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Presentation by

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The Beginning of What's Next

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Good afternoon and welcome! It's a pleasure to be with you today. I'm Bob Reiter and I lead our Global R&D for the Crop Science Division.

This annual update on our research in Crop Science is something we always look forward to, because it gives us the opportunity to share with you all the exciting advancements we've made in seeds-and-traits, crop protection and digital tools.

Our mission is to shape agriculture to benefit farmers, consumers and our planet, and – because of our leading position in these areas – we are doing just that.

That's important, because despite how commodity prices ebb and flow in any given year, as we look to the future, we see an attractive and growing Ag input market that is fueled by multiple megatrends.

When coupled with climate-driven harvest losses and increasing sustainability awareness, this means we have to innovate to produce more with less.

So when my team goes to work every day, we're laser focused on working against that goal. To do so, the priorities for my organization are to:

First, pursue sustainable innovation and deliver the leading R&D pipeline of projects

Next, to develop next-generation biotechnology traits and optimize our germplasm library with advanced breeding technologies

At the same time, advance new small molecules and biologicals

And, finally, unlock the opportunity for new business models with data science

As you heard from Liam yesterday, we are the leader in sales and profitability, and we're matching that with a leading investment in R&D that is roughly twice the size of our peers.

These resources are more than financial. With approximately 7,100 R&D employees in more than 50 countries, we serve as the technology provider to the industry and are the partner of choice for new technologies.

We know that we need to take advantage of the great science that happens inside – and outside – of Bayer to harness the opportunity in front of us. Our open innovation model is designed to ensure that we have access to the best that science can offer, and we've got a broad network that supplements the great work our discovery teams are leading.

Our agreements are centered on advancing solutions in key areas, which include sustainable protein; transformational technology; sustainable ag services and inputs; helping farmers control threats to their crop productivity; and breakthrough biology.

These agreements take many forms, including new companies funded by LEAPS like Joyn Bio and its work to engineer nitrogen-fixing microbes for corn or licensing deals we sign to access new technologies.

This network, combined with our in-house capabilities as outlined on slide 6, helps us to unlock new potential in breeding, biotechnology, small molecule development, biologicals and data science.

We've assembled the world's premier innovation platforms in agriculture, and our strength and scale in each of these five scientific disciplines gives us a significant competitive advantage in creating the solutions for growers that will meet the challenges they face today and tomorrow.

Whether it's the 1.5 billion data points generated by precision genomics to deliver biotech traits and accelerate genetic gain or the 30 to 60 molecules selected for testing annually in our small molecule program, in addition to screening hundreds of thousands of microbes every year. We're also the partner of choice for chemical and biological seed treatments because of our leading seed-and-trait footprint.

To that end, we delivered more than 20 key product and formulation advancements in 2020 and commercialized more than 430 new hybrids and varieties across corn, soybeans, cotton and vegetables.

These projects generate real value. We're expecting nearly 30 billion euros in non-risk adjusted peak for the products we're developing. Roughly half of this peak sales figure is expected incremental sales, and the rest are replacement sales that sustain our base.

These annual advancements and the continual progress my team is making is expected to keep our pipeline full for the next decade – and beyond.

Slide 8 does a great job of summarizing the balance across the reporting segments, and the value that we expect to be created from our investment every year. We also listened to you and have aligned our pipeline values by our strategic business reporting entities in our appendix to make your business modeling easier.

Let's move to biotechnology next, where Bayer remains the world's foremost developer of biotech traits.

We've built upon decades of experience now in the field. From our best-in-class screening capabilities, to the world's largest field-testing footprint to our unrivaled regulatory experience, in many cases, we've now moved on to our fifth-generation of improvement for insect control or herbicide tolerance.

Let's take a closer look at an example, starting first with our soybean portfolio, on slide 11.

Liam spent a bit of time yesterday talking about XtendFlex soybeans, and following shortly behind, and expected in mid-decade, we have HT4, the industry's first 5-way stack of herbicide tolerance coming in soybeans. This Phase 3 trait offering adds another two modes of action, tolerance to HPPD and our own proprietary 2,4-D tolerance.

