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Cultivar Semanal ®

Fertilization reduces locusts

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Fertilization reduces migratory locusts

Agricultural-scale study shows that increased nitrogen in the soil reduces pest damage

15.01.2026 | 14:37 (UTC -3)

Cultivar Magazine

Photo: Quinton Kendall, ASU

Applying nitrogen fertilizers to millet crops reduced the abundance of migratory locusts, decreased plant damage, and

significantly increased productivity. The results came from an open-field experiment conducted with one hundred farmers in two regions of Senegal. The study also demonstrated that the strategy works even with highly mobile insects, outside of cages or confined areas.

The study took place in the towns of Gossas and Gniby, in the center of the country. Each farmer set aside two hectares of millet. One received mineral fertilizer. The other remained without fertilizer. Researchers monitored the areas throughout the growing season. They measured the presence of grasshoppers, the level of leaf damage, and the final grain yield. Between 85 and 90% of the observed populations were of *Oedaleus*

senegalensis.

Fertilization in the study

Before fertilization, the number of insects showed high and similar levels in both areas. After the application of fertilizers, the numbers began to diverge. The fertilized crops started to register fewer grasshoppers than the untreated areas. The difference remained in subsequent evaluations, carried out during and after the nutritional management of the soil.

The researchers also assessed the damage caused to the leaves. In the fertilized areas, the proportion of plant tissue consumed decreased consistently.

The pattern appeared in most participating properties. The data indicated that the reduction in pests was not related to variations in air humidity or vegetation cover. Temperature had only a slight effect on insect counts.

Productivity responded directly. Fertilized areas produced, on average, more than twice as much grain compared to plots without fertilizer. Farmers did not report an increase in other pests or diseases associated with the higher nitrogen content in the plants. The yield gain occurred along with a decrease in locust pressure.

Explanation for the result

The explanation for the observed effect lies in the insects' nutrition. Migratory grasshoppers require a large amount of energy for growth and movement. They respond best to plants with low protein content and a high supply of carbohydrates and lipids. Increased nitrogen in the soil raises the proportion of protein in the leaves. This imbalance hinders the insects' efficient feeding.

In the case of millet, fertilization significantly increased the protein-to-carbohydrate ratio of the leaves. The plants began to show values ??well above the dietary preferences of the Senegalese grasshopper. When consuming this material, the insect finds it difficult to meet its energy requirements without ingesting excess protein. The result is reduced

growth, lower survival, and reduced migration capacity.

Previous research had already indicated this mechanism in laboratory settings and in experiments with confined areas. The difference in the new work involved the scale. The tests took place in open fields, integrated into the real agricultural landscape, with free circulation of insects between treated and untreated areas. Even so, the effect of fertilization prevailed.

Further information at doi.org/10.1038/s41598-025-27884-z

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New soybean pest spreads across the US Midwest.

A leafminer insect recently adapted to the crop has already appeared in Missouri and Nebraska, with management still under development.

12.01.2026 | 07:18 (UTC -3)

Cultivar Magazine

Photo: University of Missouri

Soybean producers in the U.S. Midwest are facing a new health risk. Known as the soybean tentiform leafminer (STL), it has infested crops in several states. The most recent cases occurred in Missouri and Nebraska.

The insect, identified as *Macrosaccus morrisella*, historically arises in two native legumes (*Amphicarpaea bracteata* e *Strophostyles leiosperma*Researchers confirmed the adaptation of soybeans in Canada starting in 2016. From 2021 onwards, records advanced in commercial fields in Minnesota, South Dakota, North Dakota, Iowa, Nebraska, and, in 2025, Missouri.

In Missouri, the pest has been detected in Cooper County, in an area near the

woods. Experts point to this environment as a preferred focus for infestation. Soybeans are the leading agricultural crop in the state, which increases concerns about the insect's spread.

The larval stage causes economic damage. The larvae feed inside the leaves and form light-colored mines, in the form of white spots, visible mainly on the underside. The affected tissue dies and reduces the plant's photosynthetic capacity. The mines do not cross midrib veins.

In Nebraska, the first infested crop appeared in September 2024, in Madison County. Local technicians report only one confirmed field so far. The proximity to harvest limited immediate impacts on that

crop.

Researchers have not yet defined economic damage thresholds. Provisional recommendations use references to known soybean defoliators. Initial studies indicate that insecticides with translaminar action reduce the population and area mined. Trials have also identified less susceptible cultivars.

The taxonomic classification of the pest:

Kingdom: Animalia

Division: Arthropods

Class: Insecta

Order: lepidoptera

Superfamily: Gracillarioidea

Family: Gracillaridae

Subfamily: Lithocolletinae

Genre: *Macrosaccus*

Species: *Macrosaccus morrisella*

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Corteva defines leadership for global producer services.

Arthur Cançado takes on a role focused on hedging and sustainability.

16.01.2026 | 15:05 (UTC -3)

Cultivar Magazine

Corteva Agriscience has appointed **Arthur Prudente Cançado** (pictured) as Director of Global Producer Services / Hedge and Sustainability for the Seeds business. The

executive assumes the position this January and will be based in Johnston, USA, after nearly five years based in Switzerland.

“Switzerland was an exceptional place for us to live and grow as a family. We leave with immense gratitude, great friends, and memories that we will cherish forever,” he stated. According to him, the move to the USA represents “new challenges, opportunities, and experiences, both professional and personal,” he concluded.

With over 17 years of experience in global commodities companies, Arthur has expertise in trading, risk management, hedging, and leading multicultural teams. Prior to Corteva, he held strategic positions at Nestlé, where he was responsible for global hedging operations

involving sugar, grains, energy, and soft commodities.

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Mosaic sees weak demand for fertilizers in the 4th quarter of 2025.

Phosphate sales fell in North America and Brazil.

16.01.2026 | 14:35 (UTC -3)

Cultivar Magazine, based on information from Ben Pratt

Mosaic Company reported a sharp decline in fertilizer demand in the fourth quarter of 2025 and released preliminary sales figures impacted by adverse market conditions, primarily in North America and

Brazil. Mosaic Company plans to release its full financial results for the fourth quarter of 2025 on Tuesday, February 24, 2026.

In North America, demand fell beyond the typical seasonality for the period. Autumn applications lost momentum due to pressure on the profitability of rural producers and the early start of winter, which reduced the application window. The phosphate market suffered more, due to lower price competitiveness compared to potassium. Phosphate shipments in the region were about 20% below the level recorded a year earlier. Demand for potassium also decreased, but moderately.

In this scenario, Mosaic sold approximately 1,3 million tons of phosphate and 2,2

million tons of potash in the quarter. To respond to weaker demand, the company adjusted its phosphate production plan and redirected volumes to markets with more resilient consumption, keeping production in line with the previous quarter. Lower sales pressured cash flow and increased inventories.

Situation in Brazil

In Brazil, the market deteriorated even further. Credit restrictions and intense competition, driven by the entry of lower-concentration phosphates from China, reduced demand and margins. Mosaic Fertilizantes' sales were well below expectations in the quarter. Year-to-date

volumes totaled approximately 9 million tons, stable compared to the previous year, but reflecting the market downturn.

Projections for 2026

Despite the weak quarter, the company projects a more constructive 2026. Producers should replenish nutrients after the robust 2025 harvest. Additional government payments are expected to stimulate demand for spring application in North America.

According to the company, the global phosphate market shows a balance to tightness, with the growing impact of Chinese export restrictions, expected at least until the first half of the year. Prices

have already reacted since the beginning of the year. The potassium market remains balanced, with greater stability expected after the early conclusion of the Chinese contract. The industry projects record global shipments of phosphate and potassium in 2026.

In Brazil, expansion of planted area and good productivity could sustain demand, while a repeat of the strong volume of low-grade Chinese imports seems unlikely.

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Bayer has a new global regulatory affairs manager.

Luiz Henrique Valerio combines global regulatory management with scientific strategy for herbicides in Latin America.

16.01.2026 | 10:22 (UTC -3)

Cultivar Magazine

Luiz Henrique Valerio has taken on a new role at Bayer Crop Science. The executive has become the global manager of

regulatory affairs. This position adds to his responsibilities as head of "regulatory science strategy herbicides Latam".

This professional has a long track record in regulatory affairs in the agricultural sector. He has held positions at Bayer since 2016, leading fungicide registrations. He then assumed responsibility for the regulatory strategy for fungicides and seed growth in Latin America. Since February 2022, he has been leading the scientific regulatory strategy for herbicides in the region.

Previously, Valerio worked at DuPont. He held the positions of "registration specialist" and "registration & regulatory affairs manager" between 2009 and 2016. Earlier in his career, he worked at BASF as a registration coordinator, between

2004 and 2009.

Her education includes a bachelor's degree in chemistry from the State University of Campinas. Her resume also includes a technical course in chemistry from ETECAP. She completed an MBA in business strategy and leadership at Ibmec.

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Validamycin reduces reproduction of the fall armyworm.

Study shows that antibiotics compromise fertility, longevity, and egg hatching.

16.01.2026 | 09:05 (UTC -3)

Cultivar Magazine

Photo: Russ Ottens, University of Georgia

A validamycin significantly reduced the reproductive capacity of fall armyworm (*Spodoptera frugiperda*)The effect occurred after the inhibition of the trehalase enzyme, key in the insect's energy metabolism. The substance decreased egg laying, hatching rate, and lifespan of females. The data indicate potential for the development of biopesticides with a new mode of action.

Researchers injected validamycin into pupae on the first day of development. Doses ranged from 0,5 to 10 micrograms per microliter. Even at the lowest effective concentration, the substance blocked the activity of membrane-bound trehalase. This blockage reduced glycogen stores and altered sugar metabolism.

High mortality rate

The treatment increased mortality in pupae and adults. It also caused hatching failures. At higher doses, most insects died before completing metamorphosis. At intermediate concentrations, adults emerged with deformed wings and reduced mobility.

At a dose of 0,5 micrograms per microliter, the research maintained viable adults for reproduction evaluation. Under these conditions, only 52,6% of the females produced eggs. Some individuals presented darkened and agglutinated eggs in the oviduct, which prevented normal egg laying.

The treated females lived shorter lives. Longevity was halved compared to the control group. The oviposition period also shortened. Total egg production per female showed a decrease of about 35%, although without statistical difference in the seven-day cumulative period.

The egg hatching rate dropped from levels above 90% in the control group to about 80% in the treatment group. The reduction was concentrated in eggs laid at the beginning and end of the reproductive period.

Molecular analyses

Molecular analyses showed a decrease in the expression of vitellogenin genes and

its receptor in the ovaries. These genes regulate egg formation. The alteration accompanied the ovarian delay and atrophy observed in the treated females.

Validamycin is derived from soil microorganisms and has a history of low toxicity to humans. The study points to trehalase as a promising target for controlling the pest, which is showing increasing resistance to chemical insecticides and Bt crops.

The authors emphasize that the tests used microinjection, a method that does not represent field application. Further trials with ingestion or spraying should define the doses and agronomic viability of the technology.

Further information at
doi.org/10.3390/insects17010105

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DNA testing speeds up detection of the spotted-wing fly.

A method using real-time PCR identifies infestation in a few hours and improves pest control.

16.01.2026 | 08:36 (UTC -3)

Cultivar Magazine

Photo: Hannah Burrack, North Carolina State University

Researchers at the University of Minnesota tested a real-time PCR method to detect and quantify infestation of spotted-wing fly (*Drosophila suzukii*) in fruits. The technique reduced the identification time from weeks to about five hours. The test measures the amount of pest DNA directly in the fruit tissue.

The study evaluated the method's effectiveness on eggs of *Drosophila suzukii*This approach replaces traditional techniques, such as microscopy and larval extraction, which are more time-consuming and less accurate in the early stages of infestation.

