26.Sep.2026

N º 98

Cultivar Semanal



Does cadmium affect *Spodoptera*?

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Cadmium activates corn's defenses against Spodoptera frugiperda

The higher dose reduced feeding and growth of the fall armyworm, but harmed corn development

25.09.2026 | 10:25 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: Erynn Coppedge / iNaturalist - CC BY-NC 4.0

Exposing corn to soil with 5,0 milligrams of cadmium per kilogram reduced feeding, weight, and olfactory preference of Spodoptera frugiperda larvae. The treatment also increased the accumulation of the metal in the leaves, stimulated the synthesis of benzoxazinoids, and modified the profile of volatile organic compounds. Conversely, the same concentration reduced height, leaf area, and chlorophyll content.

Researchers at South China Agricultural University in China evaluated three concentrations of cadmium in the soil: zero, 1,0, and 5,0 milligrams per kilogram. The experiment used Zhengtian 68 corn cultivar and was conducted in a greenhouse. Evaluations encompassed

parameters of growth, plant physiology, concentration and distribution of cadmium, benzoxazinoids, volatile organic compounds, Spodoptera frugiperda performance, and gene expression.

Dosages and results

The dose of 1,0 milligram per kilogram did not significantly alter the feeding and weight of the caterpillars. At this concentration, the researchers recorded some changes in benzoxazinoids, volatile compounds, and gene expression, but the effects on the insect only appeared in the treatment with 5,0 milligrams per kilogram.

At a dose of 5,0 milligrams per kilogram, larval weight and feeding rate decreased

compared to the control. Cadmium concentration in the leaves increased 28,02 times. At a dose of 1,0 milligram per kilogram, the increase reached 4,33 times.

Basic defense

Statistical analysis indicated a strong contribution from elemental defense. Total cadmium content and different chemical forms or cellular compartments of the metal appeared among the main factors associated with caterpillar performance. Variables related to cadmium accounted for 78,80% of the total importance of the model for larval weight and 82,50% for feeding rate. According to the researchers, the result points to the influence of the concentration, chemical form, and cellular

location of the metal.

Corn also intensified defense mechanisms based on metabolites. Treatment with 5,0 milligrams of cadmium per kilogram increased the expression of the ZmBX1 and ZmBX2 genes by 2,52 and 5,70 times, respectively. These genes participate in the biosynthesis of benzoxazinoids. The concentration of these compounds increased between 1,27 and 3,87 times, depending on the metabolite analyzed.

Chemical defense

Benzoxazinoids are part of the chemical defense system of corn against herbivores. In the experiment, the increase of several of these compounds in the treatment with

5,0 milligrams per kilogram coincided with a reduction in the consumption and development of Spodoptera frugiperda. Only one of them, DHBOA-Glc, showed a statistically significant correlation, and only with the weight of the larvae. The researchers were unable to experimentally separate the effect of cadmium toxicity from the effect of benzoxazinoids. The work points to the need for further tests, including with plants deficient in the biosynthesis of these metabolites.

Exposure to cadmium also altered the volatile organic compounds emitted by the corn. Larvae subjected to the choice assay showed a 49,08% lower preference for plants grown with 5,0 milligrams of cadmium per kilogram compared to the

control. The dose of 1,0 milligram per kilogram did not cause a significant difference.

Compounds and behavior

Among the compounds associated with caterpillar behavior, octadecane increased in the treatment with the highest concentration. Germacran increased only under this condition and was identified as a possible marker of the treatment. Beta-caryophyllene, on the other hand, decreased to 67% of the level recorded in the control. The analyses indicated octadecane, beta-caryophyllene, isolongifolanone, and germacran as the

variables with the greatest contribution to the olfactory response.

Scientists recommend caution in interpreting these results. The study did not test the repellent or attractant function of the compounds in isolation. Nor did it evaluate the attraction of natural enemies. Furthermore, the olfactory behavior of the larvae does not reproduce the entire host selection process in the field, in which adult oviposition plays an important role.

Transcriptomic analysis reinforced the difference between the two doses. Comparison between the control and 1,0 milligram per kilogram identified 370 differentially expressed genes. In comparison with 5,0 milligrams per kilogram, the number rose to 883. The

higher concentration activated pathways related to benzoxazinoid biosynthesis and signaling by mitogen-activated protein kinases, known as MAPK.

Physiological cost

The defensive response came at a physiological cost. In the treatment with 5,0 milligrams per kilogram, plant height decreased by 11,05%, leaf area decreased by 17,41%, and chlorophyll content decreased by 21,36%. The concentration of indoleacetic acid also decreased in plants exposed to cadmium, at both doses tested. However, malondialdehyde content increased by 33,05% only at the dose of 5,0 milligrams per kilogram, a sign consistent with greater oxidative damage.

In parallel, catalase and peroxidase activities increased.

The results support a combined defense mechanism. Corn accumulated cadmium in its tissues and, at the same time, reinforced components of its organic defense. This process coincided with reduced feeding and growth of Spodoptera frugiperda. The response, however, involved reduced plant growth and significant physiological changes. The study does not suggest applying cadmium as a control strategy (doi 10.1127/entomologia/4061).

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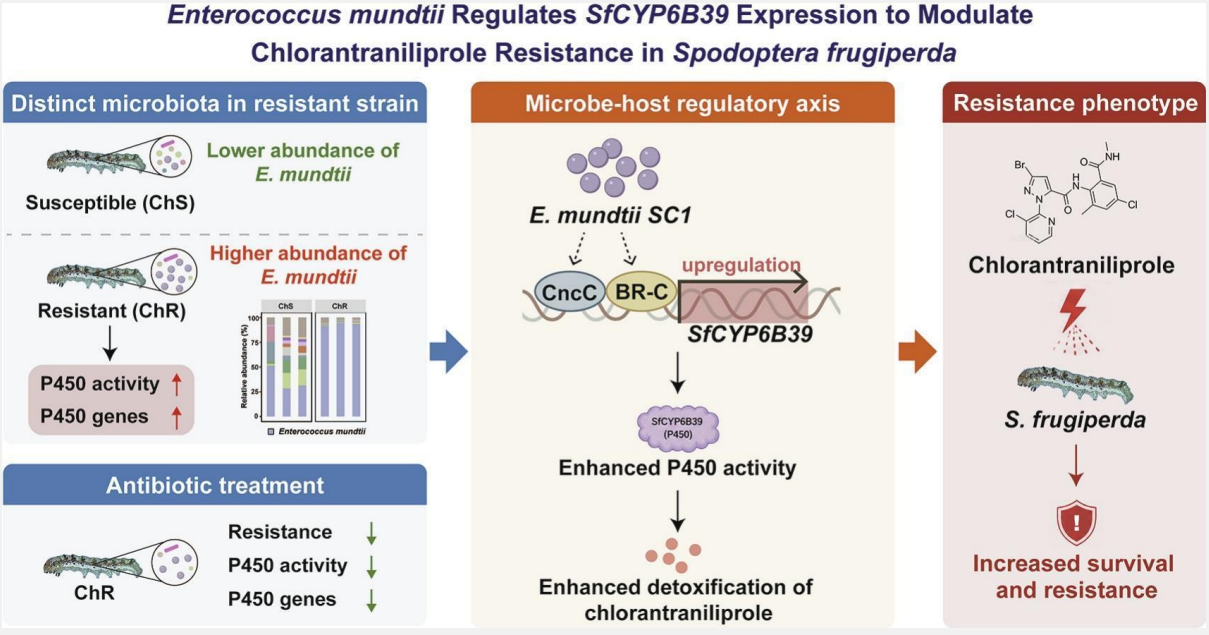
Gut bacteria increase Spodoptera's resistance to insecticide

Enterococcus mundtii activates the P450 gene associated with chlorantraniliprole resistance in caterpillars

25.09.2026 | 10:05 (UTC -3)

Cultivar Magazine



doi 10.1016/j.pestbp.2026.107362

The intestinal bacterium Enterococcus mundtii SC1 increased the resistance of

Spodoptera frugiperda to chlorantraniliprole by activating the insect's detoxification mechanisms. The effect involved increased expression of the SfCYP6B39 gene, from the cytochrome P450 family.

Researchers compared a susceptible strain with another selected over 21 generations under exposure to the insecticide (doi 10.1016/j.pestbp.2026.107362). The lethal concentration for 50% of individuals increased from 3,22 to 167,25 milligrams per liter. The resistance ratio reached 51,94 times.

Intestinal community

The resistant strain presented a distinct intestinal community. Enterococcus mundtii accounted for more than 90% of the bacterial community analyzed. Elimination of the microbiota with antibiotics reduced P450 activity by 22,8% and increased mortality after exposure to chlorantraniliprole by more than 40 percentage points.

Recolonization with Enterococcus mundtii SC1 increased P450 activity by 23,39% and induced the expression of seven P450 genes. In vitro assays did not detect direct degradation of chlorantraniliprole by the bacteria. The authors conclude that the effect is indirect, through regulation of host metabolism.

Silencing SfCYP6B39 made larvae approximately 2,7 times more susceptible to chlorantraniliprole. The lethal concentration for 50% of individuals dropped from 135,32 to 50,22 milligrams per liter. Expression of the same gene in Drosophila melanogaster increased resistance to the insecticide. The results also indicated the involvement of the transcription factors CncC and BR-C. The bacterium stimulated this regulatory pathway and favored the expression of SfCYP6B39. The signal linking the bacterium to these factors is still unknown.

Enterococcus mundtii also appeared in all evaluated individuals from five field populations of Spodoptera frugiperda collected in China.

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Setembro/2026

Beta-ionone guides egg laying in Spodoptera litura, study shows

Research identifies SlitPBP3 as a target for searching for semiochemicals linked to oviposition

25.09.2026 | 07:40 (UTC -3)

Cultivar Magazine



Photo: Tejal Jadhav / iNaturalist - CC BY-NC 4.0

Beta-ionone acts as an oviposition stimulus for female Spodoptera litura. Researchers identified the compound using a reverse chemical ecology approach based on the olfactory protein SlitPBP3. The result opens up perspectives for behavioral management strategies targeting female pests.

The team selected SlitPBP3 as a molecular target after observing its expression in the ovipositor during the calling phase. Scanning electron microscopy also revealed different types of sensilla in this structure. This result provided morphological support for investigating olfactory genes expressed in the ovipositor.

Virtual screening

Structure-based virtual screening, combined with competitive fluorescence binding assays, showed preferential binding of SlitPBP3 to beta-ionone among the compounds evaluated. Directed mutagenesis assays indicated critical participation of residues F12 and F118 in this interaction.

Silencing SlitPBP3 through RNA interference significantly reduced the oviposition preference index on substrates treated with beta-ionone. The result reinforced the protein's role in the response to the compound.

Antenna removal

The females also maintained a preference for the treated substrates after the antennae were removed. According to the study, this behavior indicates the possibility of chemosensory perception during oviposition without the participation of antennal stimuli.

Scientists propose SlitPBP3 as a screening target in reverse chemical ecology to identify compounds associated with oviposition site choice in Spodoptera litura (doi 10.1002/ps.71287).

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Saiba mais!

Agricultural Market - 25.Sep.2026

Harvest in the US puts pressure on soybean and corn prices; dollar supports prices.

25.09.2026 | 07:27 (UTC -3)

Vlamir Brandalizze - @brandalizzeconsulting



The progress of the harvest in the United States is maintaining pressure on soybean

and corn prices in Chicago. In Brazil, the strong dollar is supporting soybean prices in reais, while exports continue at a strong pace. Wheat, rice, and beans are also experiencing price movements linked to the weather, product availability, and the start of new planting cycles.

Soybean situation

In the international soybean market, attention remains focused on trade relations between the United States and China. The market is monitoring contacts between Donald Trump and Xi Jinping, but there have been no announcements of new large-volume purchases. China maintains indications of acquiring 25 million tons, as negotiated in previous

months. A purchase of 120 tons occurred during this period.

The deadline for the pause in the trade dispute, previously scheduled to end in November, has been extended by two months and moved to January. With no significant news regarding Chinese purchases, Chicago is focusing its attention on the North American harvest.

The soybean harvest in the United States has reached nearly 17% of the area, compared to an average of 12%. The above-average pace is increasing the available supply and putting pressure on futures contracts. The November position is trading near $13.

In Brazil, approximately 81,5% of the harvest has already been sold. Even so,

more than 33 million tons remain in the hands of producers. The new harvest is approaching 39% traded. The volume already sold reaches the range of 72 million tons, above the just over 71 million tons observed in the same period of the previous cycle.

Prices over the past eight weeks have favored new sales. Improved prices and terms of trade have brought producers to the market. The volume of the new crop traded is approaching the highest historical levels cited for this period.

Brazilian soybean planting is still in its early stages. In Mato Grosso, producers are waiting for more rain to accelerate the work. In Paraná, soil moisture allows for faster progress. Indications point to an

area similar to or slightly larger than that recorded last season.

Corn situation

Corn is also facing pressure in Chicago. The US harvest is nearing 20% ??of the area, compared to an average of 15%. The increased supply of product to the market is limiting price reactions.

In Brazil, the second crop harvest has reached approximately 99%. Planting of the first crop is gaining momentum in the southern states. Producers are seeking to take advantage of the conditions before the arrival of new rains.

The projections mentioned in the survey now indicate the possibility of a similar or

slightly larger area compared to last year. The increase in corn prices over the last two months contributed to this change.

Trading continues with few transactions and purchases concentrated on immediate needs. September exports are approaching 4 million tons. In September of the previous year, shipments totaled 7,5 million tons.

Wheat situation

Wheat is also feeling the downward trend in agricultural commodities on the international market, but futures contracts remain above $7. Positions expiring in 2027 are trading in the $7,20 to $7,30 range.

In Brazil, the market is acting cautiously due to excessive rainfall in the South. The high humidity could harm crops and is supporting prices.

Harvesting is progressing in Paraná. In Rio Grande do Sul, the first tasks are beginning, while much of the crop continues to develop. The largest volume of the harvest in Rio Grande do Sul is expected to occur in October and November.

Sorghum situation

In the United States, the sorghum harvest is nearing 30%, in line with the average. In Kansas, the main producing state cited in the survey, harvests exceed 10%. The

portion classified as good to excellent totals 27%.

In Brazil, the harvest has surpassed 96% of the planned area. Exports are ongoing. The cereal also remains important in human nutrition in African countries, being used in the production of flour and related products.

Rice situation

In the Rio Grande do Sul market, rice prices range between 80 and 90 reais per sack. Buyers are limiting purchases to immediate needs. Producers are selling to finance planting. Data cited from the Rio Grande do Sul Rice Institute indicate that between 10% and 15% of the state's crop

has already been sown. Projections of reduced planted area have weakened compared to previous estimates.

In Tocantins, market analysis indicates the possibility of an increase of between 5 and 8 hectares compared to last year. In southern Santa Catarina, producers report flooded areas after heavy rains. Further rainfall could hinder the progress of operations.

Bean situation

Bean prices are facing upward pressure due to the prospect of lower supply in the coming months. Stocks held in cold storage have decreased after sales made throughout the year. The next significant

influx of product is expected in about 30 days, mainly in the south and west of São Paulo.

The first harvest has a smaller area compared to previous years, according to the survey. The market also incorporates risks associated with excessive rainfall.

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Leta LaRush takes over leadership of BASF Agricultural Solutions in the US

Executive takes over on October 1st with a focus on clients, innovation, and integrated solutions

25.09.2026 | 05:59 (UTC -3)

Cultivar Magazine, based on information from Pace Sagester



Leta LaRush will assume the senior vice presidency of BASF Agricultural Solutions in the United States, effective October 1, 2026. She will lead the company's largest global market for the agricultural division.

LaRush's priority will be to strengthen its relationship with customers and support the team in delivering innovation, services, and integrated solutions to American farmers. The executive also highlighted the operation's preparation to operate as an independent company.