The efficacy and weed control flexibility that we expect this product to deliver is very exciting and you can see how well the tolerance is expressed in the plant in the photograph on the left, taken at a demonstration plot in Illinois this past summer.

But we aren't stopping there. In Phase 2 of our pipeline, we are adding PPO tolerance.

Ultimately, what these technologies will offer our farmer customers is flexibility.

They will be able to choose the weed control options that suit their operations best, knowing that the varieties they've chosen offer premium genetics and the ability to manage weeds very well on the farm.

Moving to South America, insect control in soybeans continues to be a key growth driver for us. The Intacta franchise is well established in the region, and all regulatory approvals have now been secured for Intacta 2 Xtend, with a launch expected later this year in Brazil.

However, the next generation is what we are now focused on, and the technology is in Phase 3.

It further enhances the insect control spectrum that Intacta franchise offers by delivering multiple modes of action for insect control. We believe that the current acre opportunity for this third-generation offering has a fit across South America, with a focus on Brazil.

Sticking with varietal row crops, I wanted to highlight a very important introduction for cotton growers called ThryvOn Technology.

Successive generational improvements of biotechnology traits have been a hallmark of our insect and weed control technologies for more than 10 years, but ThryvOn represents an important 'first'. This is the first biotechnology trait ever introduced for piercing and sucking insects.

It fills an important need in the cotton market, as we expect this trait to offer better control and reduced insecticide use with an acre opportunity of more than 10 million acres in the United States.

Looking at this photograph, it is clear to see that the plants protected with ThryvOn are producing more cotton. It's a very impressive trait, and we expect to broadly license it.

Moving now to corn on slide 14, our growth in the segment is supported by key launches of new insect trait offerings in corn in the next two years, both of which will include our new RNAi-based corn rootworm trait – the first in the industry.

Brazil and Argentina are gearing up for the launch of VTPro4 for the 2021/22 season, as an upgrade to our current leading corn trait offering in that market, VT3Pro. This new stacked offering has received all necessary regulatory approvals, and includes an additional mode of above-ground insect control important in tropical Brazil.

Meanwhile, in the U.S., the new corn rootworm trait is expected to be launched in 2022 under the brand name SmartStax PRO.

For above ground control, our fourth generation of lepidoptera protection continues to show outstanding efficacy, and like the RNAi-based corn rootworm trait, it will have a nice market fit in South America. In fact, we recently received full cultivation approval in Brazil for the technology, which marks a critical milestone for our planned commercial launch in the middle of the decade.

Staying with corn, it's worth reiterating Liam's comments yesterday around our continued excitement for short stature corn.

We believe this product will transform corn production in three key categories: by enabling more precise use of crop protection; optimizing use of key resources; and reducing crop loss.

I want to stick with that last point for a moment, as short stature corn reduces crop loss resulting from greensnap and stalk lodging, which can happen under challenging environmental conditions, like high winds.

In fact, in the United States this past summer, we saw one of the most significant wind events that the Corn Belt has seen in some time.

This image was taken from high above one of our test locations in Iowa in August. What you are seeing are blocks of short stature corn still standing, while traditional hybrids planted in bordering rows appear feathered and are leaning over. While this was clearly a devastating event, it offered a unique opportunity for us to see how the hybrids performed in real world conditions.

Needless to say, we're excited about what we saw, and the benefits this will offer to growers in the future.

These traits and technologies help to protect the inherent yield potential of the seed itself, but another important engine for growth in our key crops are the new hybrids and varieties we launch every year, which sustain and improve our leading seed portfolio.

To do that, we commercialize more than **430 new hybrids and varieties** across, corn, soybeans, and vegetables annually.

These hybrids and varieties perform better in growers fields, and is a key enabler of achieving price mix lift for our sales teams. Although performance varies because there are many factors a farmer has to manage, we generally see several bushels per acre or pounds of cotton lint improvement over comparable products that the farmer can buy.

To deliver those gains, it starts with germplasm.

We've compiled the largest and most diverse collection in multiple crops, which enables billions of possible genetic combinations, and with our unique tools, we're able to generate leading products for our customers.

