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Cultivar Semanal

Bacteria shapes whitefly growth

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Bacteria shapes whitefly growth

Study shows that Portiera aleyrodidarum alters the size, weight and fertility of Bemisia tabaci

11.07.2025 | 10:21 (UTC -3)

Cultivar Magazine

Five different host plants measurably altered the development of whitefly

Bemisia tabaci MEAM1. Research has shown that the presence and quantity of symbiotic bacteria *Candidatus Portiera aleyrodidarum* — mandatory in the physiology of the species — vary depending on the plant on which the insect develops. This variation directly affects the insect's nutrition, reducing or increasing the synthesis of essential amino acids, and impacting body size, weight, and egg-laying capacity.

The tests were conducted over ten consecutive generations of *B. tabaci*, maintained under standardized laboratory conditions on five plants: cotton, tomato, cabbage, tobacco, and poinsettia. The insects shared the same genetic background and presented, in all populations, obligate infection by *Portiera*

sp. and variable presence of facultative bacteria *Hamiltonella* spp. And *rickettsiae* spp.

The concentration of *Portiera* sp. in insects varied markedly. Individuals fed cabbage had the highest levels of the bacterium. The lowest levels were detected in specimens fed tobacco. The same pattern appeared in the morphometric data: the largest whiteflies came from cabbage; the smallest, from tobacco.

The direct relationship between the bacteria and the insect's nutrition was confirmed by another experiment. When the population reared on cotton was subjected to the antibiotic rifampicin, the levels of *Portiera* sp. decreased dramatically. The consequence was a

significant reduction in essential amino acid content, body size, the average weight of a thousand individuals, and female fertility.

Function of bacteria

Portiera aleyrodidarum lives in specialized cells in the abdomen of *B. tabaci*. The main function of this bacterium is to supply deficiencies in the diet of the whitefly, which feeds on phloem sap — rich in sugars and poor in nitrogen compounds. *Portiera* sp. produces amino acids that the insect does not synthesize on its own.

The amounts of these total free amino acids (FAA) and essential amino acids (EAA) directly tracked bacterial levels in

the populations. In the antibiotic-treated insects, the proportion of amino acids such as methionine, leucine, valine, and lysine significantly decreased.

This chemical loss coincided with a reduction in mean length (from 929 µm to less than 870 µm), mean mass per thousand individuals (from 39,67 µg to less than 34 µg) and oviposition (a drop of over 25%).

Difference between male and female

The difference between females and males was constant. The concentration of *Portiera* sp. in females exceeded that of males across all plants. Average body size and fecundity followed this pattern. The authors' hypothesis is that the greater metabolic demands of females impose a greater symbiotic load.

Hamiltonella spp. And *rickettsiae* spp. were also detected. Their presence varied between 73% and 90% depending on the host plant, but the researchers did not identify a clear correlation with the whitefly's biological parameters. No *wolbachia* spp., *Arsenophonus* spp.,

Fritschea spp. or *Cardinium* spp. in any sample.

	Portiera	*Hamiltonella*	*Rickettsia*	*Wolbachia*	*Fritchea*	*Cardinium*	*Arsenophonus*
Poinsétia	100%	86,70%	80%	--	--	--	--
Repolho	100%	90%	83,30%	--	--	--	--
Algodão	100%	83,30%	86,70%	--	--	--	--
Tomate	100%	83,30%	80%	--	--	--	--
Tabaxo	100%	73,30%	76,70%	--	--	--	--

Infection rates of different endosymbionts in the five populations - Source: doi.org/10.3390/insects16070703

Mandatory membership

The infection by *Portiera* sp. was universal. This confirms the mandatory nature of the association. Already *Hamiltonella* spp. And *rickettsiae* spp. are secondary symbionts — not essential for host survival, but with possible indirect physiological effects.

The experimental model avoided the influence of genetic variations, using only specimens from the same lineage. *B.*

tabaci MEAM1. This subspecies is one of the most studied due to its ability to infest more than 600 different plants. MEAM1 transmits at least 38 viral diseases to agricultural crops and is known for its resistance to multiple insecticides.

Each population was monitored by sequencing the mitochondrial COI gene, used to ensure the genetic identity of the samples. Experimental rigor sought to isolate the influence of host plants on the symbionts, and of these on the insect's physiological parameters.

The observed pattern was consistent: higher concentration of *Portiera* sp. means better protein nutrition, larger size, and greater reproductive capacity. This offers a possible explanation for the whitefly's

preference for certain plants.

The study indicates that the pest's agricultural performance can be modulated, at least in part, by strategies that interfere with bacterial symbiosis. The application of antibiotics, for example, reduced the pest's biological performance. *B. tabaci*. The technique, however, is unfeasible in the field for environmental and legal reasons. But it suggests solutions.

Plants that reduce the concentration of *Portiera* sp.—like tobacco—may have natural antisymbiotic compounds. Investigating this possibility may reveal substances capable of selectively interfering with symbiosis, compromising the pest's metabolism without affecting

non-target organisms.

Further information at doi.org/10.3390/insects16070703

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Micropep Announces New CEO to Lead Commercial Expansion

Georg Goeres succeeds the company's founder, Thomas Laurent, who steps down after nine years.

11.07.2025 | 16:18 (UTC -3)

Micropep, Cultivar Magazine edition

Micropep Technologies, a company focused on micropeptide technology for

sustainable crop protection, announced the appointment of Georg Goeres (pictured) as its new CEO, effective this July. The executive, formerly head of Indigo Agriculture's Biologicals Business Unit, has over 20 years of international leadership experience in agriculture, having worked in Europe, Africa, the US, and Latin America.

Goeres succeeds Micropep founder Thomas Laurent, who led the company from an academic discovery in 2016 to a deeptech innovator operating in Europe and North America. Under Laurent's leadership, Micropep built its proprietary Krisalix discovery platform, developed its first biofungicide molecule, and raised over $60 million in funding. According to the statement, he will continue to support the

company in a strategic advisory role.

Kevin Smith, Chairman of the Board of Micropep, said the company has reached an “exciting inflection point,” highlighting his confidence that Georg’s business expertise, industry knowledge, and leadership will guide the company through its next chapter of growth.

In his first statement as CEO, Georg Goeres highlighted the potential of the technology developed by the company. “I am thrilled to take over as CEO of Micropep at this crucial stage. With our first biofungicide advancing through regulatory processes and Krisalix poised to generate a suite of new biological products, Micropep has the potential to fundamentally reshape the future of crop

protection. I look forward to working with our team, partners, and investors to deliver on this promise," he celebrated.

After nine years at the helm of the company, Laurent expressed his pride in Micropep's work. "From an academic collaboration to a global platform company, the journey has been extraordinary. Georg brings the right vision and skills to take Micropep to its next phase. After nine rewarding years, this is the right time to step back and spend more time with my family. I remain deeply committed to Micropep's long-term success," he concluded.

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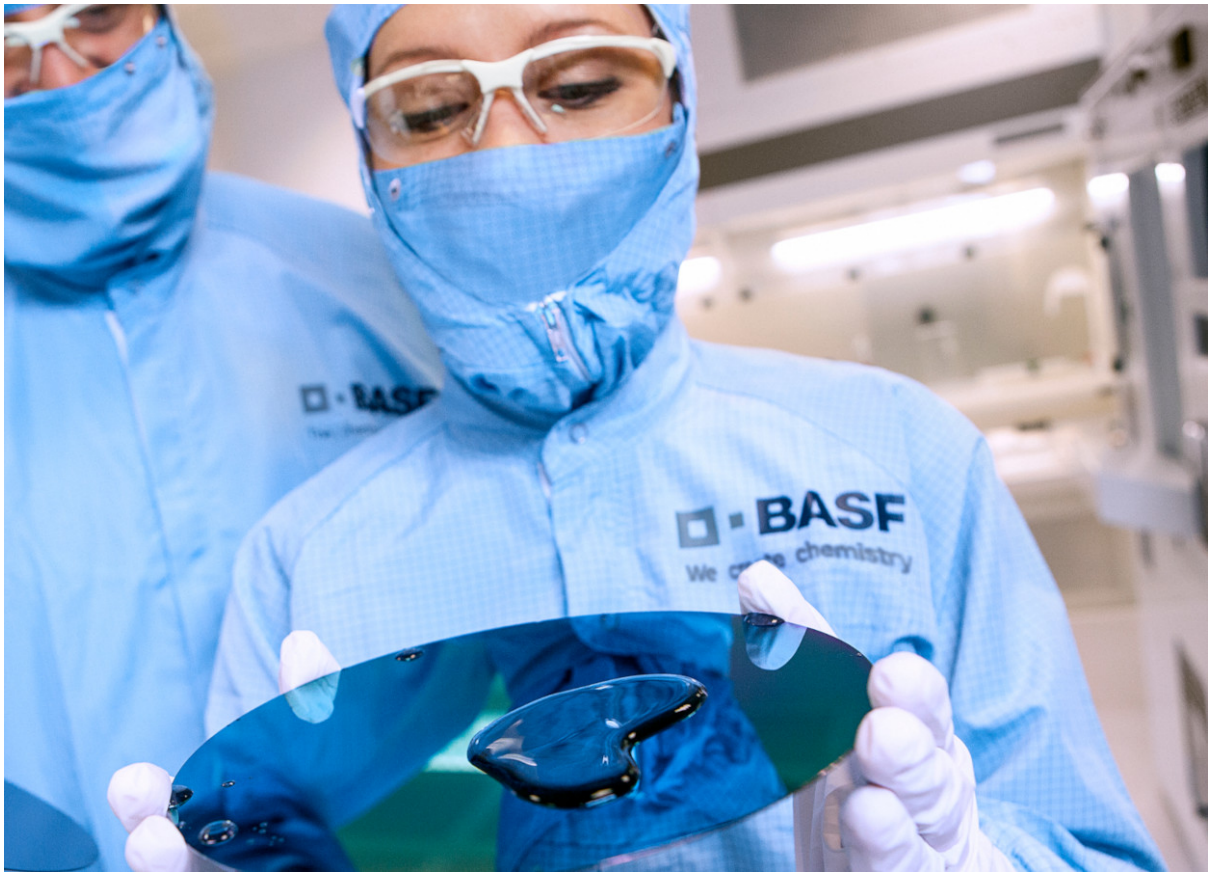
BASF reduces profit projection for 2025

Agricultural Solutions segment shows growth in volume and profitability

11.07.2025 | 15:52 (UTC -3)

Cultivar Magazine, based on information from Jens Fey



BASF released its preliminary results for the second quarter of 11 on Friday (2025)

and revised downwards its projections for the year. Sales fell 2,1% compared to the same period in 2024, totaling €15,77 billion. The performance was slightly below analysts' expectations (they forecast €15,80 billion).