According to Maximilian Becker, a member of the Board of Directors of BASF Agricultural Solutions, LaRush brings together industry knowledge and business experience. The executive also cited the new leader's focus on customers, people,

and performance.

The appointment is part of the leadership changes announced by BASF Agricultural Solutions as it prepares for a new global structure. The model envisions greater global strategic coordination and local commercial execution. The company aims to accelerate decision-making and strengthen its crop systems approach.

The strategy connects innovations, products, and services into solutions for different stages of production, from seed to harvest. The new global framework will take effect on January 1, 2027.

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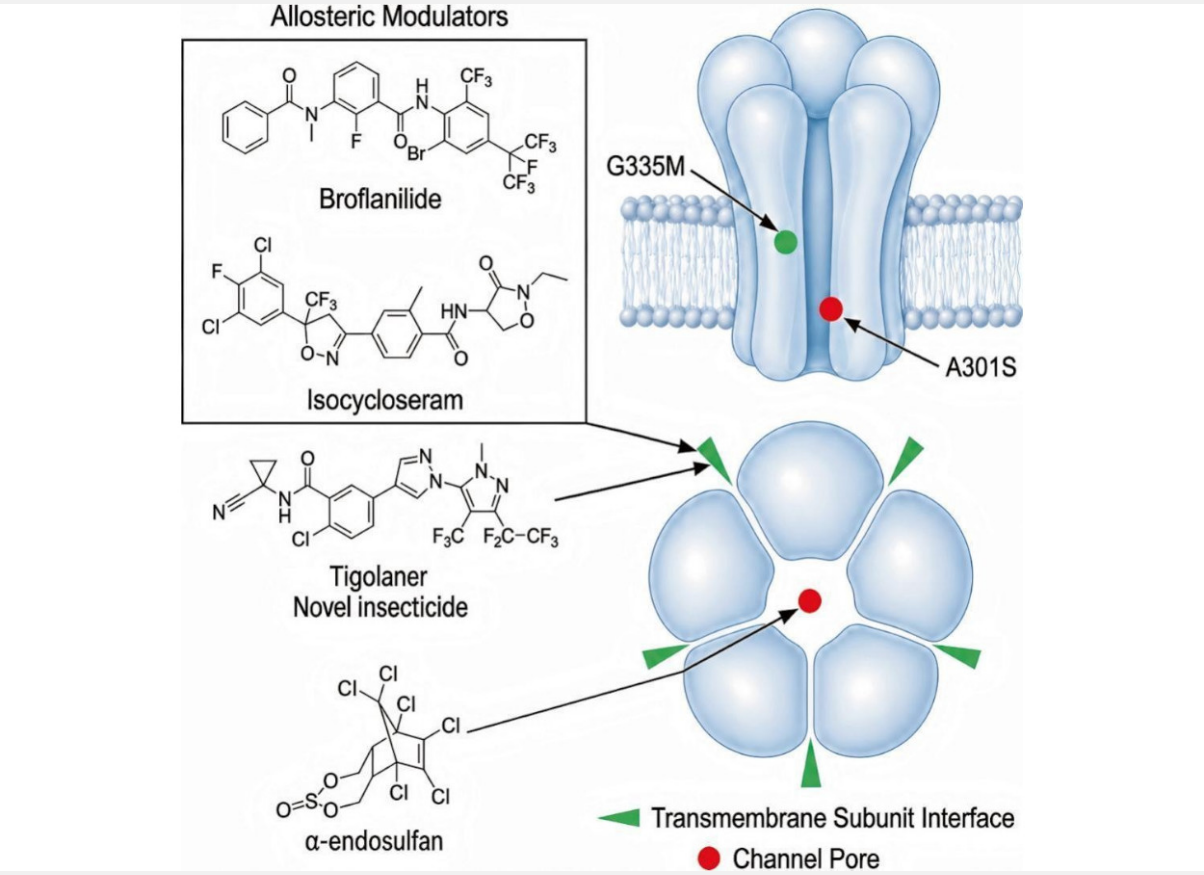
Tigolaner inhibits GABA receptors via an allosteric mechanism

Study identifies G335 as key point of action and indicates less effect from A301S resistance

24.09.2026 | 15:57 (UTC -3)



doi 10.1016/j.pestbp.2026.107359

Researchers have identified the mechanism of action of tigolaner on insect

GABA receptors. The ectoparasiticide acts by allosteric inhibition at the transmembrane interface between RDL receptor subunits. The mechanism differs from the classic ion pore blockade and reduces the impact of mutations associated with resistance to non-competitive antagonists.

The study combined pharmacological assays, bioassays with Drosophila melanogaster mutants, and molecular modeling. The A301S substitution, located in the receptor pore, reduced the potency of tigolaner by approximately two-fold in membrane potential assays. The same alteration markedly impaired the activity of alpha-endosulfan.

In bioassays, strains with A301S or A301N showed little or no resistance to tigolaner. The results indicate low dependence on the central pore site for the compound's action.

Different pattern

Another pattern emerged with the G335M substitution, located at the transmembrane interface. This mutation reduced the potency of tigolaner in vitro by 12,5 times and conferred high resistance in larval bioassays. Broflanilide and isocycloseram also lost activity against G335M, even more markedly in vitro.

Molecular modeling indicated the occupation of an allosteric cavity at the

interface between subunits. In addition to G335, residues I272, I276, P277, L313, M314, and V332 may participate in ligand recognition. This participation still depends on experimental validation.

The results indicate the potential of tigolaner to maintain activity against populations with resistance mutations in the receptor pore. The study also points to the need to monitor alterations associated with the allosteric site in future resistance management strategies (doi 10.1016/j.pestbp.2026.107359).

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Cotton health begins before pests and the first symptoms appear

Monitoring, inoculum reduction, and bio-input quality are highlighted at the congress

24.09.2026 | 15:27 (UTC -3)

Cultivar Magazine



Maintaining cotton health requires action before insect populations increase and the first symptoms of disease appear. The technical hubs at the 15th Brazilian Cotton Congress highlighted monitoring, inoculum reduction, production system management, and the integration of chemical, biological, cultural, and genetic tools. The congress was held at Expominas in Belo Horizonte. Discussions also reinforced the need to preserve the efficiency of technologies in the face of selection pressure on pests and pathogens.

Climate and production system

Aphids and whiteflies have been demanding increasing attention from cotton growers. According to researcher Rafael Pitta, from Embrapa, both pests frequently appear in surveys of production areas. In some monitoring studies, they have surpassed the occurrences of boll weevils and caterpillars. For Pitta, Integrated Pest Management (IPM), based on monitoring and decision-making based on infestation levels, is the answer to this scenario.

According to entomologist Eduardo Barros, hot weather, drought, and nutritional imbalances can favor population explosions of sucking pests. Dry spells and El Niño, which in some producing regions causes long periods without rain, increase this risk. In El Niño years, the researcher

recommends intensifying monitoring and anticipating management before populations reach high levels.

In the case of aphids, sap-sucking adds to the risk of transmitting viruses. Barros highlighted that the insect can transmit a virus considered atypical in cotton, especially when infestation occurs in the early stages of the crop. Whiteflies also benefit from heat, drought, and imbalances in the production system, including excessive nitrogen fertilization. The insect feeds on phloem sap and causes direct and indirect damage, such as the formation of sooty mold.

According to Barros, whitefly control needs to target both adults and nymphs. Nymphs are immobile and remain attached to

leaves, protected by waxy secretions, with a small body area exposed to the products. Therefore, effectiveness depends on the active ingredient, the dose, the potency of the product, and its ability to reach the target through translaminar action. For adults, the researcher cited neonicotinoids and diafenthiuron. For nymphs, he mentioned products with nymphicidal action, such as juvenoids (like pyriproxyfen), ketoenols, and diamides with activity against the pest. He also warned that generic products require attention to quality and effectiveness.

Researcher Eliane Quintela, from Embrapa Rice and Beans, emphasized that management needs to be continuous. According to her, the whitefly has about

600 host plants and is associated with damage to more than 40 crops. The life cycle varies from 18 to 33 days. Quintela associates the increase in temperatures with the shortening of this period, which accelerates reproduction. Soybeans are among the main crops that favor the multiplication of the insect, which requires looking at the system as a whole when cotton is cultivated in sequence. Weeds and volunteer plants also maintain populations between crops and should be eliminated.

Whiteflies are vectors of viruses in crops such as soybeans and beans. However, in cotton, Quintela emphasized that, in Brazil, no virus transmission by the insect has yet been identified. To prolong the

effectiveness of management, she recommends always applying insecticides that control adults and nymphs and incorporating biological control. Among the agents mentioned is the entomopathogenic fungus Cordyceps javanica. For the researcher, combining tools is essential given the pest's adaptability and the selection pressure caused by the repeated use of the same mechanisms of action.

Caterpillars: biology and resilience

Managing caterpillars also requires integrating methods. Entomologist Odair Fernandes recalled that Spodoptera

frugiperda was restricted to the American continent until 2016 and is now recorded in different regions of the world. The species originally developed in corn, but has a wide range of hosts: sugarcane, pastures, cotton, soybeans, brassicas, and cucurbits. The cycle, from egg to adult formation, varies from 26 to 39 days. In cotton, there may be more than one generation during the growing season, and the cycle is lengthened when the caterpillars consume bolls.

In assessments conducted in cornfields, 68% of the moths analyzed were females, and 72% of them were already mated. This favors an increase in the resident population in the area. According to Fernandes, higher rainfall is associated with a reduction in the species'

reproduction.

Professor Geraldo Papa, from Unesp, presented pheromones and food attractants as complementary tools to chemical control within integrated pest management. Distributed throughout the crop, pheromones alter the behavior of pests. The formulation influences performance: according to Papa, granular products last longer than liquid ones. Food attractants associated with insecticides exploit the carbohydrate needs of moths for egg maturation, thus increasing the insects' exposure to the product.

The discussion concluded with the management of resistance to Bt technologies. Kristen Knight, Bayer's technology development leader, presented

the Australian experience with Bollgard technology, which is preparing for its fourth generation in the country. The Australian program has three objectives: (a) to limit insect exposure to the technologies; (b) to reduce the selection of resistant individuals; and (c) to favor the removal of resistance alleles at the end of the growing season.

Compliance with management plans and the adoption of refuges, assessed before, during, and after the harvest, are central. According to Knight, some of the non-compliance in Australia was linked to adverse weather conditions, and success only came with the mass participation of producers.

Diseases: inoculum reduction

Controlling foliar diseases depends on decisions made before symptoms appear. In the technical hub "Foliar Disease Management," the strategy discussed for ramularia leaf spot and target spot included inoculum reduction, area planning, plant architecture, and tool selection.

Fabiano Perina, from Embrapa Algodão, warned that a crop with less ramularia pressure does not eliminate the risk for the following cycle. The inoculum remains in the areas and can cause a new increase in the disease under favorable conditions, especially in the Cerrado. Among the

disease agents, Ramulariopsis pseudoglycines predominates: a survey in previous crops identified the species in about 94% of the isolates collected in the producing regions. Perina also highlighted the high genetic variability of the populations, which requires continuous monitoring. He advocated combining cultural management, biological tools, and chemical control.

Trials conducted in 2025 recorded efficiencies between 66% and 87% in treatments for ramularia, depending on the product. The trials were conducted by a network of approximately 20 researchers, with institutional participation from the Brazilian Cotton Producers Association (Abrapa). For Perina, the objective should go beyond a single crop season. "If we do

good management, we leave a very low inoculum potential at the end of the cycle," he stated. With less inoculum, the initial disease pressure in the following cycle tends to be lower.

In target spot disease, caused by the fungus Corynespora cassiicola, the production system directly influences disease pressure. Nedio Tormen, from VerdeAgro, pointed out that the intensification of crops in the Midwest and North-Central regions can maintain more inoculum available throughout the year. Cotton planted after soybeans received special attention. High temperatures, continuous water availability, and greater canopy shading favor the progression of the disease, which reduces the photosynthetic capacity of the leaves and

can accelerate defoliation.

"Fungicide applications alone are not enough," Tormen emphasized. Closer crops increase shading, while more open and airy plants can reduce disease pressure. Therefore, managing plant architecture and the proper use of growth regulators are integral to the strategy. In the 2025 crop season trial network, treatments for target spot had efficiency between 40% and 60%. Tormen also highlighted the need to monitor fungicide resistance, noting that soybean resistance related to target spot is already well-established.

The producer's perspective was presented by Karla Kudlawiec, regional phytosanitary coordinator at SLC Agrícola. According to

her, there are important differences between first and second crop cotton, and phytosanitary management begins with planning. The positioning of cultivars needs to consider genetic and sanitary characteristics, as well as the history of nematodes and weeds. Monitoring trials, evaluating the stability of fungicides, and analyzing new tools complete the strategy.

Weight in the phytosanitary strategy

Biological control is expanding its participation in Brazilian agricultural systems. Wagner Bettiol, from Embrapa Meio Ambiente, cited a study published in 2025 that points to Brazil as the world's

largest producer and consumer of biological control agents. He attributed part of this progress to farmers' willingness to incorporate new tools. According to the researcher, the use of microorganisms is already widespread among large producers. One of the projections he presented indicates that biologicals could account for half of the pesticide market by 2050.

The expansion increases the importance of quality control. Flávia Sampaio Alexandre, from the Federal University of Mato Grosso (UFMT), presented the work of the Soil Microbiology and Agricultural Biotechnology Laboratory at the Sinop campus. Between 2020 and 2025, the laboratory analyzed 640 samples of bio-inputs used in northern Mato Grosso. The

set included commercial products, inocula, and on-farm multiplication materials, predominantly bacteria and products of this type. Among the situations found, there was, for example, the identification of a contaminating agent in one of the evaluations.

According to the researcher, quality depends on the entire chain: research, production, storage, handling, and application in the field. The training of those who handle and use the microorganisms is also crucial for the consistency of the results. "The future of bio-inputs depends on trust. And trust begins with quality," she stated.

The discussions also included new technological frontiers. Galdino Andrade Filho, from the State University of Londrina

(UEL), pointed to gene editing and RNA interference as possibilities for the coming years. He also urged the sector to pay more attention to bio-inputs specifically geared towards cotton.

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BASF announces new structure for Agricultural Solutions

Reorganization expands autonomy for local markets and puts Marcelo Batistela in charge of the Brazilian operation

24.09.2026 | 14:05 (UTC -3)

Cultivar Magazine, based on information from Erika Coradin



Marcelo Batistela, Christian Tell and Sergi Vizoso Sansano

BASF Agricultural Solutions has announced a new organizational structure focused on customers and cropping systems. The model expands the company's strategic, financial, and operational autonomy and will officially take effect on January 1, 2027.

In Brazil, Marcelo Batistela assumes the role of Senior Vice President of Business and General Manager of BASF Agricultural Solutions Brazil. An agricultural engineer, the executive has been with the company for 23 years. His career includes positions in sales, marketing, commercial excellence, and business management in Brazil and abroad. Since 2023, he has led the Agricultural Solutions division in the country.

The new organization seeks to accelerate decision-making in the countries and increase proximity to farmers. The structure also reinforces the crop systems approach. The model connects knowledge, innovations, products, and services into integrated solutions for different stages, from planting to harvesting.

Other changes

Christian Tell will assume the vice presidency of Business for BASF Agricultural Solutions America LATAM West on January 1, 2027. He has been with BASF for 23 years and has led the Agricultural Solutions area in Italy since 2023.

The Brazilian and LATAM West operations will now report directly to the global Business leadership, headed by Maximilian Becker, a member of the Board of Directors of BASF Agricultural Solutions.

Sergi Vizoso Sansano, who has been responsible for BASF's agricultural business in Latin America since January 2020, will assume the senior vice presidency of Asia-Pacific Business, based in Singapore.

The implementation of the new structure has already begun. According to the company, the reorganization also supports the evolution of the agricultural unit as an independent business, dedicated exclusively to agriculture.

