19.Sep.2026 N º 97

Cultivar Semanal



Double attack on tomatoes

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Setembro/2026

Combined herbivory alters the rhizosphere microbiome of tomato plants

Attacks by Tuta absoluta and Bemisia tabaci reduce bacterial diversity and alter nutrient allocation

17.09.2026 | 04:44 (UTC -3)

Schubert Peter, Cultivar Magazine



The simultaneous infestation of Tuta absoluta and Bemisia tabaci causes more intense alterations in the bacterial community of the tomato rhizosphere than the isolated presence of each pest. The combined attack also increases the allocation of nitrogen and phosphorus to the roots and reduces plant biomass. The results indicate a change in the tomato's resource allocation strategy in response to aerial herbivory.

These conclusions are based on a study conducted by researchers at Yunnan University in China (doi 10.1127/entomologia/3889). The work evaluated the effects of two important tomato pests. Tuta absoluta has a mining habit. Bemisia tabaci has piercing-sucking

mouthparts and extracts sap from the phloem.

Greenhouse

The researchers set up the experiment in a greenhouse. The design adopted six blocks and four treatments: plants without herbivory, plants infested only by Tuta absoluta, plants infested only by Bemisia tabaci, and plants subjected to both species.

Each plant in the Tuta absoluta treatment received ten second-instar larvae. Plants infested with Bemisia tabaci received 100 adults. The combined treatment maintained the same densities of each species used in the individual treatments.

The experiment lasted eight days.

Biomass production

Herbivory reduced tomato biomass production. Compared to the control, aboveground biomass decreased by 22,5% under attack by Tuta absoluta, 46,2% in the presence of Bemisia tabaci, and 57,4% with both species. Underground biomass decreased by 12,9%, 40%, and 44,1%, respectively.

At the same time, the ratio between root and shoot increased by 12,4% with Tuta absoluta, 13,1% with Bemisia tabaci, and 30,9% in the combined infestation. The result indicates a higher relative priority for underground tissues under herbivory

pressure.

Distribution of nutrients

The distribution of nutrients showed a similar response. The combined infestation increased nitrogen and phosphorus concentrations in the roots. The root-to-shoot ratios of these two nutrients also increased. Carbon showed different behavior, with no significant change in concentration between treatments in the roots.

Researchers interpret this pattern as a strategy for prioritizing the root system. Under attack above ground, the tomato plant redirected resources related to growth to underground tissues. The effect

did not simply correspond to the sum of the responses observed with each insect in isolation.

Changes in the soil

The changes also affected the soil. The three herbivory treatments raised the pH and reduced the levels of ammoniacal nitrogen, nitric nitrogen, available phosphorus, and dissolved organic carbon. The interaction between the two pests had a significant effect on pH and dissolved organic carbon.

Rhizosphere bacterial diversity decreased after herbivory. The Chao1 index, used as an estimate of richness, showed a significant reduction. The Shannon index

also decreased in treatments with Bemisia tabaci and with both pests. The combined infestation produced the most intense effect on bacterial richness.

Bacterial diversity showed a positive association with tomato biomass and soil dissolved organic carbon. Conversely, diversity indices showed a negative association with the root-to-shoot ratio. These results link physiological changes in the plant to changes observed in the rhizosphere environment.

The bacterial composition also responded to the treatments. Proteobacteria remained the dominant phylum. The relative participation of Firmicutes reached 9,8% in the treatment with Bemisia tabaci and 12,6% in the combined infestation.

Acidobacteriota represented 6,3% of the community in the combined treatment, below the 11,8% recorded under isolated infestation of Bemisia tabaci.

Predominant genres

Among the predominant genera were Pseudomonas, Lactobacillus, and Nitrosospira. The relative abundance of Pseudomonas reached 42,3% in the treatment with both pests. Infestation by Bemisia tabaci also promoted enrichment of bacteria of the genus Bacillus. The study relates this group to known functions of plant growth promotion, such as nitrogen fixation and phosphorus solubilization.

The structure of bacterial co-occurrence networks also changed. The presence of Tuta absoluta increased the number of nodes, connections, and the average degree of the network. Combined infestation produced broader changes than treatments with a single pest. Bemisia tabaci, on the other hand, reduced the complexity of the network and increased its modularity.

Scientists highlight two limitations. The combined treatment brought together greater herbivore diversity and higher total feeding pressure. The experimental design does not allow for a complete separation of the effects of species diversity from the effects associated with insect density. Furthermore, the eight-day period allowed for the evaluation of initial responses, but

does not allow for predicting the persistence of changes in the soil microbiota.

The results point to a direct connection between pest attacks on the aerial parts of the tomato plant, nutrient redistribution, and the organization of the rhizosphere microbiota. According to the researchers, this relationship may contribute to future studies on integrated pest management and crop resilience.

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Renato Guimarães announces departure from FMC

Executive concludes nearly three-year cycle and evaluates executive performance and board roles

16.09.2026 | 17:16 (UTC -3)

Cultivar Magazine



Renato Guimarães, president of FMC Brazil, announced that he will leave the company in November, after almost three years of service. He stated that his time at FMC brought challenges, learning experiences, and the building of relationships with clients, distributors, partners, and employees. According to the executive, the experience also reinforced values ??related to customer relationships.

"I take with me much more than professional experiences. I take with me lessons, values, and relationships built on respect, partnership, and trust," he stated.

The executive also thanked FMC employees and mentioned their participation in decisions, challenges, and achievements during their time at the

company.

When discussing his next steps, Guimarães stated that he intends to remain active in the business environment. He mentioned the possibility of holding executive positions or contributing to boards, sharing experiences and supporting organizations in their growth and transformation processes.

Guimarães has three decades of experience in agribusiness, with expertise in the agricultural inputs segment.

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Nortox launches Typhoon and Tempus with OD technology

New insecticides combine methomyl, chlorantraniliprole, and chlorpyrifos for pest control

15.09.2026 | 23:50 (UTC -3)

Cultivar Magazine, based on information from Nortox.



Nortox has introduced two new solutions for pest management: Typhoon and Tempus. The products combine two active

ingredients in a single formulation and incorporate OD (Oil Dispersion) technology, developed to improve characteristics such as stability, spreading, and adhesion during application.

OD technology consists of a concentrated suspension in which finely processed solid particles are dispersed in an oily phase. According to Nortox, the formulation promotes the stability of the active ingredients and their permanence on the leaf surface, in addition to helping reduce losses related to volatilization, ultraviolet radiation, and temperature variations.

“In developing both solutions, the company started from a common challenge in the field: to combine, in a single product, active ingredients with distinct

physicochemical properties, preserving their stability and allowing them to act in a complementary way," stated Romeu Stanguerlin, CEO of Nortox.

Typhoon combines methomyl and chlorantraniliprole

Designed for corn pest management, Typhoon combines methomyl and chlorantraniliprole—two ingredients familiar to growers—now brought together in an OD formulation. According to the company, the solution was developed to target primarily leafhoppers and caterpillars, two of the main pests affecting the crop.

Nortox highlights that the combination brings together different mechanisms of action and properties that favor the product's contact with the target and its distribution within the plant. The translaminar nature of the ingredients contributes to the action reaching different regions of the leaf tissue.

Another point highlighted by the company is the permanence of the active ingredients on the plant surface. Tests conducted during development showed a reduction of up to 76% in methomyl volatilization compared to other formulations of the active ingredient, considering the evaluated period.

Tempus is designed for caterpillars that are difficult to control

Tempus, in turn, combines chlorpyrifos and chlorantraniliprole in an OD formulation. According to João Marcos Ferrari, Commercial Director at Nortox, the solution was developed for situations involving larger caterpillars that are difficult to control.

The formulation combines the two active ingredients into a single product, reducing the need for certain tank mixing. Ferrari also highlighted that the pre-formulated combination can contribute to greater predictability of application, especially given the compatibility and stability

challenges that can arise from mixing ingredients with distinct physicochemical properties.

In addition to operational practicality, speed of control is another aspect highlighted by the company. In tests conducted by Nortox, the products started with control levels in the range of 80% to 90%, while some tank mixtures evaluated showed initial levels of approximately 50% to 60%.

The company also reported conducting evaluations over two years with 11 independent research institutions, in addition to work carried out at its own experimental stations.

“More than just combining two active ingredients into a single product, Typhoon

and Tempus are entering the market with the goal of transforming formulation quality into field performance, bringing more technology to an agriculture that needs to produce more, with precision and efficiency," said Ferrari.

Formulation as an innovation strategy

For Nortox, Typhoon and Tempus are part of a strategy to develop new blends and exclusive formulations. The company states that it seeks to increase the share of products launched in recent years in its revenue.

"At Nortox, we focus on innovation, aiming for 30% to 35% of our sales to come from

products we launch in the current year plus three years," explained Romeu Stanguerlin. According to him, Typhoon and Tempus are part of this strategy for the period of 2026 to 2029.

The company also maintains a pipeline of new products. According to Stanguerlin, Nortox has over 100 projects under development and approximately 60 products already approved for future launches, which could reach the market in the next two, four, or even six years.

The development involves evaluations carried out at the company's experimental stations. According to the CEO, more than 3 experimental plots with different treatments are conducted annually. Based on this work, some projects advance to the

next stages of development and registration.

Business expansion

With over 70 years of experience, Nortox maintains businesses in three platforms: agricultural pesticides, plant nutrition, and seeds. Currently, according to the company, approximately 90% of its business is concentrated in pesticides, while plant nutrition and seeds together account for the remaining 10%.

The company also seeks to expand its international presence. In addition to Brazil, Nortox has operations in Paraguay, Uruguay, and Chile, and recently began operations in Mexico.

“We want to grow in sales, gain market share, and expand internationally. Today we have a presence in Brazil, Paraguay, Uruguay, and Chile, and we have just opened our operation in Mexico. So we aim to grow internationally, and this is part of our strategic agenda,” stated Stanguerlin.

The company also reported that it expects revenue of R$ 3 billion in 2026. To support its growth strategy, the company is focusing on innovation, new formulations, strategic alliances, and portfolio expansion.

More than seven decades of experience

Nortox was founded on April 14, 1954, in Apucarana (PR), initially with a single product aimed at combating the coffee berry borer. The company's history was presented during the meeting by Roberto Amaral, administrative director and representative of the third generation of the family in management.

Over the decades, the company has expanded its portfolio and has also begun to operate in the synthesis and development of new molecules, in addition to its current platforms for pesticides, plant nutrition, and seeds.



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Diabrotica virgifera resistance reduces the effectiveness of refuge areas in Bt corn

Study points to non-recessive inheritance of resistance to Gpp34/Tpp35Ab1 and fitness costs in the pest

18.09.2026 | 14:20 (UTC -3)

Cultivar Magazine



Photo: Andrii Kabai / iNaturalist - CC BY-NC 40

The resistance of Diabrotica virgifera virgifera to Bt maize expressing the Gpp34/Tpp35Ab1 proteins is inherited in a non-recessive manner. According to the authors, this likely reduces the ability of refuge strategies to delay the evolution of resistance and increases the risk of it occurring. Researchers from Iowa State University and USDA-ARS evaluated two laboratory lines, DBQ and WAT, derived from field populations with evolved resistance and compared them to a susceptible line with a similar genetic background.

The genetic dominance values ??(h) were 0,76 in DBQ and 0,72 in WAT. In both lines, heterozygotes survived significantly more in Bt maize than susceptible individuals, although less than in non-Bt

maize. WAT showed complete resistance, with no significant difference in survival between Bt and non-Bt maize, while DBQ showed incomplete resistance. The resistance ratios were 124 for WAT and 38 for DBQ.

The study also identified fitness costs associated with resistance, measured in non-Bt maize and in homozygous resistant individuals. The percentages below are relative reductions compared to the susceptible line. In the DBQ, females produced 44,4% fewer viable eggs (significant effect, but with a narrow margin: P = 0,044 in a one-tailed test), and no other costs were detected.

In the WAT group, survival to adulthood was 17,1% lower, development lasted

2,81% longer, and head capsule width (an indicator of body size) was 0,81% smaller. These costs may partially offset the effect of non-recessive inheritance by selecting against resistance alleles in the absence of Bt maize pressure. The authors caution, however, that costs alone may not guarantee a lasting delay in resistance without larger refuges and integrated management.

To reduce the risk of resistance evolution, the authors suggest larger refuges and more diversified management approaches. In locations where resistance to Gpp34/Tpp35Ab1 is not yet widespread, crop rotation and planting non-Bt maize can also increase the proportion of susceptible insects in the population and delay the evolution of resistance (doi

10.1002/ps.71301).

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Saiba mais!

Agricultural Market - 18.Sep.2026

US harvest puts pressure on soybean and corn prices in Chicago.

18.09.2026 | 09:34 (UTC -3)

Vlamir Brandalizze - @brandalizzeconsulting



The progress of the soybean and corn harvest in the United States is increasing pressure on agricultural prices in Chicago.

The market is also monitoring the strengthening dollar, rising US interest rates, and the recent drop in oil prices. In Brazil, planting of the new crop is beginning to gain momentum, while exports are sustaining demand for soybeans and corn.

The U.S. soybean harvest has already surpassed 10% of the area. The historical average for this period is 6%. The faster pace increases supply and puts pressure on contracts. Rain forecast for some producing regions may limit fieldwork and reduce some of this pressure.

Chinese demand remains relevant to the market. The USDA's September supply and demand report indicates Chinese imports of 115 million tons of soybeans.

The National Association of Cereal Exporters (Anec) indicates that China's share is close to 70% of Brazilian soybean shipments, within the pattern observed in previous months.

Brazilian soybean shipments exceeded four million tons in September. The accumulated total since January reached approximately 97 million tons. In the same period of the previous year, the volume was below 90 million tons.

Sales of the new crop have reached 38,5%. In the previous cycle, the rate was 39%. The average is 40%. In volume, 71,3 million tons have already been traded, compared to 70,4 million tons in the same period last year.

Planting of the new Brazilian crop is progressing in Mato Grosso, Paraná, Mato Grosso do Sul, and parts of Goiás. The cited estimate points to an area close to 50 million hectares. With normal weather conditions, initial projections indicate production between 185 million and 190 million tons. The previous harvest reached 180,5 million tons.

Corn situation

In the US, the corn harvest has reached approximately 12%, compared to an average of 8% for this time of year. More than half of the crops have already entered the maturation stage. The absence of significant frost forecasts in the next two weeks reduces the risk to areas still in the

grain-filling stage.

In Brazil, corn exports could reach close to three million tons in September. The annual total is approximately 17,5 million tons, compared to 19 million tons in the same period of the previous year.

The harvest of Brazil's second crop has reached 97%. There are still areas in the field in Paraná, Mato Grosso do Sul, Goiás, and São Paulo. The planting of summer corn has reached 70%. Paraná is around 80%. Rio Grande do Sul and Santa Catarina are close to 70%. The southeastern states are around 60% or below that level.

Wheat situation

Wheat prices remain higher than those seen last year. In Rio Grande do Sul, prices range between 1.350 and 1.380 reais per ton. In Paraná, prices are between 1.500 and 1.520 reais per ton.

Wheat harvesting is progressing in Paraná ahead of the arrival of new rains. Recent frosts have caused localized losses in the south of the country. The source does not indicate any major damage. In Rio Grande do Sul, most crops remain in the development stage, with ears forming and grain filling.

