

35th INTERNATIONAL COTTON CONFERENCE BREMEN 2021



Presentation

Session: **Panel Discussion: Responsible Fibre Production Programs (C2)**

Title: **Bayer Crop Science: Continued Commitment to Cotton**

Speaker: **Jessie Christiansen**, Bayer Crop Science, St. Louis, MO, USA

Presentations are available on the conference archive: <https://baumwollboerse.de/en/cotton-conference/lectures/>

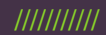
Conference Organization

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Bayer Crop Science: Continued Commitment to Cotton



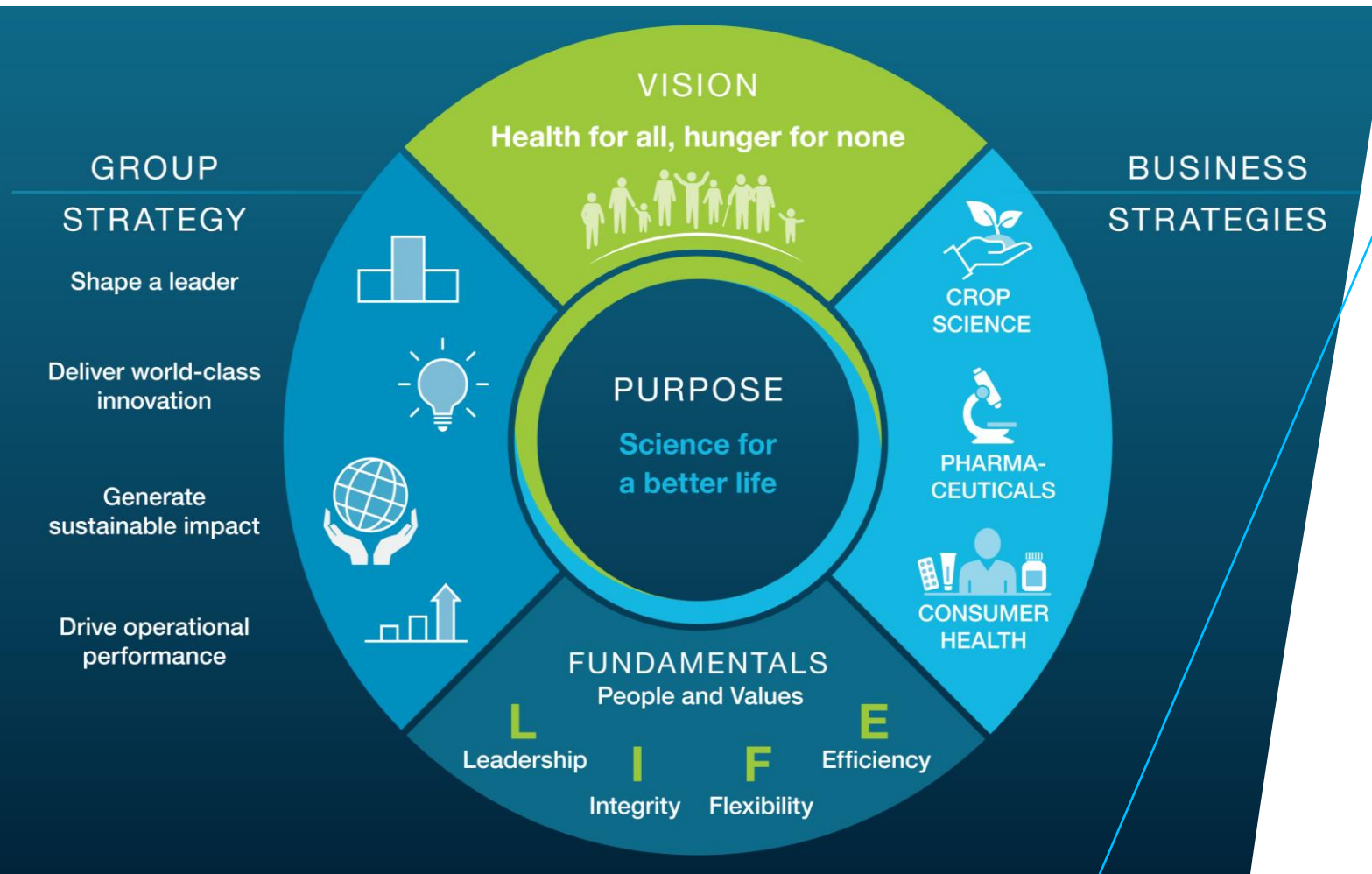
Jessie Christiansen
March 2021





Our Vision: Health for all hunger for none

Sustainability is part of our strategic and normative compass



At Bayer, **Sustainability** is

// A key enabler of our **company vision**

// A central component of and value lever within our **Group strategy**

// An **ambition** to **generate impact** at scale

// Embedded with **concrete business targets** in our **business strategies**

// **Leading by example** – Heightened responsibility for **transparency** and **engagement**



