Nueces Agriculture

"IMPROVING FOOD & FIBER PRODUCTION"

VOLUME 16, ISSUE 2 *JUNE 2023*

"Summer Edition"

Inside this issue:

Agriculture Statistics:

March 23, 2023, Barbecue Lab

According to the most recent data analysis from United States Department of Agriculture (USDA), roughly 40.5% of U.S. land is involved in agriculture – around 915 million acres. The total farmland is valued at $2 trillion dollars. There are over 2 million farms in the U.S., and the average farm size is 443 acres. 98% of U.S. farms are family owned and operated. Texas contains 14% of the United States' farming land, and there are 39 states that have at least 11,000 farms.

- The United States produces 40% of the world's crops using 20% of the land. America's farmers produce crops like wheat, corn, soybeans, cotton, fruits, and vegetables, as well as beef, pork, poultry, eggs, and dairy. 50.2 million acres of cropland is used for wheat.
- America grows, on average, 15 billion bushels of corn per year, making it 1/3 of all the corn produced in the world. In 2019, 28 million bushels of corn were produced. Most of the corn produced is not used for direct human consumption, but for animal feed and other products. 75% of the revenue within the agriculture industry is from meat sales and animal feed.
- America produces 41% of the world's soybeans with the 89.2 million acres that are planted each year. Soybeans and corn are made into several different types of products besides food. In fact, over 80,000 newspapers in the United Sates use soy ink to print.
- Texas produces 33% of the cotton in the United States and produced 6.42 million bales in 2019. The average 1 million bales of cotton are produced per year and make 5 billion pairs of jeans.
- There are 619,172 beef farming operations in America, and these farms account for 19% of the world's beef. 97% of beef farms are family owned and operated and are located throughout all 50 states.

Upcoming Training:

PRIVATE APPLICATOR TRAINING

When …. June 6, 2023 **Pre-Registration Required …. (361) 767-5223**

Time …. 8:30 AM **Where. ……. A&M AgriLife Ext. Office, 710 East Main, Robstown, TX**

Fee: $50.00 (Includes study manuals)

A Private Applicator is defined by law as a person who uses or supervises the use of a restricted-use or state-limited use pesticide for the purpose of producing an agricultural commodity.

FARM WORKER PROTECTION SAFETY TRAINING

When …. September 1, 2023 **Time …. 9:00 AM**

Where. ……. A&M AgriLife Ext. Office, 710 East Main, Robstown, TX

Pesticide handlers and workers must be trained every year unless they are certified applicators. All participants in this training will be issued cards verifying they have successfully completed the required training and given a copy of the sign-in roster for their employer's files.

TEXAS A&M AGRILIFE EXTENSION

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These Four Challenges Will Shape the Next Farm Bill—and How the US Eats.

By Kathleen Marrigan , Arizona State University May 8, 2023

For the 20th time since 1933, Congress is writing a multiyear farm bill that will shape what kind of food U.S. farmers grow, how they raise it and how it gets to consumers. These measures are large, complex and expensive: The next farm bill is projected to cost taxpayers US$1.5 trillion over 10 years.

Modern farm bills address many things besides food, from rural broadband access to biofuels and even help for small towns to buy police cars. These measures bring out a dizzying range of interest groups with diverse agendas.

Umbrella organizations like the American Farm Bureau Federation and the National Farmers Union typically focus on farm subsidies and crop insurance. The National Sustainable Agriculture Coalition advocates for small farmers and ranchers. Industry-specific groups, such as cattlemen, fruit and vegetable growers and organic producers, all have their own interests.

Environmental and conservation groups seek to influence policies that affect land use and sustainable farming practices. Hunger and nutrition groups target the bill's sections on food aid. Rural counties, hunters and anglers, bankers and dozens of other organizations have their own wish lists.

As a former Senate aide and senior official at the U.S. Department of Agriculture, I've seen this intricate process from all sides. In my view, with the challenges in this round so complex and with critical 2024 elections looming, it could take Congress until 2025 to craft and enact a bill. Here are four key issues shaping the next farm bill, and through it, the future of the U.S. food system.

