

News Release

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Strong pipeline of BASF agricultural innovations will benefit food security, climate and environment

- **Innovations in seeds and traits, seed treatment, biological and chemical crop protection, and digital farming solutions for important crops worldwide**
- **Improvements for climate resilience, biodiversity preservation, precision applications and reduced CO₂ emissions**
- **Projected peak sales potential of more than €7.5 billion confirmed**

BASF announces its ten-year outlook on agricultural innovations that support food security for future generations, while minimizing the impact of farming on the climate and the environment. The company focuses on improving agricultural outcomes in major crops, like wheat, canola, soybean, corn, cotton, rice, as well as fruits and vegetables. According to estimates from the Food and Agriculture Organization of the United Nations (FAO), these crops account for more than 50% of the world's farmland, which is why innovations applied on such a large scale have the potential to make farming even more productive and sustainable.

Within these major crops, BASF continues to innovate across its pipeline of seeds and traits, seed treatment, biological and chemical crop protection, as well as digital farming solutions and will launch major pipeline projects across all business areas over the next decade. The value of the innovation pipeline is strong, with an estimated peak sales potential of more than €7.5 billion. The importance of BASF's products and solutions to society is growing, as the company systematically incorporates sustainability criteria into its agricultural research. In 2021, it spent

about €900 million in R&D in the Agricultural Solutions segment, representing around 11% of the segment's sales. In 2022, BASF will continue to invest in research and development of agricultural innovations at a high level.

While focusing on selected crop systems in key regions, the company tailors its products, technologies and services to help farmers grow their crops optimally even in challenging environmental conditions. "Innovation in agriculture is essential to enable sustainable food production. We need to find the right balance for better yield – yield produced in ways that meet the demands of future generations, has minimal impact on the environment and helps farmers make a living," said Dr. Livio Tedeschi, President of BASF Agricultural Solutions. "Our innovations enable both more productive and more sustainable farming – key levers identified by the United Nations and incorporated in their [Sustainable Development Goals](#). At BASF Agricultural Solutions, we made this a priority and committed to [clear and measurable targets to boost sustainable agriculture by 2030](#)."

"Over the past decade, we have developed a broad portfolio that leverages all technologies needed for a more sustainable future of agriculture," said Dr. Peter Eckes, President R&D and Regulatory of BASF Agricultural Solutions. "As a trusted and reliable innovation partner, our research for agricultural solutions reflects a long-term strategy that gives farmers stability in a changing world and allows them to increase yield and reduce the impact of farming on natural resources."

Preserving biodiversity by combining Ideltis™ hybrid wheat, crop protection and digital tools in Europe

To meet the needs of a growing global population, wheat farmers need to increase their yield by 1.7% annually for the next 20 years. BASF contributes to this by researching combinations of its offering that optimize agricultural outcomes and sustainability. Ideltis hybrid wheat will be launched in the second half of the decade. It will be supported by xarvio® Digital Farming Solutions for optimized seeding recommendations through zone-specific field data analysis and precise application of sustainable crop protection innovations, like Revysol® fungicide, Axalion™ insecticide and Luximo® herbicide. Revysol increases yield resulting in 4% less land needed. Innovations in Revysol formulation also enable farmers to reduce the amount of fungicide applied, further lowering the CO₂ output.

Patrice Sainsard, wheat farmer from France, is counting on these connected innovations to improve wheat yield: “I am confronted with more and more difficult weather conditions over the last years. It is challenging to achieve a decent yield, but we need to have greater and more stable yields in wheat to meet nutritional needs of a growing population – with new restrictions through the European Green Deal, basically we need to do more with less.”

Precision application and efficient land use through a diverse, tailored soybean innovation pipeline for Latin American farmers

BASF is developing and connecting innovations across seed, crop protection and digital solutions, tailored to the needs of Latin American farmers. Coming to farmers by mid-decade, the company is advancing several new Revysol- and Xemium®-based mixtures that provide effective control of soybean diseases, including Asian Soybean Rust, and help manage resistance. In addition, soybean farmers will benefit from a novel trait in development for tolerance to nematodes, pests that induce yield losses of around 30%.

To control weeds with precision inputs, BASF together with Bosch developed the Smart Spraying solution that combines xarvio’s agronomic intelligence with Bosch’s high-tech camera sensor technology and software. The technology offers real-time, automated pre- and post-emergence weed identification and management. Smart Spraying reduces the risk of weed resistance by using specifically developed herbicide formulations and optimized rates, ensuring that herbicide is applied only where and when needed. Through spot application, it can reduce herbicide volume use by up to 70%, depending on prevailing field conditions and weed pressure. The Smart Spraying solution is expected to launch in Brazil, North America and Europe within the next 18 months. Brazilian farmer and agronomist Maurício De Bortoli believes that the use of innovations like Smart Spraying is essential for success: “In fact, we are always adding new technologies in the field. We usually research, measure, quantify what each technology adds and each year we add more technologies to increase productivity. So, we are evolving over the years.”

