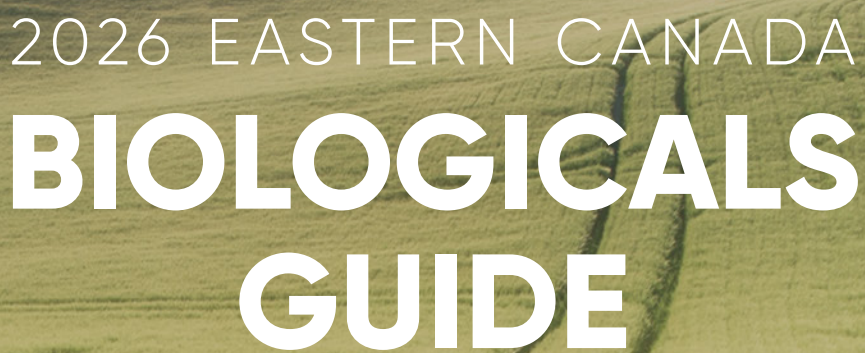




2026 EASTERN CANADA

BIOLOGICALS GUIDE



biologicals

Growing Together

Corteva Agriscience biological products offer Canadian farmers innovative solutions to combat weed, pest, disease, and climate pressures.

What is a Biological?

Biological products from Corteva consist of materials that already exist in nature. Some of our products are actual living organisms, like beneficial bacteria. Others, like enzymes, are derived from natural materials.

Maximize your Acre with Biologicals

Our pipeline is full of exciting new developments. Expect more biological solutions from Corteva in these categories, coming soon:

Boost Performance

Activate the plant and its environment to maximize genetic potential by enhancing the plants' ability to efficiently utilize soil, nutrients, water, and sunlight.

Build Resilience

Empower crop vigour to withstand adversity and stress by enabling crops to thrive in the face of abiotic stresses and unfavourable weather.

Protect Potential

Shield crops from pests to ensure viability by incorporating powerful and flexible solutions in crop protection programs.



Optimize Productivity

Biologicals can improve plant performance by unleashing their full potential – enhancing physiological processes and minimizing stresses.

Next Level Crop Management

Biologicals give us the ability to take our crop management to the next level. Giving you the peace of mind to manage unpredictability and control the uncontrollable, helping you unlock new levels of on-farm potential.