////// We follow clear principles to take sustainable agriculture to the next level

Guiding principles for Sustainability @ Crop Science

1

Focus on **transformational topics** related to ag where we can really make a difference

2

Always keep the **farmer's perspective** in mind while creating value for environment & society

3

Link sustainability strategy to the **core of our business and R&D/technologies**

4

Define KPIs to make all commitments **measurable**



Shaping Agriculture

To benefit farmers, consumers and our planet



Our Strategic Pillars



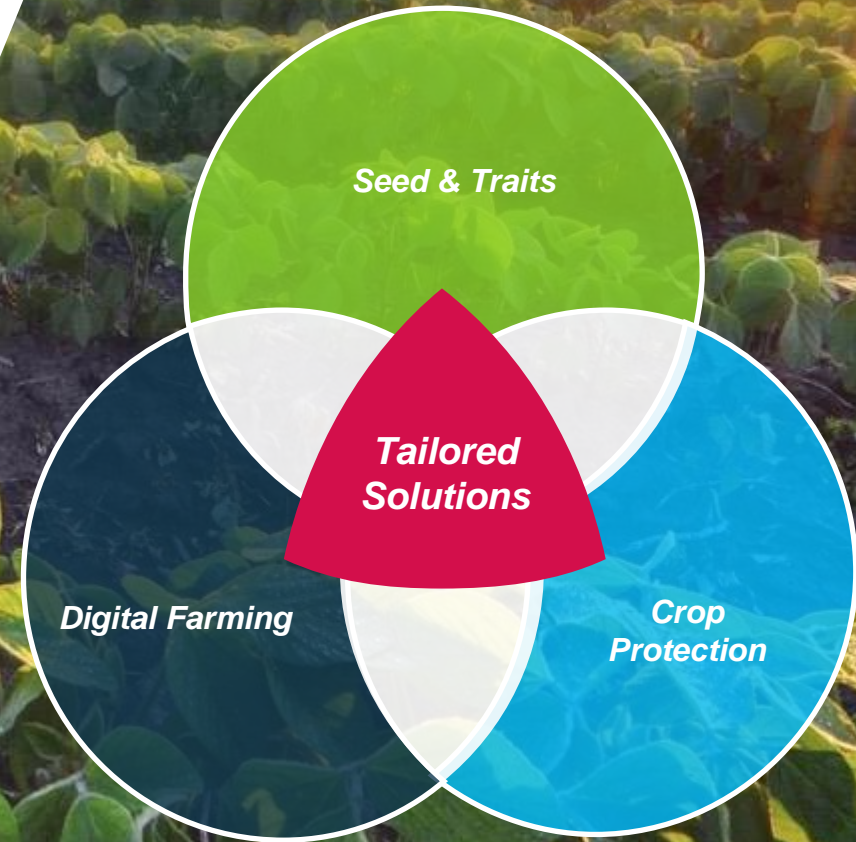
Deliver world-class innovation



Pioneer the digital transformation



Set new standards of sustainability



> Tailored solutions are key to giving farmers the tools they need to sustainably manage resources and improve productivity.



Living up to Our Responsibility

Achieving our transformational commitments by 2030
delivering tailored crop solutions to our customers

> **Advancing a carbon-zero future for agriculture**

30% Reduction in field greenhouse gases emitted per kg of crops produced

> **Produce higher-yielding crops with fewer natural resources and inputs**

30% Reduction in Crop Protection impact on the environment

> **Empowering smallholder farmers to access sustainable agricultural solutions**

>100_M Smallholders benefit from access to education, products & partnerships





Bayer Crop Science (BCS) provides valuable inputs to support the global cotton market

USA

- BCS is the #1 Seed Brand and Trait Platform
- #1 global fiber exporter
- Fast technology adoption
- BCS provides: seed, traits, CP and digital tools