Innovations in North American canola production to strengthen farmers’ climate resilience

To strengthen growers’ resilience in challenging environments, BASF innovates for the industry’s most comprehensive portfolio in canola. The company continues to

improve its leading InVigor® canola products through selection for hybrid vigor, while also developing yellow-seeded canola hybrids to be grown in historically less productive farmland of Canada and the U.S. where conditions are drier and hotter. Yellow-seeded canola hybrids will feature herbicide tolerance, a critical tool for weed control in canola production, and BASF plans to bring this innovation to the field mid-decade. The combination of traits and genetics will allow farmers to produce a high-value oil crop under challenging conditions like drought and heat stress.

Extreme and varying weather conditions also means diseases and pest outbreaks are difficult to predict and control. This is why the earliest possible protective measures are important, such as BASF's new seed treatment Vercoras®. It provides seeds with broad-spectrum protection against important seed- and soil-borne diseases like blackleg and against flea beetle insect damage. Further, xarvio FIELD MANAGER from BASF Digital Farming, an automated, digital crop optimization tool used worldwide, helps protect fields from seeding to harvest, combining and constantly analyzing a wide range of agronomic inputs, including weather data and in-season risks such as diseases. From the data, it recommends when, where and how much crop protection to apply.

Reducing emissions in farming with climate smart solutions for rice production in Asia

To reduce emissions and water usage in rice cultivation, BASF is bringing innovations to Asia, and combining them with already available products. The company will offer two herbicide tolerant traits that can be used in direct seeded rice hybrid systems as an alternative to paddy rice. When the traits are bred into the rice crop and combined with the complementing herbicides as a system, this allows the control of quality lowering weeds and helps reduce emissions through the direct seeded option. For the Asia Pacific region, the Clearfield® Rice System is already available, and the Provisia® Rice System is expected to launch mid-decade.

Combined with digital solutions from BASF, rice farmers can reduce carbon emissions up to 50% per ton of produce. Masaharu Kawamura, rice farmer from Japan, said: "We are working hard to make sustainable agriculture possible and digital solutions are a major contributor. xarvio FIELD MANAGER allows us to cope with complex agricultural environments, especially with unusual weather, and helps us optimize the application of pesticides and fertilizers."

Supporting local, indoor food production with innovations in vegetable seed and biological crop protection

BASF is optimizing seed and crop protection for growing food indoors. In 2021, the company's vegetable seed business, marketed under the nunhems® brand, opened a new state-of-the-art greenhouse for breeding vegetable seed varieties. The advanced indoor growing technologies will save water, energy and other agricultural inputs, and will be matched with BASF's vegetable seed varieties specifically bred for these conditions. The company is employing greenhouses like these to provide foundational research for efficiently producing and harvesting fruit and vegetable crops such as tomatoes, cucumbers, peppers and lettuce throughout the year.

As partners with vegetable seed innovations, BioSolutions by BASF like Velifer® BioInsecticide and Serifel® BioFungicide are optimized for performance in greenhouse settings, and will continue to launch worldwide, including in the EU, China and Latin America over the coming years. Farmer José Filipe Ruiz Chavez, who grows tomatoes and peppers in greenhouses in Mexico, said: "The experience we had with Serifel has been very good because it has reduced and controlled powdery mildew. We have a vigorous and healthier plant, a cleaner and more organic produce."

To find out more about BASF's innovation pipeline in agriculture, please visit our innovation website www.AgInnovation.basf.com.

About BASF's Agricultural Solutions division

Farming is fundamental to provide enough healthy and affordable food for a rapidly growing population while reducing environmental impacts. Working with partners and agricultural experts and by integrating sustainability criteria into all business decisions, we help farmers to create a positive impact on sustainable agriculture. That's why we invest in a strong R&D pipeline, connecting innovative thinking with practical action in the field. Our portfolio comprises seeds and specifically selected plant traits, chemical and biological crop protection, solutions for soil management, plant health, pest control and digital farming. With expert teams in the lab, field, office and in production, we strive to find the right balance for success – for farmers, agriculture and future generations. In 2021, our division generated sales of €8.2 billion. For more information, please visit www.agriculture.basf.com or any of our social media channels.

About BASF

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. Around 111,000 employees in the BASF Group contribute to the success of our customers in nearly all sectors and almost every country in the world.

Our portfolio comprises six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of €78.6 billion in 2021. BASF shares are traded on the stock exchange in Frankfurt (BAS) and as American Depositary Receipts (BASFY) in the U.S. Further information at www.basf.com.