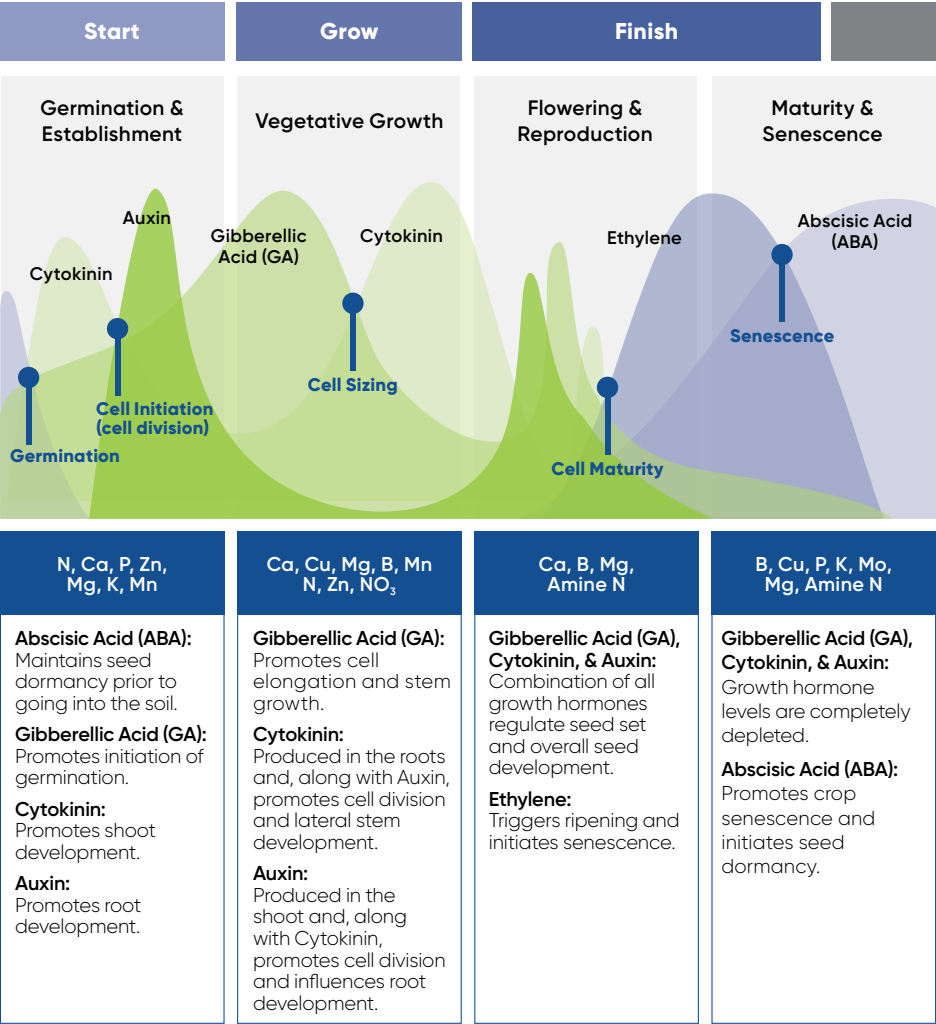
Sustainable Production

Biologicals are here to create the highest impact for everyone, and everything involved – the farm, the environment and our planet, government, and society.

PLANT HORMONE CYCLE

Plant hormones, nutrients, and hormone co-factors regulate plant growth and reproduction much like hormones, nutrition, and vitamins regulate growth in humans and animals.

Auxin and Cytokinin give birth to new cells. Auxin then directs food movement to the new cells and with Cytokinin, stimulates cell growth. Gibberellic Acid, which is made inside the new cell, controls the rate of movement of food into the new cell and its size.



CORTEVA AGRISCIENCE BIOLOGICALS APPROACH

Corteva takes a distinctive approach to addressing crop challenges that goes beyond traditional agronomic applications. Corteva places a strong emphasis on maintaining hormone balance and plant nutrition to foster the development of robust and healthy crops. This approach not only improves crop health but also enhances their natural defense mechanisms, making them better equipped to withstand environmental stressors, diseases, and pests. Corteva's commitment to plant health management represents a forward-thinking strategy that promotes sustainable and high-yield agriculture while minimizing the environmental impact of farming practices.

Environmental/Physiological Stresses

Corteva products are at the forefront of addressing environmental and physiological stresses in agriculture. By enhancing nutrient absorption, promoting plant health, and managing plant hormone balance they empower crops to withstand adverse environmental conditions and promote sustainable farming practices.

CHALLENGE	SOLUTION
Frost Damage	Bio-Forge™ PREMIER  STRESS MITIGATION Applied 24-72 hours after damage has occurred
Wind Damage	
Herbicide Damage	
Hail Damage	
Heat Blast	X-Cyte™  PHYSIOLOGICAL SUPPORT Applied during flowering, before the onset of heat

Seeding Challenges

Corteva biological seed treatments optimize seed performance, leading to healthier crops, improved root development for crops seeded in saline soils, and also enable early planting in cold conditions. Corteva innovations are revolutionizing crop production by enhancing yield, sustainability, and resilience.

CHALLENGE	SOLUTION
Cold Soils	Bio-Forge™ PREMIER  STRESS MITIGATION Apply on seed
Poor Germination	Fortified Stimulate™ YIELD ENHANCER  PHYSIOLOGICAL SUPPORT Apply on seed

Nutrient Efficiency

Nitrogen is essential for plant survival and a key element for optimal crop health. Ensuring nitrogen is available to your crop during key stages of growth is vital for maximizing plant productivity. By increasing nitrogen availability through the use of products such as biostimulants, we can promote healthier plants and help maximize crop potential by providing continuous supplemental nitrogen – ensuring crops have access to it when they need it most.

