



THE COMBINE

# ANNUAL REPORT 2021

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## About The Combine

The Combine is a statewide initiative supporting high growth entrepreneurs in food and agriculture. The program consists of go-to-market support through mentorship and a capital readiness program, networking events, a group of partnering producers across the state, as well as incubation space on Nebraska Innovation Campus.

## Ag Innovation Happens in Nebraska

In 2021, we saw a year of economic transition. Corn and soybean prices showed remarkable resilience during the past twelve months. Futures prices peaked in May 2021 at over \$7.50 per bushel for corn and \$16 per bushel for soybeans. However, the COVID-19 pandemic continues to expose dramatic flaws in our food system. The fastest growing startups are the businesses that solve the most pressing problems. The current Combine Incubator companies as well as program alumni aim to tackle some of these issues: labor shortages, rising input costs, new regulatory and financial opportunities around carbon sequestration and regenerative agriculture. In 2021, several incubator companies announced successful seed fundraises while several new businesses applied and were accepted into the program. The OnRamp Agriculture Conference was held as a hybrid virtual event with an in-person VIP gathering in Omaha. Nebraska grabbed national agtech headlines in May when Valmont purchased Prospera for \$300M. We continue to be incredibly optimistic on the innovative future of Nebraska agriculture and the entrepreneurs backing Nebraska's most prominent industry.

- The Invest Nebraska Team

## Founding Sponsors



## Visionary Sponsors



## Statewide Sponsors



## Supporting Sponsors





# 2021 Insights Network

## MEMBERS OF THE INSIGHTS NETWORK:

- **Farmers & Producers Across Nebraska**
- **Assist Entrepreneurs In Customer Discovery**
  - Assisting entrepreneurs through properly defining problems faced in the industry as well as on site feedback.
- **Participate in Pilot Projects**
  - On farm/ranch trials for in-the-field testing and producer feedback on the startup's products.

# 87

*members*

# 70

*communities*



The Insights Network was created to help bridge the gap between agricultural startups and Nebraska producers. The network allows for quick and comprehensive feedback to startups along with real world scenario testing. Meanwhile, producers are exposed to potential technology advancements on their operation and the opportunity to help shape future developments. Current operations grow the following crops: corn,

wheat, soybeans, alfalfa, popcorn, white corn, peas, seed corn, dry beans, sunflowers, oats, millet, sugar beets, sorghum, cover crops, and vegetable production. Various aspects of the livestock industry are represented including cow/calf, backgrounding, finishing, dairy barns, nursery-to-finish hog production, and pullet raising to egg production.

## Combine Incubator Companies

### Sentinel Fertigation

**Opportunity:** Current row-crop producers spend multiple hours to visually inspect their crops to decide if the field needs additional fertilizer applied. Many times when the crops start to look like they need fertilizer, it is too late or applied broadly without precision. In 2021, Nitrogen prices hit record highs.



**Company:** Sentinel Fertigation Technologies puts automated, predictive control over center pivot fertigated acres in the hands of growers and consultants ultimately allowing them to precisely time fertigation events when the crop needs nitrogen most. In 2021, the company joined The Combine Incubator and received a state prototype grant.

**Status:** Incubator Resident

**Last Program Module Completed:** Business Module Canvas

### Corral Technologies

**Opportunity:** Current cattle producer decisions on stocking and carrying capacity are based on limited financial knowledge which is often constrained by the labor needed to move and re-adjust physical fencing in the pasture.



**Company:** Corral is interested in learning how operations manage their pasture. The company is interested in exploring how improved pasture management through software could lead to improved animal health while reducing manual labor. In 2021, the company was awarded a \$150k prototype grant, a LaunchLNK grant, and has been continuing software and hardware development. The company expects to execute several pilots in 2022.

**Status:** Incubator Resident

**Last Program Module Completed:** Customer Interview Module

### Treadsure

**Opportunity:** With increasing turnover in ag machinery and equipment there is a strong need for improved pricing accuracy. The employees of the hundreds of ag equipment dealer across the country still rely on paper catalogs for comparable tire information.



**Company:** Dawson is a traditional agriculture tire and wheel sales and distribution business. The business recognizes an opportunity to create a stand-alone solution that brings current disparate data sources in user manuals and field sales representatives' information to improve the resale process of agriculture tires. In 2021, the company released its open beta and hired a full time team member to focus on sales and product development.

**Status:** Incubator Virtual Resident

**Last Program Module Completed:** KPI's & Operations

## Combine Incubator Companies



### Nave Analytics

**Opportunity:** In the U.S. alone, irrigation consumes 68% of the total groundwater pumped each day. This equates to nearly 57 billion gallons of water daily. Although less than 16% of the total agricultural acres in the U.S. are irrigated, these acres account for a massive 40% of the total crop production. Today, less than 20% of irrigated farms use advanced on-farm water management decision tools.



**Company:** Nave is an idea stage company that is interested in exploring how predictive models can be integrated into current planting, irrigation and herbicide application scheduling. In 2021, the company was formally created, began customer interviews and hired a contract software developer.