5.0M ha

GREECE, TURKEY, SPAIN

- BCS provides: seed and CP
- Non-GMO market

INDIA

- BCS provides: seed, trait, CP
- Working with local partners
- Technology adoption slowed

12M ha

3M ha

AFRICA

- BCS provides: traits and CP
- Bt cotton is first trait launching in Kenya, Nigeria, Malawi

1.6M ha

MEXICO

- BCS provides: seed, traits and CP
- Cotton is the only GMO crop

0.15M ha

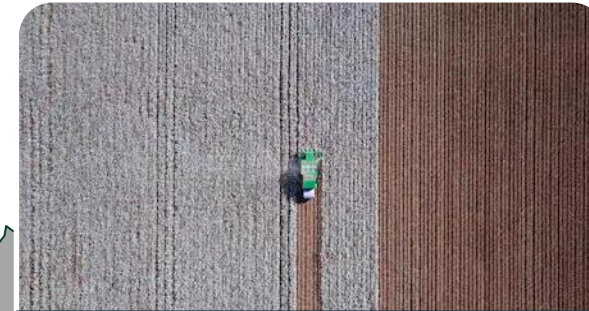
BRAZIL

- BCS provides: seed, traits, CP and digital tools
- #2 global fiber exporter
- Technology adoption increasing

0.35M ha

AUSTRALIA

- BCS provides: traits, CP and digital tools
- High yields and fiber quality
- Fast technology adoption