Rice situation

Rice from Rio Grande do Sul is experiencing a period of increased value

and export demand. Deals destined for the foreign market were close to 90 reais. The aforementioned expectation points to the possibility of a record for September in rice exports from Rio Grande do Sul.

In Tocantins, rice prices range between 105 and 110 reais, with reports of deals for exports from the state reaching up to 120 reais. The recovery in prices has changed the outlook for planting.

Bean situation

Beans enter a period of restricted supply after the end of the third harvest. The first areas of the summer crop in southwestern São Paulo remain in vegetative growth, pod formation, and grain filling.

The best quality carioca beans range in price from 300 to 330 reais per sack. Most transactions in producing regions occur between 300 and 310 reais. Commercial carioca beans are priced between 285 and 300 reais per sack.

Black beans are also experiencing higher demand and lower supply. Prices range between 225 and 250 reais per sack. The market recorded a weekly increase of more than 10 reais per sack in some transactions, while retailers are increasing their need for restocking.

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Saiba mais!

Adama announces new CEO and CFO for October and November

Zhigang Hao will assume the presidency in November; Sammy Leibowitz will head the finance area starting in October

18.09.2026 | 05:45 (UTC -3)

Cultivar Magazine



Adama Ltd. announced the appointment of Zhigang Hao as Chairman and CEO, effective November 1, 2026. The company also appointed Sammy Leibowitz as Chief Financial Officer (CFO), with an expected start date of October 1.

Hao will replace Gaël Hili, the new president of Seeds at Syngenta Group, starting November 1st. Hili will then lead the combined seed portfolio for agricultural and vegetable crops. He will also remain a member of the group's leadership team.

Hili will also assume the chairmanship of the boards of Adama Agricultural Solutions Ltd. and Adama Ltd. This will allow him to maintain a stake in the company's long-term direction.

Hao joins Adama after serving as CEO of Adisseo, a global company specializing in chemicals and animal nutrition. His experience includes operations, business transformation, corporate governance, and international business management. The executive will leave France and relocate to Israel.

Leibowitz returns to Adama after serving at Syngenta Group as Global Head of Performance Acceleration. Prior to that, he worked for over 13 years at Adama, holding leadership roles in finance, corporate development, and strategy. During that time, he participated in the formulation and execution of the company's transformation strategy.

Leibowitz will replace Efrat Nagar, who is scheduled to leave on September 30 after

22 years at Adama. Nagar held various financial leadership positions and spent five years as part of the global leadership team, three and a half of which were spent as CFO.

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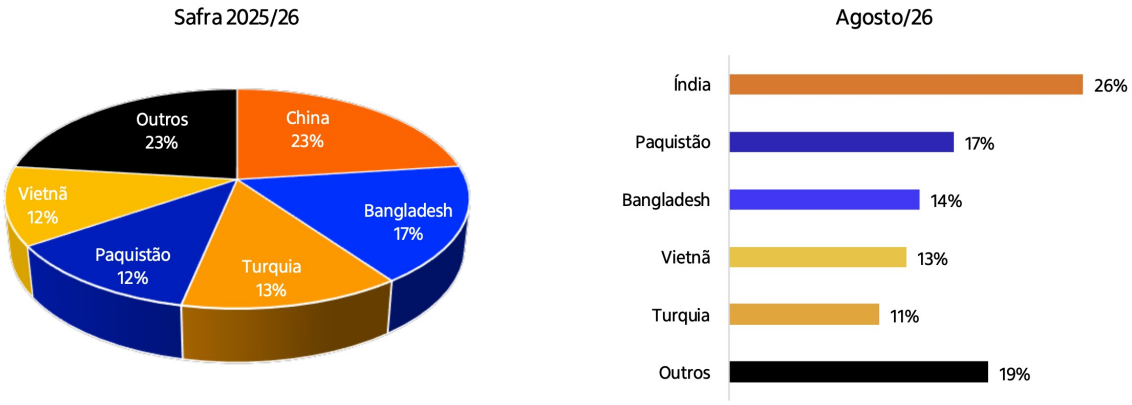
Tighter global supply favors cotton recovery

Global deficit and smaller US harvest support prices; Brazil increases exports and may expand acreage

17.09.2026 | 12:59 (UTC -3)

Cultivar Magazine, based on information from Itaú BBA

Principais destinos do algodão brasileiro



Fonte: Secex

The global cotton market enters the 2026/27 season with supply lower than consumption and reduced stocks. Itaú BBA estimates global production at 25,5 million tons, compared to consumption of

26,8 million tons. The deficit reaches approximately 1,2 million tons. As a result, ending stocks are expected to decrease from 16,4 million to 15,2 million tons. This scenario increases the sensitivity of prices to production losses and demand behavior.

The adjustment gains importance outside of China. The country holds a large share of global inventories, but these reserves circulate less in international trade. Without Chinese volumes, availability between exporters and other consumers shows less leeway. Additional losses in the United States, India, or other major producers could exacerbate this squeeze.

Situation in the United States

In the United States, drought and crop deterioration led the U.S. Department of Agriculture to reduce its production estimate. The projection fell from 2,96 million to 2,87 million tons between August and September. The average projected yield declined to 0,87 tons per hectare, compared to 0,96 tons per hectare in the previous season.

In the week ending September 13, 36% of U.S. cotton crops were rated good or excellent. A year earlier, the proportion was 52%. At the beginning of the month, about 59% of the cotton area was facing some degree of drought. Texas had the

most critical situation.

Lower production has reduced the estimated ending stocks in the United States to 780 tons. This volume corresponds to approximately 26% of total usage. Exports remain projected at 2,7 million tons. According to Itaú BBA, this smaller buffer limits the US capacity to increase shipments and opens up opportunities for competing suppliers, particularly Brazil.

China and India

China is also expected to harvest less cotton. The agricultural attaché from the United States Department of Agriculture projects 7,1 million tons in 2026/27, a 5,6%

decrease compared to the previous cycle. The official estimate points to 7,3 million tons. The reduction stems from the smaller area planted in Xinjiang and less favorable weather conditions. Chinese consumption is expected to remain close to 9 million tons.

This production deficit does not automatically imply an increase in Chinese imports. The country maintains high inventory levels and manages import quotas. External purchases also depend on the difference between domestic and international prices and the profitability of the textile industry.

India adds another source of uncertainty. The development of El Niño and the irregularity of the monsoons increase

production risk. Much of Indian cotton is grown using rainfed cultivation. Poorly distributed rainfall can reduce productivity, decrease exportable supply, and increase the need for imports to supply the local industry.

Situation in Brazil

In Brazil, the 2025/26 harvest reached a record production of nearly 4,4 million tons of cotton lint. This result occurred even with a reduction in the cultivated area. The Rally da Safra survey indicates approximately 2,07 million hectares planted, a decrease of 6,3%. Favorable weather conditions, greater use of irrigated areas, and advances in management sustained productivity.

Mato Grosso maintained its national leadership. Cotton productivity in seed cotton could reach 337 arrobas per hectare. The state's lint production could reach approximately 3 million tons. In Bahia, irrigated areas now represent 44% of the total. Lint production was estimated at approximately 980 tons, a 23% increase, with productivity close to 368 arrobas per hectare in seed cotton.

Brazilian progress is also evident in exports. The 2025/26 marketing year, between August and July, saw record shipments of 3,4 million tons. China imported 1,5 million tons of cotton during this period. Brazil supplied 784 tons, equivalent to 51% of Chinese purchases.

The diversification of destinations gained momentum at the beginning of 2026/27. In August, Brazil shipped 106,3 tons of cotton, a volume 37% higher than that recorded a year earlier. India accounted for 26% of shipments in the month. Pakistan, Bangladesh, Vietnam, and Turkey also gained market share. This distribution reduces dependence on the Chinese market.

Prices and fertilizers

The recovery in international prices has improved the economic outlook for the next harvest. In New York, cotton has appreciated by more than 8% since July. The average price rose from 77,5 to 84 cents per pound in the first half of

September. In the domestic market, prices in Rondonópolis advanced 6,4% between the beginning of July and the first half of September, to R$ 4,04 per pound.

The rise in cotton prices also improved the exchange rate with fertilizers. This movement increased the producer's purchasing power in relation to monoammonium phosphate, urea, and potassium chloride. For second-crop cotton in Mato Grosso, Itaú BBA revised its agricultural margin estimate for 2026/27. The projection increased from 26% in April to approximately 38% in August.

This scenario increases the possibility of expansion of the Brazilian planted area in 2026/27. Preliminary estimates suggest an area exceeding the record of 2,2 million

hectares registered in 2024/25. Despite this, Itaú BBA projects production of 4,2 million tons, below the 4,4 million tons of the previous season. The projection considers more conservative productivity and climatic risks associated with El Niño.

The report indicates that the phenomenon will continue to influence the crop at least until April 2027, according to the United States National Oceanic and Atmospheric Administration. In Mato Grosso, the pace of soybean planting and the competitiveness of corn may also affect the window for second-crop cotton. The expansion of Brazilian supply may still put pressure on the basis during the 2027 harvest, even with more balanced international fundamentals.

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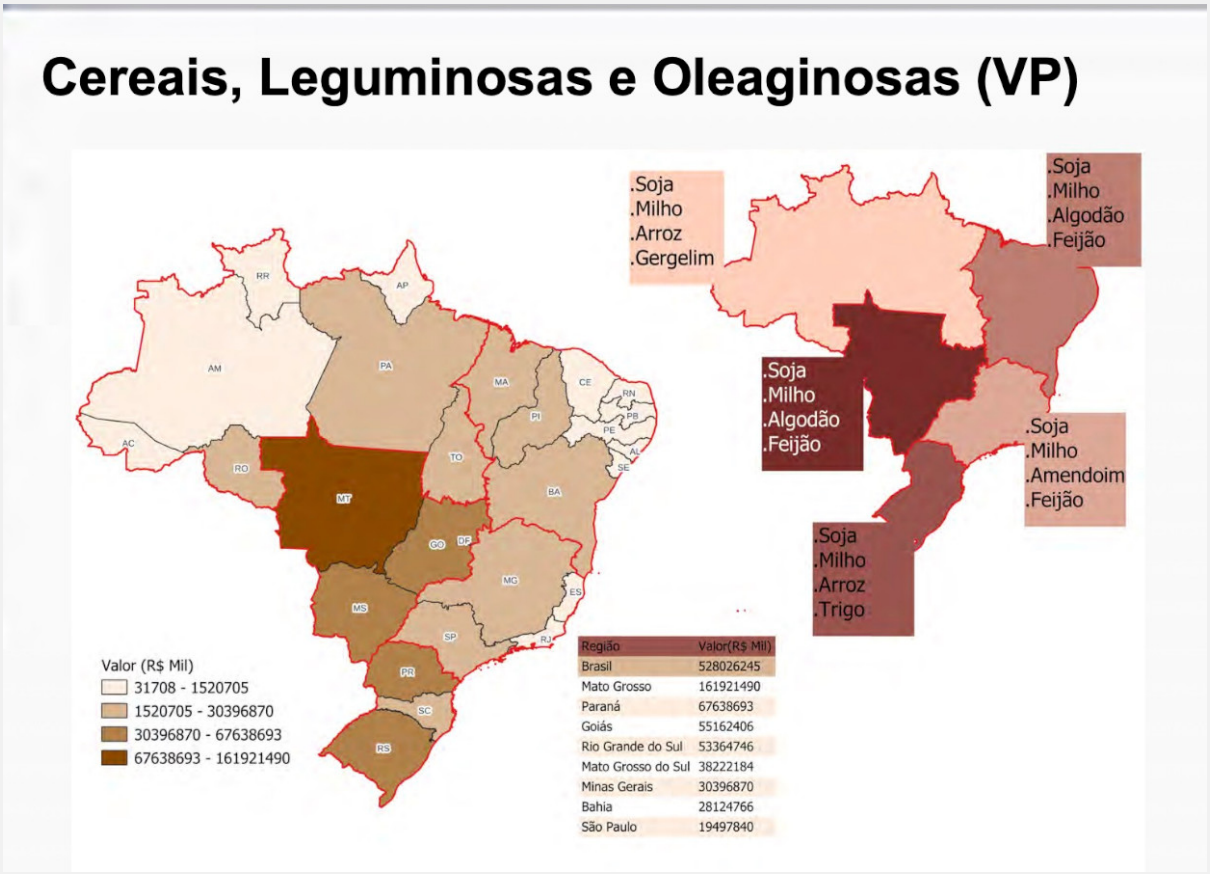
ATENÇÃO ESTE PRODUTO É PERIGOSO À SAÚDE HUMANA, ANIMAL E AO MEIO AMBIENTE; USO AGRÍCOLA; VENDA SOB RECEITUÁRIO AGRONÔMICO; CONSULTE SEMPRE UM AGRÔNOMO; INFORME-SE E REALIZE O MANEJO INTEGRADO DE PRAGAS; DESCARTE CORRETAMENTE AS EMBALAGENS E RESTOS DOS PRODUTOS; LEIA ATENTAMENTE E SIGA AS INSTRUÇÕES CONTIDAS NO RÓTULO, NA BULA E RECEITA; E UTILIZE SEMPRE OS EQUIPAMENTOS DE PROTEÇÃO INDIVIDUAL.

The value of Brazilian agricultural production hits a record R$ 927,2 billion

Grain harvest reaches 345,4 million tons in 2025, with growth in soybean and corn production and expansion of planted area

17.09.2026 | 10:43 (UTC -3)

Cultivar Magazine, based on information from IBGE



Source: IBGE

The value of production of Brazil's main agricultural crops reached R$ 927,2 billion in 2025, the highest result in the historical series. This amount increased by 18,4% in nominal terms compared to 2024. National production of cereals, legumes, and oilseeds also reached a record high, with 345,4 million tons, an increase of 18,2%. This addition totaled 53,4 million tons. The data are part of the 2025 Municipal Agricultural Survey (PAM).

Soybeans and corn sustained much of this growth. The two crops accounted for 88,7% of Brazilian grain production. This performance reflected increased average productivity and expansion of agricultural areas. In 2024, El Niño negatively impacted productive areas in the South and Midwest, with low rainfall in several

regions and excessive precipitation in Rio Grande do Sul. The climatic scenario presented more favorable conditions for important crops in 2025.

The planted area for all crops surveyed by PAM reached 101,3 million hectares, an increase of 4,2%, or 4,1 million hectares. Soybeans gained an additional 1,7 million hectares of harvested area. Corn added 995,2 hectares and sorghum, 203,4 hectares. The total harvested area reached 100,6 million hectares, a rise of 4,4%.

Soybeans occupied 47,6 million hectares, equivalent to 47,3% of the harvested agricultural area in the country. Production reached 165,3 million tons, a 14,4% increase over 2024. The gain

corresponded to 20,8 million tons. Productivity advanced 10,3% and the harvested area increased by 3,7%. The recovery in prices also contributed to the economic result. The oilseed accounted for 34% of the total value of agricultural production surveyed. Its production value grew by 21,1%.

Corn production reached a record 141,2 million tons, 23,1% higher than the previous year. In the first crop, the harvested area decreased by 5,4%, but productivity increased by 16,6% due to better weather conditions. The second crop expanded in area, production, and yield, reaching 115,4 million tons. The value of corn production increased by 38,9%, placing the cereal in second

position among agricultural products in terms of value generation.

Beans, wheat and cotton

Beans and wheat followed opposite trends in terms of planted area. The harvested area of ??beans fell by 7,2%. For wheat, the reduction reached 13,9%. According to the research, unattractive prices during the planting period reduced producers' interest. In wheat, productivity increased by 21,9%, offsetting part of the reduction in planted area. National production grew by 4,9%, to 7,88 million tons, while the value of production fell by 2%.