CHALLENGE	SOLUTION
NUTRIENT EFFICIENCY	
N Nitrogen	Utrisha™N  NUTRITIONAL EFFICIENCY
B Boron	Sugar Mover™ PREMIER  PHYSIOLOGICAL SUPPORT
Zn Zinc	X-Tra Power™  NUTRITIONAL FOUNDATIONS

CORTEVA AGRISCIENCE PRODUCT SOLUTIONS

Corteva offers a comprehensive range of product solutions tailored to various stages of the crop life cycle. With seed treatment solutions that provide an excellent starting point, enhancing seed health and vigour to give crops a robust beginning. In-furrow products are designed to deliver essential nutrients and biostimulants directly to the developing plant roots, ensuring optimal growth from the early stages. Corteva’s in-season product solutions offer effective protection to aid in stress mitigation and overall crop health. By promoting a strong start to a strong finish for the growing season, Corteva’s solutions contribute to healthier plants, increased yields, and improved agricultural sustainability.



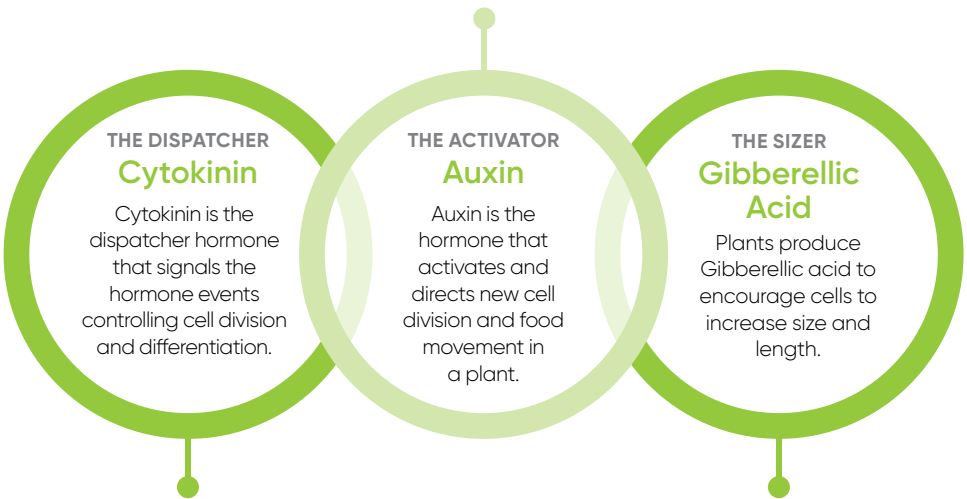
PRODUCTS	SEED TREATMENTS	IN-FURROW	VEGETATIVE GROWTH (HERBICIDE TIMING)	REPRODUCTIVE GROWTH (FUNGICIDE TIMING)	MATURITY
Fortified Stimulate™ YIELD ENHANCER PHYSIOLOGICAL SUPPORT	Promote Germination	Promote Growth		Improve Seed Set	
Bio-Forge™ PREMIER STRESS MITIGATION				Crop Stress Management	
Sugar Mover™ PREMIER PHYSIOLOGICAL SUPPORT				Fill Pods, Heads and Ears	
X-Cyte™ PHYSIOLOGICAL SUPPORT				Heat Blast Protection	
Utrisha™ N NUTRITIONAL EFFICIENCY			Nutrient Efficiency		

Always read and follow label directions. Conduct a “Jar Test” using all products in proper proportion in order to establish physical compatibility.

GROWTH HORMONES

Plant growth hormones, also known as phytohormones, are essential chemical messengers that govern various aspects of plant growth and development. These hormones include Auxins, Gibberellins, and Cytokinins, each with its unique functions.