Negative linear relationship

The researchers observed a negative linear relationship between egg concentration and PCR Ct value. The higher the number of eggs per sample volume, the lower the Ct recorded. The model showed a good fit in standard samples and in fruits collected in the field.

In laboratory tests, the method detected infestation in blueberries, raspberries, and strawberries. The amplification rate reached almost 97% of the samples. In the field, the addition of polyvinylpyrrolidone increased the success of the analyses, especially in raspberries. The compound

reduced the interference of phenols present in the fruits, which impair the molecular reaction.

Identification capability

The study demonstrated the ability to identify concentrations equivalent to one egg per fruit in strawberry samples. In larger volumes, the technique may generate false negatives when infestation occurs at a very low level. Even so, the authors validated the protocol in naturally infested fruits, with counts ranging from one to 52 eggs per sample.

The spotted-wing fly has no market-accepted tolerance level. Distributors reject contaminated shipments. Rapid

detection facilitates management decisions before harvest and shipment. The method also supports varietal resistance studies and control strategies in the early stages of the pest.

Further information at doi.org/10.3390/insects17010102

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Agricultural Market - January 16, 2026

China supports fundamentals and soybeans rebound after USDA scare.

16.01.2026 | 08:16 (UTC -3)

Vlamir Brandalizze - @brandalizzeconsulting

The international soybean market reacted after the USDA report increased its crop projection without a corresponding

adjustment in demand. Prices in Chicago lost momentum at the beginning of the week, sought to stabilize, and then began to show signs of recovery. The March contract is trying to hold at US$10,40 per bushel. The July contract is targeting US$10,70 and maintaining momentum towards US$11.

The main support came from China. The Chinese government confirmed imports of 8,04 million tons in December. The accumulated volume for 2025 exceeded 112 million tons. Brazilian soybeans accounted for almost 90 million tons. Purchases grew 6,5% during the year. The number was above the USDA's projection for the period, estimated at 108 million tons.

Market analysis suggests the USDA is behind schedule in its estimates. The official projection indicates 112 million tons for 2025/26. Analysts see room for higher volumes in 2026. Domestic Chinese demand for protein remains strong. Consumption includes pork, poultry, fish, eggs, and milk. The market is working with imports between 115 and 118 million tons. There is an expectation of volumes close to 120 million tons, given strategic stockpiles.

The USDA report projected a Brazilian harvest of 178 million tons. Field conditions indicate a harvest between 175 and 180 million tons. The estimate remains aligned with the productive potential. The harvest started slowly, at around 1%. The delay is concentrated in February and

March. The window for the second corn crop is shrinking.

Domestically, business is progressing. The 2024/25 crop has approximately 90% of its production sold, averaging 91%. The new crop has 32% of its production negotiated, in line with the previous year and below the average of 37%. Producers are facing tight exchange rates. The harvest is expected to put pressure on supply. Premiums remain positive in the short term. The trend indicates a decline when the harvest reaches 40% to 50% and ports accumulate volume. Chicago shows a slight upward bias, but March sees a large supply increase.

Corn situation

Corn prices felt the impact of increased harvests in the United States and China. Stocks grew. Even so, the relationship between production and consumption indicates a deficit. Fundamentals remain positive. Chicago prices retreated and then resumed a gradual upward trend.

In Brazil, the summer harvest totals 113,3 million tons. The market has traded approximately 92 million tons, representing 81,2%. The historical average reaches 82%. Producers still hold 21,3 million tons from the current harvest. About 4 million tons remain from the previous harvest. The total available reaches 25,3 million tons. Harvesting is progressing slowly, between 2% and 3%. The pace should pick up in the coming weeks. Production of the first

harvest is projected between 25 and 26 million tons, with crops in good condition and favorable weather.

Rice situation

Rice crops are in good condition in most regions. Harvesting is occurring sporadically on the northern coast of Santa Catarina, with a low percentage of the national volume. Retailers are buying little. Prices for a 5-kilo package range from R$ 9,89 to R$ 27,89. Promotions focus on prices between R$ 12 and R$ 17.

In Paraguay, the harvest has reached approximately 10%. Some crops are performing well, but half of the area is facing significant losses. The harvest is

expected to decline. Argentina is starting its harvest with a smaller area and lower potential. Uruguay is repeating the same scenario. The Asian market registered another drop in prices. Despite this, global consumption is expected to exceed production. Stocks are likely to decrease in the new season.

Bean situation

The first bean harvest is underway with limited supply. Producers are holding onto their product, while buyers are seeking volume. The market is reacting positively. Premium carioca beans are priced between R$230 and R$250 per sack. Commercial carioca beans are trading between R$210 and R$230. Black beans

are showing a stronger reaction, with prices ranging from R$145 to R$170. In Paraná, deals are exceeding R$150, with asking prices between R$170 and R$180. The planted area has decreased by approximately 50% in the state. Supply remains tight. Demand is expected to strengthen in the coming weeks.

By **Vlamir Brandalizze** - *@brandalizzeconsulting*

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One in four new tractors in Germany is a Fendt.

The brand leads in registrations despite the overall market decline, according to official data.

16.01.2026 | 07:47 (UTC -3)

Cultivar Magazine, based on information from Fendt

One in four German farmers will choose a Fendt tractor in 2025. Data released by the

German Federal Motor Transport Authority (KBA) and the German Engineering Federation (VDMA) show that the brand led new tractor registrations in the country, even with a market downturn.

According to the KBA, Germany registered 24.440 new tractors in 2025. The volume fell 12,4% compared to 2024, with 3.464 fewer units. Fendt once again led the ranking, with 6.326 registrations. Its market share reached 24,3%. In practice, almost one in four tractors registered that year came from the Marktoberdorf factory.

Official assessments indicate that Fendt achieved a 30,9% market share in the 51 hp and above category. The brand's total registration volume remained at 6.326 units. Starting at 68 hp, the Fendt e100

Vario model pioneered this segment. In this segment, approximately one in three registered tractors belonged to this brand.

“This is the third consecutive year that we have led the registration statistics in Germany. The result gains significance in a challenging year,” stated Wolfgang Möhrer, head of sales for Fendt in Germany. He credited the performance to the dealer network's work and the portfolio's adherence to the demands of farmers and service providers.

Fendt's advance was also evident in other European markets. In Switzerland, tractor registrations grew by 3% in 2025, totaling 1.624 units. Fendt led with 362 registrations and a 22,3% market share.

In the Netherlands, 2.205 new tractors were registered in 2025, a decrease of 11,3% compared to 2024. Fendt achieved a 22% market share, with 494 units. The best-selling models in the country were the Fendt 620 Vario, Fendt 516 Vario, and Fendt 314 Vario.

In Denmark, tractor registrations totaled 1.145 units, a 26,6% decrease compared to the previous year. In the 40 hp or more range, there were 1.126 units, a drop of 24,12%. Fendt led the Danish market for the first time, with 198 Varios registered.

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Study highlights limitations of sexual confusion in the control of Cydia pomonella.

Combined protocols further reduce pest mating in orchards.

15.01.2026 | 15:07 (UTC -3)

Cultivar Magazine

Photo: Csaba Szaboky, Bugwood

A study showed that most sexual confusion programs used against *Cydia pomonella* It has a limited effect on female mating in the field. The research evaluated commercial apple and pear orchards in the United States between 2023 and 2024 and indicated better results only when producers combined different management technologies.

Cydia pomonella, also known as the apple mothIt directly attacks the fruit and is among the main pests of temperate climate fruit growing. Control through mating confusion has gained widespread adoption in recent years.

Researchers monitored 82 orchards in the Yakima Valley, Washington state. The team tested 20 mating confusion

programs, either alone or in combination. The work included traps with attractants for both sexes and the weekly release of sterilized insects to reduce the effect of external migration.

Variation between areas

The results showed great variation between treated areas. On average, less than half of the females of *C. pomonella* In conventional breeding programs, captured females remained without mating. This rate was only about 20 percentage points higher than that observed in orchards without sexual confusion.

The best results were achieved with combined programs. Strategies that

integrated aerosols, handheld dispensers, and microencapsulated pheromones reached over 75% of unmated wild-type apple moth females. Among sterilized females, this percentage exceeded 90% in some treatments.

The use of sterilized insects increased the accuracy of the measurements. The technique allowed for a greater number of females to be collected. *C. pomonella* assessed by orchard and reduced interference from already mated migrant populations.

The study also linked mating and fruit damage. In 2024, 28 orchards underwent assessment for injury caused by... *C. pomonella*Areas with a higher proportion of mated females recorded more damage,

especially in organic systems and orchards near unmanaged sources of the pest.

According to researchers, sexual confusion, applied in isolation, reduces mating in the codling moth by about 20%. Increasing the intensity and combining technologies amplifies this effect.

Further information at doi.org/10.3390/insects17010099

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BASF strengthens its fruit and vegetable business in Latin America.

Elena Fumagalli Romário takes over the strategic marketing management of the segment.

15.01.2026 | 14:26 (UTC -3)

Cultivar Magazine

Elena Fumagalli Romário (In the photo) is the new Strategic Marketing Manager for

the Fruit and Vegetable Growing System for Latin America at BASF. The executive will be responsible for the regional strategy of the segment, focusing on growth, innovation and strengthening the company's presence in the Latin American market.

Elena has been with BASF for about three years, and previously held the position of Strategy Manager for Latin America in the Agricultural Solutions area, where she worked on the development of strategic initiatives and market analysis. Her professional background includes stints at companies such as Suzano, Corteva Agriscience, and DuPont, with solid experience in marketing, market intelligence, and new business development.

Elena holds a degree in Chemical Engineering from the Polytechnic University of Milan and a double degree in Environmental Engineering from the University of São Paulo. She also has supplementary training from institutions such as Harvard University and Ceibs.

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The biodiesel sector is expected to grow in 2026 after a record high.

Demand could exceed 10 million tons with the maintenance of B15 and advances in industrial capacity.

15.01.2026 | 14:14 (UTC -3)

Valeria Campos

The year 2025 was marked by the consolidation of mandatory biodiesel

blending mandates, with Brazil operating under the B15 regime from August onwards, according to guidelines from the Ministry of Mines and Energy. According to StoneX, this progress came after a series of fluctuations in previous years, caused by the adverse economic context and the impact of the pandemic, which had limited the growth of mandatory blends.

With the resumption of the schedule, the sector has once again shown consistent growth, also driven by the enactment of the Future Fuel Law, which establishes targets for annual increases until 2030 and reinforces the country's commitment to more sustainable energy sources.

The most recent data from ANP (National Agency of Petroleum, Natural Gas and

Biofuels) indicates that, in 2025, national biodiesel production reached record levels, a direct result of the increase in the blending content. Consumption of soybean oil, the sector's main input, followed this trend, totaling 7,9 million tons in the year. Soybean crushing and the use of alternative raw materials, such as beef tallow, pork fat, and residual oils, also registered significant advances, demonstrating the diversification of the national production matrix.

In the industrial sector, installed production capacity jumped to 42,6 m³/day in 2025, with the Central-West and South regions standing out, concentrating more than 70% of production. The sector also observed consolidation movements, such as the

acquisition of plants by large groups, and the entry of new players, intensifying competitiveness and market fragmentation.

Higher demand expected in 2026.

For 2026, the outlook remains optimistic. StoneX projects that biodiesel demand could reach 10,5 million tons, a scenario based on maintaining the B15 level throughout the year. Assuming an increase to B16 starting in March, demand could exceed 11 million m³, requiring approximately 8,9 million tons of soybean oil. Industrial capacity utilization is expected to vary between 57% and 64,5%,

depending on the pace of sectoral expansions and government decisions regarding the mandatory mandate.

The sector is closely monitoring the schedule of increases foreseen in the Future Fuel Law, which provides for a gradual increase in the biodiesel content in commercially sold diesel up to B20 by 2030. Producers and investors are already preparing to meet the growing demand, expanding existing plants and investing in new units, mainly in regions with a higher supply of soybeans.