Large Growers



Smallholder



High Value



US Example: Breeding innovation drives yield & fiber quality

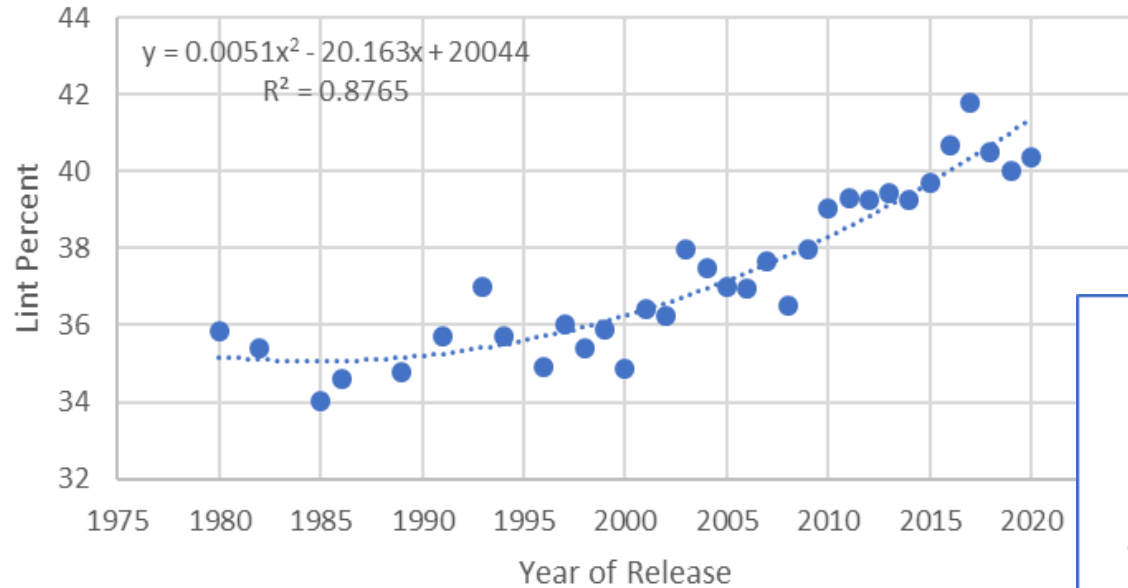


Plant Breeding

Creating New Possibilities and Solutions for Big Challenges

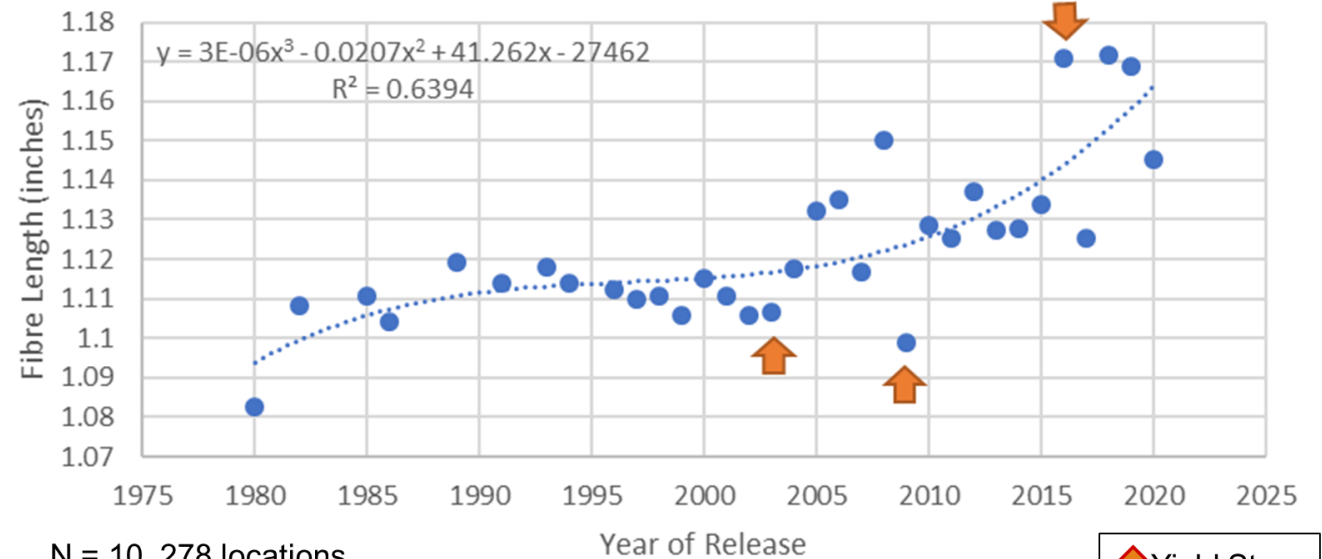


Deltapine® Varieties Long-term Lint Percent Trends
Year of Release 1980 to 2020



N = 10,200 locations

Deltapine® Varieties Long-Term Fibre Length Trend
Year of Release 1980 to 2020



N = 10, 278 locations

↑ Yield Steps



Let's talk about genetically modified organisms (biotech traits)

Genetically modified foods are ***just as safe*** as conventionally grown food according to the UN Food and Agricultural Organization (FAO), the World Health Organization (WHO), the European Food Safety Authority (EFSA) and the U.S. National Academies of Science.



Source: NAS report, Genetically Engineered Crops: Experiences and Prospects
Source: WHO: <http://www.who.int/mediacentre/factsheets/fs204/en/index.html>
Source: FAO: <http://www.fao.org/3/a-c1134e.pdf>

The increased productivity of genetically modified crops has saved

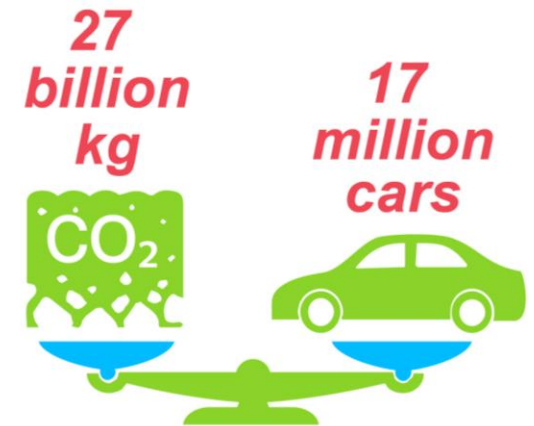
183 million ha of natural habitats from 1996-2016 equivalent to the ***size of South Africa.***



Source: ISAAA: <https://www.isaaa.org/resources/publications/books/54/abstract/summary/default.asp>