The Price Tag:

Farm bills always are controversial because of their high cost, but this year the timing is especially tricky. In the past two years, Congress has enacted major bills to provide economic relief from the COVID-19 pandemic, counter inflation, invest in infrastructure and boost domestic manufacturing.

These measures follow unprecedented spending for farm support during the Trump administration. Now legislators are jockeying over raising the debt ceiling, which limits how much the federal government can borrow to pay its bills.

Agriculture Committee leaders and farm groups argue that more money is necessary to strengthen the food and farm sector. If they have their way, the price tag for the next farm bill would increase significantly from current projections.

On the other side, reformers argue for capping payments to farmers, which The Washington Post recently described as an "expensive agricultural safety net," and restricting payment eligibility. In their view, too much money goes to very large farms that produce commodity crops like wheat, corn, soybeans and rice, while small and medium-size producers receive far less support.

Food Aid is the Key Fight:

Many people are surprised to learn that nutrition assistance – mainly through the Supplemental Nutrition Assistance Program, formerly known as food stamps – is where most farm bill money is spent. Back in the 1970s, Congress began including nutrition assistance in the farm bill to secure votes from an increasingly urban nation.

Today, over 42 million Americans depend on SNAP, including nearly 1 in every 4 children. Along with a few smaller programs, SNAP will likely consume 80% of the money in the new farm bill, up from 76% in 2018.

Why have SNAP costs grown? During the pandemic, SNAP benefits were increased on an emergency basis, but that temporary arrangement expired in March 2023. Also, in response to a directive included in the 2018 farm bill, the Department of Agriculture recalculated what it takes to afford a healthy diet, known as the Thrifty Food Plan, and determined that it required an additional $12-$16 per month per recipient, or 40 cents per meal.

Because it's such a large target, SNAP is where much of the budget battle will play out. Most Republicans typically seek to rein in SNAP; most Democrats usually support expanding it.

Anti-hunger advocates are lobbying to make the increased pandemic benefits permanent and defend the revised Thrifty Food Plan. In contrast, Republicans are calling for SNAP reductions, and are particularly focused on expanding work requirements for recipients.

Debating Climate Situations:

The 2022 Inflation Reduction Act provided $19.5 billion to the Department of Agriculture for programs that address climate change. Environmentalists and farmers alike applauded this investment, which is intended to help the agriculture sector embrace climate-smart farming practices and move toward markets that reward carbon sequestration and other ecosystem services.

This big pot of money has become a prime target for members of Congress who are looking for more farm bill funding. On the other side, conservation advocates, sustainable farmers and progressive businesses oppose diverting climate funds for other purposes.

There also is growing demand for Congress to require USDA to develop better standards for measuring, reporting and verifying actions designed to protect or increase soil carbon. Interest is rising in "carbon farming" – paying farmers for practices such as no-till agriculture and planting cover crops, which some studies indicate can increase carbon storage in soil.

But without more research and standards, observers worry that investments in climate-smart agriculture will support greenwashing – misleading claims about environmental benefits – rather than a fundamentally different system of production. Mixed research results have raised questions as to whether establishing carbon markets based on such practices is premature.

A Complex Bill and Inexperienced Legislators:

Understanding farm bills requires highly specialized knowledge about issues ranging from crop insurance to nutrition to forestry. Nearly one-third of current members of Congress were first elected after the 2018 farm bill was enacted, so this is their first farm bill cycle.

I expect that, as often occurs in Congress, new members will follow more senior legislators' cues and go along with traditional decision making. This will make it easier for entrenched interests, like the American Farm Bureau Federation and major commodity groups, to maintain support for Title I programs, which provide revenue support for major commodity crops like corn, wheat and soybeans. These programs are complex, cost billions of dollars and go mainly to large-scale operations.

Agriculture Secretary Tom Vilsack's current stump speech spotlights the fact that 89% of U.S. farmers failed to make a livable profit in 2022, even though total farm income set a record at $162 billion. Vilsack asserts that less-profitable operations should be the focus of this farm bill – but when pressed, he appears unwilling to concede that support for large-scale operations should be changed in any way.