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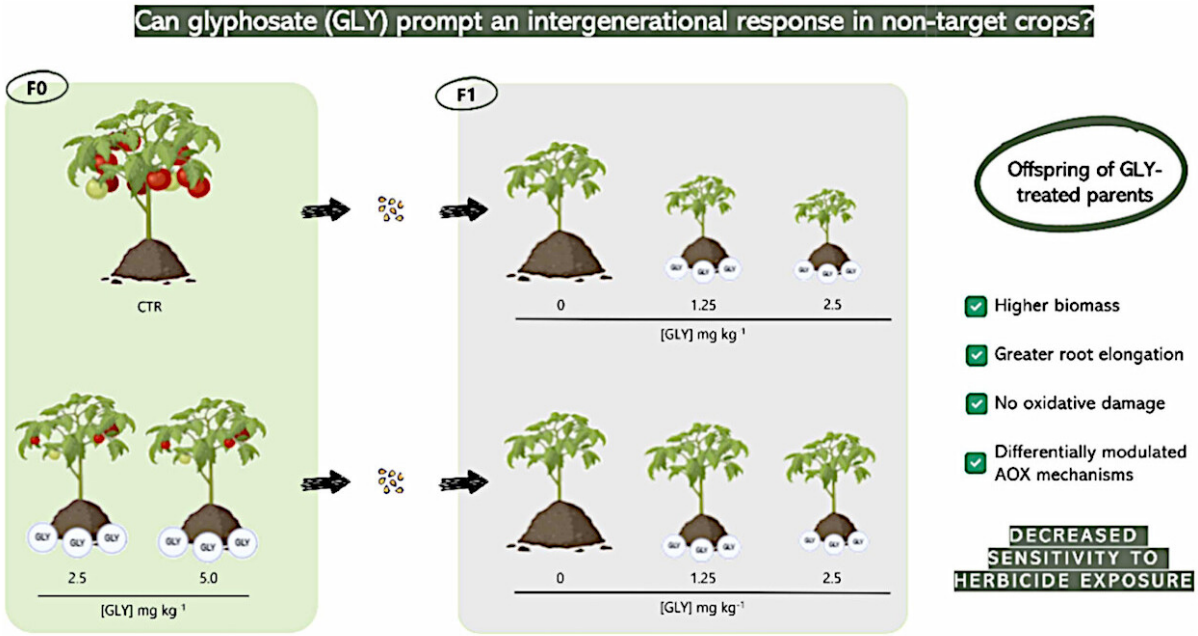
Glyphosate residues in soil generate an adaptive response in tomatoes.

Tomato daughter plants exposed to the herbicide show reduced sensitivity to the product.

15.01.2026 | 13:46 (UTC -3)

Cultivar Magazine



Waste glyphosate In tomato plants, herbicides in the soil elicit an

intergenerational response. Daughter plants originating from parents exposed to the herbicide grew larger and suffered less physiological stress when re-exposed to the product. The result indicates a heritable adaptation.

The research evaluated tomato plants as a model plant. Scientists cultivated parent plants in soil with glyphosate at doses of 0, 2,5, and 5,0 mg per kilogram. The seeds produced by these plants originated a new generation. This generation grew for 30 days in soil with new doses of the herbicide. The experiment measured growth, biomass, production of reactive oxygen species, and antioxidant activity.

Reduced growth

Glyphosate reduced root and shoot growth in all plants. The intensity of the effect varied according to the origin of the seeds. Offspring of unexposed parents suffered the greatest reductions, especially in the roots. Offspring of exposed parents maintained greater root elongation, mainly at the lowest dose tested.

The study also assessed oxidative stress. Plants from unexposed parents accumulated more hydrogen peroxide and showed greater lipid peroxidation, signs of cellular damage. The antioxidant system was activated, but did not prevent physiological damage. In contrast, plants from exposed parents maintained redox balance and did not show significant oxidative damage.

Antioxidant enzymes

The activity of antioxidant enzymes varied according to parental history. In plants from exposed parents, the need to activate multiple enzymes was lower. Catalase stood out only in the offspring of plants subjected to the highest dose of glyphosate, which contributed to reducing toxic compounds derived from stress.

The results indicate that the plants' response to glyphosate depends on both the current dose and the exposure of the previous generation. The work suggests the existence of heritable physiological memory, possibly associated with metabolic adjustments and epigenetic mechanisms.

More information at

doi.org/10.1016/j.plantsci.2026.112990

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Brazil should harvest 353,1 million tons of grains in the 2025/26 harvest

With a 0,3% increase in production and a 2,6% increase in cultivated area, soybeans stand out.

15.01.2026 | 09:55 (UTC -3)

Cultivar Magazine, based on information from Conab

Brazilian grain production is expected to reach 353,1 million tons in the 2025/26 harvest. This figure represents a 0,3%

increase compared to the previous cycle. The projected planted area is 83,9 million hectares, a 2,6% increase, according to the National Supply Company (Conab).

The Central-West region leads production, with 174,5 million tons, equivalent to 49,4% of the national total. The Center-South concentrates 84,2% of production, while the North and Northeast together account for 55,8 million tons, 15,8% of the total volume.

A **soybean** It remains the country's main crop. Production is estimated at 176,1 million tons, a 2,7% increase, or 4,6 million tons more than the previous harvest. The cultivated area increased by 2,8%, reaching 48,7 million hectares. Productivity saw a slight decrease of 0,1%, reflecting irregular rainfall in Mato Grosso do Sul and

soil limitations in Goiás.

O **corn** It is expected to face a 1,5% drop in production. The projection is 138,9 million tons, compared to 141 million in the last harvest. Productivity is down 5,3%, with a reduction of 343 kg/ha, influenced by weather problems in the South and Southeast. The planted area, however, increased by 4%, reaching 22,8 million hectares.

O **sorghum** The data shows strong expansion. Estimated production is 6,7 million tons, a 9,2% increase. The cultivated area grew by 11,3%, reaching 1,8 million hectares. Productivity, however, decreased by 1,9%. Most of the cultivation occurs in the second crop season.

A **mamona** Progress is being made in all indicators. Production grew by 47,4%, reaching 147,4 tons. The cultivated area increased by 9,3%, totaling 76,1 hectares. Productivity rose by 34,8%, driven by good weather conditions in Bahia.

the culture of **sunflower** Production is also advancing, with an estimated 101,9 tons, a 1,5% increase. The planted area grew by 3,1%. Productivity fell by 1,5%, reflecting the regularity of rainfall in Rio Grande do Sul.

O **cotton** The cultivated area is expected to decrease by 2,8%, totaling 2 million hectares. Cotton production is estimated at 3,8 million tons. Planting is underway, with 25,1% completed in the first week of January.

Production **bean** It should reach 3 million tons, a decrease of 0,5%. The first crop saw a reduction of 11,1% in area and 7,4% in production. The remaining crops will be sown until July.

For **rice**The estimate indicates a 13,3% drop in production, with 11,1 million tons. The irrigated area decreased by 6,6%. The production of rainfed rice fell by 26%, totaling 857 tons.

Production **peanut** It also declined. The forecast is for 1,1 million tons, a drop of 1,9%. The planted area saw a slight increase of 0,5%.

O **Sesame** Estimates remain stable: 399,4 tons of production and 608 hectares of cultivated area.

The planting of the first summer crops is almost complete. Initial harvests have already begun in some regions. The second and third crop plantings will be completed by June.

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**	**2.026,5**	**(2,8)**	**2.773**	**2.673**	**(3,6)**	**5.782,8**	**5.416,5**	**(6,3)**
ALGODÃO - PLUMA	**2.085,6**	**2.026,5**	**(2,8)**	**1.954**	**1.884**	**(3,6)**	**4.076,1**	**3.818,2**	**(6,3)**
AMENDOIM TOTAL	**280,4**	**281,8**	**0,5**	**4.136**	**4.040**	**(2,3)**	**1.159,7**	**1.138,2**	**(1,9)**
Amendoim 1ª Safra	273,1	274,5	0,5	4.202	4.103	(2,4)	1.147,6	1.126,2	(1,9)
Amendoim 2ª Safra	7,3	7,3	-	1.662	1.668	0,3	12,1	12,0	(0,8)
ARROZ	**1.763,9**	**1.589,0**	**(9,9)**	**7.233**	**6.961**	**(3,8)**	**12.757,7**	**11.061,4**	**(13,3)**
Arroz sequeiro	394,6	310,1	(21,4)	2.935	2.763	(5,8)	1.158,2	857,0	(26,0)
Arroz irrigado	1.369,3	1.278,9	(6,6)	8.471	7.979	(5,8)	11.599,5	10.204,4	(12,0)
FEIJÃO TOTAL	**2.693,0**	**2.641,6**	**(1,9)**	**1.137**	**1.153**	**1,5**	**3.060,6**	**3.046,2**	**(0,5)**
FEIJÃO 1ª SAFRA	**908,5**	807,6	**(11,1)**	**1.170**	1.218	**4,1**	**1.062,7**	**983,6**	**(7,4)**
Cores	347,3	333,4	(4,0)	1.707	1.820	6,6	592,8	606,7	2,3
Preto	169,0	118,6	(29,8)	1.953	1.769	(9,4)	330,2	209,7	(36,5)
Caupi	392,2	355,6	(9,3)	356	469	31,7	139,7	166,8	19,4
FEIJÃO 2ª SAFRA	**1.400,1**	1.407,1	**0,5**	**953**	**967**	**1,5**	**1.333,6**	**1.360,2**	**2,0**
Cores	294,6	297,9	1,1	1.499	1.501	0,1	441,6	447,1	1,2
Preto	286,6	292,4	2,0	1.616	1.658	2,6	463,2	485,0	4,7
Caupi	818,9	816,8	(0,3)	524	524	0,1	428,9	428,1	(0,2)
FEIJÃO 3ª SAFRA	**384,4**	**426,9**	**11,1**	**1.728**	1.646	**(4,8)**	**664,4**	**702,6**	**5,7**
Cores	326,5	361,0	10,6	1.883	1.802	(4,3)	614,9	650,6	5,8
Preto	14,1	14,1	-	1.268	1.145	(9,7)	17,9	16,2	(9,5)
Caupi	43,8	51,8	18,3	721	695	(3,7)	31,6	36,0	13,9
GERGELIM	**608,0**	**608,0**	**-**	657	**657**	**-**	**399,4**	**399,4**	**-**
GIRASSOL	**61,9**	**63,8**	**3,1**	1.622	**1.598**	**(1,5)**	**100,4**	**101,9**	**1,5**
MAMONA	**69,6**	**76,1**	**9,3**	**1.437**	**1.938**	**34,8**	**100,0**	**147,4**	**47,4**
MILHO TOTAL	**21.842,3**	**22.714,1**	**4,0**	**6.457**	**6.114**	**(5,3)**	**141.037,4**	**138.867,1**	**(1,5)**
Milho 1ª Safra	3.772,6	4.029,3	6,8	6.610	6.427	(2,8)	24.935,8	25.895,2	3,8
Milho 2ª Safra	17.430,3	18.092,7	3,8	6.496	6.105	(6,0)	113.228,4	110.461,0	(2,4)
Milho 3ª Safra	639,4	592,1	(7,4)	4.494	4.241	(5,6)	2.873,4	2.510,9	(12,6)
SOJA	**47.346,1**	**48.672,6**	**2,8**	**3.622**	**3.619**	**(0,1)**	**171.480,5**	**176.124,4**	**2,7**
SORGO	**1.632,0**	**1.816,3**	**11,3**	**3.739**	**3.670**	**(1,9)**	**6.102,2**	**6.665,7**	**9,2**
SUBTOTAL	78.382,8	**80.489,8**	**2,7**	**4.363**	**4.261**	**(2,3)**	**341.980,7**	**342.968,2**	**0,3**

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	545,8	-	2.368	2.368	-	1.292,3	1.292,3	-
CANOLA	211,9	211,9	-	1.627	1.627	-	344,8	344,8	-
CENTEIO	2,1	2,1	-	2.381	2.381	-	5,0	5,0	-
CEVADA	139,2	139,2	-	4.358	4.358	-	606,6	606,6	-
TRIGO	2.445,9	2.445,9	-	3.219	3.219	-	7.873,4	7.873,4	-
TRITICALE	11,4	11,4	-	3.211	3.211	-	36,6	36,6	-
SUBTOTAL	**3.356,3**	**3.356,3**	**-**	**3.027**	**3.027**	**-**	**10.158,7**	**10.158,7**	**-**
BRASIL (2)	**81.739,1**	**83.846,1**	**2,6**	**4.308**	**4.212**	**(2,2)**	**352.139,4**	**353.126,9**	**0,3**

Legenda: (1) Produção de caroço de algodão; (2) Exclui a produção de algodão em pluma.
Fonte: Conab.
Nota: estimativa em janeiro/2026.