We genotype those seeds, grow them in protected culture, test them in the field and analyze those results to help deliver ever better products to our customers.

While that process has become more efficient and predictive over time, that evolution has accelerated, we expect to be even more transformational in the next five to ten years.

We're calling the next phase of our breeding effort Precision Breeding, and the best way to think about it is that it has evolved from selecting the best seeds to designing the best seeds.

The way it works is that artificial intelligence selects from a nearly infinite number of potential gene combinations, and matches these to customer needs.

Our breeding pipeline – now globally connected – continuously learns through new data, allowing us to optimize recommendations that maximize customer experience.

It's a truly remarkable transformation that has occurred, and tools like gene editing are giving us even more capabilities to refine and deliver what our customers need.

Gene editing is a science you've heard us talk about for a few years now, but the possibilities in the area are really taking shape. Our efforts are directed toward traits with high commercial relevance, such as disease control or making the plant more productive.

In fact, together with our collaborator Pairwise, we've now identified nearly 200 unique gene sequences that can improve productivity or disease resistance across a variety of commercially relevant row crops. For example, we've also found a unique target that results in increased kernel rows. And more rows of kernels means more yield.

It's a very exciting development in early phase research, but is an excellent example of what gene editing is capable of achieving.

Let's shift now from seeds to crop protection innovation that's designed to protect the genetic potential of the seed on slide 22.

You heard from Liam yesterday about the critical role that crop protection will play in the mid-term growth of the company, and I'll elaborate on how efforts in my organization are contributing to that, and ensuring it continues through this decade and beyond.

And it starts by discovering promising candidates, which our researchers are doing at a far greater pace than in recent years.

By refining our approach to early phase research, we've been able to double the number of small molecule candidates in discovery.

New MOAs like these are building upon our exceptional track record of success in delivering new active ingredients to the market, just as we have in biotechnology traits.

In fact, we've launched at least one new active ingredient every year since 2007, 15 to be exact, and we have about 10 AIs in the pipeline today.

The strides we've made in small molecule discovery allow us to increase the number of developmental candidates with new modes of action and a higher probability of regulatory success.

This stems from our extensive, early safety testing and from the use of differentiated starting points in discovery – identified through complementary technologies in screening and phenotyping --- all fueled by data science.

That's particularly relevant, because while we've been focused on discovering new molecules, we also have an equal focus on formulation innovation to maintain efficacy and extend the life of our vast portfolio.

To illustrate how this works, let's look at the active in our Luna brand family of fungicides, fluopyram. We grew fluopyram's sales as we expanded its formulations and registrations across crops, spectrum and application methods.

This drove an 8-fold increase in sales of the molecule since its initial launch. And we see the potential to double the sales over the next decade.

Our technical expertise, high standards for safety and keen awareness of grower convenience and use preferences has driven our leadership in life cycle management ---- and has defined our approach.

Let's move to new actives next. With a more than 300 million euro peak sales potential, Plenexos is the next generation ketoenol insecticide that we're looking forward to launching in 2024. This foliar and soil-applied insecticide is very effective against key sucking pests like aphids and white flies across a broad range of row crops and horticulture uses.

You can see the visible difference in the plants protected with Plenexos compared to the tattered leaf tissue of the unprotected plants.

We expect to begin regulatory submissions next year, and are planning to commercialize the insecticide in several world areas, including the Americas and Asia Pacific.

Switching to herbicides, I'd like to provide an update on a molecule that we debuted last year in Phase 2 of our R&D pipeline and has already advanced to Phase 3. This is the first new-mode-of-action in post-emergent herbicides in more than 30 years.

The reason it's so beneficial is that it offers very effective post-emergence control of tough grasses that have shown resistance to glyphosate. Plus, we believe it will have many uses in various markets, beyond traditional nonselective use. You can see how well this herbicide controls resistant weeds versus glyphosate alone or glyphosate with another herbicide, so we're very excited about the opportunity.

Additionally, this opens opportunities for herbicide tolerance trait systems and we already have some approaches under evaluation.