27 billion kilograms

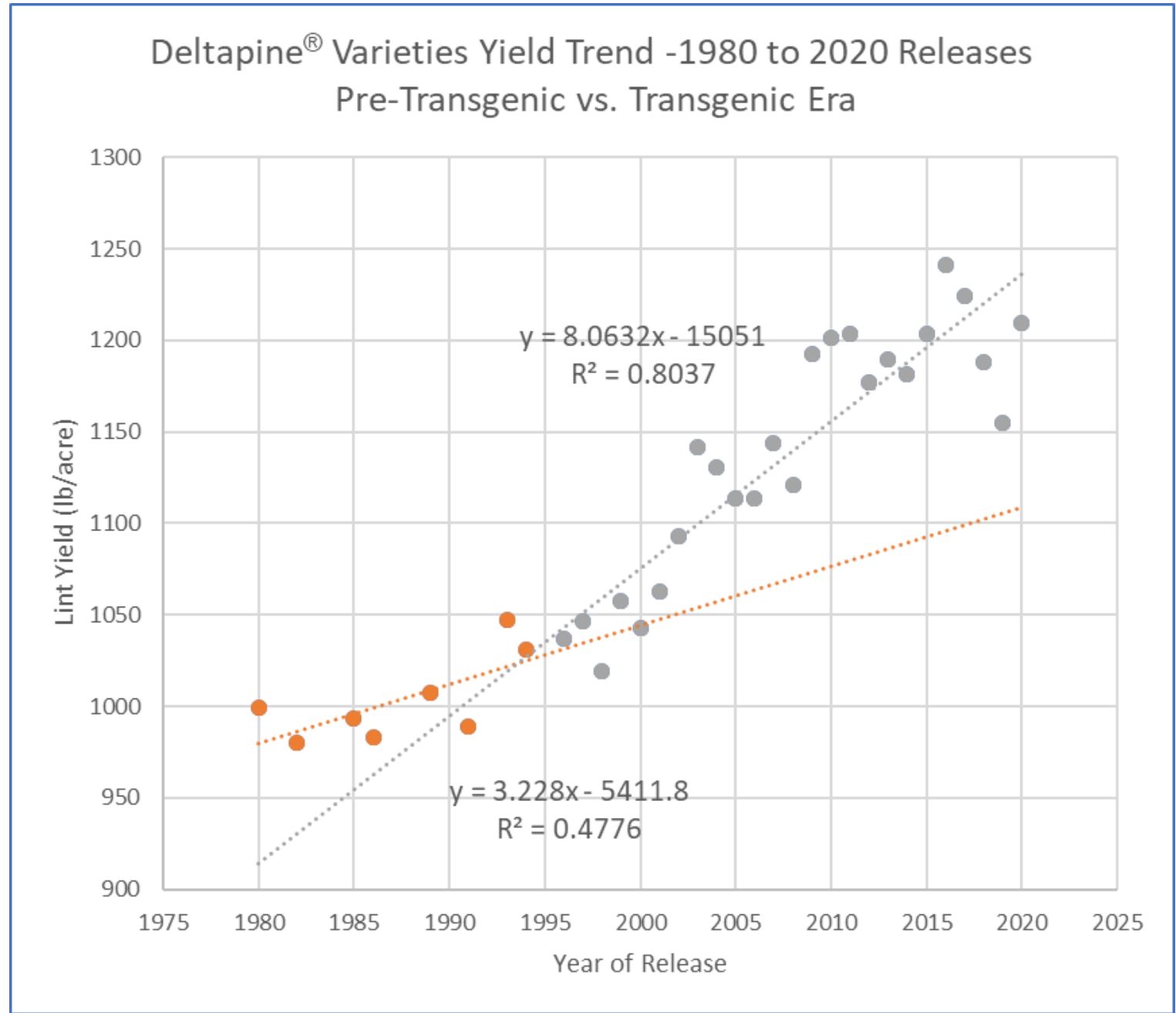
of CO₂ was captured in soils in 2016 (equal to nearly 17 million cars), thanks to no-till farming practices – which rely on the use of genetically engineered crops.



Source: ISAAA: <https://www.isaaa.org/resources/publications/books/54/abstract/summary/default.asp>



Yield Trends: Pre-Transgenic Era 1980 – 1995 vs. Transgenic Era 1996 to Present





What will ThryvOn™ Technology be able to provide Growers?

ThryvOn™ Technology will be the **industry's first cotton biotechnology trait that will provide season-long protection through built in trait technology** to the whole plant against tarnished plant bugs and thrips species.*

ThryvON™
TECHNOLOGY

Expected soon!

Bollgard[®]3
ThryvON™
With **XTENDFLEX[®]**
TECHNOLOGY

Expected soon!

*ThryvOn™ Technology has proven protection against tobacco thrips (*Frankliniella fusca*); Western flower thrips (*Frankliniella occidentalis*); tarnished plant bug (*Lygus lineolaris*) and the Western Tarnished Plant bug (*Lygus hesperus*).