When I served as deputy secretary of agriculture from 2009 to 2011, I oversaw the department's budget process and learned that investing in one thing often requires defunding another. My dream farm bill would invest in three priorities: organic agriculture as a climate solution; infrastructure to support vibrant local and regional markets and shift away from an agricultural economy dependent on exporting low-value crops; and agricultural science and technology research aimed at reducing labor and chemical inputs and providing new solutions for sustainable livestock production.

In my view, it is time for tough policy choices, and it won't be possible to fund everything. Congress' response will show whether it supports business as usual in agriculture, or a more diverse and sustainable U.S. farm system.

Ag 101: Getting a Pesticide Applicator Certification

By Michelle Miller, Farm Babe January 24, 2023

Pesticides is a term for a broad range of products that control pests and diseases, which include those under more specific categories such as herbicides (to kill weeds), insecticides (to kill insects), fungicides (to kill fungi), and so on. Responsible pesticide usage in both convention and organic production helps to protect our food supply while ensuring the safety of farmers, workers, land, and our community.

Without pesticides we would lose more crops overall and have more damaged crops, which would contribute to less food, higher costs of production, and lower efficiency.

The U.S. Environmental Protection Agency (EPA) helps protect workers through rigorous scientific testing of pesticides for human health and environmental safety. They also set labels with directions for proper use, storage, and disposal of pesticides, which further protect workers, the public, and the environment. Other risk mitigation measurements may include reduced application rates, extending the time before people can access the area where a pesticide has been applied (restricted entry interval), closed systems for mixing and loading pesticides to reduce exposure, and personal protective equipment (PPE), such as gloves, safety glasses, and respirators, based on what is needed.

With all of these factors to consider, how does one ever keep track of all of this, let alone make sure they're applied correctly? Another keystone of effective and safe pesticide use in agriculture is having trained and qualified people applying the products. Pesticide applicator certification programs meet this need.

Who must get a pesticide applicator license?
People who use or supervise the application of restricted use pesticides (RUPs) are required by federal law to be certified in accordance with EPA, state, territorial, and tribal regulations.
The EPA classifies pesticides into two main groups: restricted use pesticides (RUPs) and general use (unclassified) pesticides. The difference between the two is that RUPs cannot be bought or used by the general public, because without added restrictions and training they pose a significant risk to human health and/or the environment. It's similar to prescription medications, which require medical supervision versus over the counter medications that anyone can access. Directions for use, dosages, who can use them, and for what purpose may require more knowledge and restrictions, so that the maximum benefits can be reached.
It's important to note that, just like with medications, even if something is classified as general use, it can be misused and caused harm.

Why is pesticide applicator certification important?
These certification programs make sure that people are trained and knowledgeable in the application of pesticides, so that we can minimize risks to human health and the environment.
Farmers live on or near the land they farm, so they're directly affected by the safety of the products that they use. Any added product, like a pesticide, is also an added expense. So it's important to avoid using too much or even too little of the product. Over application wastes money and can increase risks as described above. However, too little can contribute to pesticide resistance, which decreases the effectiveness of the pesticide on the pests.

We want to make sure any pest control products that we're using remain effective. That's why proper, up-to-date knowledge and training of pesticide applicators is so important.

Pesticide Applicator Certification types

The EPA divides pesticide applicators into two main groups: private applicators and commercial applicators. If you're using pesticides for an agricultural commodity on land owned or rented by you or your employer, you're considered a private applicator. Otherwise you are a commercial applicator.

The EPA sets standards for the certification of private applicators. They are certified on the state, territory, or tribe level after passing a written or oral test, attending a training class, and/or via another system approved by EPA. It varies by location, exactly how this is accomplished, so it's important that people check with their appropriate government organization.

Regardless of the certification process the EPA requires all certified private applicators to have a practical understanding of pests and agricultural control practices of them, how to store, use, handle, and dispose of pesticides and their containers properly, as well as their associated legal responsibilities. They must also be able to understand pesticide labels, and apply the pesticides in accordance with the warnings and instructions on the labels. Further they must be able to identify common pests and their signs of damage, environmental conditions to avoid contamination, as well as what to do in case of a pesticide accident.

