellents and there are very few remaining crop protection products to address the problem. Farmers need a new solution that's future-proof, with a good environmental and regulatory profile. With an excellent crop safety profile, and efficacy on par with chemical alternatives, this repellent is an innovative biological seed treatment that will help farmers maintain yield and protect their crop.

Bob Reiter: "Within a rapidly growing market, we expect the sales of biological products to grow to more than 1.5 billion euros in 2035, a more than seven-fold increase versus the 200 million euros sales baseline in 2022."

As part of growing biologicals, Bayer's approach to partnerships includes accelerating the delivery of products to market more quickly through distribution agreements with leading innovators. As previously [announced](#), Bayer and AlphaBio Control are working together to launch the first ever bio-insecticide for arable crops, including oilseed rape and cereals, which is expected to launch in 2028. With regulatory expertise, established distribution channels, and a systems approach that can integrate products into holistic toolsets these products will help Bayer to scale the biological contribution to regenerative agriculture.

AI is speeding up R&D and delivering digital offerings

Digitalization has become one of agriculture's most exciting frontiers through advances in application technology and data science. Bayer is leveraging the latest Artificial Intelligence (AI) technology and expertise to speed up the development of seeds, traits and crop protection as well as to provide cloud-based solutions for the food value chain.

"AI is a core technology in powering the digital transformation of agriculture, which helps tackle climate change and ensure global food security," explained Jeremy Williams, Head of Digital Farming for Bayer's Crop Science Division.

Advancements in precision agriculture and digital farming technology are helping farmers maximize the productivity and sustainability of their land and agricultural practices. Climate FieldView has become an essential decision tool with subscriptions on more than

250 million crop acres globally. It is the largest database of grower and field trial seed performance data in the industry.

Together with Microsoft, Bayer developed [AgPowered Services](#) based on Microsoft's Azure Data Manager for Agriculture. They provide ready-to-use capabilities for businesses and organizations of all sizes to license and use for their own internal or customer-facing digital solutions. Another example of the collaboration with Microsoft is the pilot of an [expert GenAI system](#) to benefit farmers and up-level agronomists in their daily work. Bayer has been using proprietary agronomic data to train a large language model (LLM) with years of internal data, insights from thousands of trials within its vast testing network, and centuries of aggregated experience from Bayer agronomists around the world. The result is an expert system that quickly and accurately answers questions related to agronomy, farm management, and Bayer agricultural products.

Note to editors: The presentations of Crop Science Senior Executives in Chicago can be followed via [livestream](#). This includes the possibility to ask questions. It starts at 2:15 pm CT.

An overview of the 10 blockbusters that will be delivered by Bayer's Crop Science Division can be found [here](#).

About Bayer

Bayer is a global enterprise with core competencies in the life science fields of health care and nutrition. In line with its mission, "Health for all, Hunger for none," the company's products and services are designed to help people and the planet thrive by supporting efforts to master the major challenges presented by a growing and aging global population. Bayer is committed to driving sustainable development and generating a positive impact with its businesses. At the same time, the Group aims to increase its earning power and create value through innovation and growth. The Bayer brand stands for trust, reliability and quality throughout the world. In fiscal 2023, the Group employed around 100,000 people and had sales of 47.6 billion euros. R&D expenses before special items amounted to 5.8 billion euros. For more information, go to www.bayer.com.

Contact for media inquiries:

Global contact:

Alexander Hennig, +49 175 3089736

Email: alexander.hennig@bayer.com

US contact:

Brian Leake, +1 314 370 3285

Email: brian.leake@bayer.com

Contact for investor inquiries:

Bayer Investor Relations Team, phone +49 214 30-72704

Email: ir@bayer.com

www.bayer.com/en/investors/ir-team

Find more information at www.bayer.com.

ahe (2024-0101E)

Forward-Looking Statements

This release may contain forward-looking statements based on current assumptions and forecasts made by Bayer management. Various known and unknown risks, uncertainties and other factors could lead to material differences between the actual future results, financial situation, development or performance of the company and the estimates given here. These factors include those discussed in Bayer's public reports which are available on the Bayer website at www.bayer.com. The company assumes no liability whatsoever to update these forward-looking statements or to conform them to future events or developments.