Cotton production reached 9,92 million tons, a 16,4% increase. The expansion of the harvested area, yield gains, and prices contributed to a 29,5% increase in the value of production. Coffee and cotton maintained significant weight among the crops linked to the export agenda.

Coffee and rice

National coffee production totaled 3,4 million tons, a 3% increase over 2024. The value of production grew by 44,7%, reaching R$ 100 billion. Arabica coffee accounted for 2,2 million tons, a decrease of 6,8%. Its production value reached R$ 71,4 billion. Robusta coffee reached 1,2 million tons, an increase of 26,8%, and generated R$ 28,6 billion.

In the rice sector, production rose 18,6%, reaching 12,6 million tons. The planted area increased by 8%, and average productivity grew by 7%. Even with a larger harvested volume, the value of production fell by 12%. The research attributes the decline to low prices, fluctuations in the international market, and increased domestic supply.

Analysis by region

Mato Grosso maintained its leadership among the states of the Federation in terms of the value of agricultural production. The state registered a growth of 37,1% and now represents 17,9% of the national total. The Central-West region also took first place among the major

regions. The regional value reached R$ 288 billion, an increase of 31,8%. The Southeast region came in second place, with a difference of R$ 17 billion, despite regional growth of 17,7%.

Among the municipalities, Sapezal, in Mato Grosso, registered the highest value of agricultural production in the country, with R$ 8,6 billion, a 46,6% increase. Cotton accounted for approximately R$ 5,1 billion of this total. São Desidério, in Bahia, totaled R$ 8,2 billion. Sorriso, in Mato Grosso, appeared in third position. The ten municipalities with the highest production values ??totaled R$ 65,9 billion, equivalent to 7,1% of the national agricultural value.

The PAM 2025 also expanded the range of products investigated. New crops in the horticulture group contributed R$ 13,1

billion, or 1,4% of the total value. In fruit production, 24 fruits generated R$ 95,6 billion, a growth of 4,2%. The inclusion of strawberries, acerola, cupuaçu, and soursop added R$ 5,5 billion to the national result. Without these new fruits, the value of fruit production would have decreased by 1,8% year-on-year.

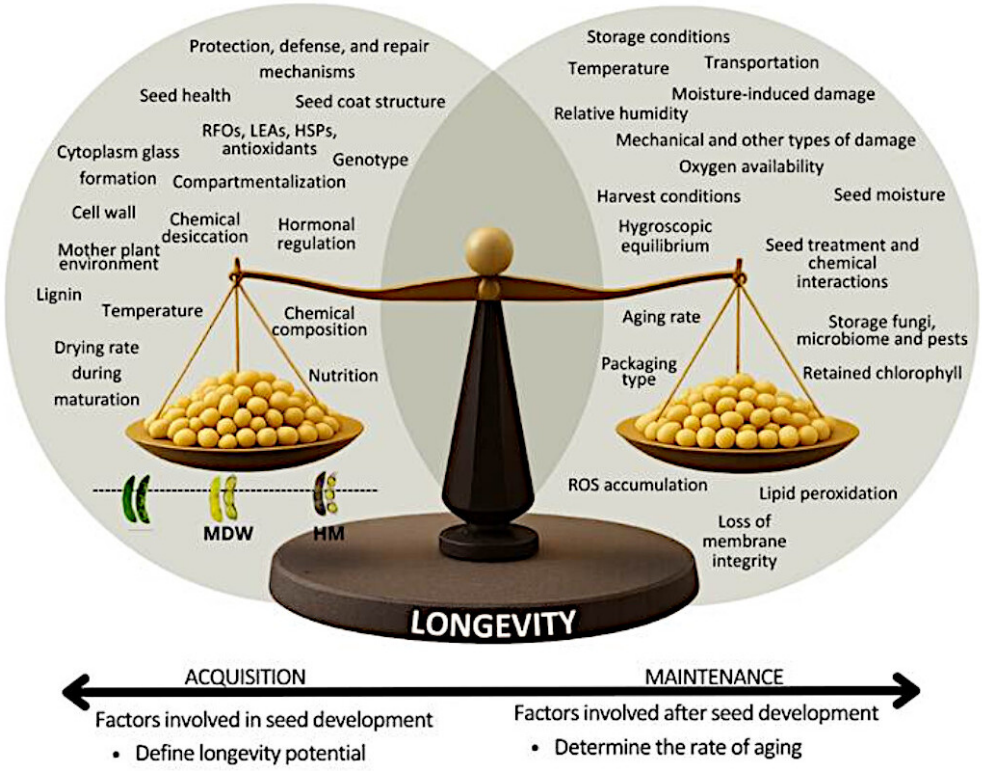
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The longevity of soybean seeds is consolidated by late maturation

Study shows role of genotype, environment, and management in the ability to preserve vigor during storage

17.09.2026 | 10:23 (UTC -3)

Cultivar Magazine



doi 10.1590/2317-1545v48307479

The longevity of soybean seeds does not depend solely on storage conditions. A significant part of this potential is formed in the field during maturation. Researchers point to late maturation as a physiologically active and decisive phase for maintaining viability and vigor after harvest. The work also proposes an updated interpretation of physiological maturity for seed production.

Scientists dispute the association between the point of maximum dry matter accumulation and the end of the acquisition of physiological quality. According to the researchers, the seed continues with metabolic activity after this stage. During this interval, structural, metabolic, and molecular adjustments linked to longevity occur (doi

10.1590/2317-1545v48307479).

Physiological attributes

Physiological attributes appear sequentially during development. Germination capacity emerges at stage R7.1. Desiccation tolerance is consolidated at R7.2. Vigor parameters, such as germination speed, seedling length, and dry matter, reach maximum values ??at R7.3. Maximum longevity occurs only at R9.

This sequence helps explain differences between batches with similar germination and initial vigor. Two seeds may show equivalent performance immediately after harvest, but maintain this condition for

different periods. Studies show a progressive increase in longevity between R7.3 and R9. In different genotypes, years, and Brazilian environments, seeds in R9 showed average increases of approximately 30% to 80% in the P50 parameter compared to seeds in R7.3. P50 indicates the time required for a 50% reduction in viability under a given aging condition.

Late ripening

Delayed maturation involves the activation of protective mechanisms. These include LEA proteins, heat shock proteins, raffinose family sugars, and oxidative stress control systems. There is also repression of genes linked to

photosynthesis, functional deactivation of chloroplasts, and alterations related to the cell wall.

The formation of a glassy cytoplasm also contributes to preservation. With the loss of water, cellular viscosity increases. The reduced molecular mobility slows down the rate of reactions associated with deterioration. Even in this state, however, oxidative reactions are still possible. The presence of oxygen, free radicals, and volatile compounds can promote damage during storage.

The integument participates in this protective system. In addition to its physical function, it regulates the diffusion of gases and volatile compounds. Lignin and antioxidant substances also help to

limit oxidative damage. Researchers cite glutathione, tocopherols, and lipocalins among the compounds involved.

Significant influence

Genetics exerts a significant influence. Evaluations with 47 cultivars and 113 lines recorded differences greater than 60 days in P50. In another experimental set, longevity showed a genotypic heritability of 0,90. The interaction between genotype and environment also showed a high value, with a heritability of 0,84. The results indicate a strong genetic component, but also a great influence of conditions during seed formation and maturation.

The maternal environment influences this potential. Temperature, water availability, fertility, and soil conditions affect processes related to cell protection, metabolic stability, and molecular repair. The researchers compiled studies in which longevity showed a positive association with nitrogen, phosphorus, calcium, copper, and manganese in the soil. Studies they cited also linked soil management systems with differences in seed vigor and conservation.

Chemical desiccation

Pre-harvest chemical desiccation deserves attention in this context. This practice reduces the time seeds are exposed to adverse field conditions, but it can also

accelerate maturation. In a study applying paraquat to R7.3 seeds, initial germination did not decrease, but the P50 (post-fertilization period) was reduced by up to 20% compared to natural maturation. This result suggests a possible interruption of processes related to longevity acquisition.

This effect does not occur in isolation. A study cited by the scientists indicates losses in plants without desiccation after remaining in the field for up to 20 days after physiological maturity. Rainfall, wetting and drying cycles, temperature, and humidity accounted for a significant portion of the variation in quality. Thus, desiccation can preserve seeds under high environmental risk, although it does not directly promote longevity.

The problem becomes more complex in indeterminate growth habit cultivars. The plant may have seeds at different stages at the time of application. Less mature fractions risk premature interruption of development and retention of green pigments. More advanced fractions remain subject to deterioration caused by the environment. Determining the timing of application needs to consider this non-uniformity and the spatial variability of the crop.

Routine tests

Scientists point out limitations of routine tests in predicting behavior during storage. Germination, tetrazolium, and accelerated aging can detect batches with immediate

compromise, but they do not always distinguish materials with different storage potentials. Batches with high initial vigor may exhibit very different P50 values.

Researchers advocate the use of complementary approaches based on survival curves. This strategy allows for monitoring the loss of viability over time and comparing the storage potential between batches. The interpretation must consider temperature and humidity during the test, as these conditions alter the deterioration mechanisms.

The main change they propose involves the concept of maximum physiological quality. Maximum dry matter accumulation marks an important stage, but it does not conclude the development of seed quality.

Late maturation completes mechanisms responsible for preserving germination and vigor after harvest. This understanding broadens the role of field management in forming seed lots with more predictable performance during storage, transport, and distribution.

The study was conducted by scientists Carolina Pereira Cardoso, Samara Moreira Perissatto, and Edvaldo Aparecido Amaral da Silva.

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Trichoderma produces dsRNA against Myzus persicae

Study validates salivary gland genes as RNAi targets and develops fungal platform to produce dsRNA

17.09.2026 | 07:56 (UTC -3)

Cultivar Magazine



Photo: David Cappaert / Bugwood

Researchers have identified secretory protein genes from the salivary glands of Myzus persicae with potential for aphid control through RNA interference (RNAi). The study also developed Trichoderma asperellum strains capable of expressing double-stranded RNA (dsRNA) directed at the selected targets.

The team performed transcriptomic analysis at different developmental stages of the insect. The work identified genes with high expression during the nymphal stage. RNAi tests confirmed these genes as targets capable of reducing the survival and reproduction of Myzus persicae.

External genes

Scientists also incorporated external genes into Trichoderma asperellum. The modified strains produced dsRNA directed to the selected targets. The results confirmed the incorporation and transcription of this genetic material by the fungus.

The strategy seeks to address two limitations of using RNAi in pest management: the instability of dsRNA and the limited availability of effective target genes.

According to the study, the Trichoderma-based platform may allow for more stable dsRNA production and, in the future, serve as a vehicle for RNAi-based management technologies. Its use depends on in vivo functional validation, a step still needed before applying the approach to aphid control (doi 10.1002/ps.71215).

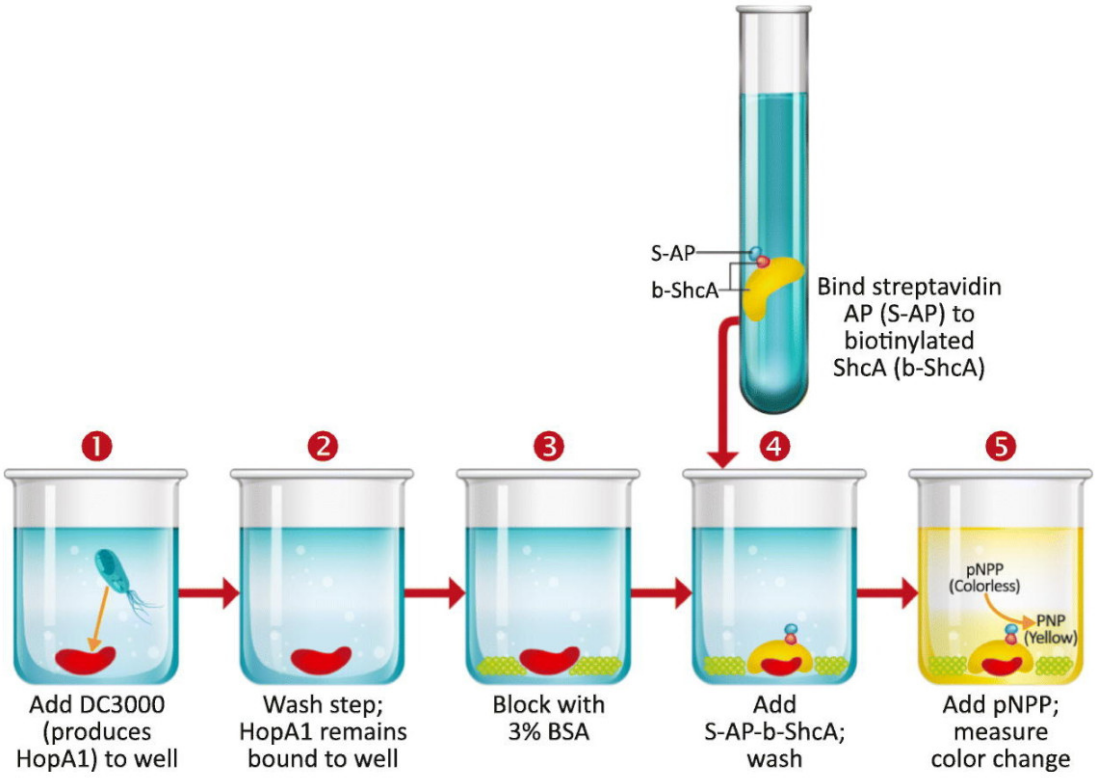
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New test detects live bacteria linked to plant diseases

The ELCA method uses the interaction between proteins of Pseudomonas syringae and achieves a limit of 100 CFU per milliliter

17.09.2026 | 07:05 (UTC -3)

Cultivar Magazine



doi 10.1016/j.mimet.2026.107681

Researchers at Pennsylvania State University have developed a method capable of detecting live cells of Pseudomonas syringae, a bacterium associated with diseases in various crops, vegetables, and woody ornamental plants. The assay, called ELCA, showed a detection limit of 100 colony-forming units per milliliter and differentiated live cells from dead populations and non-target strains.

ELCA does not require antibodies. The method exploits the interaction between the chaperone ShcA and the effector HopA1, proteins linked to the type III secretion system. Living cells produce HopA1. The binding between the proteins triggers a colorimetric reaction. The solution changes from colorless to yellow

in the presence of the target.

The proposal seeks to overcome a limitation of DNA- or epitope-based tests. These components can remain after bacterial death and generate positive results without indicating viable inoculum. In the experiments, the signal from live cells of the DC3000 strain outperformed that of cells inactivated by ultraviolet radiation at some of the concentrations evaluated.

The study presents ELCA as a proof of concept. The researchers point out the need to reduce background signals and optimize reagent concentrations. The approach may also serve as a basis for testing against other pathogens with similar chaperone and effector systems (doi 10.1016/j.mimet.2026.107681).

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CNH will update engine software to reduce downtime

The package will follow new EPA guidelines and extend the deadline for repairs before power reduction

16.09.2026 | 16:52 (UTC -3)

Cultivar Magazine, based on information from CNH



CNH will begin distributing software updates for its equipment's emissions systems in the fourth quarter of 2026. This measure will follow new guidelines from the U.S. Environmental Protection Agency (EPA) and will give operators more time to correct certain faults before automatic engine power reduction.

