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A New Spring Wheat Germplasm Promises to Reduce Economic Losses

By: Maribel Alonso

Researchers at USDA's Agricultural Research Service (ARS) are helping American wheat farmers fight a devastating crop disease.

Researchers released a new spring wheat germplasm line with resistance to Fusarium head blight. This challenging fungal disease leads to significant annual economic losses in cereal crop production, estimated at \$2.7B over the period from 1998 to 2000, and poses health risks to consumers.

Fusarium head blight (FHB), or scab, is the number one fungal disease impacting small-grain cereal production in the U.S., particularly wheat and barley. The primary cause of the disease is the fungus *Fusarium graminearum* L., although it can also be triggered by multiple strains or species of *Fusarium*.

FHB pathogens produce a toxin that contaminates the grain and flour, leading to production losses as it poses health risks for humans and animals. Over the years, it has become clear to farmers, researchers, and breeders that the most effective way to control this disastrous disease is by enhancing cereal crops with genes that show resistance to FHB. However, the source of effective resistance to FHB is currently limited in wheat and barley. Therefore, there is an urgent need to find new resistance genes that could be used to fight the disease, especially in durum wheat and barley.

In a scientific breakthrough led by ARS Research Geneticist Xiwen Cai with the Wheat, Sorghum, and Forage Research Unit in Lincoln, NE, scientists at ARS and the North Dakota Agricultural Experiment Station leveraged insights from previously published studies to develop a new spring wheat germplasm line named 'WGC002.' This germplasm carries a novel gene [Fhb7The2] found in wild grass that provides significant resistance to Fusarium under diverse environments.

The scientists used plant breeding techniques to select genes with the desired traits from wild grass in their breeding lines, which have now been successfully integrated into different market classes of U.S. wheat.

"This is a significant discovery because there are very few resistance genes currently available. This marks the first effective FHB resistance gene identified in wild species that has been bred into spring, winter, and durum wheat," said Cai. "Moreover, this gene exhibits what we refer to as an additive effect, meaning it enhances and strengthens the resistance level of another gene."

WGC002 Spring Wheat Germplasm has already been utilized by many wheat breeding programs locally and around the world. ARS scientists in Lincoln, NE, have now been deploying this novel FHB resistance gene in elite varieties of winter, spring, and durum wheat.

Scientists anticipate a substantial reduction in U.S. economic losses from wheat crops affected by FHB within just a few years if farmers begin growing new varieties with this resistance gene.

WGC002 was developed with financial support from the Agriculture and Food Research Initiative, the USDA National Institute of Food and Agriculture, the US Wheat & Barley Scab Initiative, and USDA-ARS CRIS Project.

This research was part of a series of collaborative studies conducted by ARS scientists and partners to identify FHB resistant genes in wheat and wild relatives. Multiple genes have been found to be resistant to FHB, but only two of them [Fhb1 and Fhb7] have been used and characterized as effective sources of resistance in breeding for wheat variety development. Selecting multiple genes simultaneously to provide robust and durable resistance is a common and effective practice in this effort.

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16-17 "America's pork producers appreciate the 2025 Dietary Guidelines putting pork front and center on the plate. They took note of producer concerns and rightly gave pork their due.

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Livestock losses and wolf deterrence efforts cost Californians millions



Photo credit: Axel Hunnicutt/CDFW

The return of wolves to California is seen as a conservation success by some, but the predators have come to depend on cattle as a food source. Photo by Axel Hunnicutt, California Department of Fish and Wildlife

By Ria DeBiase

Nearly a decade after the California Department of Fish and Wildlife confirmed the state's first wolf pack, the rural community in Sierra Valley faced unprecedented challenges when the Beyem Seyo wolf pack began to regularly attack and kill domestic livestock. Despite extensive efforts at non-lethal deterrence, the pack became so dependent on cattle as a food source that several members of the pack were ultimately euthanized in October 2025. A new study by UC Cooperative Extension analyzed the costs associated with these wolf attacks and found that, when combining the costs of livestock losses and interventions aimed at deterring further depredations (the injuring or killing of livestock by wolves), the economic toll over seven months reached at least \$2.6 million.

The gray wolf, a species protected under both federal and state Endangered Species Acts, was first introduced into Idaho and Yellowstone in the mid 1990s. After a century-long absence, the first wolf was documented migrating into California in 2011, and the first pack was confirmed in the state in 2015. By the end of 2024, at least 50 individual wolves had been confirmed in California. While some saw this as a conservation success story, ranchers in Sierra Valley experienced the downside of this resurgence when the Beyem Seyo pack began preying on local cattle in March 2025.

By summer, the pack was found near residences during daylight hours and had become dependent on cattle as its main source of food. To reduce the harm this pack was causing to the community, CDFW deployed what they called the Summer Strike Team – a group of biologists, wardens, and CDFW staff – whose goal was non-lethal hazing and deterrence of wolf-related livestock attacks. Yet despite spending 18,000 staff hours over 114 days, the attacks continued to increase, and by October 2025, 92 cows and calves had been

injured or killed by the pack. As a result, four members of the pack were ultimately euthanized.

Tina attaches a camera to a wood fence post as Ken watches. Their dog stands next to Ken

To monitor wolf activity on rangeland, Tina Saitone attaches a camera to a fence post with assistance from the late Ken Tate, UC Cooperative Extension specialist. Photo by Andy Barron for Los Angeles Times

To better understand the economic impact of this livestock depredation, UC Davis professor of Cooperative Extension Tina Saitone and UC Cooperative Extension livestock and natural resources advisor Tracy Schohr analyzed the direct costs associated with the attacks.

First, they looked at the direct costs of cattle losses between March 7 and Oct. 10, 2025, that either the CDFW or the U.S. Department of Agriculture verified as 'confirmed' or 'probable' wolf depredations; only these verified kills were eligible for rancher compensation under the state's Wolf Compensation Program. Using the fair market value for these 'confirmed or probable' kills, the authors estimated \$234,735 in losses to Sierra Valley ranchers.