Federal regulations for commercial applicators require the demonstration of practical knowledge of core pesticide use and safety as well as more in depth knowledge within a particular category. There are 10 federal certification categories. The categories are: agricultural pest control; forest pest control; ornamental and turf pest control; seed treatment; aquatic pest control; right-of-way pest control; industrial, institutional, structural and health-related pest control; public health pest control; regulatory pest control; and demonstration and research pest control.

However, states, territories, and tribes can add or delete categories from this list as needed. For example, Indiana has 15 categories, while New York has 28 for commercial applicators.

Commercial applicators are also certified on the state, territory, or tribal level via passing a written or performance-based test, and/or another EPA-approved system. All applicators are required to be recertified to maintain their certification. Usually this is done via continuing education courses every three to five years. Your state university extension service and environment/agriculture government websites are great places to start if this is something you're interested in. Some examples include: Penn State Extension, Purdue Extension, University of Minnesota Extension, Iowa Department of Agriculture and Land Stewardship.

Having trained pesticide applicators helps to protect our food supply, while making sure our communities and environment are safe. It has long been important that the EPA provides rigorous standards for the state, territorial, and tribal certification programs, which tailor to the needs of the particular application.

Six innovations that can help feed the world.

By Mark Tutton, CNN May 9, 2023

When it comes to feeding the planet, we face some monumental challenges.

The global population has increased from 7 billion to 8 billion in the past 12 years, and the UN projects it will reach around 10.4 billion people in the 2080s. That's a lot of extra mouths to feed.

At the same time, the climate crisis means food will become more scarce and more expensive, according to United Nation's climate change panel, while some crops will lose their nutritional value.

Rising to the challenge may take a new agricultural revolution. CNN asked three experts to outline the innovations that can help increase food production without harming the planet.

Plant-based coatings

An astounding 40% of the food grown globally is never eaten, according to WWF. Some is lost during and after harvest, some is lost in the supply chain, and some is wasted when it goes bad on shop shelves or in our homes.

One way to extend the shelf-life of produce is to cover it in an edible plant-based coating, says Richard Munson, author of "Tech to Table: 25 Innovators Reimagining Food."

Munson gives the example of US company Apeel, which he says has created "tasteless, odorless, invisible, and edible coatings – consisting of fatty acids and other organic compounds extracted from the peels and pulp of produce – that act as a physical barrier to keep water in and oxygen out."

He says Apeel's coatings can double the shelf-life of avocados, oranges, and other produce.

Researchers in India have also developed edible coatings they say can keep food fresh for longer.

Climate-resilient crops

For many parts of the world, climate change means water is becoming increasingly scarce, and that presents a huge problem for farmers in regions such as the Middle East, which is reliant on desalinated sea water in many places. Globally, more than 1 billion hectares (2.5 billion acres) of land – an area larger than China – – are already degraded by salinity, according to Dr. Tarifa Alzaabi, director general of the International Center for Biosaline Agriculture (ICBA), a not-for-profit research organization based in Dubai.

One solution is to grow crops that thrive in salty soil. She says ICBA has identified a number of salt-tolerant varieties of date palm, and is successfully cultivating Salicornia, an edible plant found in many parts of the world. Alzaabi describes it as a "desert superhero" for its ability to grow in the brine that's created as a byproduct of the water desalination process.

She adds that ICBA has also tested technologies such as hydrogels (gels that retain water) and sub-surface irrigation systems, and found they can significantly cut farmers' water use.

Precision farming

Around the world, food is grown on land of all sizes and all types, but that diversity means farmers often fail to take into account landscape complexity and soil variability, according to Chandra A. Madramootoo, a professor of Bioresource Engineering at McGill University, in Montreal, Canada.

He says that one solution is precision farming, an approach that "enables the selection of crops, and chemical and water applications within spatially similar land and soil zones."

This can be done through digital mapping, using technologies such as drones and sensors to distinguish the type and characteristics of soil. Geospatial modeling (using statistical models of soil characteristics and topography) can be used to group together areas of landscape that have similar properties.