The decline was driven by negative exchange rate effects across all segments and lower prices, especially for chemicals. Total sales volume grew slightly, driven by the agricultural solutions and surface technologies segments.

EBITDA before special items was €1,77 billion, in line with market consensus. However, it was lower than the €1,96 billion recorded in the second quarter of 2024.

The Agricultural Solutions segment stood out with significant growth in operating profit, exceeding analysts' most optimistic estimates.

Surface technologies and nutrition and care also saw EBITDA increases. Meanwhile, the materials, chemicals, and industrial solutions segments saw declines. The "other" segment also saw a significant decline.

EBIT before special items was €0,81 billion, above expectations (€0,78 billion). However, it was below the €0,97 billion of the previous year. Total EBIT reached €0,49 billion, below analysts' estimates and the 2024 result.

Net income totaled €0,08 billion, down from €0,43 billion in the second quarter of

2024. The company attributes the decline to higher tax burdens and lower contributions from equity investments.

Free cash flow reached €0,53 billion, exceeding the previous year's figure (€0,47 billion).

BASF revised its EBITDA forecast for 2025 to between €7,3 billion and €7,7 billion. Previously, it expected between €8,0 billion and €8,4 billion. The new estimate is below the 2024 result (€7,9 billion). The free cash flow forecast was maintained at between €0,4 billion and €0,8 billion.

The revision was prompted by macroeconomic and geopolitical uncertainties, such as the US tariffs announced in April and the devaluation of the dollar against the euro. The company

also forecasts lower growth in global GDP, industrial production, and demand for chemicals.

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Nitro launches biofungicide Égide Max

Product combines high-performance Bacillus strains and offers protection against pathogens for strategic crops

10.07.2025 | 15:13 (UTC -3)

Cultivar Magazine

Lana Gaias

Nitro launched foliar biofungicide Aegis Max. This new product is part of the company's biological portfolio. It provides control of foliar diseases in crops such as soybeans, corn, cotton, coffee, and sugarcane. The formulation combines two strains of *Bacillus* High-performance. It acts as a physical barrier, direct control, and induction of resistance in plants.

The company's trials have demonstrated efficacy against pathogens such as ***Phakopsora pachyrhizi*** (Asian rust), ***Corynespora cassiicola*** (target spot) and ***Septoria glycones*** (brown spot). Nitro developed the product considering the climate and soil variations of Brazilian producing regions.

Technology addresses the challenges of phytosanitary management. According to

Lana Gaias, market development manager for biologicals at Nitro, the complexity of foliar diseases requires specific tools. Égide Max, she says, delivers "a highly strategic solution, with a robust formulation, proven action, and broad-spectrum control."

Nitro emphasizes that the biofungicide can be applied at different stages of the production cycle. The aim is to integrate the product into integrated management and support sustainable strategies with consistent agronomic results.

Lana states that the biofungicide helps control resistance and reduces environmental impacts. The technology also meets consumer market and regulatory demands. "It's an active ingredient that meets future demands

without sacrificing agronomic performance," she summarizes.

The company focuses on the most representative crops in Brazilian agriculture. Soybeans top the list. Corn and cotton also face pressure from foliar diseases and nematodes. Coffee and sugarcane face similar challenges. The biofungicide is designed to serve these crops with biological protection tailored to their needs.

The product is in the registration phase to also combat ***cercospora*** spp., *Colletotrichum falcatum*, ***Hemileia vastatrix***, *Phaeosphaeria maydis*, *Ramularia gossypii* e ***Septoria glycones***.

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New bioinput factory

Nitro recently opened Bacplant in Várzea Paulista, a plant dedicated to the

production of bacterial bioinputs. The unit is already operational and increases the company's capacity in this segment tenfold. The focus is on biological solutions for nematode control, improving nutrient absorption, and promoting soil health. Currently, it is dedicated to the production of Égide Max.

The plant is part of Nitro's industrial park, which already includes units focused on biofertilizers, fungal inputs, and natural pesticides. Bacplant reinforces the company's strategy in the agricultural specialty sector. The investment is part of a R$130 million industrial plan earmarked for agribusiness in 2024.

Jonas Cuzzi

Jonas Cuzzi, marketing executive at Nitro, highlights that Bacplant provides farmers with solutions adapted to the realities of the field, based on biotechnology and local production.

The company focuses on independent research and development. With its own research and development structure, Nitro

can launch products with diverse mechanisms of action and adapted to regional conditions. This broadens its portfolio and allows it to operate in different crops and soil types.

By 2030, Nitro expects to grow and reach over 6% of the organics market. Currently, it holds a 1,4% market share.

Nitro entered the agricultural sector in 2019. Its presence in the biologicals market is part of its diversification strategy. Founded almost 90 years ago, the company also operates in the industrial chemicals and specialty chemicals segments.

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BASF has new management in Latam herbicide marketing

Maurício Feijo assumes strategic leadership of the area after almost two years leading the production systems

10.07.2025 | 08:21 (UTC -3)

Cultivar Magazine

With extensive experience in the agricultural inputs sector, Maurício Feijo

(pictured) takes on the role of Strategic Marketing Manager for Herbicides in Latin America (Strategic Marketing Manager – Herbicides Latam) at BASF. He has worked at the company for over five years and previously held the position of Regional Crop System Lead for rice and integrated systems in Latin America.

An agricultural engineer with a degree from Esalq/USP and a master's degree from Texas A&M University, Feijo has a consolidated career in agribusiness, working for companies such as Sumitomo Chemical, Nutrien, and the Ministry of Agriculture, where he led technical teams in the areas of plant health and agricultural inputs.

At BASF, in addition to his previous roles in strategic marketing, he also led medium- and long-term planning for crops such as rice and wheat, leading product development strategies, market positioning, and connected solutions.

With this new position, Feijo assumes responsibility for leading marketing strategies for the herbicide portfolio in Latin America, focusing on innovation, product lifecycle management, and increasing regional competitiveness.

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Government sets minimum prices for the 25/26 summer harvest

Values ??defined by the PGPM seek to protect the producer from falling market prices

09.07.2025 | 15:21 (UTC -3)

Ministry of Agriculture, Cultivar Magazine edition

The Ministry of Agriculture (Mapa) published, this Wednesday (9), Ordinance

No. 812, which updates the minimum prices of summer and regional products for the 2025/26 and 2026 harvests. The values, set by the National Monetary Council (CMN), serve as a reference for the operations of the Minimum Price Guarantee Policy (PGPM).

Among the products with new prices are seed and lint cotton, long grain rice, cultivated natural rubber, cultivated cocoa (kernels), beans (colored and black), milk, cassava, corn, flour, among others. The measure has national scope and the prices will be valid from July 2025 to May 2027, depending on the crop's cycle.

The purpose of setting minimum prices is to ensure a minimum remuneration for rural producers and contribute to income

stability in rural areas. The proposed prices are prepared by the National Supply Company (CONAB), taking into account factors such as production costs and the behavior of domestic and foreign markets.

According to Decree-Law No. 79/1966, minimum prices must be defined before the start of planting to guide producers' decisions and signal the Federal Government's commitment to supporting marketing in the event of a drop in market prices.

Check the new prices and validity period in the link below:

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Massey Ferguson to be present at Coopercitrus Expo 2025

Highlights include the MF 500R sprayer, MF 5690 combine and MF 8S tractor planting solution and Momentum planter

09.07.2025 | 14:11 (UTC -3)

Flavia Amarante

Massey Ferguson will be present at the 2025 Coopercitrus Expo, which takes

place from July 21st to 25th in Bebedouro, São Paulo. The manufacturer will showcase solutions that combine innovation, efficiency, and robustness, highlighting the MF 500R sprayer, the MF 5690 harvester, and a planting solution consisting of the MF 8S tractor and the Momentum planter.

"Coopercitrus is a strategic trade show for connecting directly with producers. We're bringing a comprehensive portfolio aligned with key agricultural demands and ready to support farmers by offering versatile machines with onboard technology, tailored to different farm profiles and all stages of cultivation, resulting in agronomic and economic benefits," says Kellen Bormann, sales director at Massey Ferguson.

The planting solution formed by the MF 8S tractor and the Momentum planter reduces fuel consumption and pollutant emissions, providing more sustainable operations, in addition to avoiding overlapping seeds and fertilizer, minimizing loss and operating costs.

Among the technologies incorporated into the planter, there is the chassis weight distribution system that divides the central load equally, which results in better performance in uneven areas, providing homogeneous seed deposition depth and improving planting quality.

The MF 8S tractor is equipped with AGCO's 7,4-liter, six-cylinder engine, the most innovative in engine technology. The exclusive Protect-U design, with 24

centimeters of space between the cab and the engine, isolates the interior environment from unwanted noise, heat, and vibrations, offering operator comfort and quiet operation.

