

SEED APPLIED
TECHNOLOGIES



Win the Start

with Corteva Agriscience™ Seed Applied Technologies



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Win the Start with Corteva Agriscience™ Seed Applied Technologies

Inside each seed sits the promise of a full, healthy plant that will one day be harvested. But first, that seed will face a gauntlet of challenges. From the moment each seed is planted, it's challenged by disease, hungry insects and an unpredictable environment. Each factor can restrict a plant's ability to grow strong roots and leaves, produce an optimum yield—or even survive at all.

Corteva Agriscience is committed to discovering, developing and delivering the industry's highest-quality seed treatments to help protect the seed from the start, so it can develop to its full potential.

Seed Treatment Benefits

Seed treatments, including fungicides, insecticides, nematicides, and biologicals, play a critical role in agriculture and the production of a healthy crop. In addition to helping manage against early season pests and diseases, they:

- Help reduce damage from pests that can introduce fungal, bacterial, and viral disease
- Reduce or may eliminate the number of foliar sprays due to targeted protection against pests
- Reduce threats to the plant that can reduce crop yields and save natural resources (water, soil, nutrients, energy, money and labour)
- Seed treatment is an efficient use of pesticides and reduces overall chemical usage
- Improves seedling emergence and health, especially in no-till or conservation tillage situations
- By using multiple various modes of action in seed treatment products, seed treatments contribute to Integrated Pest Management (IPM) practices and help increase the lifespan of other useful technologies like crop protection products and traits

Guard against uncertain environmental conditions

- The protection value of seed treatments increases under stressful environmental conditions
- Variable weather conditions and unknown pressure make it difficult for farmers to predict which fields will need additional protection. These conditions can change after planting occurs making seed treatment more valuable.
- Earlier planting to maximize genetic potential and strive for higher yields increases the risks of pest pressure
- Soil protection practices such as cover crops and reduced-till can slow soil temperature warm-up, which also creates a stressful condition for seed germination



Lumiderm™
insecticide seed treatment

Competitor



Non-nematicide treatment

Lumialza™
nematicide seed treatment

Corteva Seed Applied Technologies Commitment

Corteva Agriscience Seed Applied Technologies is focused on discovering and developing premium products that enable each seed's genetic potential and ultimately increase farmer productivity. We work with products from our own broad collection of chemistry and other strategic collaborators to bring the most innovative and effective seed applied technologies to the market. Because our formulations are validated for both performance and benefits, farmers can trust seed treatments from Corteva to deliver real results and value.



What Makes Corteva Seed Applied Technologies Unique?



Discovering novel actives

Corteva Agriscience works to discover new actives for seed protection, drawing on the world-class Corteva research pipeline and the resources of strategic collaborators who are on the cutting edge of seed protection innovations. At our Centre for Seed Applied Technologies (CSAT)—with locations around the world—Corteva screens a diverse range of technologies, looking for new ingredients with the most valuable characteristics and modes of action to meet farmers' needs.



Developing products to solve challenges

Among the hundreds of possible product combinations we evaluate, Corteva only brings seed treatments to market that are proven to solve on-farm challenges. Every product formulation is thoroughly tested in the lab and in the field to get a complete understanding of its characteristics and benefits, and ensure it performs to expectations.



Delivering support

Corteva seed treatment products help plants reach their full genetic potential and add value to seed. Products are supported by our team of scientists dedicated to seed-applied technology and our rigorous six-step PASSER process which evaluates every formulation for plantability, application, seed safety, stewardship, efficacy and regulatory factors to ensure the highest-quality seed protection.

