7th Seed Congress of the Americas

Promoting Seed Business in the Americas

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Open Innovation and Access to IP and Technology

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SAA
Seed Association of the Americas

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Corteva Agriscience™, Agriculture Division of DowDuPont

Comprehensive, Balanced and Diverse Seeds and Crop Protection Business Platforms With Global Commercial Scope

LEADING PORTFOLIO OF PRODUCTS AND SERVICES…

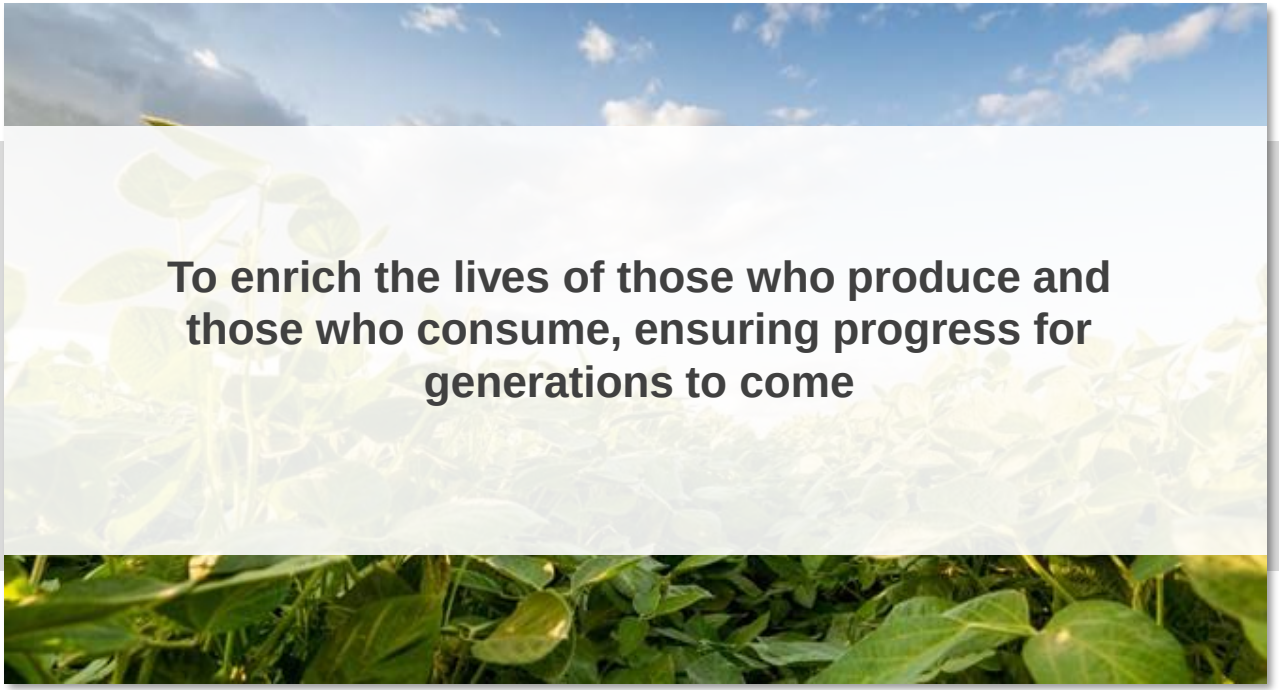
Seeds Solutions

- Alfalfa
- Canola
- Cereals
- Corn
- Cotton
- Rice
- Silage inoculants
- Sorghum
- Soybeans
- Sunflowers
- Wheat

Crop Protection Solutions

- Cereals Herbicides
- Corn and Soybean Herbicides
- Fungicides
- Insecticides
- Pasture and Land Management
- Rice, Trees and Vines Herbicides
- Seed-Applied Technologies
- Specialty Crop Herbicides
- Structural Pest Management
- Turf and Ornamental Pest Management