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Executive assumes global financial leadership at Corteva.

Marisa Bittencourt de Marques begins her role as "Global Segment Finance Leader".

15.01.2026 | 09:46 (UTC -3)

Cultivar Magazine

Executive Marisa Bittencourt Marques has assumed the position of "Global Segment Finance Leader" at Corteva Agriscience in the United States. This move expands her

international reach within the agricultural sector.

Since January 2021, Maria had been serving as Corteva's Chief Financial Officer for Brazil and Paraguay. Prior to that, she held various positions at DuPont and Pioneer.

"I arrive with a lot of energy to embark on this new challenge. I am infinitely grateful to everyone who, in some way, contributed to my professional growth," she said about her new role.

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Indigo signs carbon credit agreement with Microsoft.

12-year agreement provides for the purchase of 2,85 million credits.

15.01.2026 | 05:42 (UTC -3)

Cultivar Magazine, based on information from Ludymila Marques

Indigo Carbon PBC announced the signing of a carbon credit purchase and sale

agreement with Microsoft. The software company will purchase 2,85 million carbon credits over 12 years.

The credits will be generated by the Carbon by Indigo program, developed in the United States. The project highlights regenerative practices as a central tool for high-integrity carbon removal. This is the third agreement between the companies. The previous ones involved 40 tons in 2024 and 60 tons in 2025.

Regenerative practices have an estimated potential to capture more than 3,5 gigatons of CO2 equivalent per year. These practices also promote soil health, increase crop resilience and productivity, and strengthen local economies. In a scenario of water scarcity, these programs

contribute to water conservation in rural communities.

According to Indigo, the contract creates significant financial incentives for producers who adopt or expand regenerative practices. The company works with farmers on 3,24 million hectares and has already paid approximately US$40 million to participants in its programs, without relying on government subsidies. According to the company, since 2018, the projects have saved 64 billion gallons of water and emitted nearly one million tons of carbon credits.

The agreement includes credits approved according to the Core Carbon Principles of the Integrity Council for the Voluntary Carbon Market. Indigo has already

registered 927.296 credits in the Climate Action Reserve, under the Soil Enrichment Protocol, using remote sensing, machine learning, and independent scientific validation. The contract provides for additional measures to mitigate the risk of reversal during the agreed duration period.

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Bioinsecticides require precise application to preserve natural enemies.

Study shows high mortality from direct contact and low residual persistence in crops.

14.01.2026 | 14:04 (UTC -3)

Cultivar Magazine

Photo: David Cappaert, Bugwood

Aphids can be controlled with physically acting bioinsecticides, provided the application is targeted. Research has evaluated products based on fatty acids, silicone polymers, and surfactants against aphids. *Myzus persicae* e *Brevicoryne brassicae*In addition to its effects on natural enemies, the results indicate efficacy dependent on direct contact and low residual risk to beneficial organisms when the product dries.

The study tested three routes of application. Direct application to insects and leaves resulted in high aphid mortality within 72 hours. *B. brassicae*Fatty acids and silicone polymers reached mortality rates of up to 90%. *M. persicae*The effect varied from 20% to 63%, depending on the

product.

natural enemies

The same direct exposure affected natural enemies. Adults of the parasitoid. *Diaeretiella rapae* In 100% of cases, they died after contact with fatty acids and silicone polymers. Predator larvae *Chrysoperla carnea* They also suffered significant losses, with mortality rates ranging from 36% to 100%, depending on the bioinsecticide.

When the insects received direct spraying and were then transferred to leaves without the product, the response maintained a similar pattern. Control of *B. brassicae* remained high. The effect on *M.*

persicae It fell. Natural enemies remained vulnerable to direct contact, especially with silicone polymers.

Exposure to waste

Exposure to only dry residues presented a different scenario. Aphid mortality was close to zero for *M. persicae* and it did not exceed 10% in *B. brassicae*Natural enemies showed low mortality. Parasitoids showed up to 33% losses with fatty acid residues. The synthetic insecticide used as a standard caused mortality between 66% and 100% under these conditions.

Researchers concluded that physically acting bioinsecticides leave no significant residual effect. This characteristic reduces

prolonged risks to natural enemies and allows for rapid recolonization of treated areas. Management requires precise application to aphid infestations.

Further information at doi.org/10.1002/ps.70518

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Fall armyworm develops migratory ecotype

Detailed study identifies distinct morphology and behavioral traits in migratory populations of Spodoptera frugiperda.

14.01.2026 | 10:25 (UTC -3)

Cultivar Magazine

Photo: Lyle Buss, University of Florida

Researchers have confirmed the existence of a migratory ecotype of fall armyworm (*Spodoptera frugiperda*)Their study analyzed morphological and flight characteristics of populations collected in the field and compared the data with lineages created in the laboratory. The conclusions reveal stable differentiation between migratory and non-migratory individuals.

Morphology adapted to flight

Migratory populations captured in the Yunnan region of China exhibited longer bodies and larger wingspans than laboratory strains. The migratory

individuals showed greater flight capacity, both in distance and time.

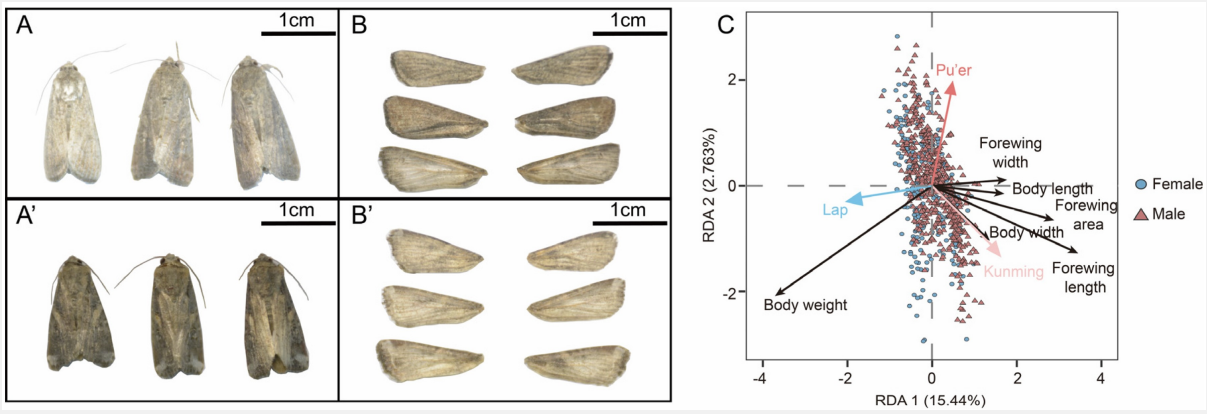
Based on these data, the authors developed a model for identifying the migratory ecotype using two morphological indices: corrected wing loading (WL) and forewing aspect ratio (FA). When applied in the field, these parameters allowed them to identify that approximately 70% of the individuals collected by pheromone traps belong to the migratory ecotype.

controlled environment

To determine whether migratory traits are inherited or induced by the environment, researchers kept migratory individuals under laboratory conditions for three

generations.

In the first generation (F1), the insects maintained morphological traits and flight performance similar to those collected in the field. In the second generation (F2), there was a significant reduction in these attributes. In the third generation (F3), all parameters were equal to those of the original laboratory lineage.



Morphological differences between Lap, Pu'er and Kunming. **(A, A')** Representative photographs of female and male fall armyworms (FAW) from the Lap, Pu'er, and Kunming populations, respectively (from left to right). Scale bar = 1 cm. **(B, B')** Representative images of the forewing of female and male fall armyworms (FAW) from the Lap, Pu'er, and Kunming populations, respectively (from top to bottom). Scale bar = 1 cm. **(C)** Redundancy Analysis (RDA)

The result indicates that migratory traits are predominantly shaped by the environment, not by fixed genetic factors.

Migration corridor

Yunnan province plays a strategic role in the migratory dynamics of the pest. Spring and summer monsoon currents bring individuals from neighboring countries to southern China, where they reproduce and begin new migrations northward. In autumn, the winds favor the return of these insects to Southeast Asia. The diversity of crops, especially corn, and the possibility of multiple harvests per year create an ideal habitat for the continuous reproduction of the insect.

The collections were carried out at two distinct points in Yunnan: Pu'er (south) and Kunming (northeast). Individuals captured in Kunming presented even more developed morphological characteristics, suggesting the influence of local factors on the expression of migratory traits.

Tool for handling

Identifying a migratory ecotype has a direct impact on agricultural management. By measuring only two parameters—WL and FA—it is possible to classify individuals as migratory or not, without the need for dissection or destructive tests. The applied logistic model achieved 92,9% accuracy in predicting the ecotype, with only two variables, making it viable for field use with

automated tools.

This methodology can be integrated into early warning and regional pest control systems, helping to reduce its population at points of origin and prevent outbreaks in distant agricultural areas. Rapid and accurate identification of the migratory ecotype also enables the targeted use of light traps, pheromones, and genetically modified crops.

Further information at doi.org/10.3390/insects17010095

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How Telenomus remus avoids superparasitism in Spodoptera frugiperda eggs

Research details egg marking and learning in the biological control of corn.

14.01.2026 | 08:48 (UTC -3)

Cultivar Magazine

Photo: Subramanian Sevgan, CC-BY-NC 4

The wasp *Telenomus remus* exhibits refined behavior to recognize already parasitized eggs of fall armyworm (*Spodoptera frugiperda*)The insect uses marks left after oviposition and internal signals from the host to avoid overparasitization. The result broadens the understanding of the use of the parasitoid in biological control programs for the main corn pest.

Researchers observed that parasitism occurs in well-defined stages. The female searches for a host with her antennae. Then, she examines each egg through repeated touches. If she considers the egg suitable, she introduces her ovipositor and deposits a single egg. Immediately afterwards, she performs a characteristic figure-eight movement on the surface of

the egg. This gesture functions as a chemical marker.

This marking reduces the chance of another female using the same egg. When it finds a marked egg, the wasp tends to avoid it. If the external information is not enough, it pierces the egg with its ovipositor to assess its internal condition. Upon detecting previous parasitism, it abandons the site.

Egg density

The study evaluated the effect of host egg density. As the number of eggs increased, the search time decreased. The parasitism rate increased until it reached a stable level. In masses with 30 eggs, the

efficiency approached the maximum observed.

The exposure time also influenced the results. With 1,5 hours of contact between the female and the egg mass, parasitism reached approximately 99%. Shorter periods limited performance. Longer times did not increase efficiency and may induce female fatigue.

Recognition and experience

The research demonstrated that the female's experience alters her behavior. Females with a history of oviposition recognized marked eggs at all temperatures tested, between 16°C and

36°C. They also maintained this ability for up to 12 hours after marking.