Auxins regulate phototropism, the bending of plant stems and leaves towards light. This response is crucial for optimizing photosynthesis and is controlled by the redistribution of Auxin hormone in response to light.



Cytokinins are involved in regulating many stress-responsive genes in plants, including those related to heat stress. They can help plants adapt to challenging environments and improve their overall stress tolerance.

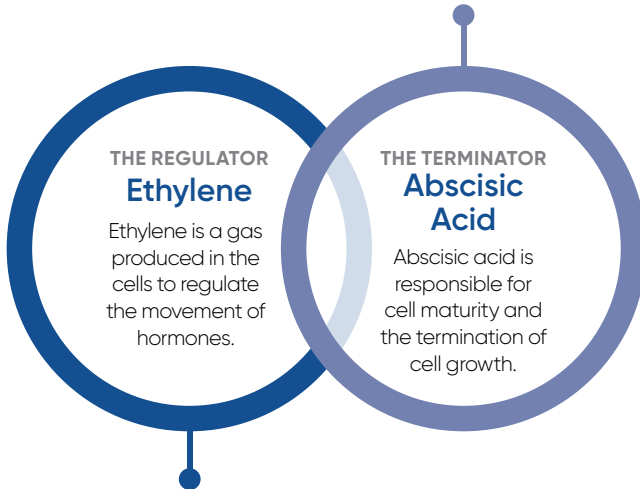
Seed have a natural dormancy period, a protective mechanism that prevents them from germinating in unfavorable conditions. **Gibberellic Acid (GA)** helps break this dormancy by stimulating the synthesis of enzymes that convert stored nutrients into forms usable for germination.

These hormones work together to coordinate vital processes such as seed germination, flowering, and responses to environmental cues, ensuring that plants adapt and thrive in their surroundings.

STRESS HORMONES

Stress hormones in plants are signaling molecules that play a vital role in helping plants respond and adapt to various environmental stresses. When a plant encounters stress, stress hormones increase, leading to physiological responses like stomatal closure to reduce water loss, the synthesis of stress-related proteins to enhance resilience, and altered root growth patterns to explore for water sources.

Absciscic Acid plays a key role in regulating seed dormancy. It inhibits germination in many seeds, preventing them from sprouting prematurely. This dormancy mechanism ensures that seeds only germinate when environmental conditions are favorable for survival.



Ethylene plays a role in plant responses to various stresses, including mechanical stress, pathogen attack, and environmental stressors like drought and high salinity.

These stress hormones act as critical mediators, allowing plants to survive and thrive in challenging conditions by initiating protective mechanisms and enhancing their overall stress tolerance.

Bio-Forge™ PREMIER



STRESS MITIGATION



Cereals



Corn



Dry Beans



Potatoes



Soybeans

BIO-FORGE™ PREMIER

- Combines **three modes of action** to deliver the broadest spectrum of physical crop management.
- **Enhances crop resilience** by aiding in the recovery of stress caused by cold, frost, herbicides, insects, and hail.
- **Increases plant productivity** by enabling the plant to quickly resume growth and spend less time recovering, resulting in less days lost during the growing season.
- Built with the **highest quality ingredients**, resulting in guaranteed analysis of actives for consistent performance, extensive tank-mix compatibility, and reliable shelf-stability.

Take Control of Crop Stress

In response to physical stress, plant hormones suppress growth pathways and activate survival mechanisms, closing stomata to conserve water. Slowed growth conserves energy and nutrients but delayed plant development can make plants more vulnerable to attacks from pests and pathogens.

By providing the plant with supplemental growth hormones and key nutrients (Cytokinin, Molybdenum, and Colbalt), Bio-Forge Premier ensures the plant is more equipped to efficiently recover from stress caused by frost, hail, wind, insect, or herbicide damage, and quickly resume growth rather than focus on recovery – leading to greater plant productivity and yield potential.