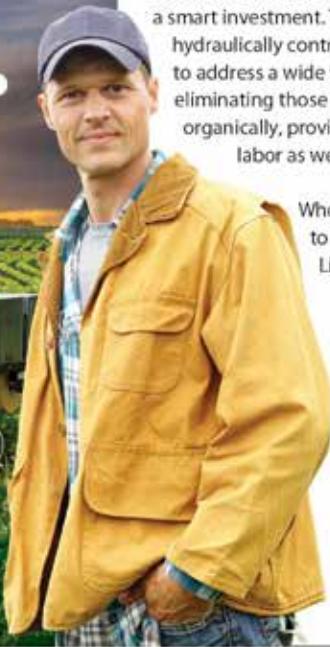
Saitone said, "Beyond direct predation, wolves impose additional costs. Cattle exposed to wolves show increased vigilance and avoidance behaviors that reduce weight gain and conception rates while increasing disease vulnerability. Producers face higher expenses from intensified monitoring, fence repairs, non-lethal deterrents, and depredation investigations."

Further, when the authors considered missing or unconfirmed cattle losses, the total wolf-related depredation losses ranged from between \$533,688 to \$1.7 million, depending on methodology. When these costs are added to the cost of agency interventions (e.g., the efforts of the Summer Strike Team), which totaled more than \$2 million, this single wolf pack was responsible for damages of at least \$2.6 million in 2025. This research underscores the importance of wildlife agency resources and funding of comprehensive livestock loss compensation programs.

To learn more about the economic impacts of the Beyem Seyo wolf pack on California, read the full article by Tina L. Saitone and Tracy K. Schohr: "The Beyem Seyo Wolf Pack: Economic Toll of Unprecedented Livestock Conflict in California." ARE Update 29(2): 1–5. UC Giannini Foundation of Agricultural Economics, online at <https://giannini.ucop.edu/filer/file/1767890615/21559/>

ARE Update is a bimonthly magazine published by the Giannini Foundation of Agricultural Economics to educate policymakers and agribusiness professionals about new research or analysis of important topics in agricultural and resource economics. Articles are written by Giannini Foundation members, including University of California faculty and Cooperative Extension specialists in agricultural and resource economics, and university graduate students. Learn more about the Giannini Foundation and its publications at <https://giannini.ucop.edu/>.

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Funding for 2025 CalAgPlate Grant Program Awarded

The California Department of Food and Agriculture (CDFA) has awarded \$218,220 for organizations to enhance agricultural education and leadership opportunities under the 2025 California Agriculture License Plate (CalAgPlate) grant program.

The CalAgPlate program is funded with proceeds generated through the sale of special interest, agriculture-themed license plates through the California Department of Motor Vehicles (DMV). Since the inception of the CalAgPlate grant program, CDFA has awarded over \$2.5 million to support agricultural education and leadership development. Current grant recipients include:

1. California Association, Future Farmers of America (FFA): \$178,500 CalAgPlate grant funding will continue to support student leadership and program development for California's statewide Future Farmers of America (FFA) program, which includes 373 school chapters across the state. These chapters play a crucial role in providing leadership instruction through the FFA student organization to 108,200 student members. The program aims to enhance student access to information about career, leadership, and programmatic opportunities.

2. San Joaquin Farm Bureau Foundation for Agriculture Education: \$10,000 San Joaquin County's (SJC) AgVenture program increases agricultural literacy and nutrition awareness among elementary school students by connecting classroom learning to real-world agricultural experiences. AgVenture will host five field days across northern, central, and southern SJC, serving approximately 12,500 third-grade students and their chaperones in partnership with 1,200 local farmers, producers, and volunteers. Through hands-on, interactive activities, students will learn where their food comes from, explore the importance of agriculture in their community, and gain exposure to the agricultural workforce.

3. Coachella Valley Unified School District: \$9,720 The School to Table project addresses reconnecting students to agriculture through hands-on composting and vertical gardening experiences. This project will support the installation of GeoBins, tumbler composting systems, and mobile vertical gardens at participating schools. Students will get to experience composting, sustainable food systems, and seed-to-table learning experiences through new garden installations. Through these activities, students will learn to transform food scraps into nutrient-rich soil and grow fresh produce in small, sustainable spaces throughout the year.

4. Beginnings Inc., Humboldt County: \$10,000 The Youth Agricultural Business and Career Development Program will transform an established greenhouse initiative into a comprehensive agricultural business and leadership program for second through sixth grade students. Field trips to local farms and business will allow students to explore diverse agricultural careers such as greenhouse management, nursery operations, herbalism, food entrepreneurship, and natural foods retail. Students will be able to apply business skills by developing, branding, marketing, and selling student-grown plant starters and garden goods, which will allow them to learn about the viable careers and entrepreneurial skills agriculture has to offer.

5. Community Bridges: \$10,000 This project will bring agricultural job awareness seminars and training opportunities to youth and families in Santa Cruz County. The project will host bilingual workshops and career panels featuring local growers, food producers, and agricultural professionals. These events will provide practical information, mentorship connections, and hands-on exposure to careers in agriculture.

Please support agricultural education and the CalAgPlate program by purchasing a special interest license plate from the DMV.



CDFA Joins Global Recognition of Women in Agriculture in 2026 - the International Year of the Woman Farmer

The California Department of Food and Agriculture (CDFA) is proud to participate in the International Year of the Woman Farmer, declared by the United Nations for 2026. The designation recognizes women's essential role in agriculture worldwide and reflects a global commitment to equity, visibility, and opportunity across food and farming systems.

Led by the United States and supported by 123 countries, the resolution highlights the critical contributions women make to food security, sustainability, and economic resilience. In California, women are not only part of agriculture - they are leading it. Here, the role of women extends far beyond the farm gate, covering virtually every role throughout the broader food value chain that includes not only farm fields and ranches, but also farm inputs and services, processing, distribution, trade, marketing and retail.

"Women farmers are at the heart of California's agricultural industry," said California First Partner Jennifer Siebel Newsom. "From stewarding our land, to strengthening our rural economies, to feeding communities across the state, California relies heavily on the incredible leadership of women farmers and agricultural innovators. I am thrilled to celebrate the International Year of the Woman Farmer so we can uplift their significant impacts and dedication to our shared future – not just in the Golden State but across the world."