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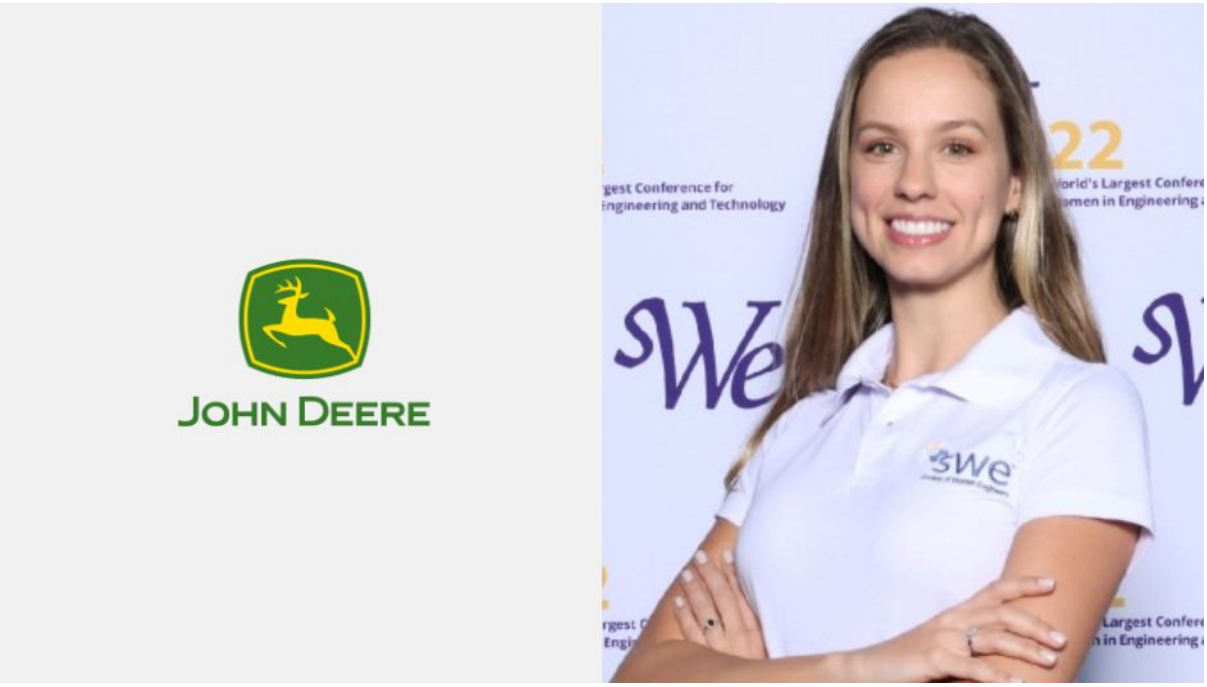
John Deere appoints new Smart Connected factory manager

Jéssica Schwinn will lead the areas of automation, data, software, testing and product programming in Montenegro (RS)

24.09.2026 | 09:27 (UTC -3)

Cultivar Magazine



John Deere has appointed Jéssica de Lima Schwinn (pictured) as the Smart Connected factory manager in

Montenegro, Rio Grande do Sul (RS). In her new role, she will be responsible for the Factory Automation, Product Testing and Programming, Data Analysis, and Software Development teams. She will also be responsible for defining and executing the Smart Connected Factory and Innovation roadmap.

“My focus will be on leveraging digital technologies, artificial intelligence, advanced analytics, automation, and Lean principles to accelerate operational excellence, foster innovation, and strengthen the competitiveness of our manufacturing operations through close collaboration with business and functional partners,” said Jéssica.

Jessica has been with John Deere for over 11 years, previously holding the position of

Production Planning and Control Supervisor. She has a degree in Production Engineering and a specialization in Logistics.

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Noam Silberstein takes over as strategy director at Vylor

The executive joins the company after nine years as senior vice president of AGI

24.09.2026 | 09:05 (UTC -3)

Cultivar Magazine



Corteva has announced Noam Silberstein (pictured) as the new Chief Strategy Officer of Vylor, its future seed and genetics company. The executive will

assume the role in October and will lead the strategy, mergers and acquisitions, and sustainability teams, focusing on driving the company's growth agenda.

Silberstein brings over two decades of experience in investment, strategy, and business leadership. Prior to joining Vylor, he served for nine years as Senior Vice President of Strategy and Corporate Development at AGI (Ag Growth International).

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The bio-inputs market is expected to grow by up to 10% by 2026

Projections from Anpii Bio indicate growth in volume, even with pressure on prices and more cautious purchases

24.09.2026 | 08:26 (UTC -3)

Letícia Rodrigues

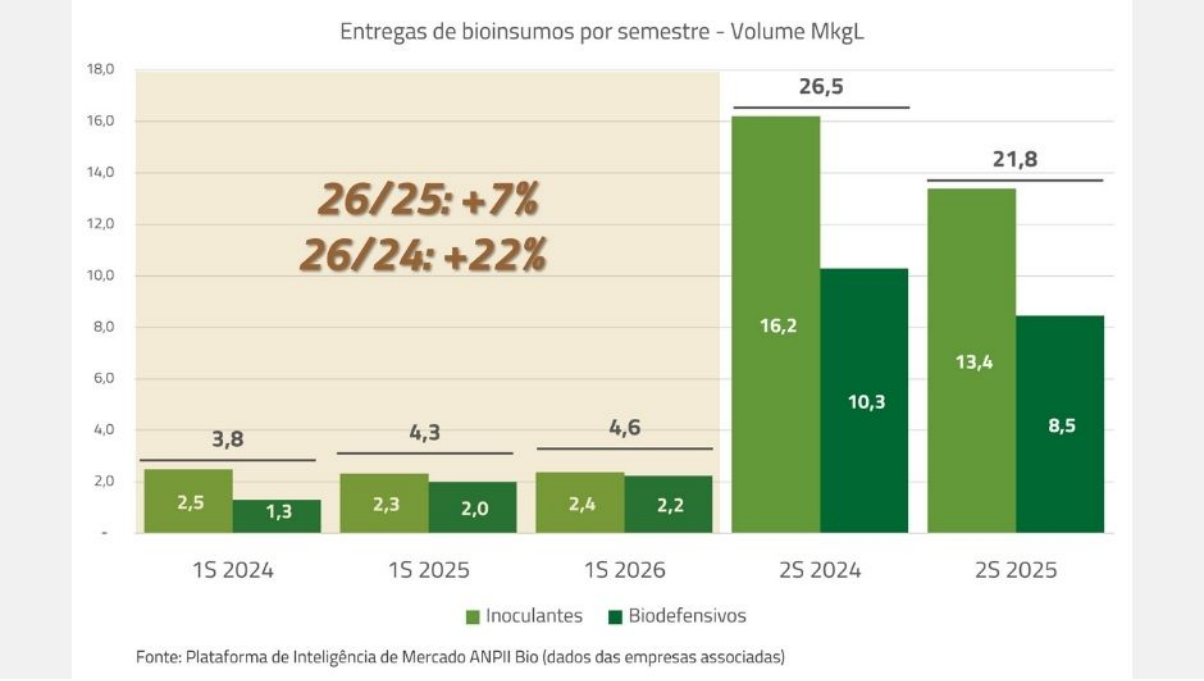




Even in a scenario of greater caution in purchases and pressure on prices, the Brazilian bio-inputs market is expected to

end 2026 with growth of 5% to 7% in sales value and around 10% in volume, compared to 2025, according to projections by Anpii Bio (National Association for the Promotion and Innovation of the Biological Industry).

In the first half of 2026, the market grew 7% in volume compared to the same period in 2025. In terms of sales value, however, there was no growth, mainly due to delays in purchases and increased price pressure on agricultural inputs.



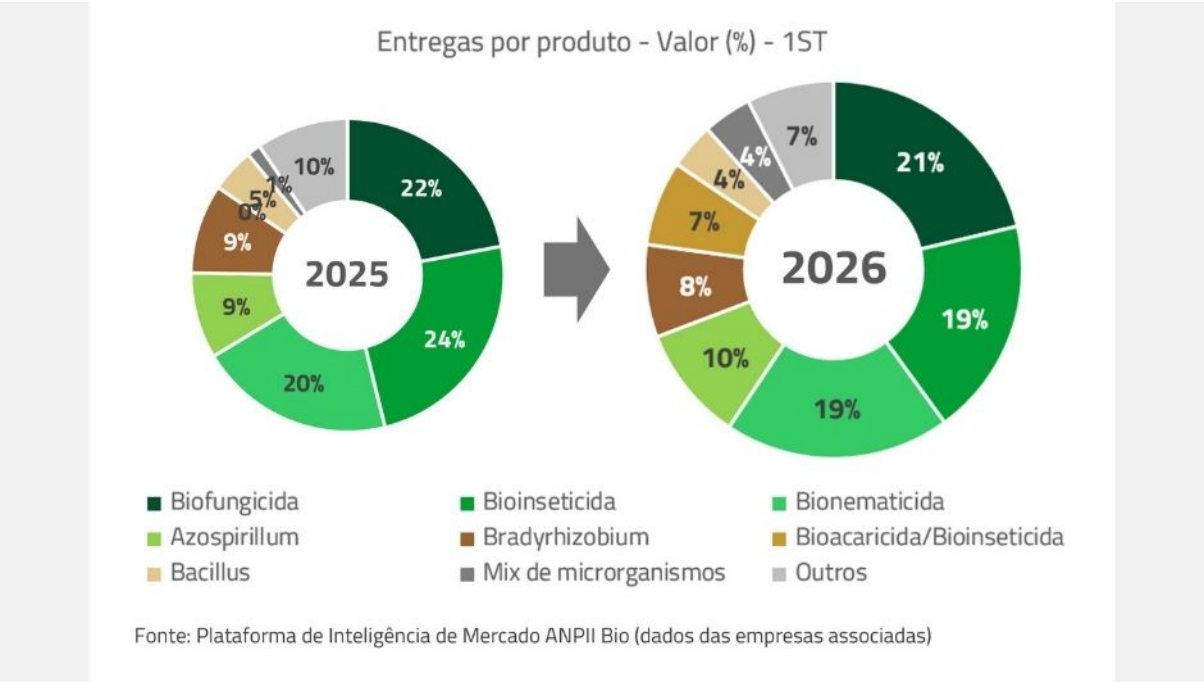
The slowdown was most evident in the second quarter, when problems related to fertilizer prices and supply intensified, and uncertainties about future prices of major agricultural commodities increased. As a result, producers delayed purchasing decisions and began to concentrate them closer to the start of the summer crop planting season.

“The growth in volume shows that the adoption of bio-inputs continues to advance, even in a more challenging environment. On the other hand, the difference between volume and value highlights the pressure on average prices, a dynamic that the industry has been observing in recent years. The expectation is for a recovery in the pace of purchases in the second half of the year, supporting a positive close for 2026,” says Larissa Bonotto (pictured), operations director at Anpii Bio.

The data is integrated into Anpii Bio's Market Intelligence Platform and was presented by 5P2R Precision Marketing to the association's member industries at the end of August. The platform compiles a

historical series that began in 2009 and currently includes data from 30 companies, allowing for monitoring of market evolution and key changes in industry operations.

Complexity and added value

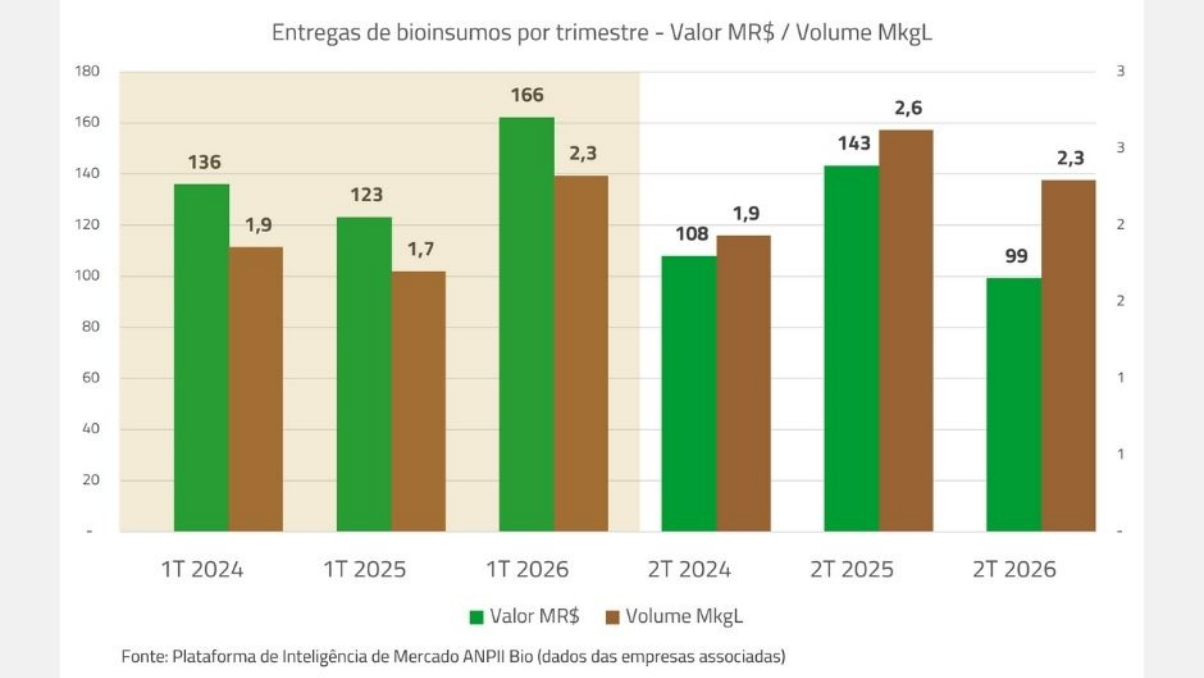


Fonte: Plataforma de Inteligência de Mercado ANPII Bio (dados das empresas associadas)

In addition to increased adoption, the data shows a transformation in the profile of

technologies offered to the market. Among biopesticides, there is a growing share of products with more than one class of use, such as nematicides-fungicides and biological acaricides-insecticides. In inoculants, formulations that combine more than one species of microorganism are also advancing.

These categories accounted for 22% of sales value in the first quarter of 2026, compared to 16% in 2025, indicating a more diversified and higher value-added offering, in contrast to a market previously more concentrated on traditional products containing only Bradyrhizobium and Azospirillum.



“This change in the mix is ??one of the signs of market maturation. Companies are expanding their portfolios and incorporating technologies with different functionalities and combinations of microorganisms. We also observe a diversification in the activities of industries, which have become present in more than one segment, keeping up with the demand for solutions that are increasingly

integrated into agricultural management," explains Anderson Nora Ribeiro (pictured), founding partner of 5P2R Marketing de Precisão, the consultancy responsible for the Anpii Bio Market Intelligence Platform.

Diversification is evident in the very composition of the industry tracked by the platform: of the 30 companies analyzed in 2026, half already operate with both inoculants and biological pesticides, while the remainder operate exclusively in one of the two segments. For reference, in 2022, this percentage of companies operating with both product categories was only 26%.

New regulatory phase

Market performance is occurring alongside a significant shift in the regulatory environment, with the Bioinputs Law (Law No. 15.070/2024) advancing to the final stage of regulation. The sector expects the decree to be published in the coming weeks, paving the way for discussions on ordinances and other sub-legal acts that will give practical application to the new framework.

For Anpii Bio, the completion of this stage is important to provide greater predictability to the regulatory environment and to monitor the evolution of an industry that has been expanding its scale, portfolio, and investments in new technologies.

“The industry is reaching this new regulatory stage with a market that has already advanced in adoption, scale, and technological diversity. Regulation can contribute to providing more security and predictability for investments and the development of new solutions. The next challenge will be to transform this milestone into applicable, balanced rules that are compatible with the characteristics of biological products,” points out the operations director of Anpii Bio.