Together, this can help "sequester more carbon in agricultural ecosystems, conserve water and reduce chemical contamination in complex farming landscapes," says Madramootoo.

Alzaabi says ICBA has been using drones to collect data on its date palm plantation, and has adopted precision agriculture techniques including sensors and smart lysimeters (devices that measure moisture loss) to optimize fertilizer application and the use of irrigation water.

Insect protein

A traditional source of protein in parts of Africa, Asia and South America, growing insects for food is becoming more mainstream elsewhere. In 2020, Nestlé launched Purina Beyond Nature's Protein pet food, which includes insect protein, millet and fava beans. In Singapore, Insectta grows black soldier fly maggots for use in animal feed. The maggots are fed food waste, such as the byproducts of soybean factories and breweries.

"Poultry and fish farms have long relied on chemicals … and irrigation to grow corn and soybeans," says Munson. "Insects such as mealworm beetles offer alternatives. They take up little space, live happily when jammed together, survive without light, breed throughout the year, emit few pollutants or greenhouse gases, and require little feed."

Taking a "wholes capes" approach

"Food production is being undertaken at the expense of biodiversity losses," says Madramootoo. One reason, he says, is a failure to take into account the "multiplicity of adjoining ecosystems."

He calls for a "wholescapes approach," producing food sustainably across all ecosystems – coastal, marine and terrestrial, including forests, agricultural land and urban areas.

"The benefits include production of protein from marine resources, integration of wetlands with aquaculture systems and fish farming, and the use of forestry systems to also produce food," says Madramootoo, adding that agroforestry and silviculture (the management of forests) can benefit peoples' livelihoods, increase food production, aid conservation and increase carbon stocks.

Urban farming

Madramootoo says that a wholescapes approach can also be applied to food production in urban and peri-urban areas – the spaces immediately surrounding a city.

"Trees in peri-urban and urban areas can provide food, provide shade, have a cooling effect and sequester carbon," he says. "Rooftops … can be used to grow food. We can make use of gray water and waste energy from homes to grow food in small plots, shade houses or covered tunnels where frost is likely to occur.

"In congested peri-urban areas, we can use vertical farms in warehouses or abandoned buildings, for example, to produce food. This cuts down the need for water and high-cost chemical inputs and reduces the waste stream."

Vertical farms of this kind have become more widespread in recent years. Using LEDs to grow crops indoors, without soil, these farms are heavily automated, with nutrient-rich water delivered straight to a plant's roots.

"They use no pesticides and cut water use by 95%," says Munson of vertical farms. "They produce 100 times the output of an equivalent-sized plot of horizontal land.

"With a growing season that never ends, they allow the quick delivery of fresh and organic greens to local restaurants and supermarkets throughout the year; and they offer good-paying jobs in formerly abandoned spaces within neglected neighborhoods."

Electric Farming: The Advantages and Potential of Agricultural Electric Vehicles

einpresswire.com May 8, 2023

Agricultural Electric Vehicles Market

OREGAON, PORTLAND, UNITED STATES—According to a new report published by Allied Market Research, titled, "Agricultural Electric Vehicles Market by Drive (2WD, 4WD), by Battery Type (Lithium Ion, Lead-Acid, Others) and by Propulsion Type (Battery Electric, Hybrid Electric): Global Opportunity Analysis and Industry Forecast, 2023-2032" Agricultural electric vehicles are vehicles that use an electric motor to obtain drive as opposed to the conventional internal combustion engine. Agricultural electric vehicles are more productive as compared to their IC engine. Electric farm vehicle uses a series of batteries to generate power and have fewer mechanical parts.

Furthermore, the trend of consolidation of small farms and their acquisition by commercial farm owners is boosting the need for agricultural vehicles and is further expected to boost the sale of agricultural electric vehicles. The electric motors have double the torque and as a result are capable of pulling heavier loads. The 60-HP tractor can conduct the work of the 120 Hp diesel tractor. Electric tractors are cost-effective and thus lower the operational cost of agriculture, maximizing the yield. Rise in awareness about clean, sustainable farming, and advancement in electric vehicle technologies is anticipated to boost the development of high power agricultural vehicles during the forecast period.