ThryvOn™ Technology is not currently available for commercial sale or commercial planting. Commercialization is dependent on multiple factors, including successful conclusion of the regulatory process. ThryvOn™ Technology may not be registered in all states. Check with your state pesticide regulatory agency for the registration status in your state.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. It is a violation of federal and state law to use any pesticide product other than in accordance with its labeling. NOT ALL formulations of dicamba, glyphosate or glufosinate are approved for in-crop use with products with XtendFlex® Technology. ONLY USE FORMULATIONS THAT ARE SPECIFICALLY LABELED FOR SUCH USES AND APPROVED FOR SUCH USE IN THE STATE OF APPLICATION. Contact the U.S. EPA and your state pesticide regulatory agency with any questions about the approval status of dicamba herbicide products for in-crop use with Roundup Ready 2 Xtend® soybeans or products with XtendFlex® Technology.

B.t. products may not yet be registered in all states. Check with your seed brand representative for the registration status in your state.

Products with XtendFlex® Technology contains genes that confer tolerance to glyphosate, glufosinate and dicamba. Glyphosate will kill crops that are not tolerant to glyphosate. Dicamba will kill crops that are not tolerant to dicamba. Glufosinate will kill crops that are not tolerant to glufosinate. Contact your seed brand dealer or refer to the Bayer Technology Use Guide for recommended weed control programs.

Insect control technology provided by Vip3A is utilized under license from Syngenta Crop Protection AG. LibertyLink® and the Water Droplet Design® is a trademark of BASF Corporation. Bollgard®, Respect the Refuge and Cotton Design®, ThryvOn™ and XtendFlex® are trademarks of Bayer Group. ©2021 Bayer Group. All rights reserved.



An Overview: Chemical Crop Protection

Much like human medicines, crop protection chemicals – pesticides – are well-tested to keep crops healthy and our food safe while also helping to preserve our vital natural resources.

The Basics

- // **What:** The broad class of chemicals that protect crops are called pesticides. Pesticides include herbicides (protect plants from weeds that compete for sunlight, space, nutrients and water), fungicides/bactericides (protect plants from fungus and bacteria that cause diseases in plants) and insecticides (protect plants from insects that like to feed on a particular crop).
- // **Why:** Without effective crop protection tools, much of the food that is grown on a farm would be consumed by pests, destroyed by diseases or overcome by weeds.
- // **How:** Crop protection chemicals help farmers produce enough food on less land to help meet rising demand while preserving vital natural resources.



Transformational Commitment: Crop Protection Environmental Impact Reduction

Our Commitment:

**30% Reduction of crop protection's
environmental impact**

Why it matters

*Need to produce higher-yielding crops with fewer
natural resources and inputs*

*Agriculture and humankind exceed
planetary boundaries*

Scope of our efforts

- // All crop protection applications during crop production
- // Environmental impact assessment focused on active ingredient

Baseline

- // Market reference crop protection application program per crop-country combination

How we can do it – Levers for Success

- // Seeds & Traits
- // Precision Farming
- // Seed Treatment Uses
- // Enhanced Formulations
- // Biologics
- // Product Stewardship
(e.g. buffer strips, drift reduction)
- // Active Ingredients
w/ enhanced environmental profile



Digital Solutions to tie it all together

Digital Farming Opportunity

Digital tools and data science are accelerating ag innovation and transforming farming to advance how we convert natural resources into food and ultimately have a positive impact on our planet.

The Climate Corporation Mission

We aim to help all the world's farmers sustainably increase their productivity with the use of digital tools.



US Example: The BCS cotton pipeline has focused on improving yield & fiber quality while optimizing inputs and resource use

Germplasm



Biotech Traits



CP & Application Technology

Digital: Optimized & Prescriptive Farming



Very importantly.....

Working together is going to be key for continuous improvement!!! Growers and the value chain need choice and a variety of solutions.



THANKS and look forward to continuing the discussion!

← → ↻ 🏠 cropscience.bayer.com/people-planet/global-impact/forwardfarming



Shaping Agriculture

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Bayer ForwardFarming Initiative *Demonstrating Sustainable Agriculture in Practice*

In collaboration with farmers and other partners, the Bayer ForwardFarming initiative enables knowledge sharing about modern and sustainable agriculture through first-hand experiences on independent farms around the world.