The organization expects that the regulation will preserve the progress made throughout the drafting process of the law and the decree, reconciling safety, innovation, proportionality, and operational viability for the industry, without losing sight of the producer's needs and the

particularities of different biological technologies.

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Tessenderlo completes US$403 million investment in FMC

Belgian group acquires 20% stake in FMC and gains the right to nominate a member of the board of directors

24.09.2026 | 06:18 (UTC -3)

Cultivar Magazine



The Tessenderlo Group has completed the purchase of 30.319.166 shares of FMC Corporation for US$13,30 per share. The transaction totaled US$403,24 million and, added to the shares already held by the Belgian group, brought its stake to

approximately 20% of the agricultural sciences company's capital. The closing occurred yesterday, after the fulfillment of the conditions stipulated in the agreement and the obtaining of the necessary regulatory approvals.

FMC and Tessenderlo had signed the purchase agreement on June 30, 2026. The transaction involved a private placement of FMC common stock. The shares were not publicly offered in the United States. The company used an exemption provided for in US law to complete the sale.

Governance structure

Tessenderlo's entry also alters FMC's governance structure. The agreement grants the investor the right to nominate a candidate for the board of directors as long as its stake remains at least 10% of the outstanding shares. FMC will expand its board by one seat at the first ordinary meeting following the closing of the transaction.

Tessenderlo has nominated its CEO, Luc Tack, to fill the new position. The appointment is contingent upon Tack meeting the independence criteria stipulated by the New York Stock Exchange rules. The agreement also ensures Tessenderlo retains the right to maintain a non-voting observer at board meetings as long as its membership

remains at least 10%.

Lock-up period

The investment includes a three-year lock-up period. During this period, Tessenderlo and its affiliates may not sell their FMC shares or carry out transactions intended to protect or transfer their economic exposure to the shares, except as otherwise provided in the contract.

After this period, the agreement maintains limitations on potential buyers. Tessenderlo will not be able to transfer shares to FMC's competitors, investors classified in the contract as activists, or buyers capable of achieving a stake exceeding 4,9% after the transaction. The

restriction does not apply to publicly registered offerings with wide distribution or to sales conducted on the stock exchange. The concept of competitor includes companies whose activity in agricultural pesticides, biological products, crop nutrition, or seed treatment is not residual in relation to the overall scope of their businesses.

Future emissions

The contract also grants rights to preserve Tessenderlo's stake in future issuances. As long as it maintains at least 10% of FMC's shares, the group will have preferential rights in certain share or convertible bond issuances. The investor may also acquire shares during specific

periods to maintain a 20% stake, according to conditions established in the agreement.

Tessenderlo must vote on his actions according to the FMC board's recommendation on matters submitted to shareholders. This obligation remains in effect until his stake falls below 10% and at least 12 months have passed since the departure of his last appointed board member. The rule does not apply to proposals related to changes in company control.

The agreement also imposes restrictions on initiatives such as additional share purchases, merger proposals, solicitations of proxies, and other extraordinary operations. These restrictions remain in

effect as long as Tessenderlo holds FMC shares and cease to be in effect in the event of a change of control of the company.

Registration rights

FMC and Tessenderlo also signed a registration rights agreement. The document grants the investor up to eight registration requests for the eventual sale of shares on the US market, which may be submitted starting 30 days before the end of the lock-up period. The exercise of these rights will be subject to limits stipulated in the contract, including a maximum of three requests per year and a minimum interval of 120 days between them. The market value of the shares

included in each request must reach at least US$50 million.

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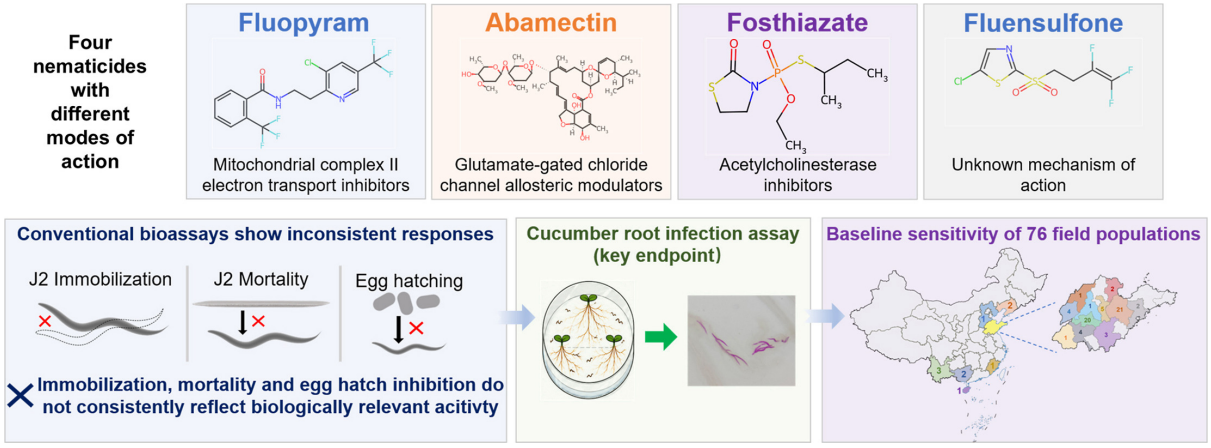
Root infection improves nematicide evaluation

A study with cucumber established the basis for sensitivity to Meloidogyne incognita

23.09.2026 | 15:55 (UTC -3)

Cultivar Magazine



doi 10.1016/j.aac.2026.09.005

Inhibition of cucumber root infection showed greater consistency in evaluating the activity of four nematicides against Meloidogyne incognita. The method also allowed establishing sensitivity values ??for 76 populations collected in vegetable production areas in China between 2019

and 2025. The study evaluated fluopyram, abamectin, fosthiazate, and fluensulfone.

The products exhibited distinct toxicological profiles. Fluopyram and abamectin rapidly immobilized second-stage juveniles of Meloidogyne incognita. Fluensulfone showed a slower and more progressive action. Immobilization was not always accompanied by mortality or a reduction in the ability to infect roots.

Concentrations and responses

In infection assays, all nematicides produced concentration-related responses. The mean EC50 values ??among the populations reached 0,58 micrograms per

milliliter for fluopyram, 0,02 micrograms per milliliter for abamectin, 1,63 micrograms per milliliter for fosthiazate, and 1,64 micrograms per milliliter for fluensulfone. The distributions showed a continuous unimodal pattern, without evident resistant subpopulations.

Fluensulfone also showed a time-dependent effect. At a concentration of 1 microgram per milliliter, immobilization increased from 13,43% after 24 hours to 93,68% after 72 hours. The product inhibited the hatching of immature eggs more intensely compared to mature eggs.

In field tests with cucumber, all treatments reduced root galls. At 90 days, control efficacies reached 82,31% with fluensulfone, 80,53% with fluopyram, 70,21% with abamectin, and 68,92% with

fosthiazate. The researchers point to the inhibition of root infection as a useful parameter for monitoring future changes in the sensitivity of Meloidogyne incognita (doi 10.1016/j.aac.2026.09.005).

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Resistance requires new management practices for amaranth and goosegrass

Researchers advocate for area-based diagnosis, early control, and integration of technologies in soybean and cotton farming

23.09.2026 | 15:32 (UTC -3)

Cultivar Magazine, based on information from CBA.



The increasing resistance of weeds requires crop monitoring, population diagnosis, and the integration of different management tools in soybean and cotton systems. Researchers gathered at the 15th Brazilian Cotton Congress highlighted pigweed and goosegrass as among the main challenges. The group also analyzed new herbicide tolerance biotechnologies and the need to preserve their effectiveness across growing seasons.

Resistant amaranth

Professor Anderson Luis Cavenaghi, from Univag, presented data on resistant amaranth. According to the researcher, the high seed production favors the spread of the weed. A single individual can produce

approximately 100 seeds. This characteristic increases the importance of control before multiplication within agricultural areas.

Cavenaghi also presented results from a project initiated in 2012. The work has already evaluated more than 18 samples. The analyses identified different resistance profiles, including resistance to ALS-inhibiting herbicides and glyphosate. The project also recorded cases of resistance involving more than one mechanism of action.

The results indicate distinct responses among amaranth populations. For this reason, the researcher advocated for the diagnosis of each area before defining the management program. Identifying control

failures allows for the recognition of possible changes in herbicide sensitivity. Monitoring also helps to reduce the multiplication and spread of resistant populations.

Crow's Foot Grass

Goosegrass received similar attention during the meeting. Fernando Storniolo Adegas, a researcher at Embrapa Soja, recalled the species' presence among the important weeds for Brazilian agriculture since surveys conducted in the 1970s.

According to Adegas, the populations found in Brazil exhibit genetic diversity, differences in cycle, and variation in seed production. These factors can alter the

response to control methods. Some populations have an annual cycle. Others may develop perennial characteristics.

The species also demonstrates an ability to adapt to different environments. Goosegrass occupies different types of soil and can find favorable conditions in compacted areas with greater light penetration. Characteristics of the leaf surface can also interfere with the absorption of herbicides.

This set of factors increases the importance of control in the early stages of development. Adegas recommended identifying the population present in the crop and confirming any cases of resistance. After this diagnosis, the producer can select the herbicides and

other tools available for each situation.

Planning should also consider different stages of the production system. Alternatives can range from sowing to the second crop or winter crops. This approach broadens intervention opportunities and reduces dependence on a single control measure.

Herbicide tolerance

Herbicide tolerance biotechnologies were also part of the discussion. Edson Ricardo de Andrade Junior, a researcher at the Mato Grosso Cotton Institute, presented the evolution of tools available for cotton farming since the previous edition of the congress.

During this period, two biotechnologies entered the market: Bayer's Bollgard 3 XtendFlex and BASF's Seletio TwinLink Plus. These platforms have accumulated two crop seasons of field use and expand management possibilities. Data presented on applications in Mato Grosso showed changes in the use of these technologies in recent cycles.

According to Andrade Junior, the new tools have provided advances in controlling important cotton weeds, including pigweed and goosegrass, compared to previously available options. Other biotechnologies remain under development and may expand the range of options in future harvests.

However, the researchers stressed the need to integrate these technologies into broader management programs. The strategy includes different mechanisms of action, cultural practices, area monitoring, and control of plants in their early stages.

Central position

Diagnosis plays a central role in this process. The occurrence of resistance does not imply a loss of effectiveness of all available tools. Management depends on identifying the populations present, the resistance mechanisms involved, and the alternatives that are still effective in each area.

The combination of monitoring, diagnosis, and integrated management aims to

reduce the expansion of resistant populations and preserve the useful life of technologies used in soybean and cotton systems.

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SLC Seeds presents its portfolio at the Cotton Congress

The company highlights cotton cultivars and promotes meetings with clients and partners during the CBA

23.09.2026 | 15:08 (UTC -3)

Cultivar Magazine, based on information from Talita Gehlen



SLC Sementes is participating in the 15th edition of the Brazilian Cotton Congress (CBA), in Belo Horizonte (MG), with a

booth dedicated to building relationships with clients and partners and presenting its portfolio for cotton farming. Highlights include more than 24 cotton cultivars, encompassing different genetics and technologies.

During the three-day event, from September 22nd to 24th, the company will hold meetings with clients to discuss market data, productivity, and cultivar performance. These conversations will be led by a market analyst from SLC Agrícola.

“Participating in CBA is an opportunity to be close to our clients, listening, exchanging information, and building conversations that truly make sense to them. We designed our booth so that everyone who comes here finds more than

just our brand: they find a space for exchange, knowledge, and connection, designed to transform information into value and provide an experience that represents how we want to relate to our clients," says Gustavo Lunardi, director of SLC Sementes.

In addition to relationship-building activities, SLC Sementes will present its solutions for cotton farming at the Congress, highlighting cotton cultivars and characteristics related to seed quality, yield potential, and adaptation to Cerrado conditions. According to the company, the portfolio includes more than 24 cotton cultivars, including materials with TMG, Deltapine, and IMA genetics, as well as biotechnologies available on the market.

According to SLC Sementes, the diversity of materials aims to meet the different production environments and needs of cotton farmers, expanding the alternatives for planning cotton crops.

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Ihara highlights products at cotton congress

Yamato SC targets goosegrass, bittergrass, and amaranth in weed management

23.09.2026 | 14:34 (UTC -3)

Cultivar Magazine, based on information from Ihara



Ihara is presenting the Yamato SC pre-emergent herbicide during the 15th

Brazilian Cotton Congress in Belo Horizonte, Minas Gerais. The product is used for managing difficult-to-control weeds in cotton farming, focusing on goosegrass, sourgrass, and pigweed.

According to the company, the herbicide exhibits selectivity for cotton and provides prolonged protection. Trials conducted by research institutes showed up to 97% control of the evaluated species. Ihara positions the technology as an alternative for rotating mechanisms of action in the face of increasing resistance to herbicides used in the crop.

The company is also showcasing the Chaser EW insecticide at the congress. This solution combines insecticidal and fungicidal action. The product is effective against cotton boll weevil, spider mite,

aphids, and thrips. The technology also features anti-feeding action, interrupting the feeding of pests, and an ovicidal effect on mites.

The presence of weeds causes losses due to competition with cotton plants for water, light, and nutrients. Some species also act as hosts for pests and diseases. According to Ihara, rotating herbicides with different mechanisms of action broadens the spectrum of control, reduces the seed bank in the soil, and hinders the selection of resistant biotypes.



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Rainbow expands its portfolio to include cotton with new product launches

Company presents insecticides, fungicide and growth regulator during the 15th Cotton Congress

23.09.2026 | 14:00 (UTC -3)

Cultivar Magazine



Rainbow presented new products for cotton farming during the 15th Cotton Congress. The portfolio includes two insecticides, a triple fungicide mixture, and a growth regulator. The company is participating in the congress for the second year.

In the insecticide segment, Rainbow launched Caterole and Furion. Both products are specifically designed for managing chewing insects, with a focus on controlling caterpillars. According to the company, these pests represent one of the main challenges for cotton producers in Brazil.

The company also expanded its fungicide offerings. Zerrust Mixx combines three components in a unique Rainbow formulation. The solution aims to address

the management of various diseases in cotton crops.

Another innovation involves plant growth management. The company presented Ezefon, indicated as a growth regulator for cotton-producing areas in the country.

The four products are part of Rainbow's strategy to expand its presence in Brazilian cotton farming. The company reported growth in the domestic market and annual expansion into new agricultural segments.

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Nutrient balance guides fertilizer management in cotton

Plenary session at the 15th Cotton Congress discusses costs, nutrient exports, and dosage definition

23.09.2026 | 13:30 (UTC -3)

Cultivar Magazine



Nutrient management in the production system needs to consider the balance between inputs and outputs, soil fertility, productive potential, and the area's history. This assessment was highlighted in a technical plenary session at the 15th Cotton Congress. The debate brought together researchers to discuss criteria for fertilizer recommendations and management efficiency.

Ana Luiza Borin, a researcher at Embrapa Algodão and moderator of the plenary session, highlighted the weight of fertilizers in the cost of cotton cultivation. According to the data presented, fertilization represents approximately 25% to 30% of the cost of cotton production. This scenario gains importance given Brazil's external

dependence. Approximately 85% of the fertilizers consumed in the country are imported.

Nutrient balance

Researcher Álvaro Vilela de Resende, from Embrapa Cerrados, defined nutrient balance as the difference between inputs, mainly through fertilization, and outputs through harvesting. The calculation can also incorporate credits from the system, although its estimation is more complex.

A negative balance indicates the removal of nutrients from soil reserves. In this condition, subsequent crops may require additional fertilization to meet plant demand and restore adequate fertility

levels. A neutral balance brings the amount removed by harvesting closer to replenishment. A positive balance indicates the formation of reserves that can be used by subsequent crops.