Scope of Ingredient and Recipe Evaluation

We have a rich history in agriculture and understand market needs

- 95+ years in seed business
- 100+ years in crop protection business
- Seed treatment expertise covering hundreds of millions of packaged seed across canola, corn, soybeans, wheat, pulse crops, cotton, rice, sunflowers, sorghum and alfalfa
 - Various seed treatment systems across the globe
 - Treatment expertise in both constant and highly variable climates

We have a tremendous group of current active ingredients and pipeline

- Committed to internal discovery
- Committed to external collaborations

Comprehensive evaluation process

- Nearly 30,000 discovery evaluations each year
- More than 60,000 field research plots each year
- Targeting conditions that represent customer environments and inform local decisions

Laboratory efforts

- Application refinement utilizing environmental changes to mimic local challenges
- Treatment dust-off reduction by fine-tuning recipes and application procedures
- Planter singulation improvements refine the application process & additives allow process modifications by hybrid/variety based on environment and genetically inherited seed coat type
- Seed safety – stringent evaluation to ensure recipes are safe to seed under normal and hostile environments



Seed Applied Technology Expertise

- Corteva's Centres for Seed Applied Technology (CSATs) are worldwide resources for seed treatment expertise
- Expertise in recipe development, application, laboratory testing, and scale-up
- Exclusive PASSER evaluation process delivers customer confidence

PASSER: Customer-Focused Recipe Development

Corteva Agriscience follows the unique PASSER stewardship process to identify and develop market-leading seed treatment recipes.



Plantability: Maximizing seed flow & planting precision

- Evaluated over different seed sizes and shapes, environmental conditions, and planter adjustments
- Benchmarked against current commercial standards

Application: Refining processes to work across seed properties (size, shape, hybrid or variety) and environmental conditions

- Seed appearance, dry down and treater residue observed in both lab- and commercial-scale treating equipment

Seed Safety: Ensuring 'No' negative impact on seedling development and early vigor

- Multiple hybrids or varieties tested by recipe
- Warm and stress germination tests key measurements unique and rigorous evaluation process

Stewardship: Minimizing potential adverse effects on people and environment

- Recipes designed to maximize coat integrity and limit loss-of-coating during handling
- Actively educate growers on best management practices to handle, store, plant and dispose of treated seed

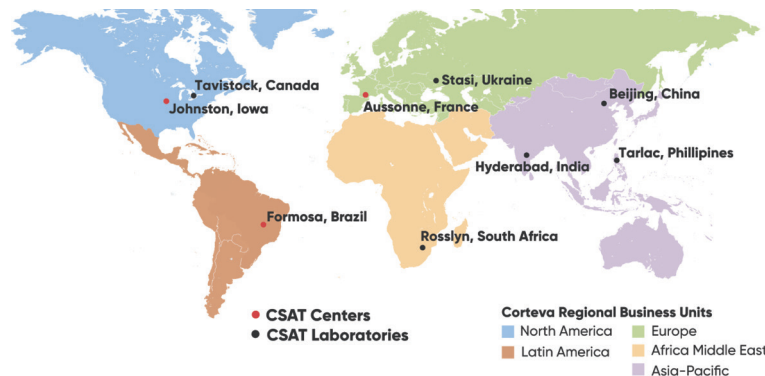
Efficacy: Evaluating protection performance and seedling vigour

- Comprehensive, multi-year evaluation program from discovery to commercialization

Regulatory: Fits with regulations and guidelines

- Informed product decisions based on safety, environmental impact, ease of use and effectiveness

Locations of Corteva Centers for Seed Applied Technologies




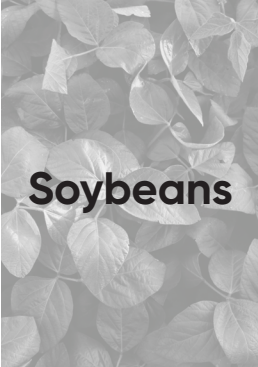


Corteva Canada Seed Applied Technologies Portfolio

Corteva offers industry leading seed treatments for all major Canadian crops and are widely available. Here's how you can access Corteva Seed Treatments:

- Ordered and applied alongside your seed order
- Available for on-farm or commercial seed treating from your local retailer
- Exclusively available on Corteva genetics as a LumiGEN® seed treatment

Talk to your local seed dealer or commercial seed treater for details on how you can protect your seed with a Corteva Seed Treatment.