California is home to more than 45,000 women producers, with women making up nearly 38% of all producers and operating on 63% of farms statewide, more than any other major agricultural state. Over the last decade, the number of women farmers in California has grown by 13%, reflecting a shift toward greater leadership and ownership across the

agricultural sector.

"California agriculture is a powerful economic engine as the number one ag producing state in the nation, and women producers play a critical role in its strength and competitiveness," said CDFA Secretary Karen Ross. "Women in agriculture support industry leadership in innovation that feeds the nation, supports millions of jobs, and leads the way on climate-smart sustainable farming practices.

Women-led farms are often at the forefront of soil health, water conservation, and long-term land stewardship. California continues to lead nationally in sustainability, ranking #1 in sustainable dairy production, with more than 80% of California wine produced in certified sustainable wineries.

To elevate these contributions, CDFA has partnered with CA Grown on a yearlong campaign to spotlight California's women farmers and their impact on the food and farming system. This effort will be featured through a coordinated digital campaign and woven throughout CDFA and CA Grown initiatives in 2026.

"One of the most influential women in my life was my grandmother, who farmed alongside my dad as an equal partner in our family operation," said Cherie Watte, Executive Director of CA Grown and a fifth-generation California agriculturist. "I look forward to celebrating all women—past and present—who contribute to the success and innovation of California's agricultural industry."

When consumers choose California Grown food, wine, and flowers, they are supporting farming families—93% of California farms are family-owned—and the women who help lead them across generations.

Additional information is available on the International Year of the Woman Farmer Campaign Materials.



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Hemp Roots Offer New Opportunities for Farmers and Cancer Research



Hemp root. Image Provided by USDA PGRU Hemp Germplasm Lab - Tyler Gordon Dan Meyers and Zach Stansell

By: Maribel Alonso

In a groundbreaking study, scientists at the U.S. Department of Agriculture, Agricultural Research Service (ARS) re-defined the value of roots in industrial hemp, providing new opportunities for industrial hemp growers and opening new avenues for pediatric cancer research.

While the above ground part of *Cannabis sativa* L. plants, or industrial hemp, is widely recognized for its broad range of uses, including fiber production and grain (as a source of protein and oil), its roots have often been unutilized. This is because, until now, they were not considered to hold significant value.

Dr. Korey Brownstein, a research chemist with the National Center for Agricultural Utilization Research in Peoria, IL, noticed a strange substance showing up in his analysis as he was studying the chemical composition of hemp roots. Intrigued by these findings, Brownstein led a team of researchers to further investigate and analyze this chemical substance to determine its precise structure.

The analysis showed the substance was multiple compounds (four in total) that researchers predicted through structural modeling to be neolignans – natural products with similar structures formed during the plant's biological processes. Although molecules with similar properties have also been found in other plants, such as paper mulberries and a tree native to Sumatra and the Malay Peninsula, this is the first time such molecules have been isolated from hemp roots.

The research team spent three years isolating and purifying these compounds—a process they described as 'complex

and increasingly difficult.' Due to potential activities of the molecules, the researchers were determined to understand their nature and uncover the complete narrative behind them.

The team also collaborated with scientists at the Pediatric Oncology Laboratory at the University of Illinois College of Medicine Peoria, where a team of researchers found that these molecules showed moderate activity in killing pediatric cancer cells (cytotoxic effect) in the laboratory setting. Refining and understanding the effect of this molecule on pediatric cancers will open new alternatives for children's cancers that are unresponsive to current therapies.

"We believe this new discovery offers industrial hemp growers a potential new revenue stream from a part of the plant that was previously overlooked," said Brownstein. "Unlike crops such as corn or soybeans, which have multiple uses, hemp has been limited in scope. But if we treat hemp as a multi-use crop, we can expand its applications and market—paper, grain, fiber, and now, potentially, pharmaceutical compounds from the roots. The discovery of these compounds adds value to this commodity."

The findings, published in a peer-reviewed journal, marks the first time these specific neolignans have been isolated from hemp and linked to possessing cytotoxic effects on pediatric cancer cell lines.

The team's next steps include scaling up compound extraction for larger, more controlled functional studies. They aim to explore a broad array of cancer cell lines to assess the therapeutic potential of these neolignans in greater depth.

"This is about opening new doors," Brownstein emphasized. "We're expanding the possibilities for using the whole industrial hemp plant. By adding value to the roots, we're giving farmers more stability and more reasons to invest in this emerging crop."



Hemp root. Image Provided by USDA PGRU Hemp Germplasm Lab - Tyler Gordon Dan Meyers and Zach Stansell

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Publisher Joe L. Neyer III

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Subscription Rate: Anywhere in the U.S. is \$18 for one year and \$36 for three years, payable in advance.

Website: californiagfarmequipment.com

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Postmaster: Please send "Address Service Requested" corrections to California Farm Equipment, Post Office Box 1128, Visalia, CA 93279

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AI tool to help farmers measure real-time crop health from the field

By Emily Dooley,

UC Davis College of Agricultural and Environmental Sciences

Leaf Spectrometry App Predicts Nutrition and Stressors

Leaf Monitor, a new mobile tool backed by artificial intelligence and predictive modeling, could revolutionize how farmers monitor crops and make decisions by providing real-time nutrition and leaf trait information in the field.

"Having this information is very valuable for the farmers," said Alireza Pourreza, associate professor of Cooperative Extension and director of the Digital Agriculture Laboratory in the Department of Biological and Agricultural Engineering at the University of California, Davis. "In five seconds, they can have a sense of how much nutrition they have in a leaf."

Development of the AI model was funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture's HiRes Vineyard Nutrition multistate project and its Animal and Plant Health Inspection Service, as well as the California Table Grape Commission.

Maha Afifi, director of viticulture research at the California Table Grape Commission, said the tool could be a game changer for the table grape industry if it leads to faster decision-making about fertilizer use. The right amount typically leads to healthier vines that produce more grapes with optimal size, weight and color.

"The evaluation of vine nutrient status is one of our top priorities," Afifi said. "At the same time, exploring new technology tools like this project is a high priority for us because they will be important to the future of the table grape industry."

Field testing

The Leaf Monitor tool uses a handheld spectrometer to measure leaf reflectance beyond the range of light visible to the human eye.