For spraying operations, the standout is the MF 500R sprayer, with AWD Smart Drive transmission, which operates on slopes of up to 36%. The exclusive LiquidLogic system features the ability to recover product from the spray system back into the tank after each application or product change, providing savings and sustainability.

The MF 5690 combine features the exclusive Heavy Duty transmission, which provides up to 25% more gradeability. The machine facilitates harvesting,

maneuvering, and movement in different topography and crop conditions, without the need for gear changes during operation.

During the fair, organized by Coopercitrus Cooperativa de Produtores Rurais, visitors will also be able to learn about the brand's after-sales, financing, and connected services.

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New Holland presents cutting-edge technology at Agronea

With support from Nordemaq, the brand showcases machinery and promotes initiatives aimed at women producers

09.07.2025 | 13:20 (UTC -3)

Cultivar Magazine

New Holland, a CNH brand, was present at Agronea—the main agricultural fair in Argentina's Chaco region—alongside its official dealership, Nordemaq. At the event, held in Charata, visitors learned about a range of machinery and solutions designed for different producer profiles.

At the Nordemaq stand, the company displayed three models of tractors — T8 PLM Intelligence, T7 and TT4.90 — beyond the CR 7.90 IntelliSense combine harvesterThe exhibition highlighted advances in embedded technology that allow for increased productivity and efficiency in the field, regardless of the type of crop or operational conditions.

The event also included a joint initiative with the Mulheres em Campanha program. During Agronea's dynamic testing

program, New Holland and Nordemaq organized a technical lecture and practical demonstration of the T7.195 tractor, aimed at women in the sector. The activity aimed to provide technical knowledge, encourage female participation, and strengthen support networks among rural producers.

"We are proud to support our dealer network and participate in one of the most important trade shows in the region. It's a way to reaffirm our commitment to producers across the country," said Federico Arroyo, New Holland Marketing Manager.

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Spodoptera frugiperda reveals distinct biological rhythms

Males and females exhibit differences in emergence time and expression of daily cycle genes

09.07.2025 | 10:44 (UTC -3)

Cultivar Magazine

Photo: Embrapa

A study by Chinese scientists analyzed the emergence circadian rhythms of adults and the expression of biological clock genes in *Spodoptera frugiperda*. Observations reveal a hatching pattern that occurs mainly at dusk, with small variations between the sexes, mainly under constant darkness.

Genetic analysis revealed discrete differences in the expression of five core molecular clock genes, suggesting possible distinct sexual strategies associated with the behavior and physiology of the species.

Spodoptera frugiperda was first detected in China in 2018. The rapid expansion of the invasive population resulted in genetically homogeneous lineages, formed by

hybridizations between previously isolated variants. This characteristic facilitates the investigation of rhythmic behaviors on a uniform genetic basis, allowing us to assess how internal mechanisms regulate activity in a new environment.

Study form

To conduct the study, researchers collected about 400 pupae from corn fields in China's Yunnan province. Using an automated infrared camera system, they monitored adult emergence under two conditions: one with a light-dark cycle (14 hours of light and 10 hours of darkness) and the other with constant darkness.

Under the light-dark cycle, adults emerged predominantly in the first hour after nightfall. Females accounted for 58% of emergences during this period. In males, this percentage dropped to 40%, with a wider distribution throughout the dark period.

When subjected to continuous darkness, the emergence peak shifted by approximately one hour and became more gradual. Maintaining this rhythm for up to three days, even without external stimuli, confirmed the action of an internal biological clock.

Biggest differences

The differences between the sexes became more evident under constant darkness.

In direct comparison, males showed significantly different emergence patterns from females, both in form and mean timing. Statistical analyses indicated that males maintained more dispersed and later emergences.

Females, however, completed the cycle more quickly. This pattern suggests that control of the emergence rhythm may involve specific sexual mechanisms, adjusted to the absence of environmental cues.

Genetic analysis

The team also investigated the expression of five genes associated with the circadian clock: cycle (cyc), clock (clk), timeless (tim), period (per), and cryptochrome 2 (cry2). Head samples from adults were collected at regular intervals for RNA analysis.

All genes studied showed oscillations over 24 hours. However, mean expression levels were consistently higher in males, especially under alternating light and dark conditions. In the dark, differences between the sexes persisted, but to a more limited extent. Phase and amplitude variations were small, indicating that the two sexes share a common basic structure in circadian control.

The cyc, clk and per genes are located on the Z chromosome of the species. Since males have two Z chromosomes and females only one, the absence of dosage compensation may explain the higher levels of expression of these genes in males. The greater presence of clk and cyc may activate the other clock genes in a cascade, increasing their levels as well. This pattern may result in small changes in the timing of behavior, such as the time of emergence.

Although the differences are subtle, they may contribute to the temporal separation of behaviors between the sexes, reducing competition and favoring niche division. The discovery of such differences in an invasive population, with no history of

temporal isolation between lineages, raises hypotheses about the origin of these mechanisms. They may arise as an adaptive response to the new environment or were already present in the source populations.

Importance for management

Research suggests that understanding the rhythm of activity of *S. frugiperda* can be useful for control strategies. Knowing when adults emerge allows for more precise actions such as releasing natural enemies or applying pesticides.

The species' biological clock also appears to be involved in migration and response to

day length. Therefore, understanding its regulation is essential for predicting outbreaks and guiding management in agricultural areas.

The authors propose that future studies include other clock-regulated behaviors, such as flight and mating, and incorporate environmental conditions closer to the wild. They also recommend including additional genes and comparing them with native populations to understand whether the observed differences arose during the invasion or were already present previously.

Further information at doi.org/10.3390/insects16070705

See also:

- Lineages of *Spodoptera frugiperda* mate at different times
- Study reveals thermal vulnerability of *Spodoptera frugiperda*
- Molecular analysis reveals how fall armyworm dodges Bt toxins

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Government creates new agricultural management classification

ZarcNM system will allow technical ranking of cultivation areas

09.07.2025 | 09:59 (UTC -3)

Cultivar Magazine

The Ministry of Agriculture (MAPA) issued Normative Instruction SPA/MAPA No. 2/2025. The regulation establishes the criteria for classifying agricultural production areas into four Management Levels (ML) within the scope of the Agricultural Zoning of Climatic Risk (ZARC). The measure aims to technically quantify the degree of adoption of good agricultural practices in each cultivated plot, starting with soybean crops.

The new system, called ZarcNM, is based on a methodology developed by Embrapa. It considers multiple management indicators, such as base saturation, calcium content, aluminum saturation, time without soil disturbance, mulch coverage, and crop diversity.

The resulting classification serves as a basis for the formulation of public policies, risk assessment and private sector strategies.

The standard requires data to be processed and validated in the Management Level Information System (SINM), a digital platform operated by accredited entities. These agents will be responsible for recording and submitting information collected through remote sensing, geoprocessing, and laboratory soil analysis.

Four levels of management

Each plot will be classified into one of four levels. The classification depends on the average of technical indicators, but may be automatically downgraded if certain conditions are not met.

For example, repeated soybean crops in succession or the absence of contour planting on slopes limits the ranking to the lowest (NM1). Diversified use of plant species and maintenance of soil cover of more than 90% before planting can raise the ranking to NM4.

The average score of the indicators follows the following scale:

- NM1: up to 1,75 points
- NM2: between 1,75 and 2,75
- NM3: between 2,75 and 3,5

- NM4: above 3,5

Validation procedures

For the classification to be validated, all data must be complete and registered with the SINM. Soil analyses must be performed by laboratories approved in official proficiency programs. Chemical analyses are valid for 24 months, while physical analyses last up to 10 years. Precise geolocation and sample traceability are mandatory.

Management data collection occurs on three fronts: (a) information provided by the producer about the history of the plot; (b) remote sensing and geoprocessing of the area; and (c) physical and chemical analyses of the soil.

Each data agent, such as laboratories or geoprocessing companies, must have an active CNPJ and qualified technical staff.

First application: soybeans

The Normative Instruction's annex details the initial application for soybean crops, which are used for grain production. The parameters may be expanded to other crops through new annexes. Embrapa will be responsible for developing and validating future methodologies.

Indicators for soybeans include:

- Base saturation (V%) between 0 and 20 cm depth

- Calcium content between 20 and 40 cm
- Aluminum saturation (m%)
- Time without soil disturbance
- Percentage of straw coverage
- Crop diversity in the last three years

Failure to meet certain criteria implies an automatic downgrade in level, even if the weighted average indicates a higher category.

Connection with rural credit

The new classification may influence access to programs such as the Rural Insurance Premium Subsidy Program

(PSR) and rural credit under the Harvest Plan. According to the regulation, MAPA and EMBRAPA will jointly decide how to apply the data to public policies. Monitoring of the entered data is also planned and may lead to sanctions in the event of fraud.

The SINM platform requires that all data used in classification be auditable. Each soil sample requires a unique identification, geographic coordinates, and metadata such as the collection date and soil layer analyzed. Traceability will be achieved through QR codes and integrated digital systems.

Deadlines and validations

The classification is valid only for the crop and season evaluated. New measurements will be required in subsequent cycles. Chemical analyses may be renewed ahead of schedule if changes occur in management, fertilization, or soil correction.

The use of classification as a criterion for access to benefits will depend on additional regulations. The publication of new parameters for other crops will be carried out by an act of the Secretary of Agricultural Policy, following a technical proposal from Embrapa.

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The US now treats agriculture as a matter of national security

Initiative targets espionage, bioterrorism, and land purchases by international adversaries

08.07.2025 | 16:35 (UTC -3)

Cultivar Magazine, based on information from the USDA

The United States government today launched a national plan to protect the agricultural sector from external threats. The measure is part of the "Make Agriculture Great Again" initiative and places agriculture at the center of the country's national security strategy.

The National Farm Security Action Plan was presented by Agriculture Secretary Brooke L. Rollins, alongside the Secretaries of Defense, Justice and Homeland Security.