The first phase will prioritize high-horsepower agricultural machinery. The manufacturer will expand availability to other product families throughout 2027.

The new software will revise the time interval between the identification of certain faults in the emissions system and the activation of power reduction. According to CNH, the change will allow for planning repairs with less impact on

critical periods of agricultural operations.

“Customers have made it clear: they need solutions that can keep them productive, especially during critical seasonal periods,” said Scott Harris, president of CNH for North America. According to him, the updates will increase flexibility in solving problems related to the emissions system without compromising performance and reliability.

Customers with a CNH Electronic Service Tool subscription will be able to perform the update after it is released. Dealerships will also be able to perform the installation remotely or in person.

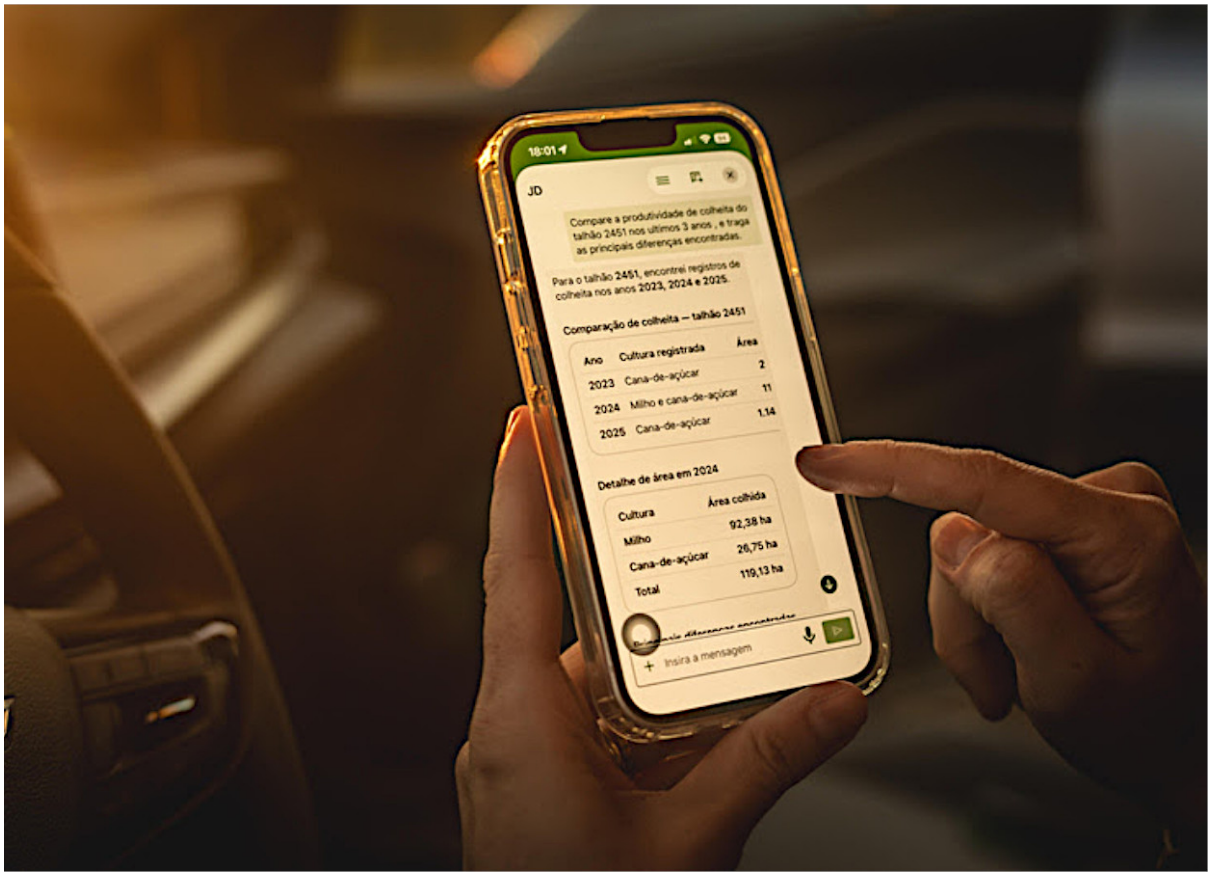
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John Deere plans to launch agricultural AI in Latin America by the end of 2026

JD will offer natural language queries; the company is approaching 100 connected machines in Brazil

16.09.2026 | 16:45 (UTC -3)

Cultivar Magazine, based on information from Danielle Morcelli Romanelli



John Deere is testing JD, an artificial intelligence agent integrated into the John Deere Operations Center, in Latin America. The company plans to launch the tool in the region by the end of 2026, in web and mobile versions. In Brazil, the company is approaching the milestone of 100 connected machines.

JD uses agronomic, machinery, and field activity data gathered in the Operations Center. Producers can ask questions in natural language and receive answers based on their own operation history. This approach reduces the need to navigate through screens, filters, and reports.

According to Cristiano Correia, global vice president of Sugarcane and vice president of Production Systems for Latin America at

John Deere, the agent aims to facilitate access to and interpretation of operational data.

Among the planned consultations are comparisons of fuel consumption in soil preparation between harvests, singulation and productivity analysis, identification of the sprayer with the greatest coverage per hour, and comparison of current conditions with previous harvest periods.

The solution will adhere to John Deere's conduct and safety standards. Responses will use information available in the Operations Center, according to the authorizations defined by the customer.

After launch, usage will require an account linked to the Operations Center and selection of the desired organization. From

this access, the producer will be able to consult the AI ??based on the data available in their operation.

Read also John Deere launches AI assistant for agricultural data analysis

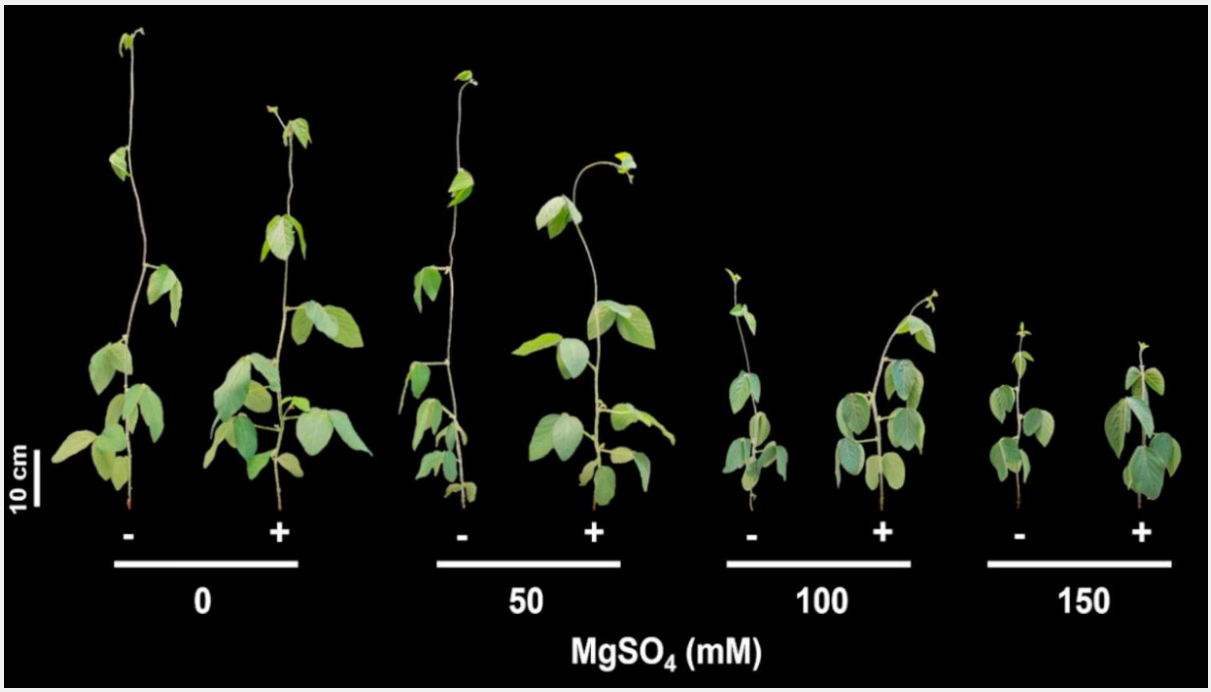
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Soy grows in Mars simulant, but does not form nodules

A USP study points to restrictions on growth and biological nitrogen fixation in MGS-1

16.09.2026 | 15:21 (UTC -3)

Cultivar Magazine



doi 10.64898/2026.09.10.750807

Researchers at the University of São Paulo managed to grow soybeans in a Martian regolith simulant, but the substrate

prevented the formation of nodules on the roots. This result limits the use of biological nitrogen fixation in agricultural systems planned for future missions to Mars.

The experiment used the BRS 284 cultivar from Embrapa. The plants were grown in a mixture of MGS-1 and vermiculite in a one-to-two ratio, with nutrient solution supplied. MGS-1 reproduces known physical and chemical characteristics of Martian regolith (doi 10.64898/2026.09.10.750807).

Plants grown in the simulant exhibited 33% shorter height, 39% fewer trifoliate leaves, and a 67% reduction in biomass compared to plants grown in sand. Root dry weight decreased by 82%.

Inoculation with Bradyrhizobium japonicum did not generate nodules in MGS-1. In the sand control, inoculated plants produced an average of 13,8 nodules.

Magnesium sulfate

Researchers evaluated magnesium sulfate as a possible cause of the inhibition. Concentrations up to 150 millimolar reduced growth and nodulation, but did not eliminate the nodules. At the highest concentration, inoculated plants maintained an average of 13 nodules. Osmotic stress induced by 300 millimolar of mannitol also reduced nodulation, without suppressing it.

The results indicate the involvement of other factors present in MGS-1. The study cites salinity, alkalinity, compaction, and low aeration among the possible components of stress. The simulant presented a pH of 7,8. According to the researchers, pH adjustments, improvement of the substrate's physical structure, and other strategies can favor the symbiosis necessary for biological nitrogen fixation.

The work was carried out by scientists Caio Felipe de Miranda-Costa, Ana Paula Avelino, and Carlos Takeshi Hotta.

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Pedro Caldas takes over marketing for Bayer in the Northern Cerrado region

Executive to lead actions in Goiás and the Mapitoba region

16.09.2026 | 09:59 (UTC -3)

Cultivar Magazine



Pedro Caldas has assumed the position of marketing manager for Bayer in the Cerrados Norte region, an area encompassing Goiás and the states of Mapitoba. The executive works from Goiânia.

Caldas worked at Syngenta since January 2020. His most recent role involved managing marketing execution, between October 2024 and September 2026. Prior to that, he held the position of customer marketing manager for the Cerrado Oeste region. During that period, he led market access, CRM, portfolio, and pricing strategies, in addition to managing a team of nine professionals.

The new role marks Caldas' return to Bayer. Between 2018 and 2020, he led

crop marketing activities and campaigns for soybeans and corn in the Eastern Unit, working in Goiás and Mapitoba. Prior to that, he held commercial and technical positions at Bayer CropScience and in agricultural distribution.

Caldas graduated in agronomy from the State University of Goiás. He also studied business management at the Getulio Vargas Foundation and marketing at ESPM.

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Study optimizes diet for Trichopria drosophilae production

Agar-free formulation increases the production of Drosophila suzukii pupae, the host used in rearing the parasitoid

16.09.2026 | 08:02 (UTC -3)

Cultivar Magazine



Photo: Karl Magnacca / iNaturalist - CC by-nc 4.0

Researchers have optimized a low-cost artificial diet for mass rearing of Drosophila suzukii, the host used in the production of the parasitoid Trichopria drosophilae. The formulation eliminates the need for agar and uses three antimicrobials. In validation assays, the diet increased pupal production by 190,8% compared to the control without antimicrobials.

The optimized composition contains 1,2 grams per liter of sodium benzoate, 1,2 grams per liter of propylparaben, and 0,3 grams per liter of potassium sorbate. The protocol eliminated sodium propionate and triclosan (doi 10.3390/insects17090960).

Five compounds

The study evaluated five compounds at three concentrations using the Taguchi method. The experimental design reduced the number of combinations needed to select the mixture from 243 to 27.

During this stage, the treatment with the highest yield produced 20,1 pupae per experimental unit. The control without antimicrobials produced 4,1. The ratio between the treatments reached approximately 4,9 times.

In the validation, the optimized formulation produced 12,07 pupae per Petri dish. The internal control achieved 4,15. Another treatment selected in the experiment generated 15,78 pupae and increased production by 280,2% compared to the same control.

Low cost

The diet uses wheat germ and low-cost ingredients. Preparation requires basic equipment and does not use agar. According to the researchers, reducing the number of preservatives also simplifies preparation and tends to lower costs.

The increased availability of pupae may favor the rearing of Trichopria drosophilae, a biological control agent of Drosophila suzukii in thin-skinned fruits. The study did not directly evaluate the longevity, fecundity, parasitism, or dispersal of the parasitoid. The researchers also point to the need to measure microbial contamination using direct methods and to evaluate antimicrobial residues.

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New mutation confers sulfentrazone resistance in cravorana

The R98Q alteration in PPO2 was first identified in Ambrosia artemisiifolia populations in the field

16.09.2026 | 07:33 (UTC -3)

Cultivar Magazine



Photo: Meneerke bloem - CC BY-SA 3.0

Researchers have identified for the first time in the field the R98Q mutation in the PPO2 enzyme of Ambrosia artemisiifolia. The genetic alteration appeared in populations collected from soybean fields in Eaton County, Michigan, United States, after recurrent control failures with sulfentrazone and fomesafen. R98Q showed an association with resistance to sulfentrazone.

Dose-response assays confirmed sulfentrazone resistance in both populations evaluated. The dose required to cause 50% plant mortality reached 5.729 grams of active ingredient per hectare in population R1 and 3.840 grams in R2. These values ??represent resistance 36 and 24 times greater,

respectively, compared to the susceptible population.

Loss of sensitivity

Fomesafefen also showed loss of sensitivity. Populations R1 and R2 recorded median lethal doses 9,1 and 7,6 times higher than the susceptible reference. The values ??remained below the field dose of 350 grams of active ingredient per hectare. Therefore, the researchers classified the result as a reduction in sensitivity, without confirmation of resistance to the product.

Two substitutions

Sequencing identified two substitutions at codon 98 of PPO2: R98L and R98Q. The latter had not yet been reported in field populations of Ambrosia artemisiifolia. No mutations associated with resistance appeared at codons 210 and 399.

Assays with the enzyme showed selective resistance caused by R98Q. The alteration reduced the action of several PPO inhibitors, with a marked effect on sulfentrazone, carfentrazone-ethyl, thiafenacil, epyrifenacil, and saflufenacil. Diphenyl ethers, including fomesafen and lactofen, maintained activity against the mutant enzyme. The results indicate the possible involvement of additional mechanisms in the reduced sensitivity to fomesafen observed in whole plants (doi 10.1002/ps.71306).

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Study reveals dual function of MINPP enzymes in insects and plants

A family of salivary phosphatases has undergone gene duplication in leafhoppers and bedbugs

16.09.2026 | 06:31 (UTC -3)

Cultivar Magazine



Photo: Paul Langlois / USDA APHIS PPQ - Bugwood

Researchers have identified a conserved family of MINPP enzymes with a role in insect feeding and the activation of plant defenses. The acronym stands for multiple inositol polyphosphate phosphatases. The study found expansion of this family through gene duplication in leafhoppers and true bugs.