Our Purpose

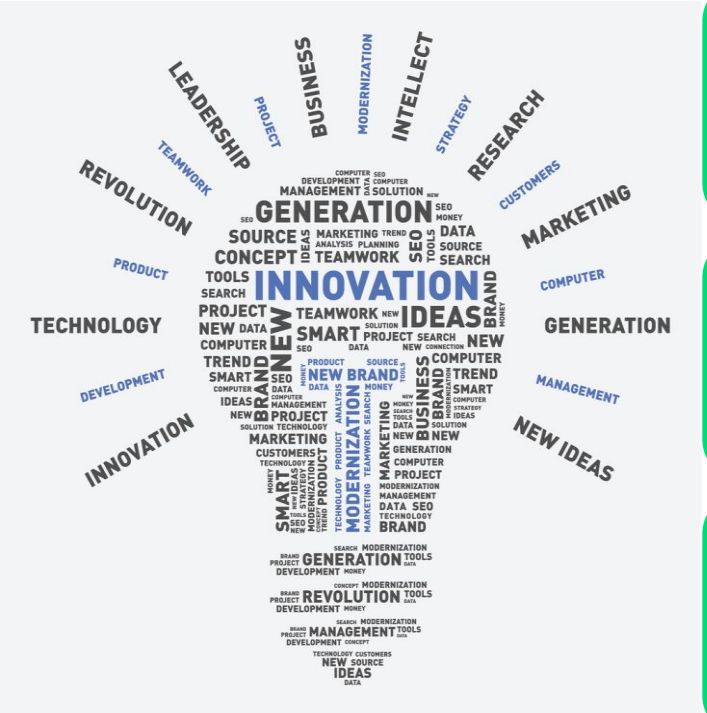


To enrich the lives of those who produce and those who consume, ensuring progress for generations to come

Corteva Applies Various Technologies

To Offer Complete Solutions

What Enables Innovation



Technology	• Science • Technical capabilities • Intellectual property • Collaborations
Policy	• Regulatory frameworks
"Social license"	• Societal value • Trust • Transparency

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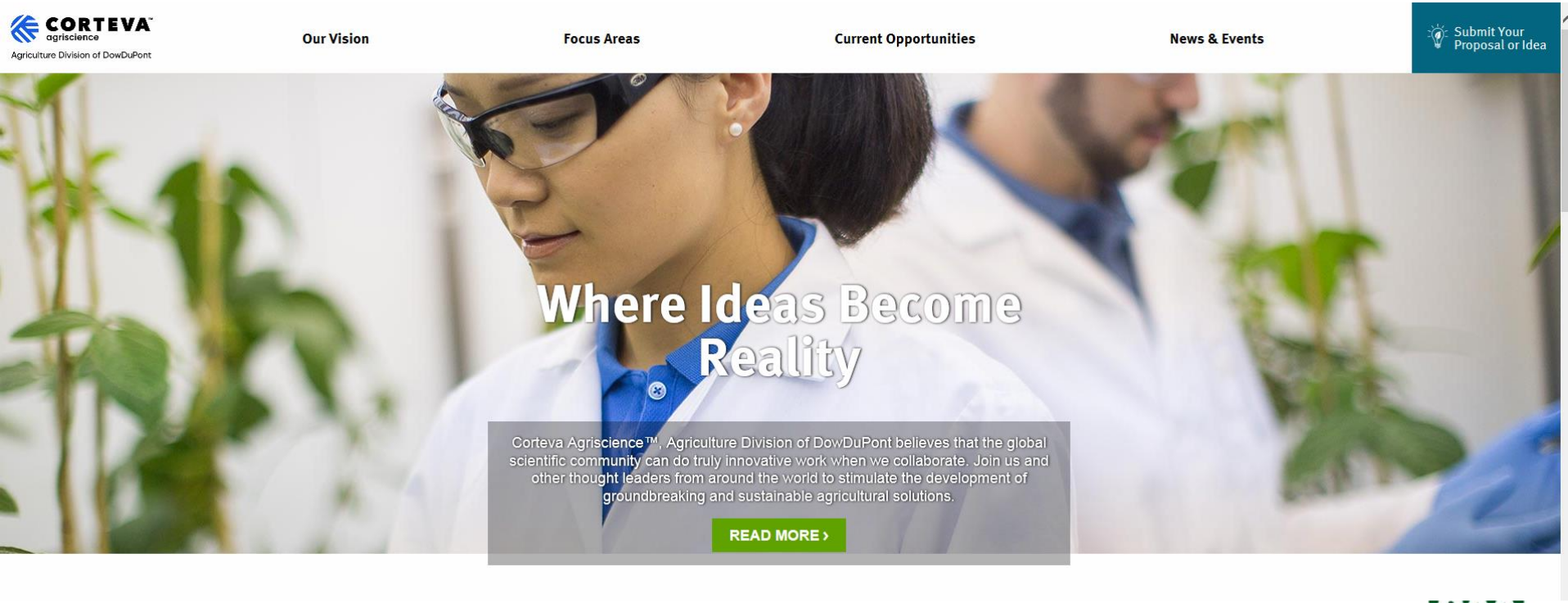
Engaging a Full Range of Stakeholders