The plan proposes direct actions in seven critical areas: defense of agricultural land; protection of production chains; security against fraud in the nutrition system; protection of agricultural research; national priority for USDA programs; health control

and defense of rural infrastructure.

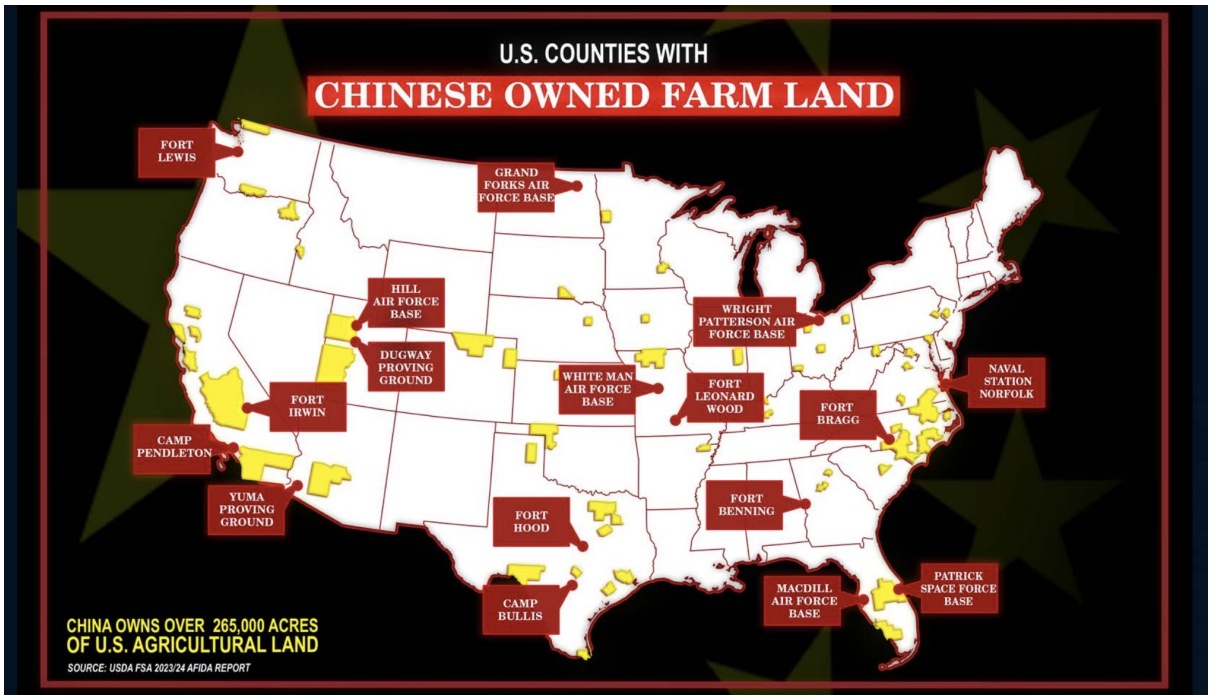
The move comes after an episode that U.S. authorities have described as serious. In June, the Justice Department arrested foreigners -- including a member of the Chinese Communist Party -- accused of smuggling a deadly fungus into the United States.

The pathogen, which has a history of causing billions in global agricultural losses, was reportedly introduced through an American research laboratory. The case has raised alarms about foreign infiltration into sensitive areas of the agricultural sector.

“We will not let adversaries control our land, our labs or our livelihoods,” Rollins said. “This plan puts American farmers and

families first. President Trump will continue to fight for them.”

The plan calls for tougher rules for foreigners buying land in the United States. It also includes a requirement for full transparency and tougher penalties. According to Senator Tommy Tuberville, Alabama currently has 2,2 million acres of land in foreign hands. “This is dangerous for our farmers and disastrous for national security,” he said.



The government also wants to stop billion-dollar frauds in food programs committed by international organizations. Another axis foresees the breaking of agreements with nations considered hostile. “American ideas will stay in America,” said the secretary.

The agricultural infrastructure is also included in the package. Rural facilities, distribution centers, cold storage facilities

and silos will now be treated as national security assets. There will be protocols against cyberattacks, sabotage and bioterrorism.

The initiative has the support of political leaders in several states. Arkansas Governor Sarah Huckabee Sanders noted that her state was the first to ban land purchases by Chinese companies. Nebraska Governor Jim Pillen declared, “Domestic security begins at home.”

The plan also gained support from representatives of the agricultural sector. Kentucky Agriculture Commissioner Jonathan Shell said the measure protects both the economy and American sovereignty. In Oklahoma, Blayne Arthur highlighted the importance of the measure

to ensure safe and abundant food for the population.

The Justice Department will step up its efforts to combat agribusiness terrorism. “We will prosecute anyone who threatens American agriculture, both here and abroad,” said Attorney General Pam Bondi. Defense Secretary Pete Hegseth warned of the risk of farmland near foreign-controlled military bases.

For Homeland Security Secretary Kristi Noem, a country that cannot feed its people cannot defend itself. “We will never allow another country to control our food supply. Food is our freedom.”

The plan calls for all USDA policies — from farmer lending to health inspections — to follow the America First directive. The

goal, Rollins said, is to ensure autonomy in production, distribution and innovation.

Georgia Agriculture Secretary Tyler Harper summed up the proposal: “A nation that cannot feed itself cannot defend itself.”

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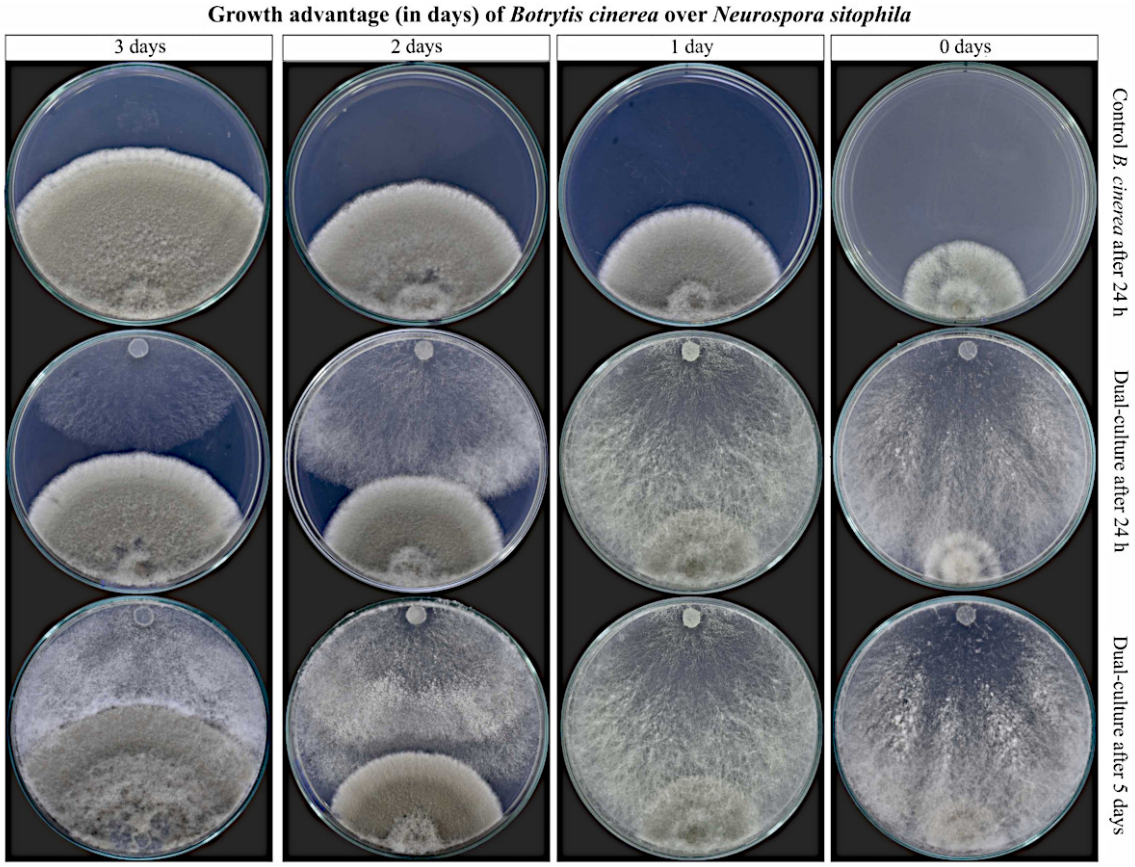
Endophytic fungus inhibits gray mold

Microorganism isolated from the plant Nectandra sp. produces bioactive compounds with antifungal action against Botrytis cinerea

08.07.2025 | 16:06 (UTC -3)

Cultivar Magazine



The endophytic fungus *Neurospora sitophila*, isolated from leaves of *Nectandra* sp. in the Amazon region of Peru, has demonstrated significant potential as a biocontrol agent against the phytopathogenic fungus *Botrytis cinerea*, which causes gray mold.

The research, conducted by scientists from the Toribio Rodríguez de Mendoza National University in Amazonas, investigated the morphological, physiological and biochemical characteristics of the strain, revealing promising adaptive and metabolic capabilities for sustainable agriculture.

The study evaluated fungal growth in five culture media (PDA, MEA, DG18, OA and CA) at temperatures of 5, 25 and 37 °C.

The best results occurred in PDA and MEA media. In PDA at 37 °C, the mycelium grew at a rate of 6,09 ± 0,27 mm/h. At 25 °C, the rate was 5,20 ± 0,13 mm/h in the same medium. Growth was significantly lower at lower temperatures or in media with lower water availability, such as DG18.