Applying this concept requires soils with built-up fertility. Areas below critical levels do not offer the same margin for using accumulated reserves. The decision must also consider technical and economic criteria.

Management tool

Felipe Bertol, coordinator of soils and research at SLC Agrícola, reported on the use of nutrient balance as a management tool. The group relates fertilizer inputs to

exports through harvesting and monitors the behavior over different growing seasons. The historical data allows them to evaluate the efficiency of the system and adjust recommendations.

The company is also evaluating the use of harvest maps to represent the spatial variability of nutrient export. The strategy is based on productivity data and aims to guide subsequent prescriptions. Areas with greater removal may require differentiated replenishment. Regions with a positive balance may allow for reduced inputs, provided the soil is in suitable condition to support this decision.

Resende drew attention to an important limitation. The extraction and export values ??available for cotton vary greatly. For

some nutrients, export levels can vary by more than 100% depending on the environment and cultivar. This difference increases the risk of error in doses calculated solely from reference tables.

According to the researcher, soybeans and corn show more stable extraction and export indicators. For cotton, obtaining reliable data still requires research advancements and standardization.

Hypothetical case

The plenary session presented an exercise for a cotton productivity of 400 arrobas, based on conditions in Goiás. The recommendation considered used 195 kilograms per hectare of nitrogen, 100

kilograms per hectare of phosphorus pentoxide, and 120 kilograms per hectare of potassium oxide.

The export estimate reached 180 kilograms per hectare of nitrogen, 60 kilograms per hectare of phosphorus pentoxide, and 30 kilograms per hectare of potassium oxide. The data reinforce a characteristic of cotton: the plant absorbs high quantities of nutrients during its cycle, but only a fraction leaves the area with the harvest.

This difference is particularly noticeable in the case of nitrogen and potassium. A significant portion of these nutrients remains in crop residues and can benefit the following crop. In the example presented, the credits in the crop residue

reached approximately 240 kilograms per hectare of nitrogen, 30 kilograms per hectare of phosphorus, and 210 kilograms per hectare of potassium, according to the indicators used in the exercise.

The export estimate also depends on the quality of the sampling. In cotton, the material taken from the field contains not only fiber and seed. About 5% of the harvested mass corresponds to residues. These components also carry nutrients.

Potassium deserves attention in this process. Part of the nutrient remains in bracts and floral debris. A fraction of these residues leaves the area during harvesting, but it doesn't always enter the laboratory analysis. This condition can alter the real estimate of export potential.

Nitrogen and potassium

Consultant Rodrigo de Oliveira Lima presented results obtained from trials with nitrogen and potassium doses in the 2024/25 growing season. The increase in nitrogen doses raised biomass production, but did not result in a corresponding increase in productivity in the case analyzed. The greater vegetative mass also increased the plant's water needs.

The results showed a decrease in efficiency with increasing nitrogen doses. The harvest index also decreased. The relationship indicates greater biomass production without a proportional gain in harvested yield.

Regarding potassium, the discussion highlighted its high absorption by cotton plants and the occurrence of luxury consumption. The plant demands a large quantity of the nutrient, although export represents a smaller portion of the total absorbed. For this reason, a recommendation based solely on export may pose a risk in soils without sufficient reserves, especially in environments with differences in texture and fertility.

Data from SLC Agrícola also indicated a lack of consistent productivity response to increased nitrogen doses. The analyzed database includes information from over 600 hectares. Average doses, in most of the evaluated environments, ranged between approximately 140 and 180 kilograms of nitrogen per hectare.

Rodrigo reported similar behavior in data from Minas Gerais, obtained from over 300 plots across four growing seasons. In years with greater water stress, dose adjustment can follow the reduction in yield potential.

Regarding potassium, doses varied between regions. Bahia showed higher values ??in some environments. Even so, higher doses did not necessarily result in higher productivity. In some situations, vegetative growth increased water demand and reduced the expected response.

The discussion highlighted limitations to recommendations based solely on extraction or export. Fertilizing based on extraction can increase the amount applied beyond practical necessity. Fertilizing

solely based on export can reduce the dose below what is needed in areas without adequate reserves.

Therefore, management involves integrating soil analysis, built-up fertility, fertilization history, productivity, nutrient export, environmental characteristics, and crop condition. The balance sheet serves as a support tool. The decision must consider the production system and the soil's capacity to supply nutrients to the cotton plant.

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Syngenta brings new technologies to the Cotton Congress

The company highlights Invencis, Victrato, and biological solutions for crop management and productivity

23.09.2026 | 10:40 (UTC -3)

Vitorya Paulo



Syngenta is participating in the 15th edition of the Brazilian Cotton Congress (CBA), the main meeting of the cotton production

chain in the country, which takes place between September 22nd and 24th in Belo Horizonte (MG). During the event, the company will present solutions focused on the main challenges of cotton farming, reinforcing its commitment to the productivity, profitability and sustainability of Brazilian crops.

Among the highlights is the launch of Invencis, a next-generation insecticide that, through the Boll Weevil and Caterpillar+ concept, establishes a new standard as a solution to the growing problem of the caterpillar complex, delivering high-performance control of Spodoptera, while ensuring the already established control of the cotton boll weevil with Plinazolin technology. The technology also presents a broad spectrum in the

management of mites, thrips and the main cotton pests, resulting in greater efficiency, productivity, quality and profitability for Brazilian farmers.

The company also highlights Victrato, a seed treatment based on the unparalleled Tymirium technology, which protects crops against soil and foliar diseases and against all nematodes, preserving the crop's productive potential. The portfolio presented at the congress also includes biological solutions, such as the Yieldon bioactivator, developed to enhance productivity and support crop development in strategic phases.

Combining chemical, biological, and digital innovation, Syngenta reinforces its role as a partner to producers in building more resilient and competitive agricultural

systems. “The Brazilian Cotton Congress is one of the most important events for the sector, as it brings together producers, researchers, companies, and leaders who help build the future of national cotton farming. For Syngenta, being present at this event is an opportunity to present technologies that address current field challenges and contribute to raising the standards of productivity, quality, and sustainability of Brazilian cotton,” says Rafael Borba, Cotton Marketing Manager at Syngenta.

“Our commitment goes beyond offering solutions. We work side-by-side with rural producers and representative entities of the sector to strengthen the entire cotton chain. This long-term partnership allows us to support the development of increasingly

efficient and profitable production, aligned with the demands of global markets, consolidating the leading role of Brazilian cotton on the international stage," the executive added.

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Diego Souza takes on new leadership role at Corteva

The executive's role will focus on customer experience, loyalty programs, and business intelligence

23.09.2026 | 09:12 (UTC -3)

Cultivar Magazine



After more than seven years at Boehringer Ingelheim, Diego Souza (pictured) assumes the position of Senior Marketing

Leader for Clients and Incentives at Corteva Agriscience. Based in Barueri (SP), he will be responsible for connecting knowledge about clients, segmentation, experience, loyalty programs, and business intelligence.

“I join Corteva with the purpose of contributing to an increasingly customer-centric, data-driven agenda connected to commercial execution, strengthening relationships with farmers and channel partners and transforming insights into business impact,” said Diego.

With over 12 years of experience in the agribusiness and animal health sectors, Diego built his professional career in companies such as Boehringer Ingelheim, Bayer Crop Science, and Monsanto

Company, where he worked in the development and implementation of commercial and marketing strategies.

In her most recent experience, she led Boehringer Ingelheim's largest animal health business unit in Brazil, working in the areas of marketing, technical aspects, market strategy, and sales.

Diego holds a degree in Business Administration and has completed training in Corporate Education at Duke University, with modules in Frankfurt, Germany, and Durham, United States.

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Mosaic announces change in global operations leadership

Walt Precourt will assume the executive vice presidency of operations in December; Karen Swager prepares for retirement

23.09.2026 | 08:32 (UTC -3)

Cultivar Magazine





Mosaic has announced changes to its executive leadership. Walt Precourt,

current senior vice president and managing director, will assume the role of executive vice president of operations on December 1, 2026. Karen Swager will leave the position and remain as a senior consultant until her retirement, scheduled for the second quarter of 2027.

Precourt joined Mosaic in 2009. Since then, he has led the phosphate and potash businesses, as well as the areas of Environment, Health and Safety, and Strategy. He has been part of the executive leadership team since 2014.

In his current role, Precourt is responsible for Purchasing, Human Resources, Public Affairs, and Global Business Services. Upon assuming his new position, he will lead global operations and the

Environment, Health, and Safety area. The executive will remain based at the company's office in Tampa, United States.

Mosaic's president and CEO, Bruce Bodine, cited Precourt's knowledge of the company's operations. According to him, the executive will take over the area during a period marked by challenging business conditions, particularly in the phosphate segment.

Karen Swager has over three decades of experience at Mosaic and its predecessor companies. Throughout her career, she has served as general manager of operating units, led the potash business, and managed the supply chain.

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Fertilizer crisis increases supply risk in Brazil

External constraints, credit, and logistics are driving increased demand for domestically produced goods and alternative energy sources

23.09.2026 | 08:23 (UTC -3)

Cultivar Magazine, based on information from Culture Comunicação



Restrictions in the international fertilizer market have led Brazilian buyers to anticipate negotiations and increase demand for already domestically produced products. The reduced supply of some inputs, particularly phosphates, is compounded by credit limitations and logistical risks. This scenario also encourages the search for new suppliers and alternative sources of nutrients.

According to Rafael Almeida, director of AgriConnection Fertilizers, the market is facing simultaneous pressure from geopolitical, financial, logistical, and commercial factors. Buyers with postponed purchases may encounter higher prices, lower availability, and difficulties receiving fertilizers within the necessary window for

crop application.

Deliveries slowed down

Fertilizer deliveries to the Brazilian market fell 5,4% in the first half of 2026, according to a survey by the National Association for the Diffusion of Fertilizers (Anda). Between January and June, the volume reached 19,02 million tons. In the same period of 2025, deliveries totaled 20,11 million tons.

In Mato Grosso, the increase in fertilizer prices has already raised production costs, according to Almeida. The pressure is concentrated on phosphate fertilizers. Nitrogen fertilizers offer greater possibilities for substitution between sources. Phosphorus presents fewer

alternatives for the producer.

Sulfur market

The international sulfur market exerts influence on this situation. According to Almeida, approximately 60% of the world's sulfur passes through the Strait of Hormuz. The raw material is used in the manufacture of phosphate fertilizers, including MAP, single superphosphate, and triple superphosphate.

The rise in raw material costs contributed to the shutdown of some phosphate plants in Minas Gerais and Goiás. Another factor came from China. The country suspended exports of some binary phosphate fertilizers destined for the Brazilian market

in 2026. This measure reduced the options available to buyers.

Supplier prospecting

Given this scenario, AgriConnection has intensified its search for international suppliers and alternative sources. The strategy includes purified MAP from Morocco as a complementary source of soluble phosphorus, potassium chloride of Canadian origin, and ammonium sulfate of Chinese origin.

According to Almeida, expanding the number of suppliers aims to reduce the risks associated with geopolitical events and the import process. The company has also begun prioritizing fertilizers that are already domestically produced. At certain

times, it has adopted advance purchase positions to ensure availability for customers.

The reorganization also extends to the nitrogen fertilizer market. The conflict in the Middle East has reduced the availability of urea from producing countries in the region. Part of the demand has shifted to other nitrogen sources. Ammonium sulfate, mainly of Chinese origin, has gained ground in this movement.

Volume traded

More than 50% of the volume traded by AgriConnection Fertilizers corresponds to nitrogen fertilizers. Ammonium sulfate is among the main products in this segment.

For Almeida, the drop in urea imports does not, in itself, imply a lack of nitrogen in the Brazilian market. Other sources can meet part of the demand.

In the phosphate sector, substitution presents greater limitations. The rise in sulfur prices has put pressure on the costs of products such as MAP, triple superphosphate, and single superphosphate. This trend increases attention to availability, acquisition time, and logistics.

The federal government has also adopted measures aimed at reducing external dependence. The Fertilizer Industry Development Program, Profert, established by Law 15.496/26, came into effect on September 4th. The law

stipulates a minimum participation of 2% of national synthetic and mineral fertilizers in the mixtures marketed in the country starting in July 2027. This percentage should reach 10% in 2037.

Expansion of operations

AgriConnection Fertilizers also projects an expansion of its operations in 2026. In 2025, its first full year of activity, the company negotiated 130 tons of fertilizers, with an approximate value of R$ 250 million. At the beginning of September 2026, the accumulated volume between deliveries made and contracted orders reached approximately 106 tons.

The company projects to surpass the 130 tons traded in the previous year. Revenue expectations point to growth between 20% and 25% in 2026, exceeding R$ 320 million. According to the company, this result stems from the expansion of operations, the increased value of fertilizers, and the greater participation of phosphates in the portfolio.

Over 80% of AgriConnection Fertilizers' volume follows the back-to-back model. In this format, buying and selling remain linked. This structure reduces the need to build up inventory and limits exposure to market fluctuations.



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Sumitomo Chemical presents new products for cotton farming at CBA

Company launches institutional campaign and second edition of the book "Ecophysiology of the Cotton Plant"

23.09.2026 | 08:15 (UTC -3)

Luis Fernando Duarte



Sumitomo Chemical is participating in the 15th Brazilian Cotton Congress (CBA),

from September 22nd to 24th, at Expominas, in Belo Horizonte (MG), with a program that brings together innovation, technical knowledge, and initiatives focused on the development of cotton farming. Highlights include the launch of the institutional campaign “Cotton Unites Us” on the 22nd, and the presentation of the second edition of the book “Ecophysiology of the Cotton Plant” on the 23rd. The company will also showcase its complete portfolio of solutions for the development of the crop at the event.

Considered one of the main events in the cotton production chain in the country, the 15th CBA will bring together producers, researchers, and industry leaders. In this environment, Sumitomo Chemical intends to expand its presence with a broad

program that combines scientific knowledge and technological development.

On Tuesday (September 22nd), the company launched the institutional campaign "Cotton Unites Us," which extends the purpose of the "Agriculture Unites Us" concept to cotton farming. This concept brings together the Japanese company's values ??for the farmer's success, meeting their needs and seeking sustainable development in the segment. For cotton farming, "Cotton Unites Us" expresses Sumitomo Chemical's commitment to the present and future of this Brazilian crop. "Alongside cotton farmers, the company builds relationships based on trust, technical knowledge, and proximity to the field, connecting families,

generations, and the entire cotton chain," says Luciano Jaloto, Marketing Director for Sumitomo Chemical Brazil.

“The 'Cotton Unites Us' campaign stems from the idea that the evolution of cotton farming is built by different people and sectors. We want to reinforce this connection and show that Sumitomo Chemical is always by the cotton farmer's side, bringing science, innovation, and knowledge so that they can overcome the constant challenges of the crop,” explains Jaloto, Marketing Director Brazil at Sumitomo Chemical. With a history and tradition in the segment, the company is involved in initiatives focused on the development of the supply chain, such as the “I'm from Cotton” movement by Abrapa, which will celebrate its 10th

anniversary in 2026 and seeks to value the fiber produced in Brazil and stimulate a responsible textile chain.



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Launch

On September 23rd, at 15 PM, the second edition of the book "Ecophysiology of Cotton" will be launched, sponsored by Sumitomo Chemical and officially presented at the company's booth during the congress. The first edition was launched at the CBA itself in 2024. The new publication is authored by researcher

Ricardo Andrade, researcher, professor, and consultant at Front Agrociência, and brings together content related to cotton physiology and the use of growth regulators.

This work addresses the role of hormones in different physiological events of the crop, such as germination, growth, flowering, and fiber formation, as well as showing how technicians and producers can use growth regulators to manage the ecophysiology of cotton in pursuit of greater operational efficiency, fiber quality, and productivity.