Phylogenetic analysis showed specific multiplication of MINPP genes in leafhoppers, with up to six paralogs per species. Some copies showed predominant expression in the salivary glands. This group included NlMINPP1b/2b, LsMINPP1b/2b, SfMINPP1b/2b, and RpMINPP2b. LsMINPP2c showed greater expression in the ovaries.

RNA interference silencing of salivary gland-associated MINPPs reduced sugar excretion, decreased fecundity, and prolonged the development of Nilaparvata lugens, Laodelphax striatellus, and Riptortus pedestris. The results indicate the involvement of these enzymes in insect feeding performance.

Effect on plants

In plants, the effect changed. Transient expression of MINPPs in Nicotiana tabacum stimulated callose deposition and reduced whitefly performance. In rice, overexpression of LsMINPP2b also reduced fecundity and sugary excretion in leafhoppers.

Researchers point to MINPPs as potential molecular targets for new pest management strategies. The family combines important functions for insect feeding and the potential to activate plant defense responses (doi 10.1002/ps.71307).

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Essential genes in insects vary between populations

The pangenome of Bombyx mori reveals conserved targets and functions acquired during evolution

15.09.2026 | 14:30 (UTC -3)

Cultivar Magazine



Photo: Lesley Ingram / Bugwood

A study of the Bombyx mori pangenome showed variation in the essentiality of genes from the Semaphorin and Plexin families among different lineages. Researchers identified conserved genes with essential functions in fertility and embryonic development. The work also found accessory genes with specific functions in certain lineages. The results support the search for more durable molecular targets for pest management (doi 10.1127/entomologia/4314).

The team analyzed 101 Bombyx mori genomes and compared orthologous genes from 37 insect species, distributed across five orders. The analysis identified five Semaphorin genes and three Plexin genes in the DZ lineage genome.

Preserved core

BmSema2a and BmPlexinB are part of the conserved core of the population. CRISPR/Cas9 editing showed the essential role of these genes. Loss of BmSema2a reduced female fertility. About half of the eggs remained unfertilized. Changes in the protein composition of the eggs accompanied the phenotype.

Inactivation of BmPlexinB increased embryonic mortality. Mutants exhibited low motility and failed to rupture the chorion. BmSema2b, classified as soft-core, also caused embryonic lethality after knockout.

Other genes

Genes not belonging to the conserved nucleus showed distinct responses. The loss of BmSema1b, BmSema5b, and BmPlexinC did not cause apparent alterations in development or reproduction. In contrast, BmPlexinA acquired an important function in the DZ lineage. Its inactivation impaired wings, locomotion, and the development of the female reproductive system.

The researchers concluded that genetic essentiality depends on the population context. Genes present in all lineages tend to conserve critical functions, while accessory genes can acquire essential roles after functional and regulatory divergence.

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Vylor prepares four platforms to expand its operations in soybeans

The plan includes new technologies for herbicides, insects, and diseases by the mid-2030s

15.09.2026 | 10:37 (UTC -3)

Cultivar Magazine



Corteva announced the soybean strategy for Vylor, its future seed and genetics company, which includes four new

technology platforms by 2035. The plan aims to expand its leadership in North America and accelerate growth in Latin America. The separation of Vylor is scheduled for October 1, 2026.

In North America, the company intends to move beyond Enlist E3 technology. Vylor plans to launch new herbicide tolerance platforms at the beginning of the next decade. The proposal combines elite germplasm and protection of productive potential.

According to Judd O'Connor (pictured), commercial and operations director of the future Vylor, the company intends to use its leadership in Enlist E3 technology as a basis for new herbicide tolerance solutions in North America. In Latin America, the

strategy involves elite germplasm associated with broad-spectrum insect control and expansion through licensing.

Conkesta E3 Platform

Vylor will maintain the Conkesta E3 platform in Latin America until the end of the decade. After that, it intends to adopt a new proprietary platform with herbicide tolerance and insect control. The company states that the package will have the broadest spectrum of insect control on the market and the potential to sustain high yields.

The company is also developing two approaches to disease management. One involves a first-generation product against

Asian soybean rust. The other uses gene editing for multiple disease resistance. Both platforms are scheduled for launch in the mid-2030s.

The planned launches should cover 95% of Vylor's soybean business. The company aims to achieve global leadership in the soybean market by the mid-2030s.

Further information about Vylor and Corteva can be found at:

- Vylor announces hybrid wheat with Xpedite technology for 2027
- Corteva reaffirms negotiation schedule and cites attempt to block spin-off
- Corteva rejects accusations and defends business separation

- Corteva's board approves the spin-off of Vylor

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Conab raises 2025/26 harvest forecast to 361,7 million tons

Production grows 2,6 percent compared to 2024/25; corn and soybeans sustain the advance in the 12th survey

15.09.2026 | 10:22 (UTC -3)

Cultivar Magazine



Brazilian grain production in the 2025/26 harvest is expected to reach 361,7 million tons. This volume represents a growth of

2,6 percent, or 9,2 million tons, compared to the previous season. The National Supply Company (Conab) updated the estimate after the twelfth field survey, conducted in the last week of August.

The new figure exceeds the projection released in August by 967,5 tons. The difference corresponds to 0,3 percent. The progress of the second corn harvest drove the revision. The crops showed higher yields than initially predicted.

The cultivated area totals 83,5 million hectares. This exceeds the area sown in 2024/25 by 1,4 million hectares, or 1,7 percent.

Soy and corn

Soybeans registered the largest absolute increase, with an addition of 1,3 million hectares. The expansion reached 2,7 percent.

Corn gained 762,5 hectares, an increase of 3,5 percent. Sorghum incorporated 537 hectares. In this case, the expansion reached 32,9 percent.

Conab estimates soybean production at 180,4 million tons. This volume exceeds the previous harvest by 8,9 million tons, an increase of 5,2 percent. The 2,7 percent expansion of the cultivated area contributed to the result. The technological package adopted by producers and favorable weather conditions in much of the country also favored the yield.

The three corn harvests are expected to total approximately 144 million tons. Production is growing by 2 percent, with an increase of nearly 2,9 million tons. The first harvest reached an estimated 29,5 million tons. The second harvest, in its final stages, is expected to produce 112,1 million tons. For the third harvest, Conab projects 2,4 million tons.

At the end of August, few areas of second-crop corn remained in the field. There were also some cotton fields remaining. Third-crop and winter crops were at different stages, from vegetative development to harvest. Conab will continue monitoring the situation in the coming months.

Wheat and cotton

Wheat shows one of the largest declines among the crops highlighted in the survey. Conab estimates production at 5,7 million tons, a drop of 27,1 percent compared to the 2025 harvest. The planted area decreased by 21,2 percent.

The wheat planting season extended from March to the beginning of August. Santa Catarina and Rio Grande do Sul had crops in the early stages during the survey. Goiás, Mato Grosso do Sul, and Minas Gerais already had areas in harvest.

Cottonseed production is expected to reach 10 million tons, a 1,5 percent increase. This volume corresponds to 4,1 million tons of lint. Weather conditions favored crop development. During the analyzed period, approximately 80 percent

of the area had already been harvested. The remainder was in the maturation stage.

Rice and beans

For rice, Conab estimates 11,1 million tons. This result is 13,2 percent lower than the previous season. Irrigated areas account for 10,4 million tons. Rainfed areas total 644,5 tons.

National bean production, considering the sum of the three harvests, is expected to reach approximately 3 million tons. This volume represents a 3,6 percent reduction. The first harvest produced 973,9 tons. The second is expected to reach 1,3 million tons. The third harvest is estimated at 666,2 tons. Cultivation is concentrated in

irrigated areas of the Center-South and in rainfed areas of the Northeast. The crops were still in the harvesting phase during the research period.

TABELA 1 - COMPARATIVO DE ÁREA, PRODUTIVIDADE E PRODUÇÃO POR PRODUTO

Brasil	Estimativa da produção de grãos			Safras 2024/25 e 2025/26					
Produto	ÁREA (Em mil ha)			PRODUTIVIDADE (Em kg/ha)			PRODUÇÃO (Em mil t)		
	Safra 24/25	Safra 25/26	VAR. %	Safra 24/25	Safra 25/26	VAR. %	Safra 24/25	Safra 25/26	VAR. %
	(a)	(b)	(b/a)	(c)	(d)	(d/c)	(e)	(f)	(f/e)
ALGODÃO - CAROÇO (1)	**2.085,6**	**2.018,4**	**(3,2)**	**2.776**	**2.910**	**4,8**	**5.789,9**	**5.874,2**	**1,5**
ALGODÃO - PLUMA	**2.085,6**	**2.018,4**	**(3,2)**	**1.957**	**2.053**	**4,9**	**4.081,5**	**4.143,8**	**1,5**
AMENDOIM TOTAL	**280,4**	**281,9**	**0,5**	**4.136**	**4.547**	**9,9**	**1.159,7**	**1.281,7**	**10,5**
Amendoim 1ª Safra	273,1	274,8	0,6	4.202	4.621	10,0	1.147,6	1.269,7	10,6
Amendoim 2ª Safra	7,3	7,1	(2,7)	1.662	1.700	2,2	12,1	12,0	(0,8)
ARROZ	**1.763,9**	**1.516,7**	**(14,0)**	**7.233**	**7.303**	**1,0**	**12.757,7**	**11.076,2**	**(13,2)**
Arroz sequeiro	394,6	252,9	(35,9)	2.935	2.548	(13,2)	1.158,2	644,5	(44,4)
Arroz irrigado	1.369,3	1.263,8	(7,7)	8.471	8.254	(2,6)	11.599,5	10.431,7	(10,1)
FEIJÃO TOTAL	**2.693,0**	**2.540,4**	**(5,7)**	**1.136**	**1.161**	**2,2**	**3.059,9**	**2.950,0**	**(3,6)**
FEIJÃO 1ª SAFRA	**908,5**	793,0	**(12,7)**	**1.170**	1.228	**5,0**	**1.062,7**	**973,9**	**(8,4)**
Cores	347,3	333,2	(4,1)	1.707	1.806	5,8	592,8	601,7	1,5
Preto	169,0	116,2	(31,2)	1.953	1.761	(9,8)	330,2	204,6	(38,0)
Caupi	392,2	343,6	(12,4)	356	488	36,9	139,7	167,5	19,9
FEIJÃO 2ª SAFRA	**1.400,1**	1.372,1	**(2,0)**	**953**	**955**	**0,2**	**1.333,6**	**1.309,9**	**(1,8)**
Cores	294,6	287,2	(2,5)	1.499	1.590	6,1	441,6	456,9	3,5
Preto	286,6	184,5	(35,6)	1.616	1.435	(11,2)	463,2	264,7	(42,9)
Caupi	818,9	900,4	10,0	524	653	24,8	428,9	588,4	37,2
FEIJÃO 3ª SAFRA	**384,4**	**375,3**	**(2,4)**	**1.726**	1.775	**2,8**	**663,7**	**666,2**	**0,4**
Cores	326,5	322,8	(1,1)	1.881	1.932	2,7	614,2	623,4	1,5
Preto	14,1	14,3	1,4	1.268	1.269	0,1	17,9	18,2	1,7
Caupi	43,8	38,2	(12,8)	721	645	(10,6)	31,6	24,7	(21,8)
GERGELIM	**901,8**	**570,2**	**(36,8)**	677	**598**	**(11,8)**	**610,9**	**340,9**	**(44,2)**
GIRASSOL	**61,9**	**77,6**	**25,4**	1.622	**1.257**	**(22,5)**	**100,4**	**97,5**	**(2,9)**
MAMONA	**69,6**	**70,7**	**1,6**	**1.437**	**1.712**	**19,1**	**100,0**	**121,1**	**21,0**
MILHO TOTAL	**21.838,0**	**22.600,5**	**3,5**	**6.464**	**6.372**	**(1,4)**	**141.157,6**	**144.009,6**	**2,0**
Milho 1ª Safra	3.772,6	4.100,7	8,7	6.610	7.191	8,8	24.935,8	29.487,8	18,3
Milho 2ª Safra	17.430,3	17.824,9	2,3	6.496	6.291	(3,2)	113.228,4	112.130,8	(1,0)
Milho 3ª Safra	635,1	674,9	6,3	4.714	3.543	(24,8)	2.993,6	2.390,9	(20,1)
SOJA	**47.346,1**	**48.608,6**	**2,7**	**3.622**	**3.711**	**2,5**	**171.480,5**	**180.406,6**	**5,2**
SORGO	**1.632,0**	**2.169,0**	**32,9**	**3.739**	**3.388**	**(9,4)**	**6.102,2**	**7.348,0**	**20,4**
SUBTOTAL	78.672,3	**80.454,0**	**2,3**	**4.351**	**4.394**	**1,0**	**342.318,8**	**353.505,8**	**3,3**

Culturas de inverno	ÁREA (Em mil ha)			PRODUTIVIDADE (Em kg/ha)			PRODUÇÃO (Em mil t)		
	2025	2026	VAR. %	2025	2026	VAR. %	2025	2026	VAR. %
	(a)	(b)	(b/a)	(c)	(d)	(d/c)	(e)	(f)	(f/e)
AVEIA	545,8	531,6	(2,6)	2.368	2.288	(3,4)	1.292,3	1.216,2	(5,9)
CANOLA	211,9	370,7	74,9	1.627	1.620	(0,4)	344,8	600,6	74,2
CENTEIO	2,1	2,3	9,5	2.381	2.261	(5,0)	5,0	5,2	4,0
CEVADA	139,2	152,9	9,8	4.358	4.022	(7,7)	606,6	614,9	1,4
TRIGO	2.445,9	1.927,1	(21,2)	3.219	2.978	(7,5)	7.873,4	5.739,7	(27,1)
TRITICALE	11,4	11,9	4,4	3.211	2.950	(8,1)	36,6	35,1	(4,1)
SUBTOTAL	**3.356,3**	**2.996,5**	**(10,7)**	**3.027**	**2.740**	**(9,5)**	**10.158,7**	**8.211,7**	**(19,2)**
BRASIL (2)	**82.028,6**	**83.450,5**	**1,7**	**4.297**	**4.335**	**0,9**	**352.477,5**	**361.717,5**	**2,6**

Legenda: (1) Produção de caroço de algodão; (2) Exclui a produção de algodão em pluma.

Fonte: Conab.

Nota: estimativa em setembro/2026.

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Vylor announces hybrid wheat with Xpedite technology for 2027

Non-GMO system increased productive potential by 10% and boosted yield under water stress

15.09.2026 | 10:08 (UTC -3)

Cultivar Magazine, based on information from Derek Burleson

Vylor plans to launch Xpedite technology in North America by the end of 2027. This proprietary system is used in the production of hybrid wheat seeds. Trials

conducted over several years have shown consistent productivity gains and greater yield stability in the face of disease and drought.

According to the company, the hybrid wheat developed with the platform increases productive potential by 10% using the same area and resources. In water-restricted environments, the hybrids obtained through the system produced up to 20% more compared to elite varieties.

The technology utilizes conventional breeding and does not involve genetic modification. For this reason, the product intended for the North American market does not require regulatory approval.

Production scale

Vylor claims to have tested the system on 100% of the wheat germplasm evaluated. The platform also expands the scale of parental seed production and seeks to accelerate the arrival of new elite germplasm to the market. The company projects doubling the annual rate of genetic gain by 2040 compared to conventional wheat.