Metabolic profile

The metabolic profile analysis identified 34 volatile compounds, 86,97% of which were ethyl esters, a chemical group associated with fruity aromas. The main compounds included ethyl 4-octenoate (29,54%), ethyl heptanoate (14,80%) and ethyl butanoate (8,59%). The fungus emitted an aroma similar to that of pineapple. These

secondary metabolites have a history of antimicrobial action and are of interest to industry.

The antagonism between *N. sitophila* e *B. cinerea* was evaluated through dual culture assays.

Even when the pathogen was inoculated up to three days in advance, N. sitophila inhibited its mycelial growth by percentages between 35,8 ± 6,8% and 58,4 ± 6,2%. The highest inhibition occurred when both fungi were cultivated simultaneously.

The authors attribute this ability to the growth speed of *N. sitophila*, the production of antioxidant compounds and the emission of volatile metabolites.

Biochemical tests

Biochemical tests showed a significant increase in antioxidant activity and in the content of phenolic compounds when *N. sitophila* was exposed to *B. cinerea*. Antioxidant activity increased from 16,90% to 77,49%. Phenolic content increased from 133,03 to 334,39 µg of gallic acid equivalent per mg of extract. These results indicate that the fungus activates metabolic defense pathways under biotic stress.

The biochemical response of the fungus may be related to the original host plant, *Nectandra* sp., known to produce metabolites with antifungal action. Previous studies have demonstrated the

ability of endophytic fungi to replicate or acquire biosynthetic pathways similar to those of their hosts. The hypothesis of horizontal metabolite transfer still requires experimental confirmation.

The data set reveals that *Neurospora sitophila* has desirable attributes for application in agricultural systems. It grows well at different temperatures, responds to stress with high production of bioactive compounds, and inhibits common pathogens in commercial crops.

Further information at doi.org/10.1016/j.napere.2025.100143

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Brazilian Soil Classification System gets new edition

Update incorporates seven years of research and expands understanding

08.07.2025 | 15:47 (UTC -3)

Cultivar Magazine, based on information from Fernando Gregio

The 6th edition of the Brazilian Soil Classification System (SiBCS), published by Embrapa after seven years of technical revisions, is now available for free download. A reference for Soil Science since 1999, the updated manual brings significant changes to definitions, nomenclature and soil classes.

The digital version can be accessed on Embrapa's website. The printed edition will be sold in the coming weeks via print-on-demand. SiBCS is considered one of the most widely distributed scientific books in the country. The 5th edition has surpassed 202 thousand downloads and 37 thousand physical copies sold.

The new edition is the result of more than 50 meetings of the National Executive

Committee for Soil Classification in 2025. According to researcher Maurício Rizzato Coelho, from Embrapa Solos, this edition was the one that accumulated the most technical changes. Highlights include changes in the second and third levels of the Spodosols class, and reformulations in the Gleissolos and Neossolos Flúvicos classes, based on studies of floodplains in the Amazon region.

The classification of these soils was based on samples collected during the dry season between Manaus, Parintins and Santarém, and analysis of more than 150 hydromorphic profiles from Embrapa's database. "These soils are often submerged, which makes the study difficult. We were able to take advantage of the dry season to characterize them

more accurately," explained Rizzato.

In addition to the technical changes, SiBCS updated the texts, redefined concepts and reorganized categories. The book standardizes the technical language used by researchers, teachers and students, in addition to guiding producers and geoscience professionals.

According to José Francisco Lumbreras, a researcher at Embrapa Solos, SiBCS directly contributes to management practices such as fertilization, soil correction, erosion analysis and agricultural planning. It also supports decisions on land use in non-agricultural areas and public policies, such as Agricultural Climate Risk Zoning (ZARC).

The system update reinforces the actions of PronaSolos, a program that seeks to expand knowledge about Brazilian soils in the coming decades. For Rizzato, a modern and well-founded system allows for more precise interpretations for multiple land uses, increasing the efficiency of projects and policies linked to the territory.

The work bears the seal of the Brazilian Society of Soil Science (SBCS) and brings together contributions from several research centers and universities in the country. The new edition incorporates results from the last three Brazilian Meetings on Soil Classification and Correlation, held in Maranhão, Goiás, Tocantins, Amazonas and Pará.

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Evogene completes sale of Lavie Bio to ICL Group

Transaction includes microbial development platforms and subsidiary team

08.07.2025 | 15:03 (UTC -3)

Re

Evogene Ltd. has completed the sale of the majority of the operations and assets of its ag-biologicals subsidiary, Lavie Bio Ltd., to ICL Group Ltd. The deal also includes the transfer of the MicroBoost AI for AG platform, used to accelerate the development of microbial products in agriculture.

Under the agreement announced in April 2025 ("ICL acquires majority of Lavie Bio activities"), ICL will now control the Biology Driven Design (BDD) platform, the microorganism bank, the advanced development programs and the commercial products of Lavie Bio. The subsidiary's technical team will also be incorporated into the new parent company.

Additionally, Evogene sold its MicroBoost AI Tech-Engine for Agriculture computational tool. The platform uses artificial intelligence to optimize the discovery and development of microorganisms for the agricultural sector.

The transaction does not include strategic and commercial agreements already signed by Lavie Bio. These contracts remain under the company's management and may generate future revenue for shareholders.

For Ofer Haviv, CEO of Evogene, the sale represents a strategic milestone. He highlighted that the combination of Lavie Bio’s technological capabilities with ICL’s global structure should boost the ag-biologicals sector and foster sustainable

solutions for agriculture.

According to Elinor Erez, vice president of research and development for ICL’s Growing Solutions division, the acquisition strengthens the company’s leadership in the global biological solutions market. She highlighted that the integration of the platforms expands the company’s capacity for innovation and reinforces its commitment to sustainable agriculture on a large scale.

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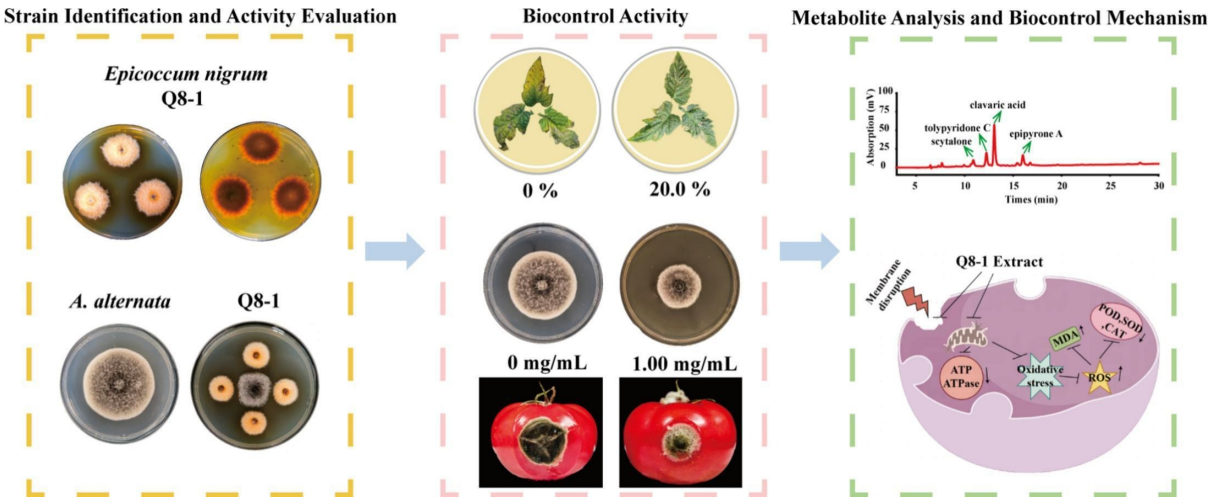
Marine fungus controls tomato disease with 87% effectiveness

Epicoccum nigrum, isolated from the China Sea, inhibits the fungus Alternaria alternata

08.07.2025 | 14:04 (UTC -3)

Cultivar Magazine



Study conducted by Chinese researchers identified a possible ally in the fight against the fungus *alternaria alternata*, which causes disease in tomato plants. This is

the marine fungus *Epicoccum nigrum*, isolated from sediments of the Bohai Sea.

In laboratory tests, the Q8-1 isolate of *E. nigrum* reduced the growth of the *A. alternata*. In tests with detached leaves, the incidence of the disease fell by up to 52% after application of the fermentation filtrate of Q8-1. In fruits treated with crude acetone extract, the size of the lesions decreased by up to 71,43%. In tomato seedlings, the disease rate fell from 98,52% to 15,56%, depending on the concentration of the extract.

The morphological identification of Q8-1 was confirmed by DNA sequencing of the ITS region. The fungal genome, with 32,6 million base pairs, revealed 43 gene clusters linked to the production of

secondary metabolites, including known antifungal compounds: tolypyridone C, epipyrone A, scytalone and clavaric acid.

The antifungal action of Q8-1 is not due to the emission of volatile compounds. The effect occurs through the release of non-volatile substances soluble in acetone. The concentration of 2 mg/mL was sufficient to almost completely inhibit the growth of the pathogen in culture medium. The EC50 value was 0,78 mg/mL.

Scanning and transmission electron microscopy showed that the extract compromises the structure of hyphae of *A. alternata*. The cells showed collapse, irregular swelling, loss of organelles and disorganization of the cell membrane.

Tests with propidium iodide revealed an increase in membrane permeability, and spectrophotometric analysis demonstrated the release of nucleic acids and a 59,22% drop in ergosterol concentration.

The extract also caused accumulation of reactive oxygen species (ROS), elevation in hydrogen peroxide and malondialdehyde levels, and significant reduction in the activity of the antioxidant enzymes catalase, peroxidase and superoxide dismutase. Oxidative stress contributed to the programmed death of fungal cells.

Furthermore, the extract reduced intracellular ATP levels from 29,9 to 3,1 µmol/g and ATPase activity from 4,4 to 0,39 µmol/h/g. Disruption of oxidative

phosphorylation compromised the energy metabolism of the pathogen.