Inexperienced females showed distinct performance. They recognized marked eggs only shortly after oviposition or when the eggs remained at 16°C. At higher temperatures or after a longer interval, the ability to recognize them decreased. The result indicates that heat accelerates the degradation of the marker substance.

Prior experience seems to compensate for this loss. The study suggests that experienced females use learning and memory to identify weaker signals. This mechanism reduces errors and avoids wasting eggs.

Biological control

The results provide a practical basis for mass rearing and field release programs. Defining the ideal egg density and exposure time improves the efficiency of parasitoid production. The finding that experienced females perform better reinforces the importance of proper management before release.

Marking behavior also explains occasional cases of superparasitism observed in the laboratory. In general, each host egg harbors only one viable wasp larva. Internal competition eliminates surpluses, but reduces the system's efficiency.

The study concludes that the success of *Telenomus remus* Controlling the fall

armyworm depends on a combination of chemical signals, temperature, time, and learning.

More information at doi.org/10.3390/insects17010093

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Tagros buys Bayer's global flubendiamide assets.

The agreement includes the Belt brand and expands the company's presence in more than 25 countries.

14.01.2026 | 07:50 (UTC -3)

Cultivar Magazine, based on information from Tagros Chemicals.

Tagros Chemicals India Private Limited announced that it has signed a definitive agreement to acquire Bayer AG's global

assets related to the active ingredient. flubendiamide (FLB)The operation covers markets in Latin America, Europe, the Middle East, Africa, and Asia-Pacific.

The contract provides for the purchase of single-use and mixture formulations related to FLB, as well as a broad range of associated business assets. The package includes brands such as Belt, Fame, Fenos, Fenos Quick, Belt Expert and Tihan.

With this transaction, Tagros expands its access to markets in more than 25 countries. The move strengthens the company's global presence and reinforces its position in the diamide insecticide segment.

The acquisition marks a strategic step by enabling the company's entry into the B2C formulations segment.

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Petrobras resumes fertilizer production in the Northeast.

The nitrogen fertilizer plants in Bahia and Sergipe are starting operations with an initial investment of R$ 76 million.

13.01.2026 | 15:45 (UTC -3)

Petrobras Agency, Cultivar Magazine edition

The month of January marks an important step forward in the resumption of operations at nitrogen fertilizer plants in

the Northeast of Brazil. In Sergipe, the unit, which had already been producing ammonia since December 31st, began urea production on January 3rd. The Bahia plant had its maintenance completed last month and is now in the commissioning phase, with urea production expected to begin by the end of January. Together, the plants will produce ammonia, urea, and AdBlue (Automotive Liquid Reducing Agent), with initial investments of R$ 38 million in each. The resumption of operations at the Fafens (Nutrient Fertilizer Plants) is already generating 1.350 direct jobs and 4.050 indirect jobs.

The Nitrogen Fertilizer Plant in Sergipe, located in the municipality of Laranjeiras, has the capacity to produce 1.800 tons of urea per day, equivalent to 7% of the

national market. In Bahia, the plant located in Camaçari can produce 1.300 tons of urea per day, which corresponds to 5% of the national market. The Fafen-BA operation also includes the Ammonia and Urea Maritime Terminals at the Port of Aratu, in the city of Candeias.

“The two Fafens, together with Araucária Nitrogenados SA (Ansa), another national fertilizer factory owned by Petrobras, located in Paraná, will account for 20% of all urea demand in Brazil. Our expectation is to increase national production to 35% in the coming years, with a new plant under construction in Mato Grosso do Sul,” projects William França, Director of Industrial Processes and Products at Petrobras.

The production of nitrogen fertilizers at the Fafens plants will primarily contribute to recovering the national capacity for strategic inputs for agribusiness, with urea fertilizer and urea for ruminant feed, and may also serve the textile, paint, and paper and pulp industries. By producing AdBlue (Arla 32), Petrobras contributes with a product essential for reducing vehicle emissions and preserving the environment.

“Currently, all the urea consumed in Brazil is imported. With the resumption of national production, Petrobras expands the supply of this input in the domestic market, reduces external dependence, and strengthens the agribusiness production chain,” emphasizes Director William. According to him, this is a strategic action, since the process uses natural gas as its

main raw material, expanding the allocation alternatives for the gas produced by the company and generating value for industry, the agricultural sector, and the country.

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Two genes explain the breakdown in wheat resistance to powdery mildew.

Research identifies a dual mechanism that allows the pathogen to bypass the Pm4 gene.

13.01.2026 | 13:59 (UTC -3)

Cultivar Magazine

Photo: Gerald Holmes, Cal Poly San Luis Obispo

Wheat resistance to powdery mildew depends on a more complex mechanism than previously thought. A study identified that the virulence of the fungus... *Blumeria graminis* f.sp. *tritici* Resistance against the Pm4 gene results from the combined action of two distinct effectors. One activates the plant's defense, while the other blocks this response. This work shows how this interaction allows the pathogen to overcome one of the main genetic sources of resistance used in wheat breeding programs worldwide.

The Pm4 gene has gained prominence for conferring specific resistance to powdery mildew races and also to the wheat blast pathogen. Unlike most resistance genes already described in the crop, Pm4 does

not encode an NLR-type receptor. It encodes a fusion protein with kinase activity. This characteristic places Pm4 in a special class of immune receptors present in cereals.

AvrPm4 Effector

Researchers identified the AvrPm4 effector as the fungal signal directly recognized by the Pm4 protein. This identification occurred after ultraviolet radiation mutagenesis in a fungal isolate initially unable to infect plants with Pm4. Six mutants then began infecting these plants. All exhibited mutations in the same fungal gene, designated Bgt-55142. This gene was subsequently defined as AvrPm4.

AvrPm4 encodes a protein that is atypical for the known pattern of powdery mildew effectors. It has 372 amino acids. It contains an RNase-like domain in the initial region. It also presents a carboxy-terminal domain called MEA, absent in other previously described effectors of the pathogen. This domain includes nuclear localization signals and repetitive regions. The study indicates that this structure may have an important functional role during infection.

Tests on wheat protoplasts confirmed that the expression of AvrPm4, in the presence of Pm4, induces cell death. This response does not occur when mutant versions of the effector are used. The result confirms that AvrPm4 functions as an avirulence

factor, activating the plant's defense when recognized.

Kinase activity

Research has advanced by demonstrating that the Pm4 protein not only recognizes the effector but also physically interacts with it. Experiments have shown that Pm4 exhibits kinase activity. It phosphorylates AvrPm4 upon contact. This phosphorylation depends on the integrity of the kinase domain. Pm4 mutants lacking enzymatic activity lose their resistance capacity.

Despite this, the mere presence of AvrPm4 does not explain the virulence observed in natural populations of the fungus.

Analyzing 78 isolates from different regions of the world, the authors found no correlation between variations in AvrPm4 and the ability to infect plants with Pm4. This indicated the existence of another genetic factor involved.

Gene SvrPm4

Genome-wide association studies and QTL mapping have revealed a second crucial locus on chromosome 8 of the fungus. At this location, researchers identified a gene that acts as a suppressor of the Pm4-mediated immune response. The gene was named SvrPm4.

SvrPm4 encodes an effector that does not activate defense in the plant. Its function is

to block cell death induced by AvrPm4. Functional assays have shown that only active variants of SvrPm4 are able to suppress the immune response. Isolates of the fungus carrying these variants become virulent even in the presence of functional AvrPm4.

The study also revealed an additional aspect. SvrPm4 had previously been described as an avirulence gene recognized by another wheat resistance gene, Pm1a. The research confirms that the active variant of SvrPm4 suppresses Pm4, but triggers an immune response when wheat carries Pm1a. Inactive variants, on the other hand, escape recognition by Pm1a and do not suppress Pm4.

This result describes a two-component genetic system. AvrPm4 activates the defense. SvrPm4 decides whether this defense will be blocked. The combination defines the outcome of the interaction between wheat and fungus. According to the authors, this arrangement helps explain the limited durability of resistances based on a single gene.

More information at doi.org/10.1038/s41477-025-02180-w

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Italian agricultural machinery market rebounds in 2025

Tractor registrations grow 13,7% with support from public incentives.

13.01.2026 | 13:04 (UTC -3)

Cultivar Magazine, based on information from FederUnacoma

FEDER UNACOMA
Federazione Nazionale Costruttori Macchine per l'Agricoltura

IMMATRICOLAZIONI-REGISTRATIONS GENNAIO/JANUARY-DICEMBRE/DECEMBER 2025

PERIODO	TRATTRICI	MIETITREBBIATRICI	TRATTRICI CON PIANALE	RIMORCHI	SOLLEVATORI TELESCOPICI
Gen-25	1.101	8	48	464	72
Feb-25	1.036	5	55	578	67
Mar-25	1.400	7	75	643	84
Apr-25	1.493	6	67	714	84
Mag-25	1.702	34	89	782	102
Giu-25	1.714	61	80	711	109
Lug-25	1.780	39	79	773	132
Ago-25	1.073	19	55	705	79
Set-25	1.414	30	64	685	97
Ott-25	1.654	13	67	692	131
Nov-25	1.487	1	42	573	149
Dic-25	1.719	11	50	492	110
TOTALE 2025	17.573	234	771	7.812	1.216
TOTALE 2024	15.450	266	529	7.504	1.029
Var. %	13,7%	-12,0%	45,7%	4,1%	18,2%

Dati Ministero Trasporti - Elaborazioni Ufficio Statistico FEDERUNACOMA
Ministry of Transport Data processed by FEDERUNACOMA Statistical Dept.

* Dati oscurati per adempiere ai dettami comunitari in merito alla divulgazione di elaborazioni statistiche in mercati oligopolistici

* Figures encoded in order to comply with the European Commission requirements concerning the publication of statistical data within oligopolistic markets

After three years of decline, the Italian tractor market returned to growth in 2025. Registrations totaled 17.573 units, a 13,7%

increase over the previous year, according to data from the Ministry of Transport compiled by FederUnacoma. This result compensates for the weak performance of 2024, when the sector reached its lowest historical level, with 15.450 units.

The recovery gained momentum in the second half of the year. The first half showed a decline compared to the previous year, but the fourth quarter boosted the positive closing figures. In 2021, the market had registered a one-off peak of 24.387 units, following the post-pandemic recovery.

Among the segments, tractors with loading platforms led the growth. Sales increased by 45,7%, with 771 units. Telescopic handlers advanced 18,2%, with 1.216

registrations. The trailer market rose slightly more than 4%, totaling 7.812 units. Combine harvesters continued their decline, closing the year with a 12% drop, totaling 234 units.

The Federation's president, Mariateresa Maschio, attributes the recovery to public incentives. According to her, the sector faced economic uncertainties, high production costs, and reduced investment capacity on farms. Support programs, such as the Innovation Fund via ISMEA, the ISI INAIL call for proposals for safe machinery, tax credits 4.0 and incentives 5.0, in addition to the Rural Development Plans, sustained demand.

The organization's director-general, Simona Rapastella, highlights the announcement by Minister Francesco

Lollobrigida regarding the refinancing of incentives for 2026. This measure could strengthen the recovery throughout the year.

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Host plant alters gut bacteria of the tomato leafminer.

Larvae fed on eggplant exhibit greater microbial diversity than those raised on tomato.

13.01.2026 | 10:37 (UTC -3)

Cultivar Magazine

Photo: Marja van der Straten

The host plant influences the diversity and composition of the gut bacteria of the tomato moth (*Tuta absoluta*)This is shown by research that compared larvae fed on tomato and eggplant. The results indicate greater microbial diversity in larvae raised on eggplant.

Researchers isolated cultivable bacteria from the gut of larvae. The work used three culture media and three incubation temperatures. The goal was to increase the recovery of microorganisms. The analyses included colony morphology and sequencing of the 16S rRNA gene.