The first commercial launch will involve Hard Red Winter wheat in North America in 2027. The company plans to add Soft Red Winter in 2029 and Hard Red Spring in 2030. International expansion may occur through its own businesses, licensing, partnerships, and acquisitions.

The company projects revenue of US$500 million from wheat in 2035 and US$1 billion in 2040, including licensing revenue. Wheat would then become the third pillar of Vylor's business, alongside corn and soybeans.

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Corteva reaffirms negotiation schedule and cites attempt to block spin-off

New statement defines dates, share distribution and financial structure; August contracts were not resubmitted

15.09.2026 | 09:49 (UTC -3)

Cultivar Magazine

Corteva has announced new milestones for the spin-off of its seed business and filed a legal initiative aimed at preventing

the operation. A document submitted to the Securities and Exchange Commission (SEC) on September 15 maintains the completion of the spin-off scheduled for October 1, 2026. It also sets September 24 as the registration date for shareholders eligible to receive shares in the new company.

Corteva's board of directors approved the distribution on September 12 (read here). The transaction provides for one Vylor share for each Corteva share held by the investor on the registration date. The distribution remains subject to the fulfillment or waiver of the conditions set forth in the process. These include approval of the listing of the shares on the New York Stock Exchange, tax and

solvency opinions, availability of financing, and absence of legal impediments.

New risk factor

A new risk factor entered the document after this approval. California, with the support of 18 other states, the District of Columbia, Puerto Rico, and nine political subdivisions, requested authorization from the United States District Court for the District of South Carolina to file a motion for an injunction against the secession.

California argues that the transaction could be classified as a fraudulent transfer. The petition seeks authorization to obtain a temporary restraining order and an injunction. Corteva denies any wrongdoing

(read here).

The company warns of potential consequences should the court accept this argument. These include the annulment of the spin-off or related transactions and the imposition of liabilities. The court could also order the return of certain assets to the new Corteva or its creditors, according to the scenarios described in the document submitted to the SEC.

Additional information

The legal dispute represents information subsequent to the article published by Revista Cultivar on August 15th (read here). The previous report focused on the minutes of the agreements on intellectual

property and the global supply of seed treatment products.

These two instruments have not been updated. The wording for the clauses regarding licenses, exclusivity, minimum purchases, supply, or treatment of intellectual property described in the August article remains unchanged.

Today's information, however, contains a caveat regarding the set of agreements for the separation. Corteva reports that the terms of the instruments intended to be in effect before or after the spin-off have not yet been finalized. The text allows for changes before the operation, including material alterations. After the separation, modifications will depend on an agreement between Vylor and the new Corteva.

Financial movement

There was also a detailed explanation of the financial transactions planned for the reorganization. Before the distribution of shares, EIDP will transfer its stake in Pioneer to Vylor. As part of this structure, there is a projected cash distribution of approximately US$726 million to US$776 million to EIDP, which will subsequently be linked to the new Corteva. Part of the funds will come from financing obtained by Vylor.

The company estimates that it will close the operation on October 1st with US$1,1 billion in cash and cash equivalents. Projected loans total US$5,668 billion. Of this total, US$3,143 billion corresponds to

short-term obligations and US$2,525 billion to long-term debt. These figures represent management estimates for the projected date of the spin-off and may change.

Vylor intends to maintain its investment-grade credit rating. The company projects a debt-to-EBITDA ratio of approximately 0,8x to 1,1x as of December 31, 2026. For the long term, it sets a maximum target ratio of 2,5x.

Dividend policy

Other information concerns the dividend policy. Vylor plans to begin quarterly payments after the separation, starting in the fourth quarter of 2026. The indicated

target corresponds to approximately 15% of annual net income. The decision will be made by the company's independent board after the spin-off and will depend on financial conditions, capital needs, market access, and debt-related obligations.

Vylor's shares are expected to be traded on the New York Stock Exchange under the ticker symbol VYLR. The company anticipates the commencement of conditional trading after the filing date. Regular trading is expected to begin on the distribution date or the first trading day following it.

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Embrapa identifies 62 soybean cultivars with STS technology

Genotyping of 423 cultivars indicates tolerance to sulfonylureas and expands information for weed management

15.09.2026 | 08:39 (UTC -3)

Cultivar Magazine, based on information from Lebna Landgraf



Photo: Antônio Neto

Researchers at Embrapa Soja identified 62 cultivars with Sulfonylurea-Tolerant (STS) soybean technology among 423 materials evaluated from 2021 to 2026. This number corresponds to 15% of the cultivars analyzed. This information can guide the choice of herbicides in weed management and help control volunteer soybeans in subsequently cultivated crops.

STS technology confers tolerance to herbicides from the sulfonylurea chemical group. These products act by inhibiting the acetolactate synthase enzyme, known by the acronym ALS. Herbicides in this group include chlorimuron, nicosulfuron, and metsulfuron. STS cultivars exhibit genetic alterations called Als1 and/or Als2.

Management options

This feature expands management options in areas with weeds resistant to other herbicides. According to Embrapa, the technology also offers an alternative to the exclusive use of glyphosate. This possibility gains importance given the need to control difficult-to-manage species and the renewed use of some sulfonylureas against glyphosate-resistant plants.

Knowledge about the presence of the technology also interferes with the planning of subsequent crops. Volunteer soybeans, known as tiguera soybeans or guaxa soybeans, grow from grains lost during harvest. Plants without STS technology can receive chemical control

with some sulfonylureas in subsequent crops. In wheat, for example, metsulfuron is among the options. In second-crop corn, nicosulfuron can be part of the management. These alternatives lose effectiveness against volunteer soybeans originating from STS cultivars.

The absence of this information at the time of cultivar selection can limit subsequent chemical control. The problem can affect systems with wheat, corn, beans, cotton, and other crops in succession. For researcher Rafael Romero Mendes, from Embrapa Soja, prior knowledge of the technology reduces the risk of selecting a strategy incompatible with the volunteer soybeans present in the area.

Expanded selectivity

STS also increases the selectivity of some sulfonylureas in soybeans themselves. Non-tolerant cultivars may exhibit phytotoxicity after exposure to the herbicide. Symptoms include yellowing, necrosis, deformities, and stunted growth. The technology allows for greater safety in the use of these products. Lower levels of phytotoxicity, below thirty percent, are expected for STS cultivars subjected to herbicides from the group, such as chlorimuron, in post-emergence. Even non-STS materials may exhibit different levels of tolerance through mechanisms such as metabolization or detoxification.

Researchers also highlight the use of sulfonylureas in pre-emergence. This method expands the tools available for weed management programs. Its application is particularly relevant in conventional cultivars with STS technology, where tolerance allows for greater selectivity.

Changes Als1 and Als2

The team used KASP genotyping to detect the Als1 and Als2 alterations. The work began with three standard STS cultivars (P46A57BX, P44A72BX, and CD250RR) and a sensitive control, BRS 1057. Previous trials confirmed high tolerance in the first three and high sensitivity in the cultivar used as a negative control.

After DNA extraction, the researchers amplified and sequenced the ALS gene. Comparing the sequences allowed them to identify mutations associated with Als1 and Als2 events. Based on this result, the team developed primers for the KASP assay and performed analyses using real-time PCR.

In the monitoring, the cultivars were grown in a greenhouse. The team collected leaf tissue at the V2 stage, with samples of one hundred milligrams. The work included 83 cultivars in 2021, 33 in 2023, 187 in 2024, 89 in 2025, and 31 in 2026. The total number of cultivars included 423. The molecular marker separated materials with and without the alterations associated with STS technology.

Materials evaluated

Among the materials evaluated in 2026, the diagnosis indicated the presence of the technology in BMX Imune TF I2X, C 2560 CE, C 2615 CE, C 2550 CE, DM 54IX57 I2X, DM 59IX61 I2X, DM 64K67 CE, and M 6131 I2X. The result represents the genetic profile of the cultivars analyzed in the survey and offers additional information for planning chemical management.

The work was carried out by scientists Fernando Storniolo Adegas, Rafael Romero Mendes, Francismar Corrêa Marcelino-Guimarães, and Dionisio Luiz Pisa Gazziero.

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Cold weather promotes black spotting in mangoes during post-harvest

Embrapa study points to temperature management, maturation, and 1-MCP as key factors in reducing export losses

15.09.2026 | 08:21 (UTC -3)

Cultivar Magazine, based on information from Clarice Rocha



Photo: Sérgio Tonetto de Freitas

Three years of research by Embrapa Semiárido confirmed the relationship between exposure to cold and internal

darkening of the pulp of susceptible mangoes. The disorder, known as black cut, occurs during refrigerated storage and transport. The external appearance remains normal, a factor that impacts inspections, market acceptance, and export losses.

Scientists observed a higher risk in fruit harvested at less advanced stages of ripeness. Temperatures between eight and ten degrees Celsius favored the problem. In the same batches, mangoes kept at 12,5 degrees Celsius did not show symptoms.

Cultivars evaluated

The study evaluated the Tommy Atkins, Kent, Palmer, and Keitt cultivars. The proposed strategies include harvesting at a later stage, adjusting the cold chain, using a controlled atmosphere, and applying 1-methylcyclopropene, or 1-MCP. This compound blocks the action of ethylene and delays ripening.

In Tommy Atkins and Keitt, untreated fruits showed an incidence close to 100% after 45 days at nine degrees Celsius. With 200 nanoliters per liter of 1-MCP, the incidence dropped to less than 60%. The lowest dose tested showed similar efficiency to the higher concentrations.

Over 90% of Brazilian mango exports originate from the São Francisco Valley. Companies in the sector have already adjusted harvest time and location, storage

and transport temperatures, the interval until shipment, and the use of 1-MCP. The research also seeks a predictive method to separate healthy fruits from susceptible ones during harvesting.

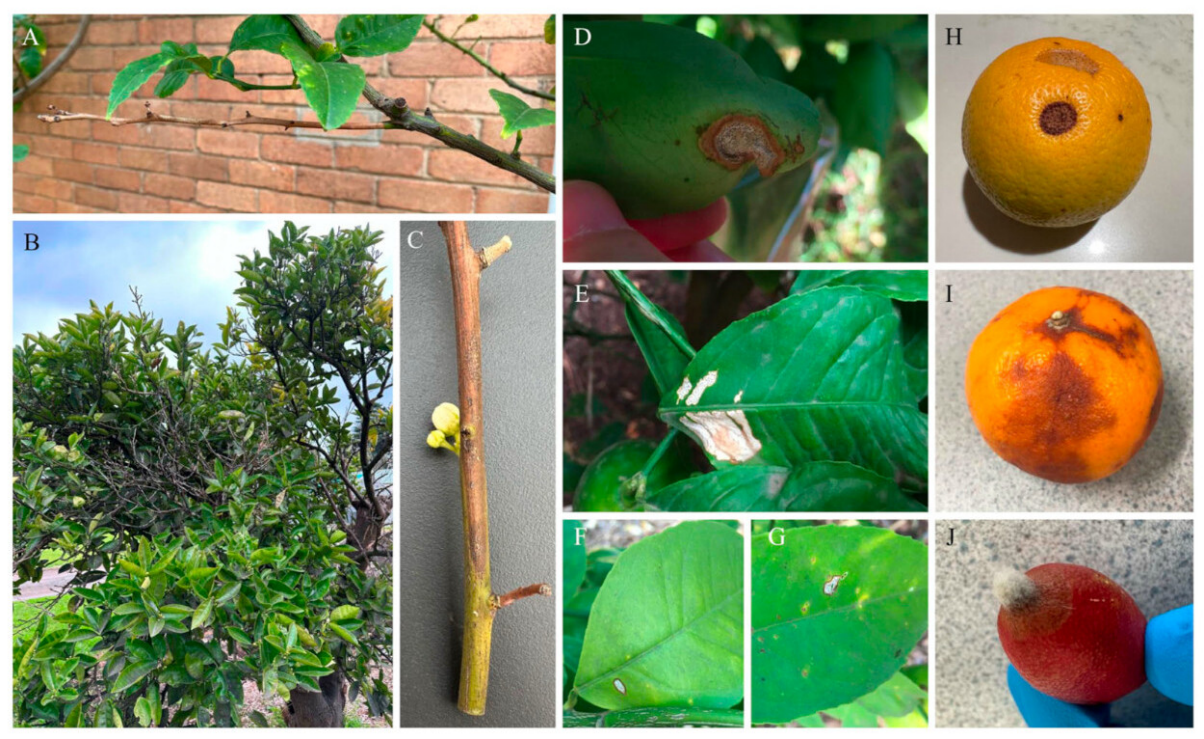
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Researchers list 39 species of Colletotrichum associated with citrus fruits

Study highlights wide diversity, latent infections, and challenges for diagnosis, management, and biosecurity

15.09.2026 | 07:52 (UTC -3)

Schubert Peter, Cultivar Magazine



doi 10.3390/jof12090687

Researchers have identified 39 species of Colletotrichum associated with citrus in different regions of the world. This group includes pathogens capable of infecting leaves, branches, petals, and fruits. Some species also remain as endophytes or in latent infections. This diversity increases the challenges for diagnosis, phytosanitary management, and risk assessment of pathogen introduction into new areas.

Scientists identify Colletotrichum gloeosporioides as the most frequent species in citrus (doi 10.3390/jof12090687). The fungus occurs in various hosts and can colonize different plant tissues. Colletotrichum karstii occupies a prominent position among the species of the boninense complex.

Colletotrichum siamense also has a wide distribution and is involved in diseases of fruits, leaves, and branches.

Associated diseases

Diseases associated with this genus include anthracnose, branch and shoot dieback, premature fruit drop after flowering, and anthracnose of the Galician lemon. Anthracnose occurs before and after harvest. Symptoms include sunken necrotic lesions, leaf spots, tissue dieback, and fruit rot. Post-harvest infections can originate in the field.

The fungus can penetrate immature fruits and remain in a quiescent state. Disease development occurs during ripening or

after harvest. Physiological changes in the fruit favor this transition. Ripening reduces some defense barriers and increases the availability of sugars. The pathogen then resumes growth and enlarges the lesions.

The study records fruit losses between 90% and 100% in anthracnose episodes under environmental conditions favorable to infection. These values ??correspond to situations reported in the literature and do not represent an average loss for citrus farming. For premature fruit drop after flowering, studies conducted in Brazil recorded productivity losses of up to 93% when flowering coincided with rainy periods.

High humidity

High humidity plays a central role in the epidemiological cycle. Colletotrichum species prefer temperatures between 25 and 28 degrees Celsius. Fruiting structures release spores after favorable conditions occur. Rain, wind, and irrigation promote dispersal to other plant parts.

After germination, many species form appressoria. These structures accumulate osmotically active compounds and develop turgor pressure of up to eight megapascals. This pressure allows the formation of a penetrating structure capable of crossing the cuticle and cell wall of the epidermis. Some species also use stomata or wounds as entry points.

This mechanism has direct implications for pathogenicity testing. Researchers warn

against the exclusive use of inoculations after artificial wounds. Removing the barrier formed by the cuticle and epidermis can overestimate the infectivity. Assays with inoculation without wounding need to be integrated into the evaluation of isolates intended for risk and pathogenicity studies.

The analyzed studies also indicate a lack of strict host or tissue specificity in several species. Isolates obtained from one organ can cause symptoms in other tissues. Some fungi associated with citrus also occur in plants of other genera. Experiments with wounded tissues demonstrated cross-infection between different hosts. The researchers caution the need for caution in interpreting these results, as artificial wounding facilitates

pathogen entry.