Toxicity tests performed with *Caenorhabditis elegans* did not detect adverse effects on nematodes after exposure to the extracts at the concentrations tested. No phytotoxic symptoms were observed in tomato seedlings treated with the extract or with the fermented Q8-1.

According to scientists, the antifungal effect of *E. nigrum* combines three fronts: destruction of the cell membrane, induction of oxidative stress and collapse of the pathogen's energy metabolism. The multiplicity of targets reduces the likelihood of emergence of resistance, a common problem with specific-action chemical

fungicides.

Further information at doi.org/10.1016/j.pestbp.2025.106552

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Federal Government launches national program to combat greening

Ministry of Agriculture Ordinance establishes criteria for controlling and preventing Huanglongbing throughout the national territory

08.07.2025 | 10:13 (UTC -3)

Cultivar Magazine

Photo: David Hall

The Ministry of Agriculture has officially created the National Huanglongbing Prevention and Control Program (PNCHLB) through Ordinance SDA/Mapa No. 1.326 of 2025. The measure aims to curb the spread of the disease known as citrus greening, caused by the bacteria *Candidatus Liberibacter asiaticus* e *americanus* , transmitted by the insect *diaphorina citri*.

The new rule defines criteria for control, surveillance, seedling production, movement of plant material and maintenance of the phytosanitary status of the federation units. The program will be coordinated by the Department of Plant Health and Agricultural Inputs, and implemented by the Agriculture and

Livestock Superintendencies of the states and the Federal District, in addition to other Suasa bodies.

Phytosanitary classification and status

The ordinance classifies the states into two categories: with or without occurrence of HLB. To maintain the status of an area free of the pest, the states must conduct annual phytosanitary surveys, maintain georeferenced records of producers, monitor the vector of transmission and develop specific action plans.

Among the required criteria, the highlight is the inspection of at least 10% of the plants in production units and 100% of the plants in nurseries that produce propagation material. Plants with suspicious symptoms must be collected and analyzed in official laboratories.

Rules for seedling production

The production of citrus seedlings must now comply with strict regulations. Nurseries and production fields in disease-free areas must operate in environments protected with anti-aphid screens, with mesh sizes of up to 0,87 x 0,30 mm, to prevent access by the vector.

Basic plants and budwood matrices must be tested annually. In the event of a positive diagnosis for the disease, contaminated batches must be eliminated without the right to compensation. Other batches are quarantined for six months, and are only released after new negative tests.

Action plans and local responsibilities

Each state must submit an action plan within 120 days of the publication of the ordinance. The document must detail strategies for surveillance, vector control, contingency for outbreaks and technical training. The execution of this plan will be essential to maintain the status of an area

free of HLB.

If the disease is detected, the state agency must inform the Ministry within seven working days. The affected area must be delimited and subject to the measures provided for.

Measures for areas with HLB occurrence

In states where greening has already been identified, producers must conduct quarterly inspections of their orchards. Plants with symptoms must be uprooted or cut close to the ground, with subsequent management to prevent sprouting. The actions must be reported to the plant protection agency twice a year.

Monitoring of the vector, application of pesticides in accordance with technical guidelines, and strict control over the production and sale of seedlings are also required. Inspections are carried out every six months.

Rules for plant transit

The transport of citrus fruits between states must be accompanied by a Plant Transit Permit (PTV) and certificates of origin with additional statements confirming the absence of leaves and branches or that the cargo comes from areas free of the pest. The transit of plants of the species Murraya paniculata is prohibited if they come from an area where

HLB occurs.

Responsibility and supervision

Compliance with the requirements of the ordinance will be monitored by state Plant Health Protection agencies, which must also maintain annual reports with the results of the actions. The documents must be sent to the state superintendencies by January 31 of the following year.

Failure to comply with these obligations may result in sanctions under federal and state legislation. Production properties without disease management or with infected host plants in urban and rural areas will be notified to eliminate the outbreaks.

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Orange trees help remove CO2 from the atmosphere

Study by Embrapa and Fundecitrus proves that citrus farming acts as an important carbon sink

08.07.2025 | 10:02 (UTC -3)

Cultivar Magazine, based on information from Vivian Chies

Photo: Carlos Ronquim

Each hectare of orange groves in Brazil's citrus belt removes, on average, two tons of carbon dioxide (CO2) from the atmosphere per year. Orange trees fix around 4,28 kilos of carbon annually in their biomass. The result comes from a study conducted by Embrapa Territorial and Fundecitrus, with support from the British company innocent drinks.

The area studied covers the states of São Paulo and the Southwest, Triângulo Mineiro. In this region, commercial production of citrus fruits accounts for 337 thousand hectares and 162 million orange trees over three years old. Together, these trees store 8,4 million tons of carbon.

The carbon sequestration process occurs through photosynthesis. Trees absorb

CO_2, convert it into biomass and fix it in their tissues and in the soil. This includes the deposition of leaves, fine roots and pruning residues. Comparison with other agricultural crops shows that citrus groves accumulate more carbon per hectare than soybeans, corn or pastures.

Each orange tree, on average, neutralizes the equivalent of 10 days of greenhouse gas (GHG) emissions from a Brazilian citizen.

Biometrics and mathematical modeling

To estimate the accumulated carbon, the scientists directly measured 80 orange trees of different ages and varieties. They

also collected biometric data from 1.321 trees in several regions. The team used satellite imagery, laboratory analyses and mathematical models known as allometric equations.

These equations relate variables such as height, trunk diameter and basal area of ??branches. From this, it was possible to estimate the living biomass and carbon contained in each tree. The results indicate that an orange tree stores, on average, 52 kilos of carbon. Per hectare, the average stock reaches 25 tons, exceeding the value of 21 tons used by national and international GHG inventories for perennial crops.

Distribution by variety and age

The study considered the main varieties in the region: Pera, Valencia and others. The distribution of carbon stored among them was proportional to the number of trees of each type. Pera accounted for 32,7% of the total, Valencia for 34,7% and the others, together, for 32,6%.

Trees over 10 years old account for 76% of the total carbon. Younger trees are expected to contribute larger volumes in the coming years as they mature.

Tool for the carbon market

Embrapa researcher Lauro Rodrigues Nogueira Júnior says the data can be used as a baseline for measuring carbon stocks in the citrus sector. This paves the way for farmers and companies to access the carbon market, with credits generated from the fixation of CO2 by orange trees.

Furthermore, the equations developed in the study allow estimates in similar orchards, based on simple-to-measure variables such as height and trunk diameter.

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AGCO 35 years: trajectory and sustainable revolution of Brazilian agriculture

By Rodrigo Junqueira, General Manager of AGCO and Vice President of Massey Ferguson South America

08.07.2025 | 09:54 (UTC -3)

In 2025, AGCO, a global leader in the design, manufacture and distribution of agricultural machinery and precision agriculture technology, celebrates 35 years of history. Present in more than 170 countries, the company has established itself as a global player in the development of machinery and technologies aimed at agribusiness. In Brazil, its operations are directly related to the evolution that the sector has experienced in recent decades.

From 1990 to the present day, Brazilian agriculture has seen a major leap in productivity and technology. Grain production in Brazil has grown by almost 500%, while the cultivated area has increased by only 2,2% per year. Soybeans, for example, have jumped from 1,5 tons per hectare to more than 4 tons

per hectare, an increase of 173%, according to the Embrapa study “Vision 2030: The Future of Brazilian Agriculture”.

Furthermore, according to data from the National Supply Company (Conab), the country has consolidated the cultivation of three crops per year, with around 30 million hectares in continuous planting systems and has assumed global leadership in exports of products such as soybeans, beef and chicken.

This growth was mainly due to initiatives such as genetic improvement of seeds, which are more productive and resistant to pests and adverse weather conditions, and the adoption of sustainable practices, such as direct planting, which contributed to soil preservation and more efficient use of

natural resources. Precision agriculture technologies, such as sensors and GPS, combined with data analysis, also enabled more efficient and personalized crop management.

AGCO has been present in each of these transformations. With a portfolio that includes its brands Fendt, Massey Ferguson, Valtra and PTx, the company has driven agricultural transformation. Its solutions have helped to mechanize, digitalize and make the agricultural production process more sustainable in Brazil and around the world. From the introduction of tractors with autopilot to the development of planters with sensors and intelligent productivity controls, AGCO has anticipated trends and responded to the needs of rural producers of all profiles and

regions.

Sustainability has become one of the central pillars of AGCO's strategy, which has set ambitious goals for decarbonization, traceability, regenerative agriculture, high-yield organic farming, animal welfare, soil health and employee safety. Its technologies are increasingly focused on low-impact production, with an emphasis on solutions that contribute to soil carbon sequestration, efficient use of fertilizers and the advancement of digital agriculture.

The focus of this journey is the rural producer. For AGCO, putting the farmer at the center of everything means developing solutions that meet the reality of the field, respecting regional characteristics and

strengthening the experience with uncomplicated, reliable and affordable products. With around 550 dealerships in South America, five units strategically located in Brazil and two in Argentina, AGCO connects directly with the rural producer.

Investments in the factories of Mogi das Cruzes (SP), Canoas (RS), Ibirubá (RS) and Santa Rosa (RS) and the inauguration of the Reman Transmission Center of Latin America, based in Jundiaí (SP), and the Planter Development Center in Ibirubá (RS), guaranteed the local production of innovative equipment, in addition to the export of Brazilian technology to strategic markets such as the United States, Europe, Africa and Latin America, reinforcing the importance of Brazil in the

development of agricultural technology.

As AGCO celebrates its 35th anniversary, it celebrates a legacy of innovation and trust built alongside farmers and reaffirms its purpose of feeding the world intelligently and responsibly, placing the farmer at the center of decisions and innovation.