 <p>Canola</p>	<p>Lumiderm™</p> <p>INSECTICIDE SEED TREATMENT</p>	<p>Lumiderm™ insecticide seed treatment provides the most complete plant protection against both flea beetles and cutworms and increases plant vigour, stand and biomass.</p>	■
	<p>Lumiscend™ Pro</p> <p>FUNGICIDE SEED TREATMENT</p>	<p>A component of the NEW LumiGEN canola disease package is Lumiscend™ fungicide seed treatment, a unique new active ingredient for powerful airborne blackleg protection.</p>	■
 <p>Cereals & Pulses</p>	<p>Lumivia™ CPL</p> <p>INSECTICIDE SEED TREATMENT</p>	<p>Lumivia™ CPL insecticide seed treatment provides a new mode of action for early season control of wireworm, cutworm, armyworm and pea leaf weevil in cereals, peas and lentils.</p>	■
	<p>NEW</p> <p>Straxan™</p> <p>FUNGICIDE SEED TREATMENT</p>	<p>Straxan™ fungicide seed treatment delivers powerful protection against early season and soil-borne cereal diseases in a ready-to-use and easy-to-apply formulation.</p>	■
 <p>Corn</p>	<p>Lumivia™</p> <p>INSECTICIDE SEED TREATMENT</p>	<p>Lumivia™ insecticide seed treatment delivers excellent protection from important early season corn insect pests.</p>	■
	<p>Lumiscend™ Pro</p> <p>FUNGICIDE SEED TREATMENT</p>	<p>Lumiscend™ Pro fungicide seed treatment is a unique combination of 3 active ingredients providing outstanding and long-lasting seed and soil-borne disease protection</p>	■
	<p>Lumialza™</p> <p>NEMATOCIDE SEED TREATMENT</p>	<p>Lumialza™ nematocide seed treatment is a biological nematocide that shields corn roots from harmful nematodes for over 80 days while cooperating with beneficial organisms to enhance crop vigour and yield potential.</p>	■
 <p>Soybeans</p>	<p>Lumiderm™</p> <p>INSECTICIDE SEED TREATMENT</p>	<p>Lumiderm™ insecticide seed treatment provides broad spectrum protection from early season insect pests in soybeans.</p>	■ ■
	<p>Lumisena™</p> <p>FUNGICIDE SEED TREATMENT</p>	<p>Lumisena™ fungicide seed treatment provides the best protection against phytophthora for healthier, more vigorous soybean stands and higher yield potential.</p>	■ ■
	<p>NEW</p> <p>LumiTreo™</p> <p>FUNGICIDE SEED TREATMENT</p>	<p>LumiTreo fungicide seed treatment is a unique combination of 3 active ingredients, including Lumisena, for excellent control of soybean seedling diseases caused by <i>Fusarium spp.</i>, <i>Rhizoctonia solani</i>, <i>Phytophthora sojae</i>, seed-borne <i>Phomopsis</i>, and seed rot fungi such as <i>Aspergillus</i> and <i>Penicillium</i>.</p>	■

Our Canadian seed treatment pipeline is full of new developments. Expect more premium seed treatment solutions from Corteva Agriscience coming soon.




Exclusive to Corteva Agriscience

LumiGEN® seed treatments are exclusive to the seed brands of Corteva Agriscience™ and represent the high performing, industry leading seed applied technologies that are available on Pioneer® brand and Brevant® seeds genetics.



The ingredients we select have been exhaustively tested across multiple years, geographies, environments, genetics spectrum and planting equipment against similar products available in the market. Our recipe ingredients are meticulously chosen from hundreds of products to ensure our selections deliver the best customer value. In addition, we thoroughly test recipes for ingredient compatibility, biological health, seed safety and adherence to the seed coat. Only seed treatments that excel in this rigorous process earn the LumiGEN® seed treatment mark of assurance.

LumiGEN seed treatments are designed, verified and proven to work with Corteva genetics, helping farmers establish healthy, uniform crops and maximize productivity.

-  **Designed for our genetics**
-  **Verified on our genetics**
-  **Proven in the field with our genetics**