- Recognize that all new technologies require a “social license”
- Engage traditional and non-traditional stakeholders about their hopes and questions related to CRISPR-Cas and how to balance the two
- Using insights as we develop our plans and as we work with others in agriculture and with those applying CRISPR-Cas across industries
- On-going discussion

Open Innovation



openinnovation.corteva.com

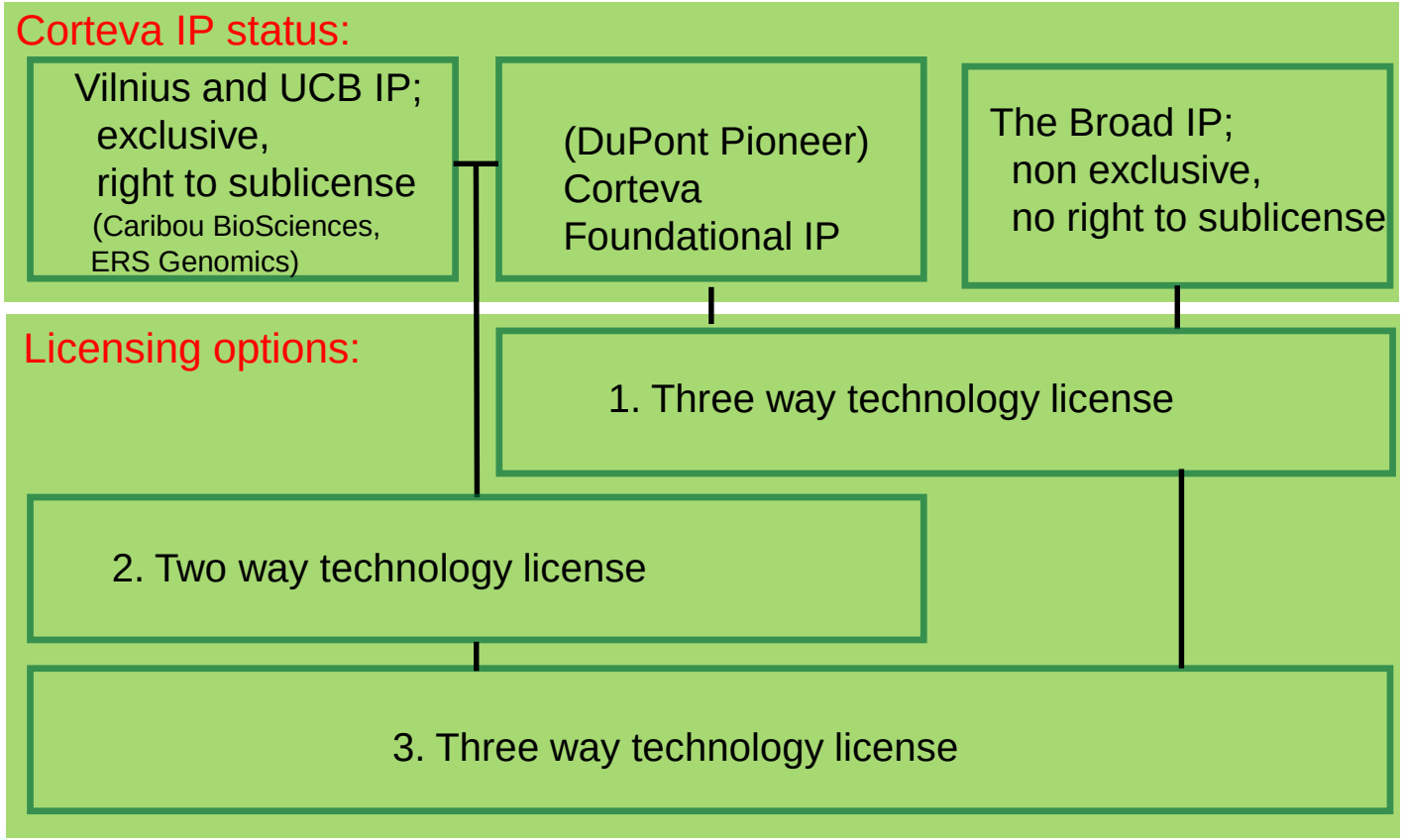
Open Innovation : Why?

- Help us answer specific research questions
- Advance overall scientific knowledge
- Develop partnerships for research projects

Open Innovation : Who?