By **Rodrigo Junqueira**, *General Manager of AGCO and Vice President of Massey Ferguson South America*

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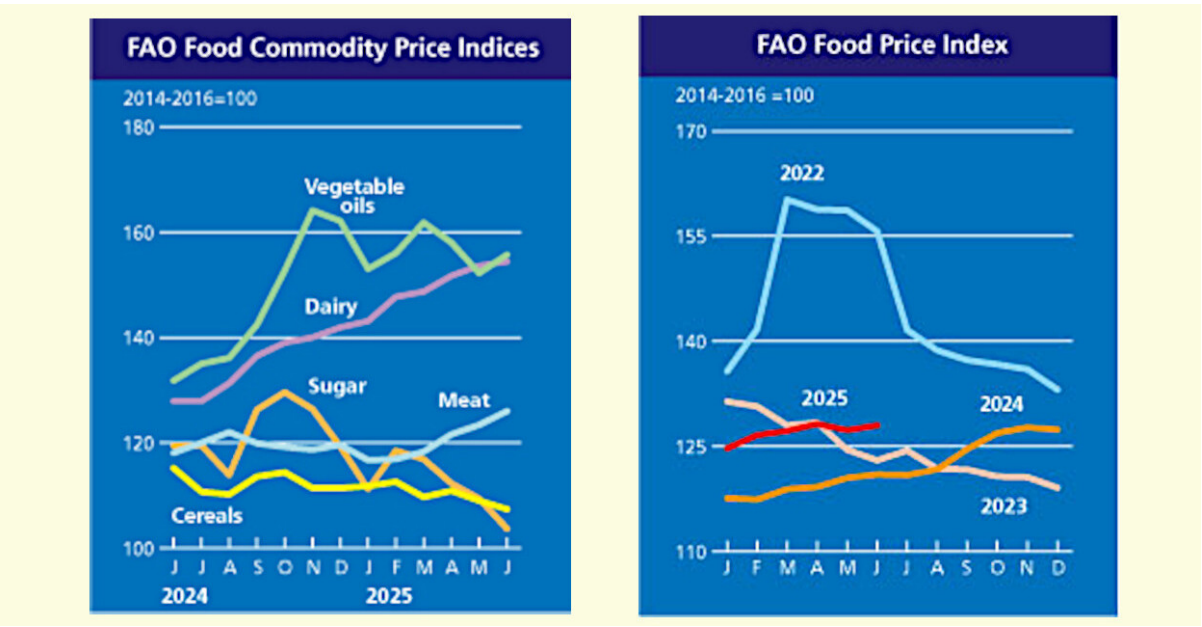
FAO food price index rises in June

Index registers an increase of 0,5% and accumulates an increase of 5,8% in 12 months

08.07.2025 | 07:01 (UTC -3)



The FAO Food Price Index reached 128,0 points in June 2025, up 0,5% from May. The increase was driven by higher prices for dairy products, meat and vegetable oils. Even with the decline in cereal and

sugar prices, the increase in these other groups offset the decline. Compared to June 2024, the index has accumulated an increase of 5,8%, although it remains 20,1% below the peak recorded in March 2022.

The Cereal Price Index fell 1,5% in the month, pressured by corn prices, which fell for the second consecutive month. Abundant supplies from Argentina and Brazil increased competition in global markets. Sorghum and barley prices also fell.

Wheat prices rose, driven by climate concerns in the European Union, Russia and the United States. Rice prices fell slightly, especially in the indica varieties, due to lower demand.

Vegetable oils rose 2,3% in June. Palm oil rose nearly 5%, driven by strong global demand and increased price competitiveness. Soybean oil followed suit, reflecting expectations of increased demand for biofuels in Brazil and the US, as well as strong international demand for soybeans. Rapeseed oil also rose, amid prospects of tight global supply. Only sunflower oil fell, with improved production estimates in the Black Sea region.

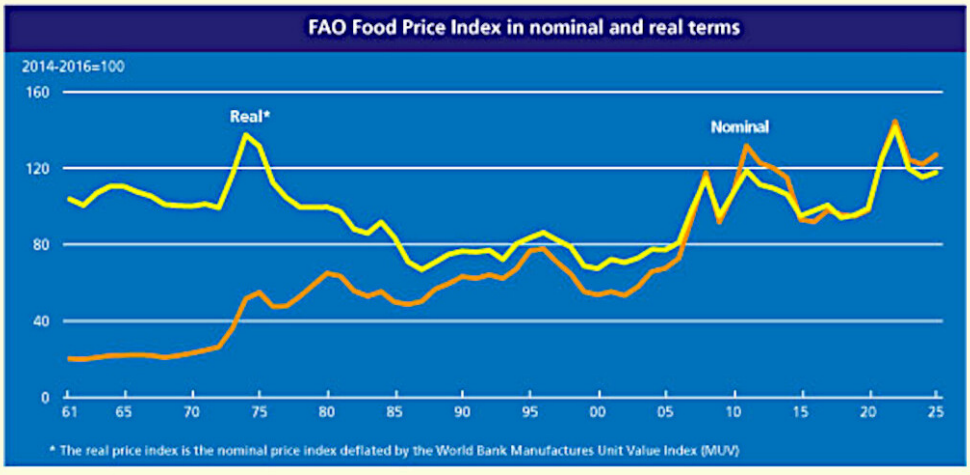
The Meat Price Index rose 2,1% and reached a new all-time high. All types of meat rose, with the exception of chicken. Beef prices rose, due to tighter supply in Brazil and firm demand in the US, which pushed up Australian prices. Pork prices rose, with strong global demand and stable supply. Lamb prices rose for the third

consecutive month. Chicken meat continued to fall, pressured by excess supply in Brazil following restrictions imposed by outbreaks of avian influenza. However, the recovery of the country's health status contributed to the gradual return of exports.

The dairy sector rose 0,5% in June. Butter prices rose 2,8% to a record high, with tight supplies in Oceania and the European Union, and strong demand from Asia. Production slowed in New Zealand, while in the EU, environmental regulations and the impact of bluetongue on livestock slowed production growth. In the US, falling inventories also pushed up prices. Cheese prices rose for a third month, supported by demand from Asia. Milk powder prices fell, amid ample supply and

weaker demand.

The Sugar Price Index fell 5,2%, reaching its lowest level since April 2021. The decline reflects improved production prospects in key countries such as Brazil, India and Thailand. In Brazil, dry weather accelerated harvesting and crushing, with more sugarcane being directed to sugar. Good rainfall and increased planted area in India and Thailand also contributed to expectations of a larger harvest in 2025/26.



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Castrolanda begins construction of grain warehouse in Tocantins

The unit in Colinas will have a capacity of 44 thousand tons and is expected to operate in the 2026/27 harvest.

07.07.2025 | 17:25 (UTC -3)

Castrolanda

In June, Castrolanda began construction on its grain receiving warehouse outside

the South-Southeast axis. Located in the municipality of Colinas do Tocantins (TO), the new unit marks an important step for the cooperative in its expansion project for the Matopiba region - considered Brazil's new agricultural frontier. The warehouse is expected to be ready to receive the 2026/2027 soybean harvest.

This is a turning point for the project: the main equipment is already in the final stages of delivery at the construction site, located on the BR-153 highway and just over 12 km from the center of Colinas, and the earthmoving stage has begun to be mobilized, taking advantage of the beginning of the dry season. The expectation is that in the coming weeks the work fronts will advance with the removal of the vegetation layer and then begin the

soil movements and preparation of the industrial area's plateaus.

“We are currently in the topography and team mobilization phase. In the next few days, we will begin removing the vegetation layer and moving soil in the industrial area, where the silo reception, drying and storage area will be located. The goal is to quickly clear the plateaus so that the civil team can lay the foundations. Everything is being carried out with technical planning and within the expected schedule,” explains Luis Fernando de Carvalho Santos, Castrolanda’s engineering specialist.

With an estimated investment of 124 million, the unit will have an initial static capacity of 44 thousand tons of grain, with

operations focused on receiving, drying, storing and marketing grains. The project foresees a modern, safe and highly automated structure, with two reception flows of 300 tons/hour each, totaling a daily capacity of 5 thousand tons.

“We are very confident about the start of the works. The arrival of the equipment and the mobilization of the earthmoving represent the beginning of a plan that we have been structuring for months. Now, we are at the ideal time to advance the work, with drought and favorable soil, which should speed up the progress of the following stages”, says Diógenes Julio Huzar Novakowiski, Grain Manager at Castrolanda.

Advances and technical management

In addition to the earthmoving stage, other areas are already being prepared in parallel. The topography of the area has been finalized and the first ground movements are taking place in the industrial part of the project - where the reception and drying structures will be located. The next phase will be the clearance of the plateaus to begin laying the foundations for silos and hoppers.

To ensure quality of execution at all stages, the project is overseen and technically managed by TÜV Rheinland, an international auditing and certification company that also worked on the

construction of Maltaria Campos Gerais. “The presence of TÜV ensures that all contracted teams are integrated, qualified and in compliance with the standards required by the cooperative,” explains Diógenes.

According to Eduardo Nobuaki Kozu, Castrolanda’s engineering supervisor, the construction site is in the installation phase and the construction company will be fully mobilized throughout the month. “This movement will boost the local economy, generating jobs and attracting suppliers from the region. Castrolanda’s arrival in Colinas is also positive in this regard: it stimulates regional development,” he points out.

Strategic project

The new unit will be a model of operational efficiency, with emphasis on the use of wood chips for drying, an alternative that optimizes biomass consumption and reduces environmental impacts. In addition to the storage structure, the project also includes an administrative office, warehouses for inputs and seeds, and an area dedicated to applied research in partnership with the ABC Foundation.

The ABC Foundation is already working on experimental trials in Tocantins, offering technical support with information on cultivars adapted to the region's soil and climate conditions. Research work is essential to mitigate production risks and

increase the chances of success for local producers.