Tomato and eggplant

In larvae fed with tomato, the study identified eight bacterial species. These microorganisms belong to two phyla and five genera. In larvae fed with eggplant, 15 species were found, distributed across three phyla and ten genera. Eggplant presented exclusive genera, such as... *Pseudomonas* e *Pectobacterium*.

The bacterium *Enterococcus mundtii* It appeared as the most abundant in both groups. The microorganism dominated most cultivation conditions. At higher temperatures, the study recorded an enrichment of thermotolerant bacteria, such as *Bacillus wiedmannii* e *micrococcus luteus*.

Bacterial diversity

The data show that bacterial diversity varied according to the culture medium and temperature. Nutrient agar presented the highest number of isolated species. Incubation at 25 ºC maintained greater microbial diversity. At 37 ºC, community simplification occurred, with a predominance of few species.

According to the authors, the differences between tomato and eggplant affect the intestinal environment of the larvae. Eggplant exerts greater selective pressure on microorganisms. This factor may explain the greater bacterial diversity observed in this host.

Further information at doi.org/10.3390/insects17010081

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BASF agrees to buy AgBiTech.

Acquisition reinforces strategy in biosolutions

13.01.2026 | 09:48 (UTC -3)

Cultivar Magazine, based on information from Julian Prade

BASF has agreed to acquire the AgBiTech group, which specializes in biological insect control. The transaction involves the complete purchase of the business, currently owned by the Paine Schwartz

Partners fund and other shareholders. The closing is expected in the first half of 2026, following regulatory approvals. The companies did not disclose the financial details of the transaction.

With the transaction, BASF acquires all of AgBiTech's assets. The package includes portfolio, intellectual property, factories, research centers, and teams. The multinational states that the purchase expands its capacity to offer differentiated solutions for insect management. The focus is on Brazil, a rapidly expanding market for biological products.

Founded in 2000, AgBiTech is headquartered in Fort Worth, Texas. The company has developed technologies based on nucleopolyhedroviruses (NPVs),

natural viruses used in pest control. The group operates in Brazil, the United States, and Australia. It serves producers of soybeans, corn, cotton, and specialty crops.

According to BASF, AgBiTech's technology complements its portfolio of biosolutions. The strategy seeks to integrate biological and chemical products into integrated pest management programs. The company highlights the pressure from chewing insects, especially caterpillars of the order Lepidoptera, as a recurring challenge in Brazilian crops.

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Adama appoints new marketing director in Brazil.

Yvan Cesar Lopes assumes integrated strategy for the area and temporarily also heads the Southern business division.

13.01.2026 | 09:33 (UTC -3)

Cultivar Magazine, based on information from Cláudia Santos

Adama announced the appointment of Yvan Cesar Lopes as the new marketing director in Brazil. The executive will be responsible for defining and executing the integrated strategy for the area, focusing on portfolio, CRM, and go-to-market (GTM). He reports to the interim CEO, Eric Dereudre.

Lopes assumes the role after a consolidated career in the company and in the agricultural sector. At Adama Brasil since 1999, he has built a career with strategic and multifunctional experience. He has held senior leadership positions in finance, sales, and marketing.

For the past seven years, he served as Business Director for the Southern region. He led the commercial operation in the

region, taking full responsibility for the execution of the Go-to-Market model, portfolio management, and the development of client relationships. This period was marked by strategic vision, operational discipline, and knowledge of producer demands and the dynamics of the agricultural market.

Until a successor is appointed, Lopes will temporarily hold the positions of Southern Business Director and Marketing Director.

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Traps with semiochemicals improve thrips monitoring.

Study indicates greater pest capture with white sticky traps.

13.01.2026 | 09:12 (UTC -3)

Cultivar Magazine

Photo: PMJ Ramakers

Researchers evaluated trap systems for monitoring thrips in alfalfa crops. Field testing showed greater efficiency with white sticky traps baited with p-Menth-8-en-2-one (dihydrocarvone). The best performance occurred when the attractant was in polyethylene bottles and the traps remained at the height of the crop canopy.

The study analyzed two dominant species in alfalfa: *Odontothrips loti* e *Frankliniella occidentalis*Both cause significant losses in productivity and quality. Infestations can reduce production by more than 20%. The insects also transmit viruses.

The trials took place in an experimental area of ??China Agricultural University in Beijing. The area did not receive insecticides before or during the

experiment period. The initial population showed a predominance of the two thrips species.

The researchers tested the height of the traps and different attractant dispensers. Traps placed with their bottom edge aligned with the top of the canopy captured more insects. The difference was not significant compared to the position 10 centimeters above the canopy.

Types of dispensers

The study also compared three types of dispensers: polyethylene bottle, rubber stopper, and PVC tubing. The polyethylene bottle showed the best overall performance. *O. loti*The highest capture

occurred with a concentration of 1 microgram per microliter (µg/µL) of the semiochemical. *F. occidentalis*The best results appeared between 10 and 50 micrograms per microliter (µg/µL).

When both species occur together in the crop, the authors suggest using PVC tubing with a concentration of 1 µg/µL. This strategy does not maximize the capture of both species, but it indicates their presence and relative abundance. This information allows for proactive management decisions.

Further information at doi.org/10.3390/insects17010084

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Golden Harvest, from Syngenta Seeds, has a new commercial director.

Ricardo Formentini is an agronomist with 17 years of experience in the agricultural sector.

12.01.2026 | 16:15 (UTC -3)

Cultivar Magazine

Syngenta Seeds has a new commercial director for the Golden Harvest brand. This

is the agronomist... **Ricardo Formentini** (pictured), who has 17 years of experience in agribusiness and has worked for giants such as BASF, Monsanto and Corteva Agriscience.

Ricardo has been with Syngenta for a year, and previously held the position of "leader" of Market Access and Sales Effectiveness. Throughout his career, the executive has held leadership positions in tactical marketing and crop protection, management, and sales.

“For me, it is a great satisfaction and motivation to take on a challenge like this. I continue with the purpose of accelerating the growth of the business, always in line with our values ??and the culture of being close to the farmer and our multiplier

partners,” said Formentini.

He graduated from the Federal University of Santa Maria (UFSM) and holds an MBA in Strategic Agribusiness Management from the Getúlio Vargas Foundation (FGV).

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Allterra announces Gabriel Bittencourt as its new Chief Financial Officer.

The executive's arrival aims to strengthen the company's corporate strategy.

12.01.2026 | 14:47 (UTC -3)

Cultivar Magazine, based on information from Mariana Cremasco

The Economist **Gabriel Bittencourt** (pictured) was announced today (January

12th) as the new Chief Financial Officer of Allterra. According to the company, his arrival represents a strategic step in strengthening the organizational structure and contributes to the improvement of corporate governance, integrating financial management and business development strategies. He will work from the São Paulo office, in direct collaboration with the teams in Limeira (SP) and Pains (MG).

Bittencourt has over 15 years of experience in multinational companies. His career includes stints at leading companies in the automotive and agribusiness sectors, including Contech Produtos Biodegradáveis ??and Lindsay Corporation, where he built solid experience in budgeting, forecasting, cash flow restructuring, and financial modeling.

In addition, he has worked directly on capital structure design, financial risk management, and support for organic and inorganic business expansion.

"Gabriel's arrival reaffirms Allterra's commitment to improving its financial governance and ensuring that innovation, efficiency, and sustainability remain essential foundations of its operations," the company concluded in a statement.

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Hugo Centurion takes over as director of Ascenza Brasil.

Executive branch strengthens management to expand markets and increase presence among farmers.

12.01.2026 | 13:32 (UTC -3)

Cultivar Magazine, based on information from Silvana Guaiume

Agricultural engineer Hugo Centurion takes over as director of Ascenza Brasil. The change aims to strengthen the

management team and consolidate the company's strategy of contributing to food production with solutions that support balanced, sustainable, and healthy agriculture. The focus is on increasing productivity, quality, and the efficient use of resources and inputs.

Centurion states that he arrives with high expectations. The executive intends to leverage growth in the country, expand markets, and strengthen the company's participation in the development of Brazilian agriculture. "I will work alongside the teams to consolidate the Ascenza Brasil brand, establish new partnerships and business deals," he says.

Renato Francischelli is leaving his position as director, but will continue to collaborate

strategically. He will support the new director during the transition period and in the continuity of the corporate strategy. His continued presence ensures alignment of decisions, progress on projects, and strengthens the governance of the growth plan.

With Centurion and Francischelli in key roles, Ascenza Brasil seeks to enhance its business strategy and expand the brand's expertise among farmers, fostering synergistic and trusting relationships.

With 15 years in Brazil, the company has registered continuous growth. In 2025, sales volume increased by 18% compared to the previous year. “We maintain growth above the market and expand our market share. The arrival of Centurion adds to our

efforts to expand our participation in the Brazilian market," says Francischelli.

As a member of the Rovensa Group, Ascenza celebrated its 60th anniversary in 2025. Its strategy prioritizes close relationships with distributors and farmers, solutions tailored to local needs, investment in innovation and sustainability, and socially and environmentally responsible practices.

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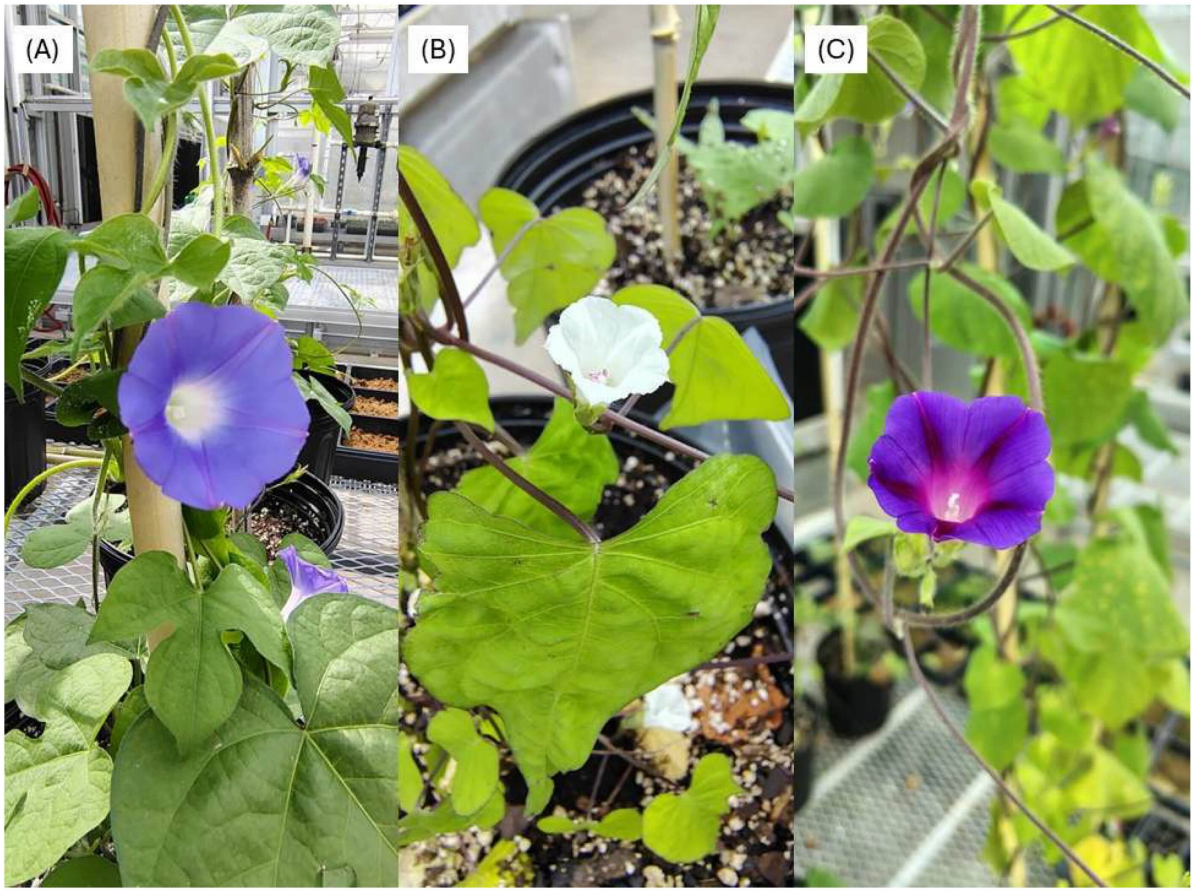
Seed dormancy keeps morning glory a chronic problem.