Once a leaf is scanned, its spectral data is uploaded to a cloud-based machine learning system designed to predict leaf traits and nutrient content. This algorithm was developed and trained by the Digital Agriculture Laboratory over five years using a dataset of thousands of leaf samples collected from California's specialty crops, primarily grapevines and almonds. The samples were chemically analyzed to determine nutrient levels and structural leaf traits, providing the data needed to build an accurate prediction model.

"Nutrient deficiencies in plants often go unnoticed until late in the season, by which point the damage is already irreversible," said graduate student Parastoo Farajpoor, who is running

the project. "This is why early detection is essential. Spectrometry provides a rapid and reliable way to identify these deficiencies before visible symptoms appear."

After a recent demonstration, Bullseye Farms irrigation manager Geoff Klein said the tool could help save money and improve yields. Bullseye grows walnuts, pistachios, tomatoes, corn, wheat, rice and sunflowers in Yolo and Solano counties.

Tailored crop management

Currently, farmers typically take leaf samples, dry them, grind them up and send the samples off to a lab for testing, which can take up to two weeks to return results. Bullseye samples leaf tissues about three times a year.

"Right now, it doesn't really make sense to go out and take tissues in every single corner just because it's expensive," Klein said. "It'd be really cool if I could just walk out there and test a couple of different places."

The Leaf Monitor tool helps farmers tailor management decisions to specific areas rather than an entire field. Calibrating fertilizer use to real-time data can prevent overuse and nitrogen runoff, a financial and environmental challenge that many growers face.

"I feel like there's a lot of times we do need to put less [fertilizer] on, where we end up putting more, because that's what the nitrogen removal formula says," Klein said. "But with this app we can use less because we know the actual conditions at the time. I think it opens a lot of doors in terms of getting data back in real time and also utilizing the level of control we have with the data."

The app can also aggregate the scans and map out spatial patterns over a large area.

"What we know is every field has variability that is not necessarily visible to the farmer's eye," Pourreza said.

The prototype Leaf Monitor tool is free and included in a set of tools that can be downloaded on the Digital Agriculture Laboratory website. A web-based version of the tool will follow while the team continues to feed new data into the algorithm to refine the predictions. On average, it achieves about 65% accuracy across all traits, with predictions for certain nutrients, such as nitrogen and phosphorus, performing better than the overall average. Users will need to pair it with a spectrometer.

"We need to produce more food while using less resources so we need to have some kind of monitoring system to give us precise and accurate feedback on our management practice," Pourreza said. "This technology is growing very fast."

Statewide Ban On Poultry and Dairy Cattle Exhibitions Lifted

The California Department of Food and Agriculture (CDFA) has officially lifted a statewide ban on poultry and dairy cattle exhibitions at fairs and shows, effective immediately.

The decision follows a period of close monitoring regarding the status of H5N1 Highly Pathogenic Avian Influenza (HPAI) in both poultry and dairy cattle throughout the state. After conducting ongoing surveillance, reviewing viral trend data, and consulting with state and federal epidemiologists, CDFA has determined that the risks associated with these exhibitions have sufficiently decreased.

The decision to resume exhibitions would not be possible without the agricultural industry's vigilance and commitment to biosecurity measures. The lifting of the ban is based on a comprehensive review of current H5N1 infection trends, a more robust understanding of transmission dynamics, and the implementation of enhanced mitigation measures. CDFA recognizes the importance of protecting animal health, public health, and California's agricultural industries while also supporting youth programs, educational opportunities, and agricultural traditions across the state.

Guidance for Exhibitors and Organizers

While exhibitions are now permitted to resume, the CDFA strongly urges all fairgrounds, exhibition organizers, and exhibitors to remain vigilant. Key safety recommendations include:

Continued Biosecurity: Implementation of enhanced biosecurity practices and disease-prevention measures is highly encouraged.

Health Checks: Animals showing any signs of illness must not be transported or exhibited.

Veterinary Consultation: Veterinarians should be contacted immediately if a disease is suspected.

Reporting: If H5N1 is suspected in poultry or cattle, parties should contact the CDFA Sick Bird Hotline at 866-922-2473.

For questions regarding this action, please contact the CDFA H5N1 Public Information Officer at cdfa.HPAIinfo@cdfa.ca.gov.



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American Pistachio Growers Welcomes USDA Plan to Purchase Up to \$80 Million in Specialty Crops to Support Food Banks and Nutrition Programs

Purchases will help local communities, stabilize pistachio prices, and ease surplus pressure



American Pistachio Growers is gratified by news that the U.S. Department of Agriculture (USDA) intends to purchase up to \$80 million in specialty crops to distribute through food banks and nutrition assistance programs across the country. These purchases, which include pistachios, will be made under USDA's authority through Section 32 of the Agriculture Act of 1935 and are intended to support agricultural producers while assisting communities in need.

The USDA's Agricultural Marketing Service (AMS) continuously purchases a variety of domestically produced and processed agricultural products, commonly referred to as USDA

Foods. These products are provided to the USDA's Food and Nutrition Service (FNS) for use in nutrition assistance programs, including food banks that operate The Emergency Food Assistance Program (TEFAP). Together, these programs form a vital component of the nation's food safety net.

"Included in this announcement is USDA's intention to purchase up to \$20 million of American-grown pistachios," said Zachary Fraser, APG President and CEO. "These purchases will deliver important benefits to our growers, consumers and local communities."

In addition to pistachios, the USDA has announced plans to purchase up to \$20 million each for almonds, grape juice and raisins.

"The federal Section 32 purchase of pistachios helps support growers by stabilizing prices, easing surplus pressure, and creating a reliable market for high-quality U.S. pistachios," said Cadee Condit, APG Vice President of Government Relations. "At the same time, it gets nutritious food into food banks and communities that need it most. For pistachio farmers, the program supports long-term sustainability and recognizes the important role growers play in feeding Americans."

Information regarding solicitations and the bidding process will be posted as it becomes available.

U.S. Pork Producers Pleased New Dietary Guidelines Put Pork Front and Center on Plate

The National Pork Producers Council applauds the U.S. Department of Health and Human Services and the U.S. Department of Agriculture's release of the 2025-2030 Dietary Guidelines for Americans, which encourage Americans to "consume a variety of protein foods from animal sources, including eggs, poultry, seafood, and red meat."