Latent behavior

Latent behavior exacerbates the problem for biosecurity. Colletotrichum gloeosporioides and Colletotrichum karstii, for example, have already been isolated from asymptomatic tissues. Other members of the genus appear as endophytes. Plant material without symptoms can, therefore, carry the fungus without visual detection during inspections. Dead leaves can also harbor saprobic species and act as a source of inoculum.

Geographic distribution also depends on thermal adaptation. Colletotrichum gloeosporioides maintains growth over a

wide temperature range and appears in tropical, subtropical, Mediterranean, temperate, and semi-arid regions. Colletotrichum siamense exhibits optimal growth near 30 degrees Celsius and frequently appears in tropical regions. Colletotrichum acutatum and Colletotrichum karstii exhibit optimum growth near 24 degrees Celsius, with a marked reduction in growth at higher temperatures.

Correct identification

For researchers, the correct identification of species represents the first step in phytosanitary assessment. Some historical records used only morphological characteristics, ITS region sequences, or

insufficient markers to separate closely related species. Scientists recommend a polyphasic approach. This procedure combines phylogeny with multiple genes, morphological characteristics, and geographic and ecological information.

Rapid molecular methods can also expand inspection capabilities. Real-time quantitative PCR already allows for the detection and quantification of different Colletotrichum species in other agricultural systems, including in asymptomatic tissues. Scientists point to the potential for developing specific assays targeting aggressive species associated with citrus. One obstacle involves selecting specific primers given the increasing number of closely related species.

Researchers also advocate for further studies on host range, aggressiveness, and environmental adaptation. Bioassays with different temperatures, humidity levels, and hosts can indicate the establishment potential of newly detected species. This information allows for estimating risks to citrus orchards, other crops, and native plants, as well as supporting quarantine measures and breeding programs for resistance.

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Corteva rejects accusations and defends business separation

The company is contesting the request to block the operation and affirms it has the financial capacity to cover any potential liabilities from PFAS

15.09.2026 | 06:24 (UTC -3)

Cultivar Magazine, based on information from Bethany Shively

Corteva has rejected accusations made by U.S. state attorneys general against the planned separation of its businesses. The company stated that it intends to defend the operation in court and classified the allegations about liabilities related to per- and polyfluoroalkyl substances, known by the acronym PFAS, as speculative and unsubstantiated.

According to the company, the future crop protection company will retain the Corteva brand. The business will have a capital structure capable of covering any potential liabilities, according to the company. Corteva also stated that it has never produced, sold, or marketed PFOA or PFOS in its seven years of existence.

Corteva's general counsel, Jennifer Johnson, stated that the separation reflects differences between the business models of the two areas. According to her, the operation will allow the companies to better serve farmers and pursue growth independently.

Johnson also denied any intention to harm, delay, or defraud creditors. She stated that the states are seeking an “extraordinary” measure, and, in Corteva’s assessment, an unprecedented one.

Request from attorneys general

The demonstration is in response to a request led by California Attorney General

Rob Bonta, with support from attorneys general from other states and municipalities. The group has asked the United States courts for a temporary order and an injunction to prevent the separation.

Bonta accuses Corteva of attempting to transfer approximately $39 billion in assets and value to a new company, Vylor, with the goal of reducing resources available to cover liabilities related to PFAS. According to the prosecutor, the operation would concentrate these responsibilities within the crop protection division. Corteva rejects this interpretation.

More information on "Corteva reaffirms negotiation timeline and cites attempt to block split".

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Study identifies rust effectors capable of suppressing immunity

Proteins from Hemileia vastatrix act in different phases of infection and target cellular components of the coffee plant

14.09.2026 | 14:13 (UTC -3)

Cultivar Magazine



Photo: Howard F Schwartz / Colorado State University - Bugwood

Researchers have identified 15 effector proteins from Hemileia vastatrix capable of suppressing pattern-triggered immunity, known as PTI. The study evaluated 44 candidates and also found five effectors capable of reducing effector-triggered immunity, called ETI. Three proteins acted on both plant defense mechanisms.

The team combined functional assays, analysis of gene expression during infection, and evaluation of protein localization within cells. The experiments utilized Nicotiana benthamiana and a Pseudomonas fluorescens-based effector delivery system.

Shared components

Candidates HvEC_006, HvEC_053, and HvEC_081 suppressed PTI and ETI. According to the researchers, this behavior suggests action on regulatory components shared by both immune pathways. The molecular targets of these proteins remain unknown.

The 15 effectors capable of reducing PTI also favored the multiplication of Pseudomonas syringae on the leaves used in the assays. The bacterial population outnumbered the control by more than three orders of magnitude after 48 hours.

Gene expression showed sequential use of effectors during infection. Some exhibited greater activity in dormant or germinating urediniospores. Others

reached higher expression during host penetration or in later stages of biotrophic colonization.

Cellular location

Cellular localization analysis revealed a concentration of six effectors in the nucleus. Three others accumulated in the chloroplasts. These compartments participate in processes related to the regulation of the plant immune response.

The results offer criteria for prioritizing effectors in studies on avirulence genes recognized by coffee SH resistance genes. The work also expands the understanding of the mechanisms used by Hemileia vastatrix to maintain colonization of living

tissues (doi 10.1111/mpp.70341).

The study was carried out by Thiago Maia, Gustavo Marin-Ramirez, Maicon N. Araujo, Larissa G. Zanardo and Sérgio H. Brommonschenkel.

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BASF selects banks to prepare for the IPO of Agricultural Solutions

Offer planned for Frankfurt moves forward with legal and operational separation; readiness targets mid-2027

14.09.2026 | 10:55 (UTC -3)

Cultivar Magazine, based on information from Holger Kapp



BASF has announced the appointment of Citi, Deutsche Bank, Goldman Sachs, and JP Morgan as global coordinators for the preparation of the initial public offering (IPO) of Agricultural Solutions. The company expects to be IPO-ready by mid-2027 and plans to list the business on the Frankfurt Stock Exchange.

The operation is part of BASF's "Winning Ways" strategy. The plan envisions transforming Agricultural Solutions into an independent agricultural company, operating in crop protection, seeds, genetic traits, biological solutions, and digital tools.

The legal and operational separation of the business is ongoing. Approximately 80% of Agricultural Solutions' global operations

have already migrated to their own legal entities. These structures utilize a new enterprise management system specifically designed for the agricultural sector.

According to BASF, the change aims to expand its capacity to respond to the demands of agricultural markets, make operations more agile, and bring the company closer to its customers. Agricultural Solutions also develops the governance structures and competencies necessary for a publicly traded company.

BASF will present a strategic and operational overview of the business during its Capital Markets Day, scheduled for November 24, 2026. All four members of the BASF Agricultural Solutions board of

directors will participate in the event.

The company has not yet decided whether to proceed with the IPO nor has it set a date. The decision will depend, among other factors, on capital market conditions.

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Corteva's board approves the spin-off of Vylor

Seed company will have its own shares listed on the New York Stock Exchange starting October 1st

14.09.2026 | 09:14 (UTC -3)

Cultivar Magazine, based on information from Bethany Shively



Corteva's board of directors has approved the spin-off of the company's seeds segment. The transaction will create Vylor

Inc., an independent publicly traded company. The distribution of shares to Corteva shareholders is expected to take place on October 1, 2026.

Each registered Corteva shareholder at the close of trading on September 24 will receive one Vylor common share for each Corteva share held on that date. The company anticipates cash payments for any fractional shares.

Corteva aims to complete the distribution before 9:30 a.m. New York time on October 1st. The operation seeks federal income tax-free treatment in the United States for Corteva shareholders, with the exception of cash payments made in lieu of fractional shares.

Vylor's shares are scheduled to begin trading on the New York Stock Exchange on September 25th, in a "when-issued" format, under the ticker symbol VYLR WI. This trading will continue until September 30th. Regular trading, under the ticker symbol VYLR, is expected to begin at the market open on October 1st.

Between September 25th and 30th, Corteva shares will be traded on two markets. The ticker symbol CTVA will grant access to Vylor shares. The ticker symbol CTVA WI will allow trading without this access.

Shareholders registered on September 24 do not need to take any action to receive the shares. The distribution is still subject to the fulfillment or waiver of usual conditions stipulated for the transaction.

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Roots adjust anatomy and metabolism in response to the microbiota

Study links root complexity, bacterial colonization, and survival under low nutrient supply

14.09.2026 | 08:11 (UTC -3)

Cultivar Magazine

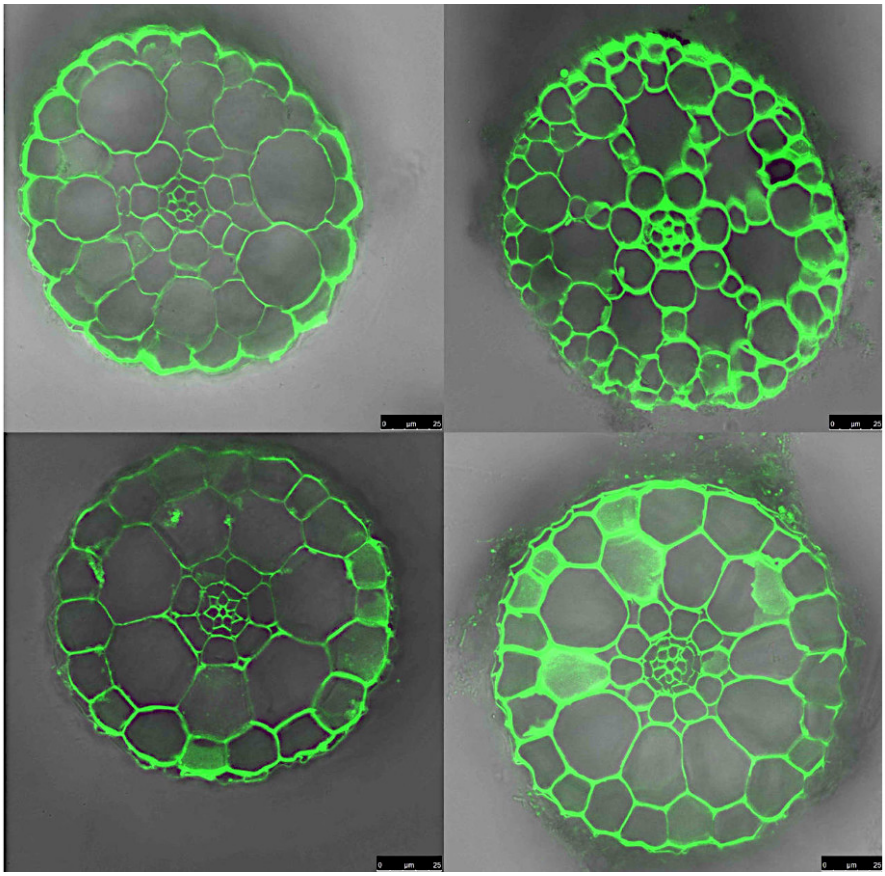


Photo: University of Nottingham

The anatomical complexity of roots determines part of the plant's response to colonization by microorganisms and can increase survival under low nutrient availability. Researchers at the University of Nottingham, in the United Kingdom, have identified a relationship between root anatomy, metabolism, and microbiota composition. The work also pointed to the plant metabolite N6,N6,N6-trimethyl-L-lysine as a component of the mechanism responsible for anatomical plasticity induced by microorganisms.

The scientists worked primarily with aquatic plants from the Lemnaceae family. This group includes species with varying degrees of root complexity. Some have multiple roots and a greater number of cell

layers. Others have a single root and reduced anatomy. This diversity allowed them to analyze the effect of the physical structure of the root on the establishment of the microbiota (doi 10.1038/s41467-026-76440-4).

Experimental data

The experiments included 12 species and six accessions of Lemnaceae. The team also included Pistia stratiotes, an aquatic plant from the Araceae family with a more complex root system. The researchers cultivated the plants in natural water with microbiota and in sterilized water.

The presence of microorganisms amplified anatomical differences between roots.

Plants with more complex initial anatomy showed greater plasticity after colonization. Species with initially simple roots exhibited a smaller response. Bacterial diversity in roots also showed a positive correlation with the number of root cell layers. This number served as an indicator of anatomical complexity.

Bacterial communities

The composition of bacterial communities also varied according to root anatomy. The relationship appeared in the roots, but not in the fronds. According to the study, this result indicates the participation of the root micro-habitat structure in the selection and establishment of the microbiota.

The effects gained importance under resource limitations. In sterilized water, all species maintained linear growth during the evaluated period. In natural water, frond growth followed a saturation curve. The researchers associated this behavior with competition for resources between plants and microorganisms.

Approximately 74% of plants grown in natural water showed faster growth in the initial stages compared to plants grown without microorganisms. Growth in the presence of microbiota showed a significant correlation with 20 of the 21 root anatomical characteristics evaluated. In axenic plants, only seven characteristics showed a significant relationship with growth.

Survival and anatomical plasticity

Survival also mirrored anatomical plasticity. In natural water, plants with more complex roots after interaction with the microbiota showed lower mortality. The original root complexity did not produce the same effect in plants kept in sterilized water. The results indicate an advantage of microbiota-induced plasticity in environments with competition for nutrients.

The team repeated some of the tests with a synthetic community composed of 190 bacteria. The experiments used different concentrations of nutrients. Under low

availability, bacterial inoculation induced more evident anatomical changes in plants with roots of medium or high complexity. The bacterial composition of the roots showed an association with anatomical complexity, while nutrient availability did not explain this composition in the same experiment.

Roots built

The researchers also constructed “synthetic roots” with varying levels of physical complexity and controlled metabolic composition. The isolated change in anatomy altered the diversity and composition of the bacterial communities. The result provided experimental evidence for a direct effect of

microhabitat structure on colonization.

The interaction occurred in both directions. The microbiota modified the anatomy and metabolism of the roots. The anatomy and metabolic profile, in turn, influenced the establishment of the bacteria. Tests with Spirodela polyrhiza, a species with a relatively complex root system, showed distinct anatomical responses after changes in the composition of the bacterial community. Lemna aequinoctalis, with a less complex anatomy, showed fewer alterations.

Experiments with isolated bacteria did not reproduce the amplitude of changes observed with microbial communities. The result indicates the participation of microbial diversity in the induction of root

plasticity. Some strains also exerted a specific influence on anatomical characteristics.

Metabolic analysis

Metabolic analysis identified 341 metabolites with putative annotation and differences between axenic and inoculated plants. Scientists selected 15 compounds whose concentration was negatively correlated with the anatomical complexity of the roots. Among them, L-citrulline and N6,N6,N6-trimethyl-L-lysine achieved the highest level of confidence in identification.

N6,N6,N6-trimethyl-L-lysine has received special attention as a regulator of anatomical plasticity associated with

microbial colonization. The University of Nottingham's press release points to the direct application of this compound and synthetic biology approaches as possible ways to direct interactions between roots and microorganisms. These strategies still represent perspectives derived from research, not validated agronomic practices in the field.

For researchers, knowledge about the chemical dialogue between plants and microbiota can support microbiome-based strategies. The work also indicates possible applications in breeding programs and in the development of tools aimed at colonization by beneficial microorganisms. The experiments, however, focused on aquatic plants and controlled systems. Transferring these mechanisms to

agricultural crops will require further evaluation.