- Academic scientists and academic centers
- Not for profit organizations engaged in food security
- Consumer-oriented startup companies
- Innovation hubs – Incubators and accelerators
- Crowd sourcing organizations
- Industry partners
- Technology startups
- Companies with common interest in technology
- Innovators, globally

Licensing Platforms



License Terms

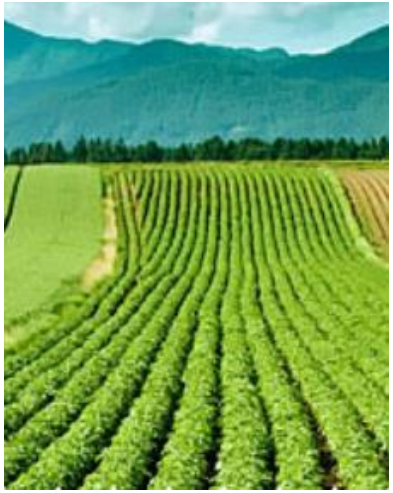
- **IP Coverage: F**oundational patent families from the Broad Institute, DuPont Pioneer/Corteva, Vilnius University, UC Berkeley, University of Vienna and ERS Genomics
- **Non-Exclusive**
- **Royalty :** adapted to the activities chosen and the size of the licensees with preferential terms for Not-For-Profit/Public research organizations
  - Academic: no license fee
  - Commercial; license fee
- **Independent Licenses:** Licensees maintain the ability to seek independent licenses from the Broad, from Corteva or from third parties
- **Stewardship requirements:** no work in Tabaco, gene drive, Terminator technology, Herbicide Tolerance not preferred, need to steward technology and products

Corteva Agriscience Collaborations through Open Innovation

CIMMYT
Targeting Maize Lethal Necrosis Disease

Danforth Center
Targeting Cassava Improvement

ICRISAT
Targeting food security crops such as sorghum and millet



The J.R. Simplot Company
Targeting consumer products such as potatoes, strawberries and avocados

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Regulatory Framework

Appropriate, science-based regulatory oversight for plants developed with CRISPR-Cas advanced plant breeding, consistent with plants developed through other plant breeding methods

✓ Gene edited plants are indistinguishable from plants that could be produced with conventional breeding tools and have a long history of safe use

✓ It is the characteristics of the plant, not the production method, that determines its safety

- Protecting health and the environment while promoting innovation
- Science-based, accommodate new evidence and learning
- Cost effective and commensurate with the risk
- Transparent, consistently applied and enforced
- Globally harmonized

Is there a connection between PBI Regulatory framework and Intellectual Property Protection?

No:

Regulatory requirements and IP protection are completely different legal frameworks

Some common questions follow:

Who owns the patents on CRISPR?

- Many of the patent holders, worldwide, are universities and research institutes
- Patent landscape for gene editing is dynamic and evolving rapidly
- Patents are not only held in the US and Europe but also Asia, particularly Korea and China
- Other methods of gene editing, like ZFN, and TALEN, have different patent application dynamic
- Updated information available on public patent databases such as the Worldwide Espacenet or Patentscope

How accessible will methods like CRISPR be for plant breeding?

- A license may be required
- Most patent holders have out-licensing and distribution policies for medical, agricultural, and industrial applications
- For CRISPR-Cas, the primary patent holders provide free licenses for research to academic and non-profit institutions
- Also non-exclusive, royalty-bearing, licenses to organizations that want to use CRISPR for commercial purposes
- Application of the technology also depends on additional technology/methodology plus enabling knowledge

Does regulatory status affect the patentability of CRISPR?

- No. Regulatory status and patentability are governed by separate legislations
- These two distinct legal frameworks have different objectives:
  - The objective of regulatory frameworks is to protect human/animal health and the environment
  - The patent system is designed to stimulate innovation in all fields of technology
- Whether a product does or does not fall under the regulatory framework for biotechnology has no bearing on the patentability of such product
- PBI products can be protected under the patent system – regardless of their regulatory status - provided that they meet the patentability criteria (novelty, inventive step, industrial applicability and enabling disclosure)

How can patents on plant products made with gene editing affect plant breeding?

- ISF and its members are committed to help create an environment that fosters innovation, and supports the development of tools (such as the International Licensing Platform for vegetables) which serve this purpose.
- The emergence of PBI will not change that. It is the same situation as patents on ‘conventionally’ developed products.
- National Laws govern if patents are possible on characteristics resulting from gene editing.
- All patents are for a specific period of time and with geographical limitations.
- Some countries permit breeding with plants containing patented characteristics, most do not.

How will patents on plant products made with gene editing methods affect farmers' ability to save seed?

- Whether farmers will be allowed to save seeds of a variety covered by a patent, regardless of whether gene editing was used, will depend entirely on the national legal framework.
- In some countries where the biological material may be protected by patents, farmers can save seed with or without an obligation to pay royalties.
- In countries where exemptions are not introduced, a farmers' ability to save seed is restricted.

Seed is Life