“This is a project that was born with a solid foundation in information, innovation and cooperation. We are building more than just a warehouse. We are consolidating Castrolanda’s presence in Matopiba with the same commitment we have in Paraná: supporting our members with safety, convenience, technology and a vision for the future”, highlights Diógenes.

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Control reduces spots, but wheat yield depends on multiple factors

Study indicates that effective fungicides alone do not guarantee high yields

07.07.2025 | 14:17 (UTC -3)

Cultivar Magazine

Photo: Daniel Debona

An experiment conducted in 13 locations in Brazil indicated that yield gains in wheat are not directly related to the level of fungal infection of the leaves. On the other hand, the use of fungicides drastically reduced the severity of leaf spots in wheat and increased grain yield and hectoliter weight.

Data relates only to fungi *Pyrenophora tritici-sudden* (causing yellow spot), *Cochliobolus sativus* (causing brown spot) and *Parastagonospora nodorum* (causing glume spot) -- and should not be considered a fact for other diseases.

The conclusions emerge from a series of trials coordinated by the Cooperative Wheat Trials Network, an initiative coordinated by Embrapa Trigo. The tests

evaluated eight fungicide combinations in cultivars with different levels of resistance.

Technical advances and new uncertainty

The efficacy of the fungicides was evident. The applications reduced the average severity of the diseases from 18,9% (without treatment) to 3,7% in the best treatment. Productivity increased by up to 792 kg/ha compared to the control (without treatment).

Between treatments, according to Tukey's test at 5% significance, there was no difference.

However, the expected pattern—lower severity resulting in more grains—was not

confirmed. Statistical analyses showed no direct relationship between disease levels on the leaves and final crop yield. Paradoxical situations were recorded: sites with high severity showed high productivity, and sites with low severity showed limited productivity. This defies intuitive perception.

Biological complexity beyond foliage

The researchers suggest that additional factors may have influenced the results. Ear diseases, such as head blight and blast, and specific microenvironmental variations may have played a decisive role in determining yield, regardless of the presence of leaf spots.

This finding imposes a paradigm for management. Reducing foliar severity remains essential, but it does not guarantee high yields on its own. The environment and the interaction between multiple pathogens impose a degree of uncertainty that only integrated strategies can address.

Fungicides and relative efficiency

Despite the lack of direct correlation, the use of fungicides brought tangible benefits. Effective products recorded some of the best performances in yield and hectoliter weight.

The use of fungicides increased the average pH of the grains, rising from 69,8 kg/hL (without treatment) to 73,3 kg/hL in the most effective treatments. Even so, few samples reached the Type II market standard, which reinforces the influence of other field factors.

The field as a dynamic laboratory

The research involved 14 trials, of which 12 showed significant incidence of the disease. Applications followed three defined phenological stages, with precision spraying and intervals of up to 18 days.

Eight treatments with different chemical combinations were compared. All showed

superior efficacy to the standard control (trifloxystrobin + tebuconazole). Three maintained severity below 5%.

The average yield in untreated plots was 2.100 kg/ha. In treatments with fungicides, the average yield varied from 2.546 kg/ha to 2.898 kg/ha.

More information can be found in Research and Development Bulletin 128, on the Embrapa website.

Tratamento	Ingrediente ativo	Rendimento de grãos de trigo (kg ha^{-1})			Diferença[3] (kg ha^{-1})
		Média[1]	IC limite inferior[2]	IC limite superior[2]	
1	Controle negativo (sem aplicação de fungicida)	2.100 b	1.304	3.402	–
2	Controle para comparação (trifloxistrobina + tebuconazol)	2.546 a	1.576	4.113	440
3	Metominostrobina + tebuconazol e clorotalonil	2.898 a	1.794	4.682	792
4	Trifloxistrobina + protioconazol + bixafem	2.705 a	1.674	4.369	599
5	Azoxistrobina + mancozebe + tebuconazol	2.704 a	1.674	4.368	598
6	Epoxiconazol + cresoxim-metílico e piraclostrobina + epoxiconazol	2.865 a	1.773	4.628	759
7	Pidiflumetofem e azoxistrobina + ciproconazol	2.652 a	1.641	4.285	546
8	Propiconazol + azoxistrobina + pidiflumetofem[4]	2.825 a	1.748	4.564	719
CV (%)		**3,4** –	–	–	–

Means, clusters, confidence intervals and relative difference for wheat grain yield (*Triticum aestivum*) estimated for different fungicide treatments. Summarized data from 14 trials of the Wheat Cooperative Trial Network for leaf spot control, 2024 harvest. **(1)** Means that do not share any letters in common are significantly different according to Tukey's test at 5% significance. Data were logarithmically transformed prior to analysis. **(2)** Limits (lower and upper) of the 95% confidence interval (CI) of probability. **(3)** Average difference between the value of the variable in

the treatment with fungicide in relation to the treatment without fungicide application (negative control). **(4)** Product with Temporary Special Registration (RET) for experimentation during the period of testing. - Source: Cooperative Wheat Testing Network

Tratamento	Ingrediente ativo (i.a.)	Dose i.a. (g ha^{-1})
T1	Controle negativo (sem aplicação de fungicida)	–
T2	Controle para comparação (trifloxistrobina + tebuconazol)	75 + 150
T3	Metominostrobina + tebuconazol e clorotalonil(1)	79,8 + 119,6 e 1.080
T4	Trifloxistrobina + protioconazol + bixafem	75 + 87,5 + 62,5
T5	Azoxistrobina + mancozebe + tebuconazol	94 + 112 + 1.194
T6	Epoxiconazol + cresoxim-metílico e piraclostrobina + epoxiconazol(1)	412 + 50 e 78 + 48
T7	Pidiflumetofem e azoxistrobina + ciproconazol(1)	30 e 60 + 24
T8	Propiconazol + azoxistrobina + pidiflumetofem	75 + 60,1 + 45,1

Description of fungicide treatments used in the trials of the Wheat Cooperative Trial Network for leaf spot control in the 2024 harvest. - Source: Wheat Cooperative Trial Network

Tratamento	Ingrediente ativo	Severidade de manchas foliares em trigo (%)			Eficácia(3) (%)
		Média(1)	IC limite inferior(2)	IC limite superior(2)	
1	Controle negativo (sem aplicação de fungicida)	18,9 d	9,7	31,0	–
2	Controle para comparação (trifloxistrobina + tebuconazol)	8,4 c	2,8	16,9	55,6
3	Metominostrobina + tebuconazol e clorotalonil	6,4 b	1,7	14,1	66,1
4	Trifloxistrobina + protioconazol + bixafem	5,9 b	1,5	13,4	68,8
5	Azoxistrobina + mancozebe + tebuconazol	6,5 b	1,8	14,3	65,5
6	Epoxiconazol + cresoxim-metílico e piraclostrobina + epoxiconazol	5,3 ab	1,2	12,5	71,9
7	Pidiflumetofem e azoxistrobina + ciproconazol	4,4 a	0,7	10,9	76,7
8	Propiconazol + azoxistrobina + pidiflumetofem(4)	3,7 a	0,5	9,9	80,4
CV (%)		**19,4** –	–	–	–

Means, clusters, confidence intervals and control efficiency for leaf spot severity in wheat, estimated for different fungicide treatments. Summarized data from 14 trials of the Wheat

Cooperative Trial Network for leaf spot control, 2024 harvest. **(1)** Means that do not share any letters in common are significantly different according to Tukey's test at 5% significance. Data were transformed to square root prior to analysis. **(2)** Limits (lower and upper) of the 95% confidence interval. **(3)** Percentage reduction in the value of the variable in the treatment with fungicide in relation to the treatment without fungicide application (negative control). **(4)** Product with Temporary Special Registration (RET) for experimentation during the period of testing. - Source: Cooperative Wheat Testing Network

Ensaio	Instituição[1]	Município, Estado	Data de semeadura (2024)	Cultivar	Reação a manchas foliares[2,3]		
					Mancha--amarela	Mancha--marrom	Mancha da gluma
E1	Embrapa Cerrados	Planaltina, DF	21/3	BRS 404	MS	MR	SI
E2	UFLA	Ijaci, MG	20/3	TBIO Calibre	MR	SI	SI
E3	Copacol[4]	Cafelândia, PR	14/5	TBIO Aton	MS	SI	SI
E4	Agroensaio[4]	Campo Mourão, PR	16/5	TBIO Toruk	MS	MR/MS	SI
E5	G12Agro[4]	Guarapuava, PR	21/6	ORS Premium	MR	MR	SI
E6	CWR[4]	Palmeira, PR	3/6	ORS Absoluto	MR	MR	SI
E7	3M[4]	Ponta Grossa, PR	1/6	BRS Reponte	MS	MR	SI
E8	Embrapa Clima Temperado	Capão do Leão, RS	10/7	BRS Belajoia	MR	MR	MR
E9	OR Genética	Coxilha, RS	20/7	ORS Soberano	MR	MR	SI
E10	CCGL[4]	Cruz Alta, RS	19/6	TBIO Toruk	MS	MR/MS	SI
E11	Agronômica	Jaboticaba, RS	14/6	TBIO Ponteiro	MR/MS	SI	MR/MS
E12	Instituto Agris	Passo Fundo, RS	11/7	TBIO Ponteiro	MR/MS	SI	MR/MS
E13	Embrapa Trigo	Passo Fundo, RS	21/10	BRS Reponte	MS	MR	SI
E14	3Tentos	Santa Bárbara do Sul, RS	13/6	TBIO Calibre	MR	SI	SI

Information on the trials conducted in the Cooperative Wheat Trial Network for leaf spot control, 2024 harvest.

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revistacultivar.com

CONTACT
editor@grupocultivar.com
comercial@grupocultivar.com