Scientific review details why Ipomoea hederacea, I. lacunosa and I. purpurea persist in crops.

12.01.2026 | 13:16 (UTC -3)

Cultivar Magazine



(A) *Ipomoea hederacea*; (B) *Ipomoea lacunosa*; (W) *Ipomoea purpurea* - doi.org/10.3390/seeds5010003

Morning glory (or morning glory) is a difficult weed to control in summer crops in warm and temperate climates. A recent scientific review showed that its persistence is due to a combination of hard seeds, long survival time in the soil, and staggered emergence throughout the growing season. The study analyzed three key species: *Ipomoea hederacea*, *Ipomoea lacunosa* e *Ipomoea purpurea*.

All three species exhibit physical dormancy. The impermeable seed coat prevents water from entering. Germination only occurs when environmental factors break through this barrier. High temperatures, daily temperature variations, and wetting and drying cycles favor the opening of the seed's water entry point.

Disappearance of numbness

The review highlights that dormancy does not disappear uniformly. Some seeds enter cycles of sensitivity. This phenomenon distributes germination across different times of the season. The result includes continuous emergence flows, even after initial herbicide applications.

In no-till planting systems, the problem intensifies. Seeds remain close to the soil surface. This condition increases exposure to temperature and humidity fluctuations. These stimuli accelerate dormancy breaking and prolong the emergence period, from late spring to mid-summer.

Species analyzed

Among the species analyzed, *Ipomoea lacunosa* It appears as the most abundant in field surveys in the southeastern United States. Studies cited in the review indicate significant productivity losses in soybeans, which vary according to the density of the infestation. The plant flowers for a long period and produces seeds even under competition from the crop.

Ipomoea hederacea It exhibits high flexibility. The species completes its cycle in a few weeks and maintains seed production even when it emerges late. This characteristic allows for constant replenishment of the seed bank in the soil.

Ipomoea purpurea It combines vigorous growth and high seed production. The review reports populations with herbicide resistance, which increases the management challenge. The seeds germinate in a wide temperature range after aging in the soil.

The study reveals significant knowledge gaps. Data is lacking on seed longevity for some species, the effects of the mother plant's environment, and models that predict emergence based on climate and soil. The authors argue that progress in these areas could improve the timing and effectiveness of control strategies.

More information at doi.org/10.3390/seeds5010003

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Lepidopteran damage affects 80% of Bt corn crops in Argentina.

Research by REM/Aapresid shows high adoption of biotechnology.

12.01.2026 | 10:19 (UTC -3)

Cultivar Magazine, based on information from Aapresid

Photo: Aapresid

Eight out of ten Argentine producers reported lepidopteran damage to Bt corn

crops in the 2024/25 growing season. This data is part of the 2025 National Survey of the Pest Management Network. The survey analyzed more than 1,8 million hectares. The study included members of Aapresid (Argentine Association of Direct Seeding Producers).

The Pest Management Network presented its results. The research has been ongoing for almost ten years. The objective involves mapping the management of weeds, insects, and diseases in the country's main crops. The scenario includes advances in biotechnologies, resistance pressure, and the search for diversified strategies.

Corn saw a high adoption rate of Bt events for lepidopteran control. Even so, 82% of the crops showed damage and the

presence of target species. corn earworm, *Helicoverpa zea*, predominated among the records.

In most cases, the damage did not require additional insecticide applications. Only between 3% and 15% of the areas received chemical reinforcement. The lowest percentage occurred in Vip corn. The highest rate appeared in other materials. *Cry*.

In soybeans, Intacta technology maintained its leading position. Biotechnology was present in 78% of the areas evaluated.

Among the weeds, *Conyza* spp. defined applications in spring desiccation. *Amaranthus* spp. e *Sorghum halepense* They led the way in post-emergence

problems in summer crops. In winter crops, producers hardly carried out post-emergence applications. When they did occur, they focused on species from the Brassicaceae family.

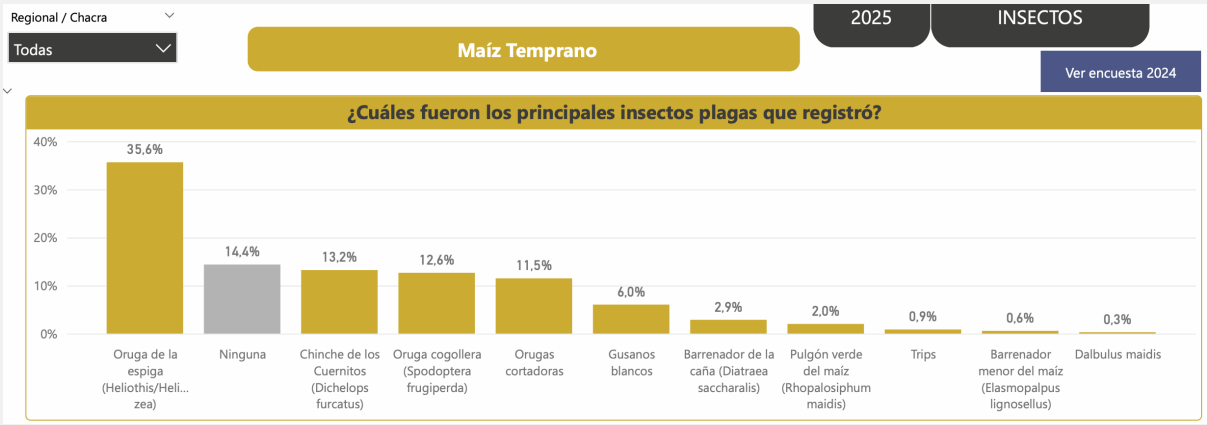
In chemical management, producers prioritized HPPD, PPO, and ALS herbicides in pre-emergence. In post-emergence, the use concentrated on glyphosate, hormonal herbicides, and graminicides.

The main insect pests varied depending on the crop. In addition to *Helicoverpa zea* in corn, *Rachiplusia nu* directed insecticide applications in wheat, sunflower, and soybean crops. In soybeans, mites of the group *Tetranychus* spp. They shared the spotlight with the looper caterpillar.

Among the diseases, *Puccinia sorghi* It was more frequent in corn. The cases rarely resulted in chemical control. In soybeans, *Septoria glycones* It required at least one application in half of the areas. In wheat, *Puccinia striiformis* This led to chemical control in more than 60% of the crops.

The use of biological products has increased. In 2025, 37,7% of producers applied some biological product, in addition to inoculants. This figure represents a 10 percentage point increase compared to 2024. Biostimulants were the most popular choices.

Chemical control remained central to weed management. Producers also adopted complementary strategies, such as service crops and reduced row spacing.


Regional / Chacra
Todas
Maíz Temprano
2025
INSECTOS
Ver encuesta 2024
¿Cuáles fueron los principales insectos plagas que registró?
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Oruga de la espiga (Heliothis/Heli... zea)
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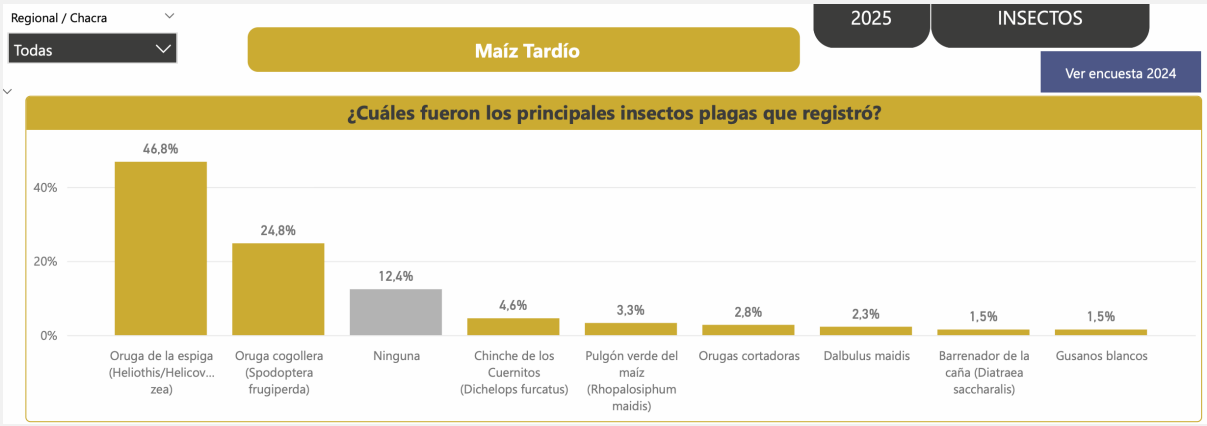
Chinche de los Cuernitos (Dichelops furcatus)
Oruga cogollera (Spodoptera frugiperda)
Orugas cortadoras
Gusanos blancos
Barrenador de la caña (Diatraea saccharalis)
Pulgón verde del maíz (Rhopalosiphum maidis)
Trips
Barrenador menor del maíz (Elasmopalpus lignosellus)
Dalbulus maidis