"America's pork producers appreciate the 2025 Dietary Guidelines putting pork front and center on the plate. They took note of producer concerns and rightly gave pork and other high-protein, nutrient-dense, and delicious meats their due when it comes to Americans' health and dietary habits," said Rob Brenneman, NPPC president-elect and pork producer from Washington, Iowa.

Quintessentially American foods like pork chops and Easter hams can remain a staple of American households, and

the guidelines go so far as to recommend parents introduce nutrient-dense foods including meat early and continue focusing on "nutrient-dense foods such as protein foods" throughout childhood.

NPPC has long advocated for sound science, including how the Dietary Guidelines are developed. The "upside down" pyramid released by the administration encourages consumers to feel good about eating and enjoying their protein as part of a healthy, balanced diet, and America's pork producers are proud to play a part in their wellbeing by providing readily available, affordable, enjoyable pork products.

NPPC will continue to review the new guidelines and work with the Trump administration to ensure future food policy decisions serve the health and nutrition interests of the American public and that pork continues to play a vital part.

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14 Vacancies on Cattle Health Task Force Advisory Boards Announced

CDFA's Animal Health Branch is announcing fourteen vacancies on the Cattle Health Task Force Advisory Board. The Board makes recommendations to the Secretary on matters pertaining to:

Adoption, modification, and repeal of regulations and procedures

Rate and collection of license fees and penalties

Posting and providing notice for changes in bylaws, general procedures, or orders

All matters pertaining to Food and Agricultural Code (FAC) Division 5, Part 2, Chapter 4, including, but not limited to, the control and management of cattle health diseases, evaluating effectiveness of cattle health programs, necessary fees to provide adequate services, and regulations required to accomplish the purposes of the chapter.

Current vacancies:

Minimum of Three (3) Industry members – The Advisory Board will consider a variety of state livestock industry representatives for this vacancy, including, but not limited to, the following: active cattle producers or are recognized representatives of a livestock trade association.

Minimum of Three (3) academic, university or extension members – The Board will consider academic, university or

extension members for this vacancy, who specialize in cattle health diseases.

Minimum of Three (3) licensed veterinarians – The Board will consider licensed veterinarians for this vacancy, who specifically practice veterinary medicine for beef and/or dairy cattle.

The remaining five (5) vacancies can be made up of industry members, university or extension members, and/or licensed veterinarians.

These vacancies were created because of term limits on the Board. The membership term for this vacancy will be 24 months. Board members receive no compensation but are entitled to reimbursement for transportation to and from meetings and for per diem expenses for lodging, meals, and incidental expenses.

Animal health plays a critical role in California's agricultural circular economy.

Applicants interested should submit resumes by January 20, 2026 to:

Dr. Nicki Humphrey Animal Health Branch 1220 N Street, Sacramento, California 95814 nicki.humphrey@cdfa.ca.gov

Additional information is available on the AHB web page at: <http://www.cdfa.ca.gov/ahfss/mpes/index.html>.

Case IH Awarded Three Agricultural Innovation Honors from ASABE



Magnum 355 Early Riser 2160

A red agricultural sprayer machine is operating in a harvested field at dusk, with digital light effects highlighting specific plants, symbolizing precision farming and advanced agricultural technology.

AE50 award winners represent the best innovations in engineering and technology across agriculture, food and biological systems

The American Society of Agricultural and Biological Engineers (ASABE) recognized Case IH for the company's outstanding contributions in the agricultural, food and biological industries with three awards. The awards – chosen by global engineering experts – highlight the continued focus of Case IH on innovative solutions to elevate farmer productivity around the world.

The following Case IH product innovations were recognized with AE50 awards:

- SenseApply™ Sense and Act Sprayer Automation
- Draft Tube Free Toolbar System for High-Tech Planting
- Seedbed Sense Speed Control Tillage Automation

"We're not just creating products for the sake of innovation; we're designing solutions built to solve our customers' toughest challenges," said Kurt Coffey, Vice President Case IH North America. "Being honored with AE50 awards is a testament to our mission of empowering customers with state-of-the-art tools that not only transform their operations but also deliver meaningful results in efficiency and productivity."

Sense and Act Automation

SenseApply technology is an economical and adaptable automated Live Variable Rate Application (VRA) solution, built to maximize the output of every input. SenseApply, available for factory-fit or as a kit, uses real-time sensing and advanced rate control to detect crop health and weeds, automatically adjusting application rates based on what the camera sees. The solution supports up to five Live VRA modes across liquid and granular applications and integrates seamlessly with existing precision farming tools. Its dual-mode Selective Spray capability pairs green-on-brown spot spraying with a Base plus Boost mode to apply product only where needed.

Customers running this advanced spray technology report

a one year pay back on the technology investment.

Early Riser® Planter Enhancements

The Draft Tube Free Toolbar System for the Case IH Early Riser 2160 24-row, 22-inch Large Front-Fold Trailing planter delivers an industry-first Large Front-Fold planter with no draft tubes or telescoping hitch. This reduces toolbar weight, shortens transport length, streamlines harness and hose routing, and increases ease of accessibility.

The design provides access for Pro-Box placement underneath bulk fill seed tanks to empty remaining seed, while also enabling seed tender, telehandler or forklift access for greater tendering flexibility in transport or planting position. The unique toolbar hitch weldments, wing weldments and wing fold cylinders are designed to handle 10 mph high-speed planting and 650 lb. automated hydraulic row unit downforce draft loads, reducing overall planter weight by 10 percent. This lighter footprint helps minimize soil compaction while increasing yield and profit potential.

Seedbed Innovation

Seedbed Sense Speed Control is a new advancement for the Case IH Tiger-Mate™ 255 field cultivator that monitors seedbed conditions in real time and adjusts tractor speed to maintain a consistent seedbed floor. Shank-mounted sensors measure levelness and use Class 3 ISO control to automatically manage seed, giving operators immediate feedback on uniformity and allowing them to set speed targets up to 10 mph based on field conditions. Operators can also customize shank sensitivity and feedback thresholds to match soil variability as part of the Soil Command tillage automation portfolio.