However, lithium-ion batteries have several limitations that affect battery performance. The limitations of lithium-ion batteries include issues related to robustness (because they need to prevent overcharging and over discharging), limited power density, and short life (Usually 500-1,000 charge and discharge cycles are required to reduce capacity), and performance will fluctuate with changes in temperature, rigidity and high cost. Compared with graphite-based lithium-ion batteries, solid-state batteries made with stable lithium metal solid electrolytes can provide up to 10 times the charge capacity. In addition, solid-state batteries provide higher energy density, such as double the energy of the same volume, and a lifetime of up to 10 years.

In addition, hybrid EV has improved the efficiency of agricultural vehicles in terms of fuel as well as government is also supporting the growth of market by providing subsidy and tax benefit on the purchase of agricultural electric vehicles. Companies are spending more on research and development of electric vehicle. For instance, In Nov 2019, CNH Industrial N.V STEYR showcased future farming technology with its STEYR Konzept a hybrid powered concept tractor. Also in March 2020 John deere showcased“Joker” the fully autonomous electric tractor with articulated steering and a tracked single axle. Thus driving the agricultural electric vehicles market.

Some of the key players in the workwear industry include - John Deere, CNH Industrial, AGCO, CLAAS, Mahindra & Mahindra, Mitsubishi Fuso, Motivo Engineering, Cummins, Dongfeng, Kubota

Key benefits

This study presents the analytical depiction of the agricultural electric vehicles along with the current trends and future estimations to determine the imminent investment pockets.

The report presents information related to key drivers, restraints, and opportunities along with challenges of the agricultural electric vehicles.

The current market is quantitatively analyzed to highlight the agricultural electric vehicle growth scenario.

The report provides a detailed agricultural electric vehicles analysis based on competitive intensity and how the competition will take shape in coming years.

Electric Tractors are Rolling Out in the Field. Here's What That Could Mean for Farmers.

By Naoki Nitta April 10, 2023

E-tractors could radically change the agricultural landscape by scaling sustainability and increasing efficiency.

A quiet revolution is rolling across American farms—and it's so hushed that you may have to strain your ears to hear it.

Although diesel tractors are practically synonymous with farming, green technology is reshaping the relationship between farmers and these workhorses—and perhaps the nature of agriculture altogether.

An emerging fleet of whisper-silent and emissions-free tractors promises to unhitch growers from the burdens of conventional farming, far beyond its reliance on fossil fuels. By harnessing electric vehicle (EV) and robotics technology, driver-optional e-tractors help scale efficiency in all aspects of field work—from seeding and weeding to harvest and equipment repair—and may clear the path to better labor, field and sustainability practices.

"People don't build that much in factories anymore. Machines do, and people are there to supervise them," says Mark Schwager, co-founder and president of San Francisco Bay Area-base Monarch Tractor, which recently debuted the first-ever, autonomous e-tractor. "That's how farming should be."

Electric tractors have their roots in Northern California, an agriculture- and tech-heavy region. Sonoma County-based Solectrac launched the first model in 2017 and, despite a slow start—the company sold about two dozen vehicles in its first four years—sales finally gained traction last year, helped by state grants and increased manufacturing capacity.

The development of e-tractors trails the EV industry, says Schwager, which commoditized the production of lithium-ion batteries, motors and power components. Monarch was founded in 2018, miles from Tesla's Fremont factory, allowing it to tap into the established manufacturing base.

Zero emissions is a key selling point of any plug-in vehicle. But with a diesel tractor spewing carbon and particulate volumes equal to that of 14 cars, replacing one with an electric version can have remarkably scaled impact, says Schwager, with no change in productivity.

The auto-sized battery can last up to 14 hours on a single 5.5-hour charge (Schwager notes that barns are generally equipped with 220-volt plugs), and it has a lifespan of 15 to 25 years depending on frequency of use. An optional cart for toting a spare battery allows for quick, in-field swaps during power-intensive operations.