Untreated

Treated with
Bio-Forge Premier



Untreated

Treated with
Bio-Forge Premier

CROPS

- Cereals
- Corn
- Dry Beans
- Potatoes
- Soybeans

INGREDIENTS

- Cytokinin (0.0075%)
- Nitrogen (3%)
- Soluble Potash (1%)
- Cobalt (1%)
- Molybdenum (1%)

FOLIAR RATE

- 250 mL/ac up to 500 mL/ac following physical damage

SEED TREATMENT RATE

- 120 mL/100 lbs of seed**

TIMING

- Herbicide timing, or for best results, 24-72 hours after physical damage

PRODUCT SIZE

- 1,000 L tote
- 2 x 10 L case

WATER VOLUME

- Ground: 20 L/ac - 40 L/ac (5 - 10 US gal/ac)
- Aerial: 10 L/ac - 20 L/ac (3 - 5 US gal/ac)

*see label for additional crop registrations
**see label for specific crop recommendations

Fortified Stimulate™

YIELD ENHANCER



PHYSIOLOGICAL SUPPORT



Cereals



Corn



Potatoes



Soybeans

FORTIFIED STIMULATE™ YIELD ENHANCER

- Fortified Stimulate Yield Enhancer is the only plant growth promoter that contains four plant growth hormones – **delivering balanced and improved plant growth.**
- **Accelerates and increases root and shoot development**, improving plant competitiveness to maximize crop potential.
- Built with the **highest quality ingredients**, resulting in guaranteed analysis of actives for consistent performance, extensive tank-mix compatibility.

Optimize the Genetic Potential of Every Plant in Your Field

Strategically formulated to ignite robust plant growth, Fortified Stimulate Yield Enhancer contains a patented formulation of four critical plant growth hormones – Cytokinin, Gibberellic acid (GA), and Auxins (IBA and IAA). Fortified Stimulate Yield Enhancer increases the levels of these naturally occurring

hormones, improving the plants growth potential, and optimizing essential plant functions. As a result, the solution accelerates root development, promotes bigger and more robust plants that will be more resilient to stress – increasing yield potential and plant productivity.



Untreated

Treated with
Fortified Stimulate Yield Enhancer

CROPS*

Cereals

Corn

Potatoes

Soybeans

INGREDIENTS

- Cytokinin (0.009%)
- Gibberellic acid (0.005%)
- Indole-3-butyric acid (0.005%)
- Indole-3-acetic acid (0.005%)

RATE

- Foliar: 125 – 250 mL/ac
- Seed Treatment: 65 mL/100 lbs of seed

TIMING

- Seed treatment and/or herbicide timing

PRODUCT SIZE

- 1,000 L tote
- 2 x 10 L case

WATER VOLUME

- Ground: 20 L/ac – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 10 L/ac – 20 L/ac (3 – 5 US gal/ac)

*see label for additional crop registrations

Sugar Mover™ PREMIER



PHYSIOLOGICAL SUPPORT



Corn



Potatoes



Soybeans



Wheat

SUGAR MOVER™ PREMIER

- Promotes uniform seed development by **improving sugar distribution** from leaves.
- Stimulates cell division and promotes **flower development** for increased yield potential.
- Built with the **highest quality ingredients**, resulting in guaranteed analysis of actives for consistent performance.

Improved Sugar Distribution

Sugar availability is essential to plant growth, helping to maximize flower production and seed development. By enhancing naturally occurring hormone levels and providing key nutrients, Sugar Mover Premier accelerates the transport of sugars produced through photosynthesis in the leaves to essential growth areas.

Supplementary boron helps to ensure that the sugars in the plant get to where they need to go by keeping

the transport channels in the plant strong. Additionally, it plays a critical role in delivering pollen for successful fertilization. Cytokinin not only stimulates cell division in the plant, but also promotes flower development and prevents premature senescence. This allows the plant's leaves to photosynthesize longer and prolongs the flower's fertilization period – improving plant productivity and increasing yield potential.