“Knowledge about plant physiology is an important tool for decision-making in the field. The book brings this knowledge closer to the producer's reality and

contributes to broadening the understanding of how different physiological processes can be managed throughout the cotton cycle, resulting in productivity gains and excellence in fiber quality," explains Lisane Castelli, Cotton Crop Manager at Sumitomo Chemical.

Knowledge that generates innovation

The release of the second edition of the book "Ecophysiology of Cotton" represents more than just Sumitomo Chemical's support for the dissemination of technical knowledge. The publication reinforces Sumitomo Chemical's vision that plant physiology is one of the main pillars of the

next evolution of agriculture, contributing to plants expressing their maximum productive potential even in the face of growing challenges posed by climate change and the various stresses encountered in the field.

This vision aligns with the concept of the so-called 5th wave of agriculture, based on the physiological management of plants. For Sumitomo Chemical, the combination of genetics, crop protection, digital agriculture, and plant physiology can help producers increase productive efficiency, optimize the use of resources such as water and nutrients, and reduce the impacts of adverse weather conditions throughout the growing season.

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Rovensa Next creates global operations department

Javier de Benito takes on a new role and will now coordinate 12 of the company's production units

23.09.2026 | 05:36 (UTC -3)

Cultivar Magazine, based on information from Anna Comellas



Rovensa Next has appointed Javier de Benito as Chief Operations Officer (COO), a newly created position to integrate the company's global operations. The executive will also join the Executive Committee and report directly to Ignacio Domínguez, President and CEO of the Rovensa Group.

The company created a global operations function under De Benito's leadership. This structure will bring together processes from the supply chain, production, distribution, customer service, and service delivery. The initiative aims to increase operational efficiency, regional integration, and responsiveness to customers.

De Benito will be responsible for the industrial, supply, and operations areas, as

well as customer service. Among his duties, the executive will coordinate Rovensa Next's 12 factories located in Europe, Brazil, Mexico, the United States, and South Africa.

According to the company, the centralization aims to increase coordination between regions and bring production planning closer to local agronomic needs. Rovensa Next also anticipates gains in product availability and in service to distributors and producers.

De Benito has extensive experience in industrial transformation, operational performance, and business integration in international markets. The executive has held strategic positions in the energy, chemical, agricultural, and industrial manufacturing sectors.

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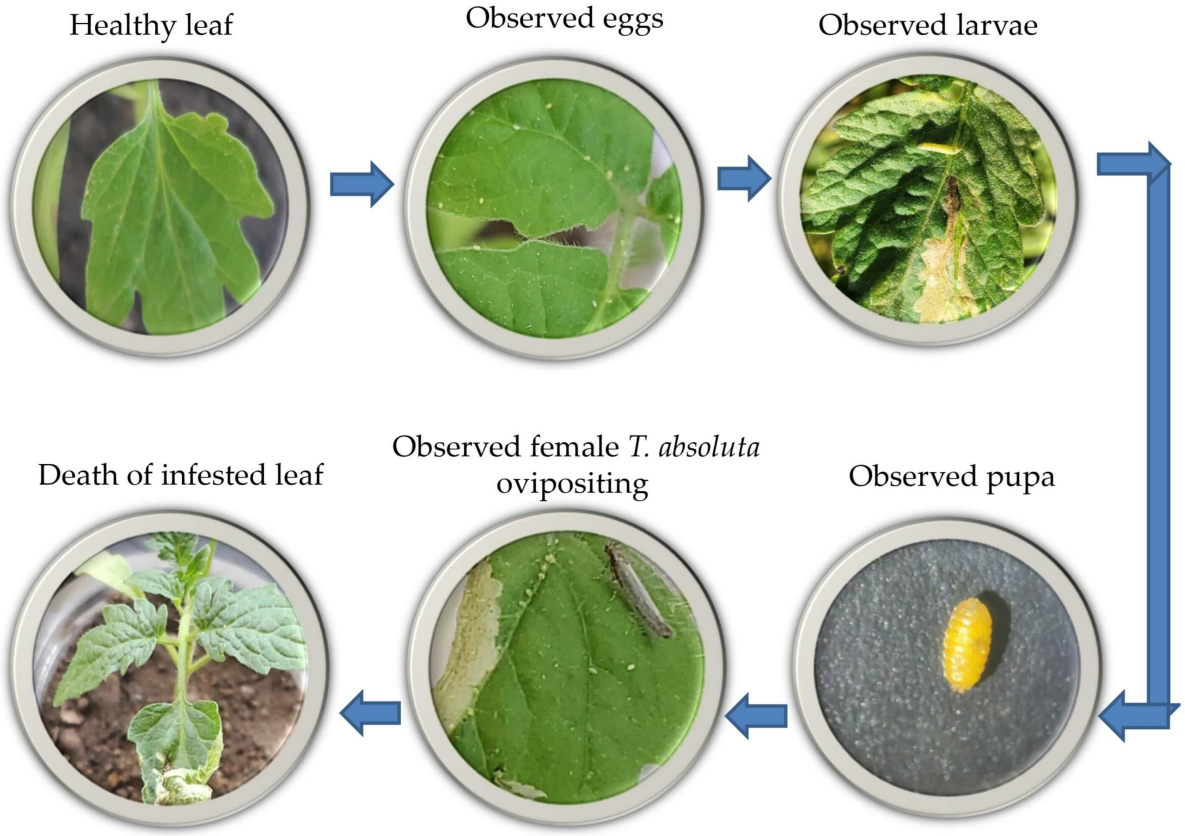
Companion plants reduce damage from Tuta absoluta in tomatoes

Allium schoenoprasum and Aeollanthus fruticosus reduced oviposition and damage in controlled tests

23.09.2026 | 05:21 (UTC -3)

Cultivar Magazine



Two companion plants showed potential for the ecological management of Tuta absoluta (Phthorimaea absoluta) in tomato crops. Researchers identified a repellent effect of Allium schoenoprasum and Aeollanthus fruticosus after tests in the laboratory, cages, and a screened house in Tanzania.

The study initially evaluated 14 species using a Y-tube olfactometer. Six plants repelled adult pests (doi 10.3390/insects17090977). Allium schoenoprasum and Aeollanthus fruticosus were among the treatments with the greatest response and proceeded to the next stages.

Double choice

In a double-choice cage test, tomatoes grown near Allium schoenoprasum showed 47,27% damaged leaves. The rate dropped to 33,94% with Aeollanthus fruticosus. Tomatoes grown alone registered 66,34% damage. Both treatments also reduced the number of eggs.

In the screened house, Allium schoenoprasum reduced leaf damage to 13,92%. Aeollanthus fruticosus registered 25%. The control without treatment reached 63,38%. In the treatment with synthetic insecticide, the damage was 9,62%. The difference between the insecticide and Allium schoenoprasum did not show statistical significance for this variable.

The combination of the two plants did not amplify the effect. The combined treatment resulted in 39,44% leaf damage.

Researchers point to the potential for including these species in the integrated management of Tuta absoluta. The results, however, came from controlled conditions. The work recommends evaluations in open fields, in different agroecological zones, as well as studies on compatibility with natural enemies and entomopathogens.

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P450 enzymes help caterpillars resist diamides

CYP321A8 and CYP6AB60 metabolized chlorantraniliprole and cyantraniliprole in in vitro assays

23.09.2026 | 04:05 (UTC -3)

Cultivar Magazine



Photo: Charles Olsen / USDA APHIS PPQ - Bugwood

A field population of Spodoptera litura, collected in Wuhan, China, showed 75,22 times greater resistance to chlorantraniliprole and 61,46 times greater resistance to cyantraniliprole compared to a susceptible laboratory population. Researchers attributed the result to the action of cytochrome P450 enzymes involved in the detoxification of insecticides.

Tests with piperonyl butoxide, a P450 inhibitor, increased the toxicity of both insecticides on caterpillars. Transcriptomic analysis identified six candidate genes: CYP321A10, CYP321A15, CYP321B1, CYP321A8, CYP6B38, and CYP6AB60.

All showed increased expression in the field population. CYP321A10 showed a

117,61-fold increase. CYP321A8 reached 22,37 times and CYP321B1, 14,35 times. The expression of all six genes was concentrated in the midgut.

Overexpression and tolerance

The researchers also inserted these genes into Drosophila melanogaster. Overexpression increased tolerance to chlorantraniliprole and cyantraniliprole, reinforcing the role of P450s in the response to these compounds.

Biochemical assays confirmed the direct action of CYP321A8 and CYP6AB60 on the two diamides. CYP321A8 reduced cyantraniliprole by 28,18% and

chlorantraniliprole by 23,40%. CYP6AB60 promoted reductions of 10,13% and 14,53%, respectively.

CYP321A8 also gave rise to greater metabolite diversity through hydroxylation, N-demethylation, cyclization, and cleavage. The results indicate the potential of these genes as markers for monitoring resistance and supporting management strategies for Spodoptera litura (doi 10.1016/j.pestbp.2026.107355).

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Bayer predicts fourth generation of Bollgard for 2028

Technology should bring together new proteins to combat caterpillars and thrips and expand herbicide options

22.09.2026 | 17:09 (UTC -3)

Cultivar Magazine



Bayer plans to launch the fourth generation of Bollgard technology for cotton in Brazil in 2028. The new platform should incorporate four proteins for lepidopteran control, an additional protein against thrips, and two new mechanisms related to weed management.

The protein designed to control thrips represents a novelty in the Brazilian market, explains Eduardo Corrêa, cotton marketing manager at Bayer. The pest occurs at the beginning of cotton plant development and has a sucking habit. For caterpillar control, the fourth-generation Bollgard will have four proteins targeting the main species present in Brazilian cotton farming.

Technology should also expand the range of herbicide tolerance options. The current generation includes glyphosate, glufosinate, and dicamba. The new platform will add mesotrione and PPO. Bayer seeks to broaden the alternatives available to producers for weed management.

Evolution of technology

This development continues the evolution of Bollgard in the country. The first generation arrived in Brazil about 20 years ago, with a protein for controlling lepidopteran pests. The second generation, launched between 2013 and 2014, added another protein for this group of insects and glyphosate tolerance.

Bollgard III arrived in 2021 with three proteins for controlling lepidopteran pests.

The varieties destined for the fourth generation undergo testing, selection, and multiplication. The company conducts these steps in parallel. The lines advance through an annual selection process, while the best ones continue with multiplication.

In Brazil, Bayer maintains a seed multiplication program during the summer growing season in the Cerrado region. Another program operates during the winter growing season in the North and Northeast. The shorter cycle in these regions allows for seed harvesting and their availability for planting in the following summer crop.



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Abrapa highlights management, quality, and natural fibers during the Cotton Congress

Gustavo Piccoli points to costs, market opening, and cotton price increases as priorities for the sector

22.09.2026 | 10:58 (UTC -3)



Cost management, fiber quality, market access, and the valorization of cotton as a natural fiber were highlighted at the opening of the 15th Brazilian Cotton Congress. The president of the Brazilian Cotton Producers Association (Abrapa), Gustavo Piccoli, advocated for careful decision-making in the face of high interest rates, production costs, climate uncertainties, and trade tensions.

Piccoli stated that the sector needs to evaluate investments, monitor demand, and work with different scenarios. In the assessment presented during the congress, competitiveness involves efficiency, quality, economic sustainability, and management capacity.

International market

The president of Abrapa also highlighted the trajectory of Brazilian cotton in the international market. According to him, Brazil currently holds the position of the world's largest exporter of the fiber. This result stems from decades of investment in the field, research, professionalization of farms, organization of state associations, and technological advancement.

Quality has gained prominence in this trajectory. Piccoli reported that more than 97% of Brazilian cotton meets the highest standards of the global textile industry. He also cited the Brazilian quality program, which has been active for ten years. According to his speech, technical advancements have led Brazil to become

a provider of reference material used in international interlaboratory rounds.

The expansion of sales to India was cited as an example of commercial progress. Piccoli reported shipments close to eight thousand tons two years ago. The volume reached 350 thousand tons in the last commercial year mentioned in the speech. According to him, more than a third of the cotton imported by the Indian market originates from Brazil.

Economic environment

Despite the expansion, the director urged caution regarding the economic environment. Fertilizers, pesticides, transportation, energy, and oil remain among the components with a direct

impact on costs. High interest rates also increase the cost of capital and influence investment decisions.

International conflicts, trade tensions, and climate uncertainties complete the scenario presented by Abrapa. These variables can alter prices, costs, and international trade flows. According to Piccoli, producers do not control a large part of these factors, but they can improve the quality of decisions made on their farms.

The organization's president also linked the competitiveness of Brazilian cotton to the institutional environment. He cited legal certainty, regulatory stability, infrastructure, logistics, credit, rural insurance, and risk management instruments. Reducing Brazil's vulnerability in the supply of

fertilizers was also on the agenda.

Piccoli advocated for the advancement of bio-inputs and the implementation of tax reform capable of preserving the competitiveness of the supply chain. In foreign trade, he pointed to the need to maintain open markets, diversify destinations, and expand international recognition of cotton produced in the country.

Natural fibers

The appreciation of natural fibers formed another central theme of the discussion. The congress's theme highlights Brazilian cotton as a natural fiber within a journey based on purpose, quality, and transparency. Abrapa aims to broaden the

debate on sustainability, synthetic fibers, and microplastics with the support of science, research, information, and transparency.

Piccoli classified cotton as a natural, renewable, and biodegradable fiber. He also associated Brazilian production with the use of technology, traceability, and international sustainability standards. According to the executive, research and innovation need to advance along with knowledge about the impacts related to synthetic fibers and microplastics.

The president of Abrapa also highlighted the importance of joint action among the different links in the chain. Producers, researchers, industry, suppliers, specialists, and entities are participating in the congress debates. The proposal

involves building common responses to the economic, technological, commercial, and environmental challenges faced by the sector.

According to Piccoli, the growth of Brazilian cotton farming required investment, research, and organization. The country's continued presence among the main players in the global market will now depend on the quality of decisions, productive efficiency, and the capacity for coordination among the agents in the supply chain.



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Tomato trichomes limit the action of Chrysoperla carnea

Study indicates better performance of Nesidiocoris tenuis against Tuta absoluta in tomato plants

22.09.2026 | 07:15 (UTC -3)

Cultivar Magazine



Photo: Celeste Welty / Ohio State University - Bugwood

The trichome architecture of tomato plants reduced the efficiency of Chrysoperla carnea in controlling Tuta absoluta eggs. In whole tomato plants, adult female Nesidiocoris tenuis consumed 54,4 eggs per plant in 24 hours. Third-instar larvae of Chrysoperla carnea consumed 5,07 eggs in the same period.

Researchers compared the two predators in laboratory assays, whole plants, and semi-open cages (doi 10.3390/insects17090974). Under artificial conditions, both species showed high predatory capacity. Consumption increased with development. Adult females recorded the highest performance in Nesidiocoris tenuis. In Chrysoperla carnea, the peak occurred in the third larval instar.

Bigger difference

The difference increased in the tomato plant. After 24 hours, 86,7% of Chrysoperla carnea larvae had left the plants. In cages with continuous oviposition of Tuta absoluta, treatment with this predator did not show a significant difference compared to the control without predator after 48 hours.

The results were different for eggplant, Solanum melongena. Chrysoperla carnea larvae consumed 79,5 eggs per plant in 24 hours. Nesidiocoris tenuis females consumed 61,9 eggs. Only 26,7% of Chrysoperla carnea larvae left the eggplant.

Performance and surface

The researchers linked the performance to the structure of the plant surface. The trichomes of Solanum lycopersicum had an average length of 4,14 millimeters. In Solanum melongena, they measured 0,48 millimeters. Eggplant showed the highest density, with 489,9 trichomes per square centimeter, compared to 77,4 in tomato plants.

The data indicate the influence of plant architecture on the movement and persistence of natural enemies. In tomato plants, Nesidiocoris tenuis maintained a greater capacity for control. Chrysoperla carnea showed better performance in

plants with short trichomes, such as eggplant.