By turning passive tillage into an intelligent, responsive process, Seedbed Sense Speed Control helps deliver a more uniform seedbed for improved planting consistency and emergence.

Along with the all-in-one FieldOps™ platform, these award-winning solutions are among the latest innovations from Case IH, built to deliver enhanced productivity and connectivity for customer operations. Visit caseih.com or speak with your local dealer to learn more.



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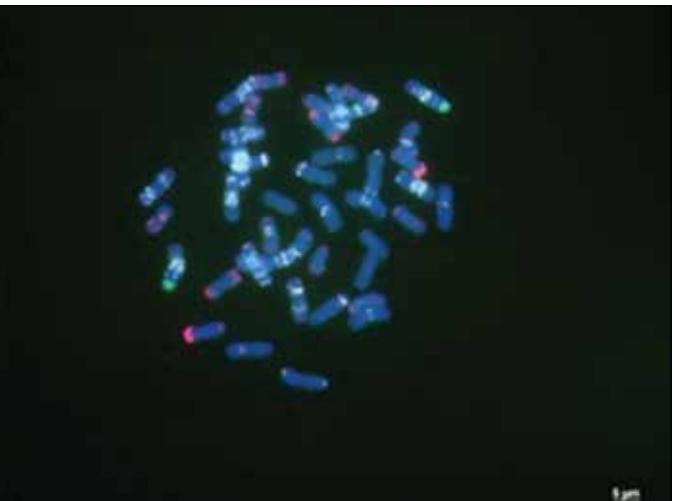
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A New Spring Wheat Germplasm Promises to Reduce Economic Losses Caused by Fusarium



Plant image of the spring wheat with FHB resistance gene Fhb7 (left) and its chromosome image (right). The terminal green segments on two chromosomes contain Fhb7. Photos provided by Xiwen Cai.

By: Maribel Alonso

Researchers at USDA's Agricultural Research Service (ARS) are helping American wheat farmers fight a devastating crop disease.

Researchers released a new spring wheat germplasm line with resistance to Fusarium head blight. This challenging fungal disease leads to significant annual economic losses in cereal crop production, estimated at \$2.7B over the period from 1998 to 2000, and poses health risks to consumers.

Fusarium head blight (FHB), or scab, is the number one fungal disease impacting small-grain cereal production in the U.S., particularly wheat and barley. The primary cause of the disease is the fungus *Fusarium graminearum* L., although it can also be triggered by multiple strains or species of *Fusarium*.

FHB pathogens produce a toxin that contaminates the grain and flour, leading to production losses as it poses health risks for humans and animals. Over the years, it has become clear to farmers, researchers, and breeders that the most effective way to control this disastrous disease is by enhancing cereal crops with genes that show resistance to FHB. However, the source of effective resistance to FHB is currently limited in wheat and barley. Therefore, there is an urgent need to find new resistance genes that could be used to fight the disease, especially in durum wheat and barley.

In a scientific breakthrough led by ARS Research Geneticist Xiwen Cai with the Wheat, Sorghum, and Forage Research Unit in Lincoln, NE, scientists at ARS and the North Dakota Agricultural Experiment Station leveraged insights from previously published studies to develop a new spring wheat germplasm line named 'WGC002.' This germplasm carries a novel gene [Fhb7The2] found in wild grass that provides significant resistance to Fusarium under diverse environments. The scientists used plant breeding techniques to select genes with the desired traits

from wild grass in their breeding lines, which have now been successfully integrated into different market classes of U.S. wheat.

"This is a significant discovery because there are very few resistance genes currently available. This marks the first effective FHB resistance gene identified in wild species that has been bred into spring, winter, and durum wheat," said Cai. "Moreover, this gene exhibits what we refer to as an additive effect, meaning it enhances and strengthens the resistance level of another gene."

WGC002 Spring Wheat Germplasm has already been utilized by many wheat breeding programs locally and around the world. ARS scientists in Lincoln, NE, have now been deploying this novel FHB resistance gene in elite varieties of winter, spring, and durum wheat.

Scientists anticipate a substantial reduction in U.S. economic losses from wheat crops affected by FHB within just a few years if farmers begin growing new varieties with this resistance gene.

WGC002 was developed with financial support from the Agriculture and Food Research Initiative, the USDA National Institute of Food and Agriculture, the US Wheat & Barley Scab Initiative, and USDA-ARS CRIS Project.

This research was part of a series of collaborative studies conducted by ARS scientists and partners to identify FHB resistant genes in wheat and wild relatives. Multiple genes have been found to be resistant to FHB, but only two of them [Fhb1 and Fhb7] have been used and characterized as effective sources of resistance in breeding for wheat variety development. Selecting multiple genes simultaneously to provide robust and durable resistance is a common and effective practice in this effort.

The Agricultural Research Service is the U.S. Department of Agriculture's chief scientific in-house research agency. Daily, ARS focuses on solutions to agricultural problems affecting America. Each dollar invested in U.S. agricultural research results in \$20 of economic impact.



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Free webinars to highlight wildfire recovery resources, latest research

Topics include water contamination, rebuilding, soil remediation, backyard animals



Intended for residents in urban and rural communities, the webinars offer information on identifying and repairing damaged structures, testing for environmental contamination, and navigating regulations and building codes. Photo by Katie Low

By Michael Hsu

In the aftermath of devastating wildfires, residents often feel overwhelmed about how to begin the recovery process.

Californians looking for guidance on identifying and repairing damaged structures, testing for environmental contamination, and navigating complex regulations and building codes are invited to attend a four-part webinar series in February. Webinars are free but pre-registration is required to receive the links.

Intended for all California homeowners, residents, resource professionals and other interested community members, these online sessions are offered by the University of California Agriculture and Natural Resources Fire Network and partner organizations. Attendees will learn how to better protect themselves, their households, their properties and communities in a post-fire environment.

"Wildfire recovery does not happen overnight, but there are many organizations and community members committed to helping residents achieve their goals of rebuilding, rehabilitation and revegetation," said Katie Low, UC ANR Fire Network statewide coordinator.

Researchers from the Fire Network and other UC ANR entities – such as UC Cooperative Extension and the California Institute for Water Resources – will share the latest research related to wildfire impacts on rural and urban communities.