Regional / Chacra
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2025
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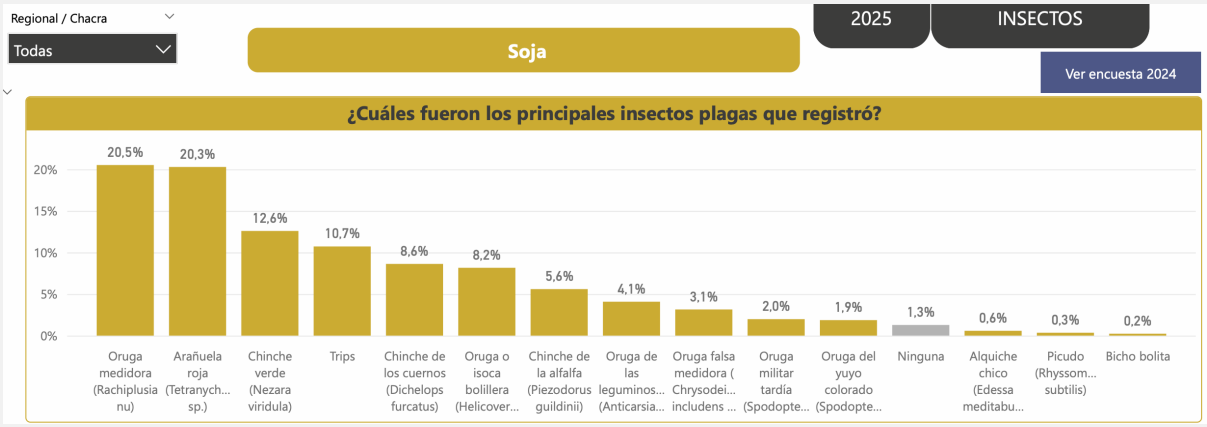
Oruga cogollera (Spodoptera frugiperda)
Ninguna
Chinche de los Cuernitos (Dichelops furcatus)
Pulgón verde del maíz (Rhopalosiphum maidis)
Orugas cortadoras
Dalbulus maidis
Barrenador de la caña (Diatraea saccharalis)
Gusanos blancos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Oruga medidora (Rachiplusia nu)
Arañuela roja (Tetranych... sp.)
Chinche verde (Nezara viridula)
Trips
Chinche de los cuernos (Dichelops furcatus)
Oruga o isoca bolillera (Helicover...
Chinche de la alfalfa (Piezodorus guildinii)
Oruga de las leguminos... (Anticarsia...
Oruga falsa medidora (Chrysodei... includens ...
Oruga militar tardía (Spodopte...
Oruga del yuyo colorado (Spodopte...
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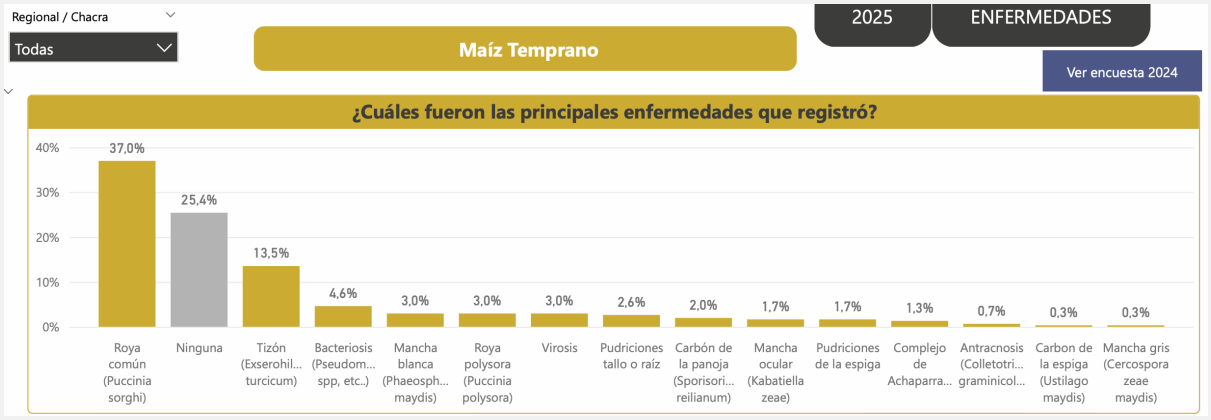
Alquiche chico (Edessa meditabu...
Picudo (Rhyssom... subtilis)
Bicho bolita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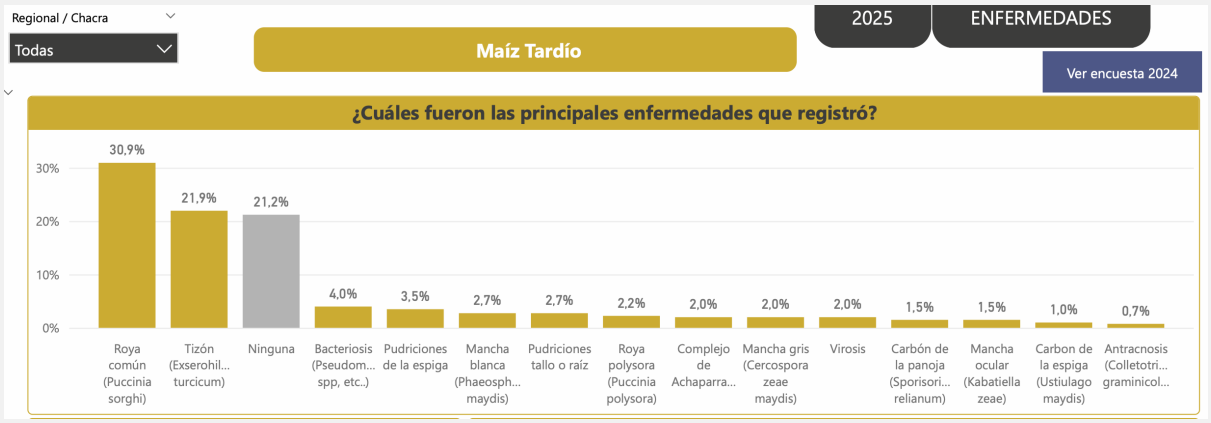
Roya común (Puccinia sorghi)
Ninguna
Tizón (Exserohil... turcicum)
Bacteriosis (Pseudom... spp, etc..)
Mancha blanca (Phaeosph... maydis)
Roya polysora (Puccinia polysora)
Virosis
Pudriciones tallo o raíz
Carbón de la panoja (Sporisori... reilianum)
Mancha ocular (Kabatiella zeae)
Pudriciones de la espiga
Complejo de Achaparra...
Antracnosis (Colletotri... graminicol...
Carbon de la espiga (Ustilago maydis)
Mancha gris (Cercospora zeae maydis)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Roya común (Puccinia sorghi)
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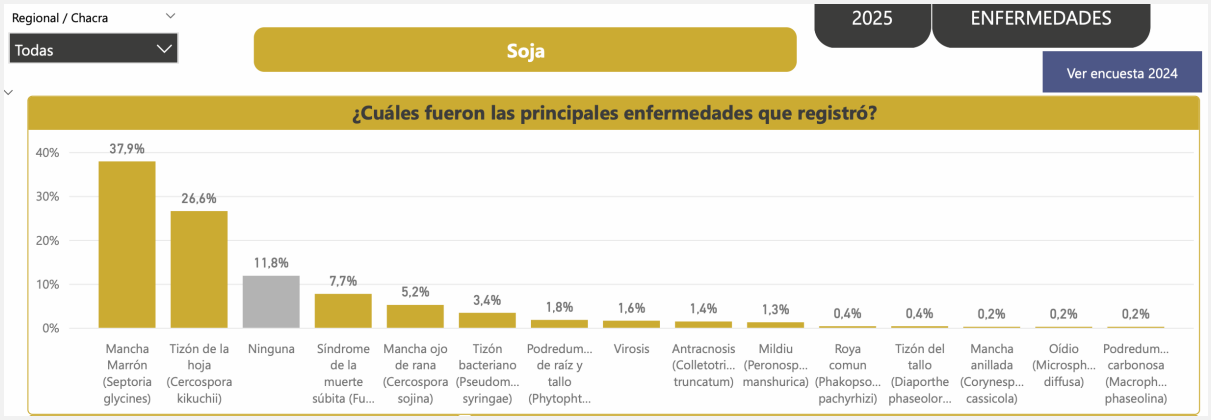
Roya polysora (Puccinia polysora)
Complejo de Achaparra...
Mancha gris (Cercospora zeae maydis)
Virosis
Carbón de la panoja (Sporisori... relianum)
Mancha ocular (Kabatiella zeae)
Carbon de la espiga (Ustilago maydis)
Antracnosis (Colletotri... graminicol...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Mancha Marrón (Septoria glycines)
Tizón de la hoja (Cercospora kikuchii)
Ninguna
Síndrome de la muerte súbita (Fu...
Mancha ojo de rana (Cercospora sojina)
Tizón bacteriano (Pseudom... syringae)
Podredum... de raíz y tallo (Phytopht...
Virosis
Antracnosis (Colletotri... truncatum)
Mildiu (Peronosp... manshurica)
Roya comun (Phakopso... pachyrhizi)
Tizón del tallo (Diaporthe phaseolor...
Mancha anillada (Corynesp... cassicola)
Oídio (Microsph... diffusa)
Podredum... carbonosa (Macroph... phaseolina)

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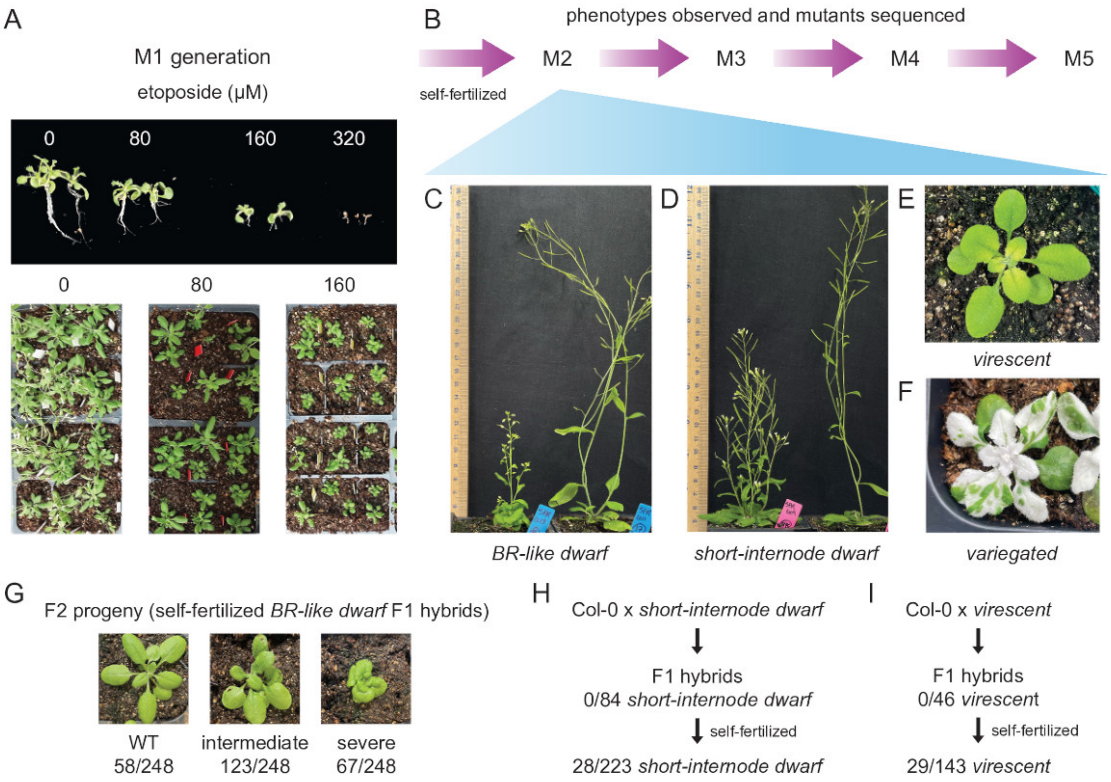
Drug used to fight cancer may replace radiation in plant breeding.

Study shows that etoposide induces heritable structural variations in plants.

12.01.2026 | 07:38 (UTC -3)

Cultivar Magazine



Researchers have developed a simple method to induce large genetic mutations in plants. The technique uses etoposide, a drug known for cancer treatment. The procedure generates heritable structural variations with high frequency. The method could replace radiation in plant breeding.

The study tested the technique in *Arabidopsis thaliana*The seeds germinated in culture medium with etoposide for two to three weeks. Afterwards, the plants were transplanted to soil. The next generation showed a wide diversity of phenotypes.

Researchers observed dwarf plants, changes in leaf shape and color, changes in flowering, and fertility problems. In 29 of the 42 lines evaluated, at least one visible phenotype emerged. The effects were

passed on to subsequent generations, confirming genetic inheritance.

Genetic analysis

Genetic analysis identified deletions, duplications, inversions, and translocations in the DNA. These structural variations range from tens of bases to millions of base pairs. Sequencing showed that etoposide induced this type of mutation without significantly increasing point mutations.

Etoposide acts as an inhibitor of topoisomerase II. This enzyme participates in relieving stress on DNA during replication and transcription. Blocking it causes double-strand breaks in the

molecule. Imperfect repair of these breaks generates chromosomal rearrangements.

Efficiency of the method

The authors compared the efficiency of the method with radiation, a traditional technique for creating large mutations. Etoposide produced more structural events per plant than common doses of gamma rays or heavy ions. Furthermore, it eliminated the need to access radioactive sources, which face legal restrictions and high costs.

The method requires few resources and can be applied in a common laboratory. The technique depends only on the

germination of seeds in a culture medium. The authors indicate potential use in various plant species.

The work points to direct applications in genetic improvement. The structural variations created can generate new traits of agronomic interest. The method can also provide genetic material for functional studies and for future strategies with genome editing.

More information at doi.org/10.1371/journal.pgen.1011977

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*The **Cultivar Semanal** magazine is a technical and scientific publication focused on agriculture in Brazil.*
It was designed to be read on mobile phones.
It is published on Saturdays.

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