Eliminating emissions is only part of the package. Equipped with sensory cameras and a fully digital interface, Monarch's debut model, the compact Mark-V, incorporates autonomous EV technology: The driver-optional tractor can be programmed for automated runs, guided remotely through fields and orchards to spray, disk or harrow or follow workers as they move along a row of crops, carrying supplies or hauling a harvest.

In an industry plagued with labor shortages and a rapidly aging workforce, "it's going to fill jobs that can't be filled," says Schwager. Using the autonomous capabilities, for example, one person can control a fleet of tractors from a screen to oversee multiple tasks spread throughout a farm. Automation could also help relieve workers from laboring in inclement conditions, he adds, and encourage growers to adopt greener practices. "If mowing runs aren't costing you anything, weeds need much less spraying."

Domenick Buck, director of coastal services at Coastal Vineyard Care Associates in Santa Barbara, recently added 18 of the e-tractors to his vineyard management company's fleet of 40 diesel engines. Although he's found the EV's weight capacity limited in towing wider and heavier implements, the fuel savings and automated features—including night vision capabilities that allow fieldwork to continue past sunset—all help the bottom line, he says. And while the technology has induced worker concerns over job security, "at this point, it's not a replacement," he adds. "By allocating certain tasks, it supplements what we already have," helping to ease anxiety over the scarcity and rising cost of labor.
As an organic and biodynamic operation, "we're also mindful of our lasting [impacts] on a property," says Buck, "so we're excited about reducing our carbon footprint." And the reduced noise pollution is a bonus, he adds—instead of the roar and rumble of a diesel engine, "this thing just hums along."

With a base price of $89,000—more than double that of a conventional compact—the savings can come at a cost. Schwager notes, however, that California offers generous rebates that can drop the price down to or lower than that of a diesel tractor. Monarch is working with other states and the federal government on similar programs, although the timeline is still unclear.

Yet the switch to electric can still work for those on a budget. With a base price of $12,990, the Amiga, a robotic micro-tractor, offers small growers a big labor solution, one that can be scaled and tailored to accommodate a wide range of needs.

Developed by farm-ng, a robotics technology company based in Watsonville, just south of Silicon Valley, the Amiga looks more moon rover than clover weeder as it zips along the rural landscape. The four-wheel platform comes with a telescoping dashboard, and it runs on swappable e-bike batteries that last up to eight hours per charge. Despite the size, the one-horsepower drivetrain can tow or haul a thousand-pound payload, and it also sports a host of autonomous and remote functions.

"We're reluctant to call it a tractor, because we're not trying to replace them," says business development director Nathan Dorn. "We're replacing work that's more precise and more difficult," and even venturing into new territory such as greenhouses and barns.

Expandable in width from 3 to 7.5 feet, the Amiga is designed for modularity. The weldable steel frame allows multiple configurations and user customization, and it accommodates add-ons such as a precision seeder, a three-point powerlifter and even a driver's seat. "It's a building block for farmers," says Dorn.

Autonomous functions include self-guided and remote navigation—farm-ng is also developing a similar technology for guiding the Blue Ghost Lunar Lander to a precise location on the moon's surface—as well as "follow me" capabilities.

Combined with Amiga's open-source platform, it's a blank canvas for endless hacks, says Dorn. The camera can be used to inventory trees in an orchard or cows on a pasture, for example, or use visual clues to gauge crop ripeness. He envisions users developing, sharing and even monetizing creative software via the company's online app store, much like a smartphone.

Despite initial skepticism from his crew around the robotic addition, "I think we pretty much have total buy-in at this point," says Ricardo Lopez, vegetable production manager of Rancho Soquel. Located in Santa Cruz County, the 17-acre organic and regenerative ranch grows a diverse range of crops—as much as 40 varieties in a given season—including tomatoes, salad greens and snap peas.

The farm, which includes grazing pastures and an orchard, has relied on mini-tractor-like, rough terrain vehicles (RTV) to transport supplies. But RTVs weigh heavily on the fields so they're kept to the perimeters, requiring workers to carry tools, equipment and harvests by hand.