Liam talked about the strategic importance of our Fox Xpro soybean fungicide formulation in Brazil. Coming right behind it in Phase 4 is next-generation Fox Supra, which includes Indiflin in the formulation. Indiflin is a new technology that is very strong against Asian Soybean Rust, and will be the new technological 'backbone' of the Fox family of fungicides.

Fox Supra combines Indiflin with Prothioconazole to help reduce the development of resistance and broaden the spectrum of efficacy to other relevant diseases.

Finally, I'd like to close the crop protection update with an overview on our biologics platform on slide 28.

This is an area that really exemplifies what it means to be able to offer farmers tailored solutions for the challenges they face.

While biotech traits and small molecules usually take more than a decade to develop, the path to market for biologics is typically shorter, only about 4 to 6 years, and we remain a key partner-of-choice in the area to commercialize new options.

With our core competencies in fermentation, formulation, field testing and grower support, we're actively developing exciting new options for farmers, as well as sustaining our leading lineup of biologics.

That brings us to Serenade, which offers unique ways to address emerging soil needs and counter foliar bacterial diseases, and we're improving upon it, with a product called Serenade Soil Activ.

It's basically an easier product for farmers to handle, with lower use rates than Serenade ASO, an important brand in the Serenade family.

Serenade Soil Activ is launching in the U.S. and Australia this year, and broader global uses will follow in the years ahead.

This is one of three new products that we've added to the commercial portfolio recently, including Vynity Citrus and Flipper, a biological insecticide for use in horticulture crops.

We've covered a lot of ground and talked primarily about individual projects that we plan to sell in the years ahead. However, unlocking the true value of these products is further informed and enhanced through data science.

Today, farmers are using FieldView on more than 150 million subscribed acres around the world. The connectivity from those acres – logging information from planters, sprayers and combines – generates valuable data. More data translates into better models, which leads to improved recommendations for growers. This improves with each season as we get new data.

Today, we're taking that a step further by integrating customer data into our R&D process. This creates a more informed pipeline, which is better aligned with our customers' needs.

So how can better data help us conduct better research and help our customers farm differently?

Well, we know that farm productivity is significantly influenced by seed and trait selection. Then – after that seed purchase decision is made – we know that, globally, 20 to 40 percent of crop production is at risk of loss to pest, disease and weed pressure each year.

To answer the seed selection opportunity, vast amounts of field-specific data are needed to make predictive recommendations to maximize product performance. This is where FieldView insight can inform customers' decision-making processes, and then help them get the most out of their seed and crop protection purchase.

For example, FieldView's Seed Advisor models improve productivity by optimizing seed placement recommendations. Today, the models used for this are powered by more than 6.9 million data points from more than 8,600 hybrids on more than 70,000 fields. That data translates into tangible value for the grower. In testing from 2017 to 2020, we could demonstrate a 6 bushel per acre yield benefit from using the recommendations.

So once the seed is in the ground, how can data science help protect that yield potential? If we look at an example in corn, we know that timely application of fungicide, can make a big difference. Our data demonstrates that 74% of the time, farmers see a positive response from fungicide application. Helping farmers to improve their returns and productivity is at the heart of what we're doing by combining our products with data science.

These are just two examples, and we believe we are just scratching the surface of how big data can further inform grower decision making to help them maximize sustainability, productivity – and profitability – on their operations.

In summary, we have a long history of converting R&D into viable, value-added solutions for growers that enhance productivity and more efficiently use natural resources to produce a crop. You can see that from the leading positions we have established to-date and the growth our pipeline builds on that strong foundation.

We've covered a lot here today – and it's only a fraction of what's to come. Truth is, there are more than a hundred projects, thousands of hybrids and varieties, and more than a hundred formulations in development here at Bayer Crop Science. We've detailed many of these in the appendix of the handout for today's talk, where you'll find our pipeline organized by strategic business entity, so you can see how we'll drive growth in those segments.

I hope you'll agree that we don't simply have the *largest* pipeline in the industry, it's the most productive and comprehensive. Each project has a place and purpose, serving unmet needs and imagining better ways to farm.

Thanks for joining us today and we look forward to connecting with you in the year ahead.

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