Topics include:

- Water Resource Contamination: Monday, Feb. 2 (5:30–7 p.m. PST)
- Soil Contamination and Remediation: Tuesday, Feb. 10 (5:30–6:30 p.m. PST)
- Backyard Chicken and Livestock Safety: Tuesday, Feb. 17 (5:30–6:30 p.m. PST)
- Rebuilding and Structure Loss: Monday, Feb. 23 (5:30–7 p.m. PST)

Attendees can choose to attend any or all of the sessions. Registration information can be found at <https://surveys.ucanr.edu/survey.cfm?surveynumber=47549>.

Targeted grazing short course slated for February to April

In addition, UC Cooperative Extension, UC ANR Fire Network and UC Davis School of Veterinary Medicine are partnering to offer a series of webinars (every Tuesday from Feb. 17 to April 21) on how targeted grazing can address fuel and vegetation management.

Intended for practitioners, resource managers, landowners and students, participants will learn about the fundamentals of small-ruminant targeted grazing, how to care for animals on targeted grazing jobs, critical business skills and how to integrate the latest technologies. Those who attend at least eight webinars and the field day (at UC Davis on April 25) will receive a certificate of completion. The course is \$60 per person.

Space is limited and spots are filling quickly; register by Feb. 13 at <https://surveys.ucanr.edu/survey.cfm?surveynumber=47484>.



To recover from damage due to wildfires such as the Palisades Fire (as seen here), resources are available to communities that can help residents rebuild and revegetate. Photo by Yana Valachovic



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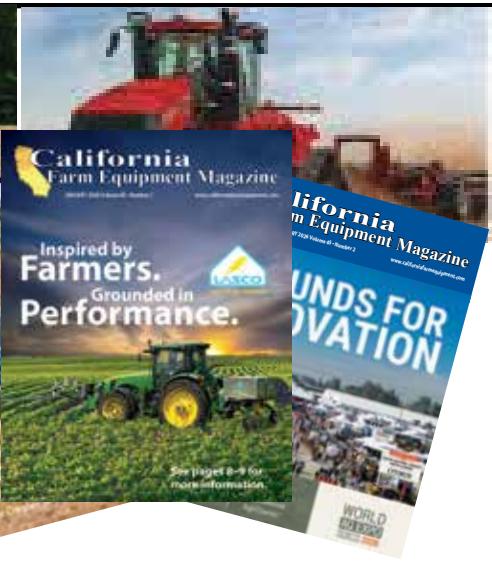
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MARCH 2026

5: Farm Day in the City 2026 Kern County Fairgrounds, Bakersfield, CA. A long-running educational agriculture event serving thousands of students and showcasing local ag organizations.

APRIL 2026

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21: California Agriculture Day, West Steps of the State Capitol. Hosted in partnership with California Department of Food and Agriculture and California Women for Agriculture. Ag Day is an annual celebration recognizing California's agricultural community by showcasing the bounty of crops and commodities produced in our state. It is also a day for farmers and ranchers to show their appreciation by bringing together state legislators, government leaders and the public for agricultural education.

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Breakthroughs for Preventing Pistachio Hull Split

UC Davis Scientists Offer Insights Into Breakage, with Potential Benefits for Fruit Crops

by Trina Kleist

When pistachio hulls split before the nuts are harvested, insects and fungi can get inside, damaging the nut, costing farmers money and contaminating the nuts. About 4% of the overall crop experiences hull split, but some cultivars can split as much as 40% under certain conditions.

Now, for the first time, scientists at the University of California, Davis, are seeking solutions for California's \$2-billion-a-year pistachio industry. New research reveals how the hull is built and how cell walls in certain layers break down, along with the genes and corresponding mechanisms that spark and control those changes.

Pectin, a component of cell walls, makes fruit skin strong in part by keeping cells hitched to each other. In pistachio hulls, the composition of pectin changes as the hull ripens, causing the cells to come unhitched. This leads to cracks and tears in the hull.

In the *Journal of Experimental Botany*, recent Ph.D. graduate Shuxiao "Susan" Zhang, a student in the lab of Department of Plant Sciences Professor Georgia Drakakaki, identified genes that control how cell walls change as the fruit ripens, leading to the hull breaking down. The research will help breeders select for traits that will make the hulls less vulnerable to tearing and cracking.

"This is the first time anyone has studied the pistachio hull at the anatomical and cellular level while also looking at gene expression and physiological data," Drakakaki said. "Susan really got into the details of how the hull is built with different layers and how the cells in those layers are of different sizes. The layers respond differently to changes in pectin, and that causes the hull to split in different ways."

Zhang built on the work of two more scientists in the department and their teams. Grey Monroe, an assistant professor, and Barbara Blanco-Ulate, an associate professor, assembled a reference genome of *Pistacia vera* 'Kerman,' the leading female pistachio cultivar in California. They also defined the stages of the nut's growth and the characteristics at each stage. Their work was published last year.

A model for fruit split in a variety of crops

Over three years, the team took samples of pistachio hulls from trees in a

commercial orchard near Fresno and at the Wolfskill Experimental Orchard, operated by UC Davis near Winters, Calif. They worked with the most common varieties grown in the state, including Kerman, Golden Hills and Lost Hills. They took samples from trees at different points late in the hulls' development, stretching over several months.

Using special imaging tools and techniques, Zhang and her team measured hull thickness and cell size, and they counted hulls that were intact, tattered, cracked or both. They also measured how well cells in the hull were sticking to each other, and in each sample counted the cells that had come unhitched.

Then, the team pulled out RNA from the samples to learn which genes were being expressed at different stages as the hull develops and breaks down. They found that key genes express differently as that process unfolds.

Since all hulls were intact at 91 days after flowering, Zhang and team reasoned that fruit ripening may be linked with hull split. So, the team also examined the genes — including those involved in pectin modification — that change the cell wall as the fruit ripens. Researchers discovered that cells in the interior layer of the hull expand, while cells in the exterior layer tend to stay the same size. This, in combination with changes in the cell wall, led to different types of hull breakdown.

"This is one of the major novelty factors for our paper," Zhang said. "Loads of people have looked at pectin in all kinds of fruits, but not many people have observed that, depending on which cell layer you're in, the pectin, cell size and so on will change differently during ripening."