The compact and lightweight Amiga, on the other hand, treads lightly and "gives us flexibility around specific needs like sowing and in-bed cultivation," says Lopez. "And people are excited about not having to haul around crates anymore."

California rebates also apply to the Amiga, notes Dorn, and can reduce the cost by as much as 90 percent. Yet switching from a diesel tractor alone carries inherent savings: A full electric charge is cheaper than a tank of gas, and not having an engine eliminates maintenance costs such as particulate filter replacements, which, according to Schwager, can run nearly $3,000. (All tractors, however, require hydraulic maintenance.)

Both Monarch and farm-ng openly support the right to repair—a seemingly rare position in the industry—and offer free, over-the-air support and updates to software and operating systems. Remote monitoring also alerts owners to issues and service needs, which, along with walk-through support, makes the technology less daunting, more accessible and more affordable.

"I've had robots in factories for my entire career and think it's unfair that farmers haven't had the same thing," says Schwager. "So I see great potential for technology to bring farming into the twenty-first century."

Flying Tractors a Window into the Future of Farming

Bloomberg May 1, 2023

Farmers have been using drones over the past 20 years mainly for aerial imaging - scanning farms from the sky with cameras to map where crops are thriving and failing. Now drones are being designed for hands-on crop management.

Early one recent morning in Vidalia, Georgia, third-generation farmer Greg Morgan launched an AG-230 drone carrying eight gallons of fungicide over a field of sweet onions. The chemical, which is essential to crop survival in this humid state, would typically be dragged and dripped from a 500-gallon tank behind Morgan's 10,000-pound tractor. Now it fell in a fine mist from the spray jets of an 80-pound drone scudding 10 feet above his cash crop.

Vidalia Onions are a $150 million local industry that, like peaches, tomatoes and other specialty crops in the Southeast, have become increasingly vulnerable to climate change. Morgan has joined the vanguard of farmers who are turning away from tractors and toward drones as they adapt to the rising cost of chemicals and contend with hotter temperatures, heavier rains, heartier weeds and prolific pests.

Farmers have been using drones over the past 20 years mainly for aerial imaging - scanning farms from the sky with cameras to map where crops are thriving and failing. Now drones are being designed for hands-on crop management: enabled to spray herbicides, insecticides and foliar fertilisers with precision, and even to distribute seeds in planting season.

A "featherweight flying tractor" - that's how Arthur Erickson, chief executive of manufacturer Hylio Inc., described the company's agricultural drones. The Houston-based startup has seen demand for its drones soar over the past three years; roughly 700 of Hylio's drones are now at work treating 700,000 acres of cropland annually.

Early adopters like 46-year-old Morgan are driving a major shift in the business of food and signaling a reality that investors and leaders of industrial agriculture should heed. Drones are poised to significantly disrupt the tractor industry, and unlike many other high-tech agricultural trends, this one is actually good for small and midsized farmers, and a big win for the planet, to boot.

In the eight months since Morgan made his $40,000 investment it has cut his fuel costs and already reduced his agrochemical usage by about 15%.

Posted on May 10, 2023 in Audio, Editorial, Featured, Your Texas Agriculture Minute—Texas Farm Bureau

YOUR TEXAS AGRICULTURE MINUTE

Technicians needed to produce our nation's heavy equipment

By Gary Joiner
Publisher

There's a significant labor shortage on America's farms and ranches.
Workers are needed to help produce our nation's food, fiber and fuel.
There's also a shortage of technicians to work on the heavy equipment that powers modern agriculture.
An AED Foundation industry report says manufacturers may need to fill as many as 73,500 heavy equipment technician positions by 2025.
The report adds equipment manufacturing possesses a job opening rate three times higher than the national average.
Workforce development will be critical to address the problem.
Manufacturers can focus on retention by improving workplace culture.
They will need to fill the talent pipeline by spotlighting demand for skilled workers and the opportunity for worthwhile careers.
The report says manufacturers should diversify and optimize recruitment strategies, and also collaborate with others.
Texas farmers and ranchers depend on heavy equipment to get the job done.
Technicians are needed to make sure that equipment is available.

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