CROPS*

Corn
Potatoes
Soybeans
Wheat

INGREDIENTS

- Cytokinin (0.003%)
- Boron (8%)
- Copper (0.2%)
- Molybdenum (0.004%)
- Monoethanolamine (16%)
 - Total Nitrogen (3%)

RATE

- Foliar: 500 mL – 1 L/acre

TIMING

- Fungicide timing

PRODUCT SIZE

- 1,000 L tote
- 2 x 10 L case

WATER VOLUME

- Ground: 20 L/ac – 40 L/ac (5 – 10 US gal/ac)
- Aerial: 10 L/ac – 20 L/ac (3 – 5 US gal/ac)

*see label for additional crop registrations

Utrisha™ N



NUTRITIONAL EFFICIENCY



Corn



Potatoes



Soybeans



Wheat

UTRISHA™ N NUTRIENT EFFICIENCY BIOSTIUMLANT

- Maximizes crop potential by increasing nitrogen availability, resulting in **healthier and more resilient plants**.
- **Compliments and diversifies a conventional nitrogen fertilizer program** by providing nitrogen at critical times during the plant's life cycle.
- **The simplest way to provide supplemental nitrogen**, giving you the peace of mind that your crop can continue to be its most productive.
- Contains a natural bacteria, providing a sustainable source of nitrogen that **reduces dependency of nitrogen uptake from the soil**.

Give your Crop the Nitrogen It Needs, When It Needs It

Utrisha™ N is a nutrient efficiency biostimulant. The natural bacteria, *Methylobacterium symbioticum*, enters the plant through the stomata and colonizes in the leaf cells. It then converts N₂ from the air into ammonium, resulting in a constant supply of nitrogen to the plant.

Utrisha N provides a sustainable, alternative source of nitrogen that reduces dependency of nitrogen uptake from the soil and ensures the plant has access to nitrogen all season long, without the risk of leaching into water tables or releasing additional greenhouse gasses.



Untreated



Treated with Utrisha N
nutrient efficiency biostimulant

CROPS*

Corn

Potatoes

Soybeans

Wheat

INGREDIENTS

- Exclusive nitrogen-fixing microbial strain, *Methylobacterium symbioticum*

FOLIAR RATE

- 135 g/ac (40 ac/bag)

TIMING

- Canola, cereals, corn: 4 leaf stage until pre-senescence
- Soybeans: 3 leaf stage until pre-senescence
- Potatoes: during active growth
- For best results apply in early morning when leaf stomata are open

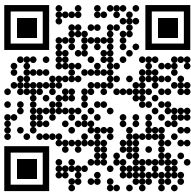
PRODUCT SIZE

- 1 case – 2 x 5.39 kg bags

WATER VOLUME

- Ground: minimum 40 L/ac (10 US gal/ac)

*see label for additional crop registrations



UTRISHA™ N SUPPORTED TANK MIX LIST

X-Cyte™



Corn



Dry Beans



Potatoes



Soybeans

PHYSIOLOGICAL SUPPORT

X-CYTE™

- Protects yield potential by **reducing kernel abortion** during times of excess heat.
- Helps improve overall crop resilience by **delaying premature senescence** caused by heat loss.
- Built with the **highest quality ingredients**, resulting in guaranteed analysis of actives for consistent performance, extensive tank-mix compatibility.

Beat the Heat with X-Cyte™

Heat Blast occurs when a combination of hot days (35° C or warmer) and warm nights (16° C or warmer) occurs. When temperatures rise to these levels in your crop, the growth hormone Cytokinin begins to degrade within your plants, often resulting in kernel abortion.

X-Cyte supplements the plant with additional Cytokinin, a naturally occurring hormone, that helps boost cell growth – improving photosynthesis and preventing plant tissues from maturing too quickly. As a result, the plants sustain photosynthetic activity and maintain nutrient and water uptake for continued plant growth and optimized yield potential.