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Syngenta announces microRNA technology to boost productivity

The Exort platform uses natural signals from plants and will have its first products expected in 2027

22.09.2026 | 05:40 (UTC -3)

Cultivar Magazine, based on information from Syngenta

Syngenta announced Exort technology, a biological platform based on natural plant microRNAs. According to the company, foliar applications in reduced doses helped

increase productivity in rice, soybeans, corn, cotton, vegetables, and fruits in trials conducted over several years and in different regions.

The technology utilizes selected microRNAs, natural molecules involved in the regulation of biological processes. These compounds act as cellular signals and influence the use of genetic instructions by plants. Exort's proposal consists of applying naturally occurring microRNAs in the field to favor the use of the crop's own resources.

Consistent gains

Syngenta claims to have observed consistent yield gains in a large-scale

biological experimentation program. The company also cites effects on grain size and commercial characteristics of vegetables and fruits. The planned management does not require changes to normal field routines, according to the statement.

The development brings together internal research in genomics, bioinformatics, and plant science. The discovery of microRNAs received recognition with the 2024 Nobel Prize in Physiology or Medicine.

The first products based on Exort technology are scheduled for release starting in 2027. Syngenta plans a gradual introduction in approximately 20 countries and across various crops in the following years.

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ADM plans to enter the voluntary carbon market

Projeto em Nebraska prevê a remoção de mais de 800 mil toneladas de CO2 por ano

21.09.2026 | 16:36 (UTC -3)

Cultivar Magazine, based on information from Jackie Anderson



A ADM anunciou hoje (21/9) que planeja entrar no mercado voluntário de remoção de dióxido de carbono (CO2), com créditos gerados a partir das operações de captura

de carbono em seu complexo de processamento de milho em Columbus, Nebraska, nos Estados Unidos. A capacidade de remoção prevista é superior a 800 mil toneladas de CO2 por ano.

The credits are in the process of certification and issuance by Puro.earth, a company specializing in infrastructure for carbon dioxide removal through engineering. The project follows the Geologically Stored Carbon methodology, in its 2024 edition.

According to ADM, certification and the issuance of the first credits are expected by the end of this year. After the certification and verification process is complete, the company anticipates a 15-

year credit generation period.

“A ADM tem mais de uma década de experiência em suporte à captura e armazenamento geológico de carbono, incluindo a operação de poços Classe VI em nossa unidade de Decatur, Illinois. Essa experiência, juntamente com o sistema de transporte e sequestro de CO2 da Tallgrass e as capacidades de outros participantes do projeto, nos posiciona para conectar a produção agrícola com os crescentes mercados de remoção de carbono em grande escala”, afirmou Kris Lutt (nna foto), vice-presidente de Inovação e Crescimento da ADM.

According to Lutt, the company already works with clients in its value chains to support emissions reduction targets and

intends to expand this work to other sectors.

Capture and storage

ADM and Tallgrass, an energy infrastructure company, began carbon capture and storage (CCS) operations in Columbus in 2025.

Biogenically sourced CO? is captured during the fermentation of ethanol produced at ADM's corn processing plant. The gas is then purified, compressed, and transported to the Tallgrass Carbon Sequestration Center in eastern Wyoming.

No local, o CO2 é destinado ao armazenamento subterrâneo permanente por meio de poços de captura e

armazenamento de carbono regulamentados por licença Classe VI do Departamento de Qualidade Ambiental do Wyoming.

For Jan-Willem Bode, president of Puro.earth, the project certification involves measurement processes, data collection, and independent auditing. "Certifying carbon removal on this scale requires rigor," he stated. According to him, the process aims to ensure the necessary measurement and verification criteria for issuing the credits.

ADM states that it sees carbon capture as part of a broader strategy of investing in low-carbon solutions. The company also cites initiatives related to regenerative agriculture and renewable natural gas.

The company has over 650 employees in Nebraska. The Columbus complex houses wet and dry corn processing units, used in the production of food ingredients, fuels, and animal feed.

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Aenda celebrates 40 years of operation in agribusiness

The organization was founded in 1986 and participated in debates on the regulation of pesticides and bio-inputs

21.09.2026 | 16:04 (UTC -3)

Antonio Villari, Cultivar Magazine edition



AENDA
ASSOCIAÇÃO NACIONAL DAS EMPRESAS DE PRODUTOS FITOSSANITÁRIOS

The National Association of Plant Protection Products Companies (Aenda) celebrates 40 years of activity in the sector

this week. Founded on September 26, 1986, the organization has participated, throughout its history, in discussions related to the regulation and development of technologies aimed at crop protection in Brazil.

Among the regulatory milestones monitored by the association are the Pesticides Law (Law No. 7.802/1989), the registration of products by equivalence and, more recently, discussions related to the modernization of agricultural pesticide legislation and the Bioinputs Law.

According to Aenda's CEO, Luis Ribeiro (pictured), the four decades of activity reflect the organization's participation in the sector's transformations. “Celebrating 40 years is recognizing continuous work

and great dedication to the sector's development. Our history is intertwined with the very evolution of agriculture in Brazil, always working in a harmonious and transparent manner with companies, regulatory bodies, and entities to overcome regulatory challenges and open opportunities for growth and security for plant protection products," he states.

According to Ribeiro, the organization also advocates for the availability of different alternatives for phytosanitary management in crops. "We defend the plurality of effective, safe, and competitive phytosanitary solutions for rural producers and we work to ensure that the advancement of agricultural productivity always goes hand in hand with

environmental responsibility and food security," he says.

Regulatory action

When it was founded in 1986, the agricultural pesticides sector was still regulated by rules dating back to the 1930s. Aenda claims to have participated in the debates that preceded the creation of the Pesticides Law, enacted in 1989.

The organization also cites among its areas of activity the support for the creation of initiatives related to the disposal of empty packaging, such as the National Institute for the Processing of Empty Packaging (Inpev), and participation in discussions that resulted in the adoption of product registration by equivalence.

In recent years, the association has also become involved in debates on updating pesticide legislation and its regulation, as well as the Bioinputs Law and the regulations governing the sector.

In 2026, Aenda also integrated the actions of the educational project "Producing Safe Food," which brings together training activities from the State Program for the Analysis of Pesticide and Related Substances Residues in Products of Plant Origin (Peara-POV). The initiative is conducted by the Agricultural Defense of São Paulo, linked to the Secretariat of Agriculture and Supply (SAA).

According to Ribeiro, among the upcoming challenges are the digitalization of the field and scientific and technological advancements applied to agriculture. “The

future presents us with new challenges, such as the digitalization of the field, the frontiers of science, and technological innovation. We are committed to leading these agendas with the same vigor and integrity as in the last four decades," he states.

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Resistance of Ostrinia nubilalis to Cry2Ab2 shows high stability

Study points to autosomal recessive inheritance linked to a single gene in a Wisconsin population

21.09.2026 | 10:12 (UTC -3)

Cultivar Magazine



Photo: Mariusz Sobieski / Bugwood

Researchers characterized the inheritance and stability of high resistance to the Cry2Ab2 protein in an Ostrinia nubilalis strain derived from insects collected in Wisconsin, USA. The strain had already been established in a previous study by F2 screening and underwent backcrosses and further selection before this work. The trait showed autosomal, functionally recessive inheritance consistent with control by a single gene or by a few strongly linked genes. Resistance persisted for 17 generations without selection pressure with Cry2Ab2 (doi 10.1002/ps.71336).

The resistant strain showed an estimated median lethal concentration of 189.329 nanograms per square centimeter. In the susceptible strain, the value was 139,7

nanograms per square centimeter. This corresponded to a resistance 1.355,3 times greater. Since the mortality of the resistant strain did not exceed 13,2% at the tested concentrations, this value is an extrapolation, and the 95% confidence interval is very wide (from 25.014 to 616.283.587 nanograms per square centimeter).

Maternal effect

Reciprocal crosses showed no significant differences in response to the protein. The result ruled out maternal effect and sex linkage. Heterozygous offspring had median lethal concentrations of 181,8 and 208,0 nanograms per square centimeter, with resistance ratios of only 1,3 and 1,5

compared to the susceptible line.

However, recessiveness depended on concentration. According to Stone's dominance index, resistance was almost completely recessive (-0,93 and -0,89). According to effective dominance, it was incompletely recessive between 90 and 270 nanograms per square centimeter (0,31 to 0,37), almost completely recessive at 360 (0,07), and completely recessive at 540 and 900, where the value was zero.

Tests with F2 generations and backcrosses also followed the expected proportions for monogenic Mendelian inheritance. Chi-square tests showed no significant difference between expected and observed mortality at 540 and 900 nanograms per square centimeter.

Lineage survival

The stability was noteworthy. The survival rate of the resistant strain ranged from 87,5% to 100% in the first, sixth, and 17th generations, even under concentrations of up to 5.400 nanograms per square centimeter, with no significant generation effect. There was no significant reduction in resistance after the removal of selection pressure. The authors note that this applies, at least, to the conditions tested, i.e., bioassays in a diet with evaluation after seven days. The evaluation was performed in three non-consecutive generations (G1, G6, and G17).

Researchers highlight implications for resistance management in Bt maize. The

high-dose strategy combined with refuge relies on the elimination of heterozygous individuals. The observed recessiveness favors this principle, but only if the expression of Cry2Ab2 in plants consistently reaches the concentrations at which resistance has proven to be completely recessive. This expression varies between tissues.

In corn variety MON 89034, for example, Cry2Ab2 reached 160 to 180 micrograms per gram of dry weight in the leaves and 62 in the stalk. Since young larvae feed mainly on leaves and older larvae bore into the stalk, scientists point out that the high-dose requirement can be met in the leaves, but not in the stalk. Furthermore, the persistence of resistance without exposure to Cry2Ab2 may increase the

management challenge, because the population may remain resistant even without selection pressure.

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Vylor plans to produce up to 300 new hybrids and varieties per year

A document submitted to the SEC details licensing goals, genetic gain, research, and seed business performance

21.09.2026 | 09:06 (UTC -3)

Cultivar Magazine



Vylor plans to add between 200 and 300 hybrids and seed varieties to its portfolio each year. The future company also

projects reaching US$1 billion in annual net royalty revenue by 2035. These goals are outlined in the registration document filed with the U.S. Securities and Exchange Commission (SEC) on September 21st. The document details the company's strategy following the separation of its seed business from Corteva.

The plan increases the importance of licensing germplasm and genetic traits in Vylor's strategy. The company intends to move from being a net licensee of technologies to a net licensor.

Vylor anticipates revenue-to-cost neutrality for royalties by 2026. The company then projects growth to a net profit of US$1 billion by 2035. This model allows for the

monetization of research and development outside of the company's own brands as well.

Market estimate

The administration estimates an annual market of US$4 billion for licensing agreements for corn and soybean seeds in the Americas. The strategy envisions contracts linked to sales of third-party seeds and planted area using licensed technologies.

The timeline includes corn traits with three combined technologies available for licensing starting in 2027. Vylor also intends to bring forward the release of the third generation of traits aimed at

controlling aboveground corn insects to the end of this decade. Another initiative foresees entry into the cotton technology licensing segment in the United States.

Portfolio renewal

Renewing the portfolio will form another pillar of the plan. The goal of 200 to 300 new hybrids and varieties per year includes materials with genetic and agronomic characteristics focused on productive potential, performance stability, and risk reduction for producers. The strategy encompasses corn, soybeans, sunflowers, and wheat, in addition to canola, cotton, rice, and sorghum.

Gene editing will play an increasingly important role in this process. Vylor estimates the potential to increase the annual rate of genetic gain from about 1% to 2%. The technology integrates research and development programs and seeks targeted modifications in specific crops. The company plans to combine internal capabilities with external partnerships to increase the productivity and resilience of materials.

Investments in research help to scale this strategy. The seed business recorded US$995 million in research and development expenses during 2025. The value had reached US$915 million in 2024 and US$842 million in 2023. In the first half of 2026, these expenses totaled US$513

million, compared to US$495 million in the same period of the previous year.

Financial data

The document also presents specific financial data for the deal intended for Vylor. Net seed sales totaled US$9,898 billion in 2025. Net income reached US$575 million. In 2024, sales totaled US$9,545 billion.

The Americas accounted for US$7,885 billion of 2025 sales. This represents a 4% increase over the previous year. Operating EBITDA for the Americas segment reached US$2,813 billion, a 16% increase. The company attributed part of the volume increase to market share gains in corn in

the United States and Brazil.

The Brazilian market accounted for US$1,160 billion in seed sales during 2025. In 2024, the value totaled US$1,017 billion. In 2023, it reached US$1,002 billion. Vylor includes Brazil among the markets in which it holds a leading position in corn seed revenue.

In the first half of 2026, seed business sales reached US$7,555 billion, compared to US$7,244 billion in the same period of 2025. In the Americas, revenue increased from US$5,890 billion to US$6,109 billion. The company cited an improved product mix in Brazil as one of the positive factors during this period.

Vylor's operating EBITDA for the Americas reached US$2,894 billion in the first half of

the year, a 9% year-over-year increase. Vylor attributed the performance to higher volumes in the United States, improved pricing and product mix in both the United States and Brazil, and a reduction in net royalty expenses. Higher expenses related to sales, administration, and research, as well as increased expenses related to non-performing loans in Brazil, limited the overall result.

Vylor will consolidate Corteva's current seed business following the planned separation on October 1st. Pioneer will fall under the new company. The structure will also focus on germplasm, biotechnology, gene editing, and licensing platforms.

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Genes increase tolerance of Aphis spiraecola to imidacloprid

Silencing CYP6CY19 and CarE6 increased aphid sensitivity to the insecticide in the laboratory

21.09.2026 | 07:36 (UTC -3)

Cultivar Magazine



Photo: Jesse Rorabaugh - CC0 1.0

Researchers have identified two genes linked to the response of Aphis spiraecola to imidacloprid. Silencing CYP6CY19 and CarE6 increased the aphid's sensitivity to the insecticide, while silencing three other genes (CYP380C6, GSTS3, and GSTL) did not alter susceptibility. The study analyzed a population collected from an apple orchard in Zhengzhou, China.

The bioassay indicated a median lethal concentration (LC50) of 13,61 milligrams per liter after 24 hours. Exposure to the product increased the activity of three groups of detoxification enzymes: cytochrome P450, glutathione S-transferase, and carboxylesterase. In the LC50, P450 activity reached 1,64 times that of the control (64% higher),

glutathione S-transferase activity reached 1,16 times (16% higher), and carboxylesterase activity reached 2,89 times (approximately 189% higher).

Inhibitors in the assay

Assays with inhibitors reinforced the involvement of P450 and carboxylesterases. Piperonyl butoxide (PBO), a P450 inhibitor, increased mortality to 68,71%, or 1,37 times that of the control group (imidacloprid alone). Triphenyl phosphate (TPP), associated with esterase inhibition, increased mortality to 62,47% (1,26 times that of the control). Diethyl maleate (DEM), used against glutathione S-transferases, did not produce a significant synergistic effect.

Transcriptome analysis identified 46 P450 genes, 42 esterase genes, and six glutathione S-transferase genes. Five genes showed a significant increase in expression after exposure, confirmed by qPCR: CYP380C6, CYP6CY19, GSTS3, GSTL, and CarE6.

RNA interference

Researchers used RNA interference to assess the function of these five genes. Reduced expression of CYP6CY19 increased mortality after imidacloprid exposure at both LC30 and LC50 concentrations, and silencing CarE6 also increased susceptibility at both concentrations. However, silencing CYP380C6, GSTS3, and GSTL did not

significantly alter mortality.

The results indicate that, among the genes tested, only CYP6CY19 and CarE6 contribute to aphid tolerance to imidacloprid. Since the evidence is indirect (gene expression, inhibitors, and RNAi), the direct catalytic role of these enzymes in insecticide degradation still needs to be demonstrated, which the authors propose to do using recombinant enzymes, in vitro metabolism assays, and metabolite detection by LC-MS/MS (doi 10.3390/insects17090973).