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Telenomus remus outcompetes Trichogramma in fall armyworm eggs

Molecular assays measured 70,25% parasitism, higher than Trichogramma dendrolimi and Trichogramma chilonis

14.09.2026 | 06:55 (UTC -3)

Cultivar Magazine



Telenomus remus showed a greater capacity for parasitism of Spodoptera frugiperda eggs compared to Trichogramma dendrolimi and Trichogramma chilonis. The study measured a rate of 70,25% for Telenomus remus. The values ??reached 41,54% for Trichogramma dendrolimi and 36,45% for Trichogramma chilonis.

The researchers who conducted the study evaluated the competition between the three species of egg parasitoids of the fall armyworm (doi 10.1002/ps.70997). The tests indicated the best performance of Telenomus remus. The species also generated a greater number of offspring and presented a higher proportion of females.

Molecular assay

The team developed a molecular assay based on the ITS2 region for specific identification of parasitoids. The method allowed them to analyze competitive interactions and quantify parasitism potential.

Exponential regression models linked ITS2 gene expression levels to parasitism rates. According to the study, this approach allows for direct molecular assessment of parasitoid activity.

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Honeybees dominate flowers and drive away other pollinators

Study identifies direct competition of Apis mellifera for shared floral resources

13.09.2026 | 15:52 (UTC -3)

Schubert Peter, Cultivar Magazine



Photo: Alberto Marsaro Júnior / Embrapa

The higher density of honeybees (Apis mellifera) reduced the abundance of other floral visitors and increased the frequency of food disputes in areas of the United Kingdom. Researchers recorded chases, displacements, and avoidance behaviors during encounters over flowers. The observations point to interference competition as a relevant mechanism in the dispute between managed bees and other pollinators.

The study tracked visitors to Rubus fruticosus and Hedera helix. Both plants provide important resources during periods of lower availability of other flowers. Observations took place in Cambridgeshire, UK, during 2023 and 2024. The sites were located up to 300 meters from known Apis mellifera colonies.

Researchers tracked 300 pairs of interactions over 93 hours (doi 10.1111/een.70139).

The team classified the outcome of each encounter according to access to the floral resource. An individual was classified as the winner when it managed to occupy the flower and caused the other visitor to lose a foraging opportunity. The scientists also recorded situations of sharing, when two insects used the resource without confrontation.

Negative association

The presence of Apis mellifera showed a negative association with the abundance of other pollinators in both plant species. In

Rubus fruticosus, the survey counted 1.789 floral visitors. Honeybees accounted for 57% of this total. Bumblebees represented 23%, hoverflies 11%, solitary bees 7%, and other visitors 2%. The higher density of Apis mellifera showed a significant relationship with a lower relative abundance of visitors not belonging to the genus Apis. The effect was stronger among bumblebees.

In Hedera helix, researchers recorded 2.232 visitors distributed across 30 taxonomic groups. Solitary bees comprised 41% of the total, predominantly Colletes hederae. Honeybees accounted for 27%. The increase in Apis mellifera density was accompanied by a reduction in the abundance of solitary bees and hoverbees. The number of floral units also

influenced visitor abundance.

Researchers recorded 171 pairs of interactions during 43 hours of observation in Rubus fruticosus. Honeybees participated in 53,3% of the encounters. They gained access to the resource in 65,7% of the interactions in which disputes occurred. The win rate exceeded the expected value from statistical analysis. Solitary bees lost access to the resource in 61,5% of the encounters. Syrphid bees lost in 66,6%.

Frequency of disputes

The frequency of disputes in Rubus fruticosus increased with the increase in density and number of visits by Apis

mellifera. The study also found an influence of environmental variables. Temperature and humidity showed a positive association with competitive interactions in some analyses. Higher wind speeds were associated with a lower number of disputes.

The observed behaviors reinforced the hypothesis of interference competition. In Rubus fruticosus, other visitors avoided honeybees in 28,4% of the victories recorded for Apis mellifera. Physical displacement of the other visitor occurred in 20,1% of the victories. Chases appeared in 6,1%. In 14 episodes with chases, the honeybee initiated the action in 80% of the cases.

The pattern also appeared in Hedera helix. The survey totaled 129 interactions over 50 hours. Honeybees achieved the highest number of competitive victories and occupied the resource in 50,6% of encounters. Other visitors avoided Apis mellifera in 35,6% of the species' victories. Displacements accounted for 15% and chases for 5,5%.

Greater vulnerability

Hoverflies showed greater vulnerability in encounters. In interactions with honeybees on Hedera helix, half of the hoverflies avoided the bee, 44% were displaced, and 6% were chased. In all interactions on this plant, the group lost the resource in 60,4%

of cases. The analysis of behaviors also indicated a significant association between the pollinator group and the type of interaction. Displacements and chases by Apis mellifera made an important contribution to this result.

Diverse pattern

Not all solitary bees exhibited the same pattern in the presence of Apis mellifera. In Hedera helix, Colletes hederae individuals managed to obtain the resource in some encounters with honeybees. When Apis mellifera previously occupied the flower and a solitary bee arrived at the location, the group of solitary bees won more frequently than the honeybee. The researchers point to the need for further

studies on characteristics of Colletes hederae capable of reducing the effects of interference competition.

The study differentiates this process from exploitative competition. In exploitative competition, a visitor consumes nectar or pollen and reduces its availability for other insects. In interference competition, the interaction occurs directly. A visitor drives away, displaces, or prevents another from accessing the resource. The results indicate the participation of both mechanisms, but highlight a possibly underestimated importance of interference in pollinator communities.

Scientists emphasize that the observations focused on two plant species and interactions at the floral patch scale. The work did not assess long-term population

effects. The team proposes further studies on other resources, including cultivated areas, as well as the analysis of environmental and landscape factors. According to the researchers, a more detailed understanding of interference competition could support measures aimed at reducing the effects of high honeybee densities on other pollinators.

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Helm expands Crop Solutions leadership structure in Brazil

Changes integrate the Crop Protection and Plant Advantage areas and create a new Pricing and Market Access directorate

11.09.2026 | 16:25 (UTC -3)

Cultivar Magazine, based on information from Cristiane Andrade



Emerson Oliveira, Gustavo Oliveira and Pedro Cazzonatto

Helm announced changes to the leadership structure of its Crop Solutions business unit in Brazil. Starting in

September, commercial directors Emerson Oliveira and Gustavo Oliveira will have expanded scopes, encompassing Crop Protection and Plant Advantage operations. The company will also create a new Pricing and Market Access directorate, which will be headed by Pedro Cazzonatto starting in October.

These changes are part of the company's strategy to integrate business operations and align the leadership structure with business needs.

Effective September 14th, Emerson Oliveira will assume the commercial directorship of Crop Solutions, with responsibility for Crop Protection and Plant Advantage operations. He will lead the regional offices in Passo Fundo (RS),

Londrina (PR), and São Paulo (SP) and will continue to be responsible for the Market Development Coordinators (CDMs) of Plant Advantage.

On the same date, Gustavo Oliveira will also expand his role and will be responsible for both business areas. His scope will include the regional offices of Goiânia (GO), Western Mato Grosso, Eastern Mato Grosso, and Luís Eduardo Magalhães (BA).

According to Helm, the expansion of responsibilities aims to leverage the leadership's experience and strengthen commercial integration between Crop Protection and Plant Advantage.

New board

Effective October 1st, Pedro Cazzonatto will assume the new Pricing and Market Access Directorate of Crop Solutions Brazil, following the transition of the current structure.

Among their responsibilities will be defining and evolving the pricing strategy, expanding the company's access to different market segments, and acting as the focal point for Strategic Review 2030, Helm's strategic roadmap for that period.

The new management team will focus on integrating pricing and market access strategies and expanding the company's ability to identify opportunities and support the execution of its business strategy.

According to the company, the changes aim to consolidate a more integrated

structure for Crop Solutions Brazil and expand its capacity to respond to the demands and opportunities of the agricultural market.

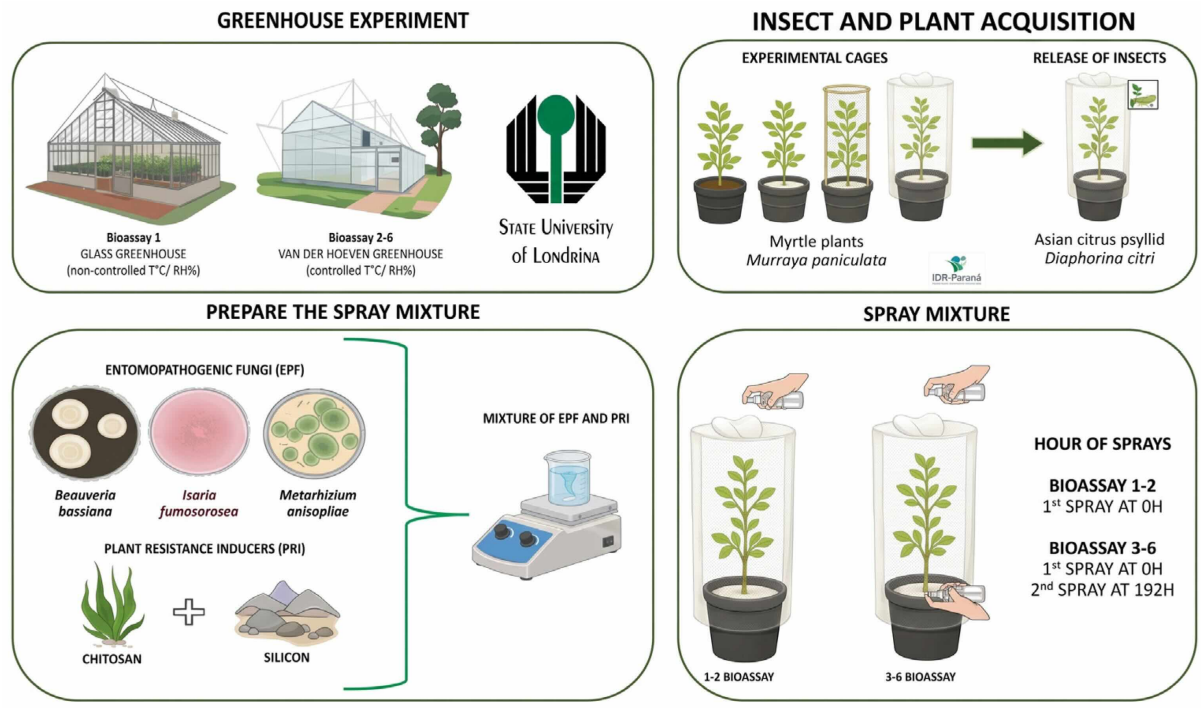
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Biostimulants enhance the action of fungi against Diaphorina citri

Mixture with silicon and chitosan increased psyllid mortality under favorable environmental conditions

11.09.2026 | 16:16 (UTC -3)

Cultivar Magazine



doi 10.3390/insects17090947

The association of entomopathogenic fungi with biostimulants based on silicon dioxide

and chitosan increased the mortality of Diaphorina citri in some of the bioassays carried out in a greenhouse. However, the performance depended on environmental conditions. A temperature of 34 degrees Celsius and relative humidity close to 35 percent limited the action of the biological agents. At 26 degrees Celsius and relative humidity around 67 percent, the fungal treatments reduced the survival of the psyllid.

This study evaluated commercial formulations of Beauveria bassiana, Metarhizium anisopliae, and Cordyceps fumosorosea, also presented in the work as a synonym for Isaria fumosorosea. The researchers applied the fungi alone or in mixtures with biostimulants containing

silicon dioxide and D-glucosamine derived from chitosan. The objective involved evaluating the compatibility of the tank mixture and its effects on the mortality of adult Diaphorina citri, the main vector of Huanglongbing, HLB (doi 10.3390/insects17090947).

Six bioassays

The researchers conducted six bioassays in greenhouses at the State University of Londrina, in Paraná. The host plants used were Murraya paniculata. The insects came from a colony free of Candidatus Liberibacter asiaticus. The adults were between seven and ten days old after emergence.

The first bioassay was conducted in a greenhouse without climate control, at a temperature of 34 degrees Celsius, with a variation of two degrees, and relative humidity close to 35 percent. Under these conditions, Beauveria bassiana, applied alone or with biostimulants, did not increase the mortality of Diaphorina citri compared to the untreated control. The researchers attribute the result to the unfavorable environment for the development of entomopathogenic fungi.

The second assay was conducted at a temperature of 26 degrees Celsius, with a variation of two degrees, and relative humidity close to 67 percent. In this environment, Beauveria bassiana and the combination of the fungus with

biostimulants caused higher mortality than that recorded in the control. Subsequent bioassays maintained these environmental conditions.

Experiments three to five

In experiments three through five, the researchers also evaluated *Metarhizium anisopliae* and *Cordyceps fumosorosea*, in addition to *Beauveria bassiana*. In the sixth bioassay, the experimental design was reduced to six treatments, including only *Beauveria bassiana* and *Cordyceps fumosorosea*—alone or combined with biostimulants—in addition to controls with water and with biostimulants alone;

Metarhizium anisopliae was not part of this last trial. The protocol included two sprayings. The first occurred 24 hours after the release of the insects. The second occurred 192 hours after release. Each application used ten millliliters of spray solution per cage, with five millliliters directed from top to bottom and five milliliters from bottom to top.

The results indicated no antagonism between the biostimulants and the commercial fungi. In some assays, the combination increased psyllid mortality compared to the fungus applied alone. In the fourth bioassay, the combination of Beauveria bassiana with the biostimulants showed higher mortality than the isolated application of the fungus in the evaluation

performed after 192 hours. In the fifth assay, the same combination also outperformed Beauveria bassiana applied without the biostimulants.

Sixth bioassay

In the sixth bioassay, Cordyceps fumosorosea associated with biostimulants reduced insect survival in evaluations performed after 24, 192, and 480 hours. The combination of Beauveria bassiana with biostimulants showed a significant effect in the 192 and 480-hour evaluations. At the end of the experiment, the treatments consisting of fungi and biostimulants outperformed both the untreated control and the isolated application of biostimulants.

The inclusion of an organosilicone adjuvant, evaluated in the fourth trial, did not increase insect mortality. The study also showed an advantage of the synthetic insecticide used as a reference. The combination of lambda-cyhalothrin and chlorantraniliprole showed faster initial mortality and, in several trials, higher mortality than that recorded with the biological agents.

According to the researchers, this difference in the time of action represents a significant limitation in the management of Diaphorina citri. Entomopathogenic fungi require a longer period for infection and death of the host. For an insect vector, the speed of control becomes important due to the risk of transmission of the agent

associated with HLB.

Influence of microclimate

The data also reinforce the influence of microclimate on biological control. The study does not allow for defining exact limits of protection offered by biostimulants in situations of heat and low humidity. The researchers themselves highlight an experimental limitation: the first two bioassays took place in different greenhouses and at different times. Thus, the effects of temperature and humidity were also associated with spatial and temporal variations.

Research suggests that tank mixing of commercial entomopathogenic fungi with silicon dioxide and chitosan is a viable alternative for integrated management programs for Diaphorina citri. However, the outcome depends on environmental conditions favorable to fungal activity. Researchers recommend further studies in climate chambers with different combinations of temperature and relative humidity, as well as field trials to evaluate the persistence, operational efficiency, and viability of this strategy in commercial orchards.

The work was carried out by Éder M. Carrilho, Paulo SG Cremonez, Luciano M. de Oliveira, Fernando T. Hata, Maurício U. Ventura and Humberto G. Androcioli.

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Decisivo contra as lagartas

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CONTACT
editor@grupocultivar.com
comercial@grupocultivar.com