Corn Tip Back: Effects of heat blast on corn resulting in kernel abortion

CROPS* Corn Dry Beans Potatoes Soybeans	INGREDIENTS • Cytokinin (0.04%)
	FOLIAR RATE • 500 mL/ac
	TIMING • Fungicide timing, should be applied during VT-R1 staging, before the onset of a heat event
	PRODUCT SIZE • 1,000 L tote • 2 x 10 L case
	WATER VOLUME • Ground: 20 L/ac - 40 L/ac (5 - 10 US gal/ac) • Aerial: 10 L/ac - 20 L/ac (3 - 5 US gal/ac)

*see label for additional crop registrations

Golden Harvest™

NUTRITIONAL FOUNDATIONS

Golden Harvest™ is a unique liquid fertilizer (5-18-2-1) with high levels of micronutrients (B, Cu, Mn, Mo & Zn) and nutrient enhancing fulvic acid designed to supplement soil-applied fertilizer for prevention of nutrient deficiencies. For more information on key micronutrients, see page 21.

WHAT IS HEAT BLAST?

Heat blast on crops refers to the damaging effects of prolonged exposure to excessively high temperatures. This stress condition can cause scorched leaves, along with delayed silk emergence and pollen desiccation. In corn, heat stress (a.k.a. heat blast/tip back) can lead to poor synchrony with pollen shed, reducing kernel numbers.

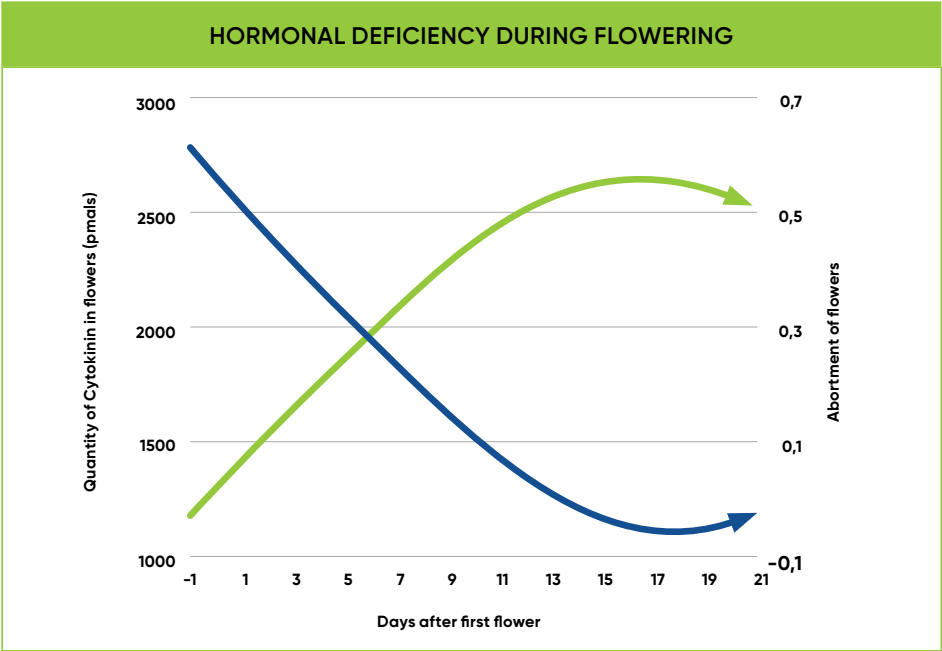


CROP	CRITICAL TEMPERATURE	CRITICAL GROWTH STAGE	RESPONSE TO HEAT STRESS
Canola	>28° C	Flowering & Pollination	Pod Drop & Flower Abortion
Corn	>35° C	Flowering & Pollination	Leaf Roll & Tip Back
Cereals	>27° C	Grain Fill	White or Bleached Awns
Pulse Crops	>32° C	Flowering & Pod Set	Pod Abortion

CYTOKININ TO PROTECT CROPS FROM THE HEAT

Cytokinin helps shield plants from heat stress. Cytokinin boosts cell growth, which enhances food production through photosynthesis, to help the plant handle stress better. Cytokinin also slows the aging of plant tissues and helps plants to use water more efficiently. All of these actions work together to help plants bounce back from heat stress, keep their tissues healthy, and continue to function properly. Using Cytokinins is a valuable way to protect our crops from the harmful effects of heat stress.