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The US is evaluating regulatory approval for two Bayer cotton products

Events MON 96012 and MON 89151 enter public consultation after preliminary evaluations by APHIS

21.09.2026 | 07:15 (UTC -3)

Cultivar Magazine



Photo: Wenderson Araujo / CNA

The U.S. Animal and Plant Health Inspection Service (APHIS) has opened a public consultation on Bayer Crop Science's requests to deregulate two genetically engineered cotton varieties. Submissions may be made until November 20, 2026.

The first request involves MON 96012. The event exhibits tolerance to the herbicides glyphosate, glufosinate, dicamba, 4-hydroxyphenylpyruvate dioxygenase inhibitors (HPPD) of the triketone class, and PPO inhibitors. Bayer has requested APHIS to determine its unregulated status.

The second process deals with MON 89151. The cotton plant expresses three insecticidal proteins: Vip3Cb1.1, Cry1Da_7, and Cry1B.3. The technology

aims to protect against damage caused by the feeding of target lepidopterans.

APHIS conducted preliminary plant pest risk assessments for both events. In both cases, the agency compared the genetically modified materials with the respective non-modified cotton plants. The preliminary analyses indicated a low probability of increased plant pest risk.

After the consultation period ends, APHIS will evaluate the comments and other available information. The agency may approve or deny each application for unregulated status under the rules of Title 7, Part 340, of the Code of Federal Regulations.

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Body size affects thermal acclimation of Solenopsis invicta

Medium and small worker ants developed tolerance to cold and heat after 15 days of exposure

20.09.2026 | 16:09 (UTC -3)

Cultivar Magazine



Photo: Johnny N Dell - Bugwood

Thermal acclimation increased the resistance of medium and small Solenopsis invicta workers to extreme temperatures. Large workers showed low mortality even without acclimation. The result indicates a relationship between body size and thermal plasticity in the invasive species.

Researchers exposed large, medium, and small worker ants to moderate cold or heat for 15 days. The cold treatment used nine degrees Celsius for two and a half hours a day. The heat treatment used 30 degrees Celsius for the same daily period. Afterward, the insects faced temperatures of minus one, one, 35, or 37 degrees Celsius for two hours.

Reduced mortality

Cold acclimation reduced mortality in medium and small worker ants by less than one degree Celsius. Heat acclimation also increased the tolerance of these groups below 35 degrees Celsius. Among large worker ants, the treatments did not produce a significant survival gain under these conditions.

RNA analysis showed a size-dependent molecular response. Medium-sized worker bees exhibited the highest number of differentially expressed genes. The processes involved included lipid and small protective molecule metabolism, cuticle and membrane maintenance, ion transport, antioxidant detoxification, and

sensory signaling.

Reduction in genes

The researchers also detected a sharp reduction in the expression of hundreds of genes linked to odor receptors in average worker ants acclimated to both cold and heat. Heat shock proteins showed smaller variations after prolonged acclimation, in contrast to responses already observed after acute heat stress.

The study indicates a potential effect of acclimation on the climatic adaptation of Solenopsis invicta and on its capacity for geographic expansion (doi 10.3390/insects17090971).

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AI advances in bee monitoring, but faces limitations in the field

A review of 140 studies points to generalization among beehives as the main challenge for practical use

20.09.2026 | 11:03 (UTC -3)

Cultivar Magazine



Photo: Catia Urbanetz / Embrapa

Artificial intelligence has expanded the ability to monitor honeybee colonies, identify parasites, and track individuals, and is beginning to be applied to predicting events such as swarming, although predictive analysis is still a largely unexplored frontier. However, models have difficulty transferring between hives, apiaries, and environmental conditions, which limits the use of these tools in beekeeping. This conclusion appears in a systematic review of 140 studies published between 2011 and 2025. The work brought together applications of machine learning, computer vision, signal processing, and deep learning.

The researchers organized the studies based on biological questions, rather than

computational techniques. The analysis encompassed seven areas: monitoring colony health, tracking and re-identification of individuals, detection of Varroa destructor and diseases, monitoring hive entry and traffic, classification of species and subspecies, analysis of the waggle dance and social behavior, as well as pollen and foraging. The focus is on honeybees in general, which includes studies with Apis mellifera and Apis dorsata (doi 10.1016/j.compag.2026.112426).

Colony health

Colony health monitoring accounted for 52 of the 140 studies. This category includes identifying the presence of the queen,

predicting swarming, detecting anomalies and stresses, estimating productivity, and multimodal monitoring. Scientific production gained momentum after 2018. Applications of classification and monitoring with predictive analysis led this growth.

Among the computational tasks, 54 studies addressed health monitoring and predictive analysis. Another 40 dealt with classification, 26 with pose tracking or estimation, and 20 with detection. The results show progress from rule-based systems and isolated sensors, through classical machine learning, to neural networks capable of working with video, audio, and time series from sensors.

Main restriction

The main limitation lies in validation. Many models exhibit high performance within the same hive, the same apiary, or the same image conditions, but lose quality in new contexts. In acoustic studies on queen presence, the performance of convolutional networks fell below chance in hives not included in the training, and the recordings grouped by hive identity, not by queen status. This indicates that the models learn colony-specific signals.

The review notes that the queen's condition may be intertwined with hive construction, colony size, microphone placement, or genetics. Tests on hives excluded from training are uncommon:

none of the acoustic swarming studies have performed them, and in the area of ??colony health, most work uses one or a few hives.

Limited data

The limited amount of data also affects the results. In several cases, classical methods outperformed deep networks. In a dataset of 19.597 samples, a 31-coefficient MFCC acoustic descriptor combined with random forest achieved 0,99 across five evaluation metrics, ahead of four pre-trained convolutional networks.

The pattern also appears outside of acoustics: in Varroa mite detection in hyperspectral images, PCA with SVM

located 37 out of 38 mites (F1 of 0,99), while Faster R-CNN, trained with only six images, had an F1 between 0,85 and 0,89. The researchers associate this behavior with the reduced availability of data for more complex architectures. Deep learning, however, remains essential in detection, long-duration tracking, and multi-stage systems.

Swarming forecast

Swarming prediction shows progress, but with still limited evidence. Studies have used sound, temperature, weight, humidity, atmospheric pressure, and hive vibrations. A low-cost multisensor system indicated swarming 24 to 48 hours in advance, with 85% accuracy and an F1 of

0,69. However, the database had only 11 confirmed swarming events, compared to 51 sequences without swarming, and did not explicitly adopt independent hive division.

An approach based on vibrations recorded in the honeycomb produced average alerts between approximately 10 and 22 days before the event, but without validation that excluded an entire colony, and some of the sets came from accelerometers installed in different frames of the same hive. Acoustic classifiers, on the other hand, achieved approximately 99% accuracy within the same dataset, without testing on hives excluded from training. The review highlights that differences between databases, sensors, prediction horizons, and validation protocols prevent a direct

comparison of performance.

Multimodal systems also yielded relevant results. A network based on cross-attention combined images of the hive entrance with internal audio and achieved 93% accuracy in four sanitary condition classes, under five-partition cross-validation. The best model based solely on images reached 70%, and the best based solely on audio, 81%. The greatest gain appeared in the class related to pesticide exposure, where the F1 score rose from 48% to 91%. This is the clearest example of modal fusion in a single model, a practice still rare in the literature.

Permanent sensors

The review also points to the potential for permanently installed sensors. Cameras, microphones, and equipment for temperature, humidity, carbon dioxide, and weight can generate continuous data without frequent hive opening. Automation can reduce some manual inspection and expand the scale of apiary monitoring. However, operational use depends on systems capable of maintaining performance after changes in location, equipment, season, and colony.

The researchers present four priorities for the next stage in the field. The first is to create public reference databases with multiple apiaries, standardized divisions, fixed metrics, and mandatory evaluation with separation between training and test hives. The authors consider this to have

the greatest impact in the short term and a prerequisite for evaluating the others. The second is to test whether self-supervised pre-training and foundational vision and audio models reduce dependence on small sets and improve generalization between hives. The third is to move from descriptive monitoring to predictive analysis, with longitudinal and multidomain systems that integrate, over days or weeks, signals such as health, traffic, pollen intake, and dance communication. The fourth is to design systems attentive to field deployment conditions, with interpretable outputs, supported by explainable artificial intelligence, and calibrated uncertainty estimates. Along these lines, the article cites autonomous agentic systems as an emerging paradigm, with the caveat that

irreversible actions, such as chemical treatments, require strict human supervision.

The synthesis indicates a shift in research focus. According to the authors, the field has already gone beyond proof of concept: it is possible to detect, classify, track, and count under controlled conditions. What is lacking is demonstrating consistent performance in colonies, apiaries, and conditions different from those used in the development of the models.

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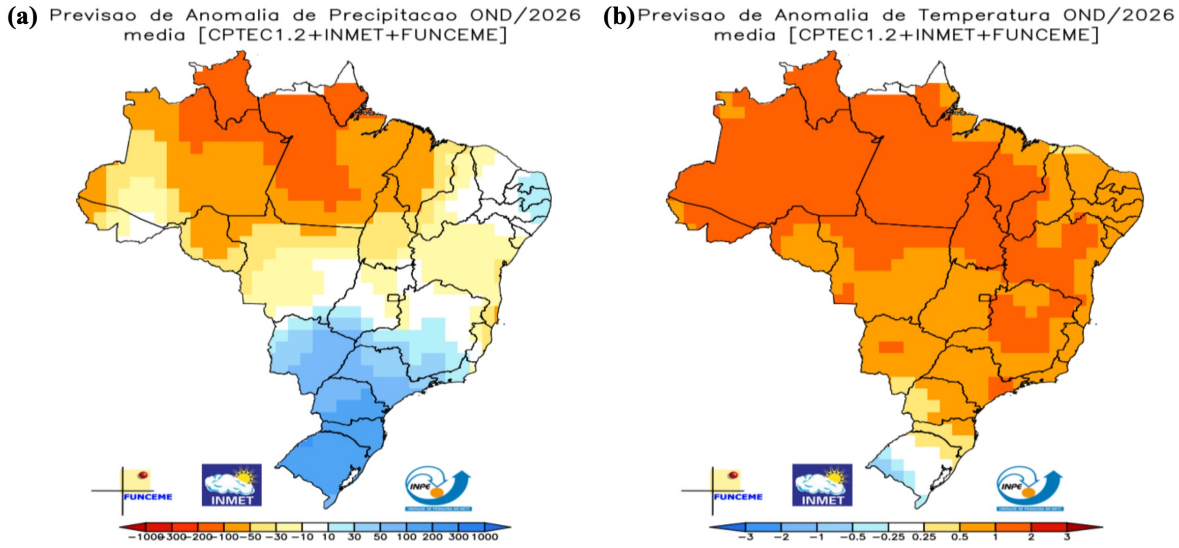
A very strong El Niño is expected to mark the spring of 2026 in Brazil

Forecast indicates irregular rainfall in the North-Central region and excessive rainfall in the South, impacting the 2026/27 harvest

20.09.2026 | 10:25 (UTC -3)

Cultivar Magazine, based on information from Inmet



Forecast of anomalies in (a) precipitation (mm) and (b) average air temperature (°C) for the October, November, December 2026 quarter, produced jointly by Inmet, Cptec/Inpe and Funceme.

The spring of 2026 is expected to occur under the influence of a very strong El Niño, with distinct effects on rainfall

distribution and temperatures in Brazil. The joint forecast from Inmet, Inpe, and Funceme indicates a precipitation deficit in much of the North-Central region, excess rainfall in the South, and above-average temperatures across a large area of ??the country. This scenario demands attention to planting planning and water management during the beginning of the 2026/27 growing season.

Projections released by NOAA/CPC indicate a 98% probability of very strong El Niño conditions in the October-December 2026 quarter. This classification considers values ??equal to or greater than 2 degrees Celsius in the Relative Oceanic Niño Index for the Niño 3.4 region. Surface waters in the Equatorial Pacific have

recorded positive anomalies since March 2026.

South

The Southern Region is expected to have above-average rainfall in all three states. Rio Grande do Sul and Santa Catarina may register accumulations up to 200 millimeters above the historical average for the quarter. Temperatures are expected to exceed the average in much of the region. In eastern Paraná, positive deviations may reach 1 degree Celsius. Rio Grande do Sul tends to register values ??close to the average, with negative anomalies of up to 0,5 degrees Celsius in the south of the state.

The higher frequency of rainfall in the South can favor summer crops and pastures with adequate nutrition. Conversely, rainy periods can reduce the available windows for agricultural operations and hinder the entry of machinery into the fields.

In irrigated rice-growing areas, excess water deserves attention, especially in poorly drained soils. The combination of low drainage capacity and high rainfall accumulations can compromise the emergence and initial establishment of the crops.

Southeast

In the Southeast region, the forecast indicates the possibility of excessive rainfall in São Paulo, Rio de Janeiro, and south-central Minas Gerais. Deviations could reach 100 millimeters. A large part of Espírito Santo may experience a deficit, with negative anomalies of up to 50 millimeters.

São Paulo and southern Minas Gerais present favorable conditions for planting soybeans and corn. The predicted rainfall volumes may contribute to higher levels of water storage in the soil. In northern and northwestern Minas Gerais and Espírito Santo, reduced rainfall, along with higher temperatures, should increase the evaporative demand of the atmosphere and the water needs of plants and animals.

The northern and northwestern regions of Minas Gerais deserve attention in the soybean-growing areas. Irregular rainfall at the beginning of the rainy season, combined with heat, can increase the risk during crop establishment. The forecast recommends daily monitoring of weather forecasts to support planting planning.

In São Paulo, the predicted conditions tend to favor sugarcane and fruit and vegetable farming. Despite the higher temperatures, the accumulated rainfall and its distribution should help meet the water demands of the crops.

Midwest region

In the Central-West Region, the forecast indicates distinct conditions among the producing areas. Mato Grosso do Sul, southern Goiás, and southern Mato Grosso are expected to receive higher rainfall totals. This scenario tends to favor the sowing, establishment, and initial development of the 2026/27 soybean crop, even with above-average temperatures.

Northern Mato Grosso and northern Goiás present a different condition. The forecast indicates lower rainfall volumes and high evapotranspiration demand. This combination may increase the risk of water deficit at the beginning of the cycle.

For Mato Grosso, the forecast indicates a rainfall deficit, mainly in the north-central region. Temperatures may exceed the

climatological average by up to 2 degrees Celsius in the northern part of the state. In Mato Grosso do Sul and southern Goiás, the trend favors excessive rainfall.

North East Region

The Northeast region should also face a predominance of rainfall deficit. Part of the eastern sector, between Rio Grande do Norte and Alagoas, may register volumes slightly above average. Temperatures should remain above climatological values. In some states, deviations may reach or exceed 2 degrees Celsius.

In Matopiba, the combination of irregular rainfall and higher temperatures may increase the challenges for the start of the

new grain harvest. In irrigated areas, the scenario tends to present more favorable conditions, although the heat may increase the water demand of the crops. Monitoring water availability and irrigation timing becomes important during emergence, establishment, and vegetative development.

In the rainfed areas of Northeast Brazil, the start of the rainy season can show strong variations in rainfall between nearby locations and even within the same property. High temperatures can increase water losses through evaporation and transpiration. The forecast also points to a possible reduction in the regrowth rate of pastures and lower availability of forage mass.

Northern Region

In the Northern Region, the forecast indicates rainfall will be predominantly below the climatological average across almost the entire area. Roraima, northern and northeastern Amazonas, as well as western and south-central Pará, may register accumulations up to 200 millimeters below the average. Eastern Acre, the extreme northwest of Pará, and northern Amapá are forecast to be close to the climatological conditions.

Temperatures are expected to be above average across the entire Northern Region, with deviations of up to 2 degrees Celsius. Northern Amapá and northwestern Pará may experience values ??close to the average for this period.

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