The physics of forces operating within the cell layers and humidity also influence degradation of the hull, Zhang found.

Because pistachio hulls are the fruit of the tree, even though we eat the seed, the research has applications for many non-berry fruit crops, Zhang concluded.

The California Pistachio Board funded most of this research, with additional support from the United States Department of Agriculture's National Institute of Food and Agriculture, the James Monroe McDonald Endowment and the University of California Agriculture and Natural Resources.

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Easy Bites for the

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FAMILY FEATURES

Whether you're tailgating with friends or hosting a watch party at home, every football fan needs a game plan to crutch, dip and cheer their way through opening kickoff, halftime and right down to the final play of the game.

Some of the best game day grub is hearty and savory but adding layers of flavor and texture can take recipes to the next level.

For example, these Burger Bowls feature all the classic ingredients of a great burger, just without the bun. A tasty option for gluten-free guests or those who are cutting carbs, the bowls are made with Dandy Iceberg Lettuce from Duda Farm Fresh Foods, which boasts a legacy of quality, innovation and consistency in fresh produce cultivation since 1926.

Pulled pork, another tailgating treasure, gets an instant upgrade with the crunch of a fresh coleslaw topper and zesty pickled celery and jalapenos on the side. The winning play is to use crisp, fresh celery for the best flavors and a satisfying crunch with every bite. Since celery is 95% water and high in fiber, it leaves fans feeling comfortably full and ready to root for their favorite team.

This season, keep your snacks fresh and healthy while winning prizes like product coupons and gift cards to stock up for the next game through the Dip It to Win It Sweepstakes. Visit dudafresh.com to learn more and find additional game day recipes.

Burger Bowls

Recipe courtesy of Casa de Crews

Prep time: 10 minutes

Cook time: 10 minutes

Servings: 4

Burger Bowls:

2 cups French fries, homemade or frozen
2 tablespoons olive oil
1 pound ground beef or ground turkey
1 teaspoon Worcestershire sauce
1 teaspoon garlic powder
½ teaspoon smoked paprika
½ teaspoon salt
½ teaspoon black pepper
Dandy Iceberg Lettuce, shredded
2-3 Roma tomatoes, diced, pickle chips or spears, chopped, cheddar cheese shredded

Burger Sauce:

½ cup mayonnaise
2 tablespoons ketchup
1 tablespoons Dijon mustard or yellow mustard
1 tablespoon pickle juice
1 teaspoon Worcestershire sauce
1 teaspoon onion powder
1 teaspoon garlic powder
½ teaspoon smoked paprika

To make burger bowls: Cook French fries according to package directions.

In medium skillet over medium-high heat, heat olive oil. Add onion and saute until translucent, 5-7 minutes. Add ground beef to skillet, breaking up meat with spatula. Add Worcestershire sauce, garlic powder, paprika, salt and pepper; brown until cooked through. Drain and discard excess liquid and grease.

To make burger sauce: In jar, mix mayonnaise, ketchup,



Pulled Pork Sandwiches with Pickled Celery and Jalapenos

Recipe courtesy of The Adventure Bite

Prep time: 10 minutes

Cook time: 10 hours

Servings: 9-10

4½ pounds pork shoulder or Boston butt
26 ounces sweet and spicy barbecue sauce
½ tablespoon garlic
½ tablespoon fresh cracked black pepper
fresh sandwich buns
Dandy Celery, cut and pickled jalapenos
coleslaw (optional)
potato salad (optional)
baked beans (optional)

Place pork in slow cooker.

Mix barbecue sauce, garlic and pepper. Pour over pork shoulder.

Cook on low 8½ -10 hours or high 6-7 hours.

Shred meat and serve on buns with pickled celery and jalapenos. Top with coleslaw, if desired. Serve with potato salad or baked beans, if desired.

mustard, pickle juice, Worcestershire sauce, onion powder, garlic powder and paprika well to combine.

Assemble bowls with layer of shredded lettuce, 3-4 ounces ground beef, diced tomatoes, pickles, cheddar cheese and 1/2 cup fries.

Drizzle with burger sauce and mix well.

Tip: Burger sauce can be made in advance and stored in refrigerator in jar with airtight lid.



SOURCE: Duda Farm Fresh Foods

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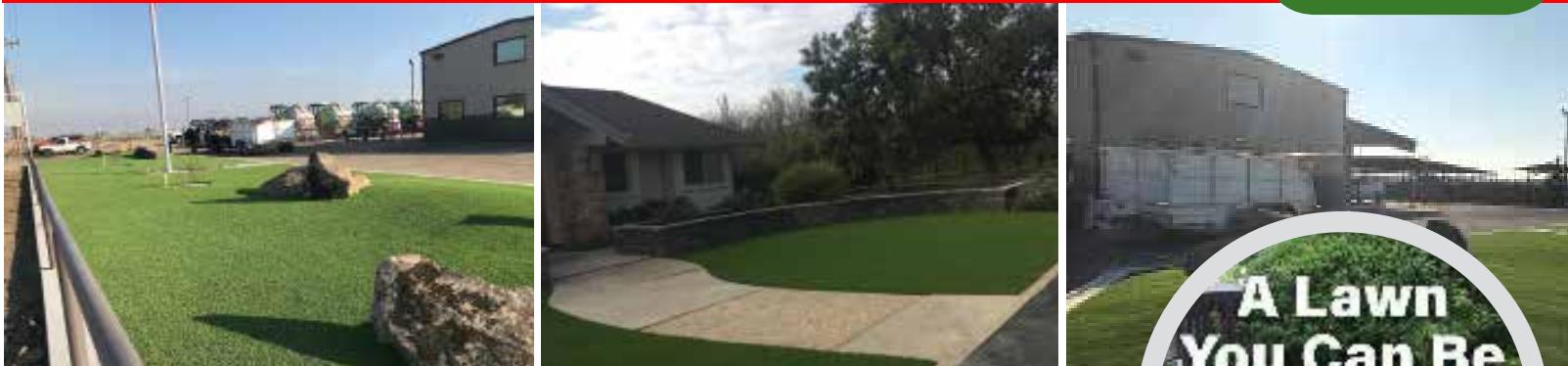
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