In addition, cytokinin plays a role in reducing flower abortion in plants by promoting the growth and development of flowers, which increases the likelihood that flowers will be successfully pollinated. They can also enhance the overall health and vigour of the plant, making it better able to support the development of its flowers. Overall, Cytokinins contribute improved yield in many crops.



There is a direct correlation between Cytokinin being reduced in the plant and reduced pollination.

HOW PLANT NUTRIENTS WORK TOGETHER

Photosynthesis:	Nitrogen (N), Phosphorus (P), and Potassium (K) convert light energy to chemical energy (sugars) and provide the building blocks required for the synthesis of chlorophyll and other molecules involved in photosynthesis. Iron (Fe), Manganese (Mn), and Magnesium (Mg) are essential components of chlorophyll, which captures light energy.
Nutrient Uptake & Transport:	Nitrogen (N) influences the opening and closing of stomata to control water and nutrient uptake. Copper (Cu) and Zinc (Zn) help regulate the uptake and use of macronutrients, ensuring a balanced nutrient profile within plant tissues.
Cell Wall & Structure:	Macronutrients provide the bulk of the materials for plant structure. Calcium (Ca) is essential for building strong cell walls. Potassium (K) helps regulate cell turgor pressure. Boron (B) is involved in cell wall formation.
Resilience to Stress:	Macronutrients and micronutrients work together to enhance a plant's resilience to environmental stressors. For instance, calcium and magnesium help maintain cell membrane stability during drought conditions, while micronutrients like iron and copper are involved in antioxidant defense mechanisms to protect against oxidative stress.

KEY MICRONUTRIENTS

Ca

Calcium is crucial for plants as it strengthens cell walls, regulates cell processes, aids enzyme function, enhances nutrient uptake, and boosts plant resilience against environmental stressors.

Mg

Magnesium is vital for plants as it's a core component of chlorophyll, enabling photosynthesis, and activates enzymes essential for energy production, nutrient uptake, and protein synthesis, all of which are critical for plant growth and development.

Mn

Manganese is important for plants because it helps with photosynthesis and nutrient uptake. It acts as a helper, making sure plants have the energy and nutrients they need to grow and stay healthy.

B

Boron is essential for plants as it supports cell wall formation, pollen tube growth, nutrient uptake, sugar transport, enzyme activation, and regulates water uptake through stomatal function, all of which are vital processes for plant growth and development.

Zn

Zinc is important for plants because it helps enzymes work properly. These enzymes are like the workers in a plant's factory, and they help with tasks like making DNA, proteins, and chlorophyll (which plants use for photosynthesis). Zinc also helps control plant growth and development. It's like a plant's regulator, making sure things run smoothly. Overall, zinc is crucial for keeping plants healthy and helping them cope with tough situations.

Cu

Copper is vital for plants as it activates enzymes, aids in photosynthesis through chlorophyll production, regulates iron uptake, contributes to cell wall formation, all essential for plant health and growth.

Mo

Molybdenum is crucial for plants because it plays a central role in nitrogen metabolism. It is an essential component of enzymes that convert nitrogen from the soil into forms that plants can use to make proteins and grow. Without molybdenum, plants cannot efficiently use nitrogen, leading to nitrogen deficiency and poor growth. In essence, molybdenum ensures that plants can access and utilize the nitrogen they need to thrive and develop properly.

Questions?

Visit your local crop protection retailer.

Contact us at Corteva.ca/contact

follow us  @CortevaCA

Refer to product label for complete use instructions.

Visit us at **corteva.ca**



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