**Status:** Incubator Resident

**Last Program Module Completed:** Business Model Canvas



### Thyreos Vaccines

**Opportunity:** Infectious Bovine Rhinotracheitis (IBR) is an economically significant respiratory disease caused by a herpesvirus. IBR has negative impacts beyond respiratory issues. It can also decrease milk production and fertility, and often leads to secondary bacterial infections.

**Company:** The Thyreos R2 platform is a major breakthrough that allows for production of effective vaccines against many herpesviruses that infect a range of animals from livestock and companion animals, to humans. The company's roadmap includes the human-health market, but initial commercial opportunities are focused on the animal health space. In 2021, the company made progress on its preclinical studies and SBIR grants proposals.



**Status:** Incubator Resident

**Last Program Module Completed:** KPI's & Operations



### Platform Cattle

**Opportunity:** The markets for top performing genetics of seed stock producers have historically been geographically confined due to the physical proximity to bull sales. This can lead to pricing disparity across the industry.

**Company:** Platform Cattle aims to develop a software platform helping seed stock producers find customers who desire their genetics and conditioning practices. After customer interviews the company is compiling initial industry data via e-commerce sales of supplements. In 2021, the company held successful sales trip in Nebraska and Texas. The company has begun a partnership with Symbrosia Cattle Feed.



**Status:** Incubator Resident

**Last Program Module Completed:** User Feedback & Tests

## Combine Incubator Alumni



### Terrace Ag

**Opportunity:** Rural ag land appraisals entail a time-consuming process managing PDF's, spreadsheets, and state documents. The end results often does not include the most relevant comparable sales.

**Company:** Terrace Ag is an end-to-end software solution for farmland valuations. The platform enables ag land appraisals or evaluations to be performed 40% faster through data, integration and automation. The company allows farm managers and rural land appraisers to access sales database, GIS mapping, comparable sales, and report writing all in one platform. The company is now integrated with Farm Credit Services of America.

**Status:** Incubator Graduate

**Last Program Module Completed:** Capital Readiness



### Grain Weevil

**Opportunity:** Each year preventable on-farm deaths occur when farmers climb inside grain bins. Proper grain bin management can lead to less spoilage and a higher margins for grain farmers.

**Company:** The Grain Weevil team is exploring how robotics can improve both grain bin management as well as safety engaging the grain directly with its drive system and a variety of adaptable tools to safely and efficiently aid in the extraction of grain from the grain bin. In 2021, the company raised a seed round over \$1M dollars and completed its National Science Foundation SBIR application. The team is now working on the company full time.



**Status:** Incubator Graduate

**Last Program Module Completed:** Capital Readiness



### Birds Eye Robotics

**Opportunity:** The \$405B poultry market needs labor solutions for the over 300,000 barns worldwide. Many of the jobs associated with the industry are tedious and unappealing.

**Company:** Dynamic Motion aims to solve the labor issue in the poultry industry through robotic automation. The specific problem the team is focused on is the autonomous retrieval of mortality within barns. In 2021 the company raised a seed round of \$1M dollar, completed its USDA and National Science Foundation SBIR application and has hired a full-time robotics engineer.

**Status:** Incubator Graduate

**Last Program Module Completed:** Capital Readiness

## Combine Startups-In-Residence



**cropx**

### CropX

**Opportunity:** As more and more on-farm variables and data points are collected digitally producers are looking to make actionable decisions to optimize input application, leading to significant water, fertilizer, energy and labor savings.

**Company:** CropX is an ag-analytics company that has developing advanced adaptive irrigation services, which automatically optimizes irrigation, thereby delivering dramatic crop yield increase and water and energy cost savings to farms. CropX's technology was developed by a team of world-leading scientists and has been validated on-farm over the past five years.

**Status:** Startup-In-Residence



**MARBLE**  
TECHNOLOGIES

### Marble Technologies

**Opportunity:** Today, the U.S. meat and poultry industry is a \$100 billion industry employing 500,000 people. Vulnerability introduced by the lack of additional capacity threatens the economic health of the meat industry and the security of the global meat supply as highlighted by the COVID-19 pandemic.

**Company:** Marble Technologies is based in Lincoln and Cambridge Massachusetts. The company aims to support food systems using AI, robotics, and process engineering to add resiliency to the agri-food supply chain. Starting with meat processing (specifically beef and pork) they are automating tasks to mitigate industry-wide labor shortages.

**Status:** Startup-In-Residence



**FARMAFIELD**

### FarmAfield

**Opportunity:** Traditional institutional investment opportunities in agriculture have been limited with low transparency in deployment schedules and complex tax advantages. These can result in missed opportunities in new developments in agriculture such as solar and regenerative agriculture.

**Company:** FarmAfield is an online marketplace streamlining capital deployments in the ag sector. The marketplace allows for the purchase of real agricultural assets and complimentary risk management strategies. The company is currently partnering with the Department of Energy to conduct a feasibility study of utilizing the platform to increase capital to solar projects in agriculture.

**Status:** Startup-In-Residence

## Combine Startups-In-Residence

### GreenEye

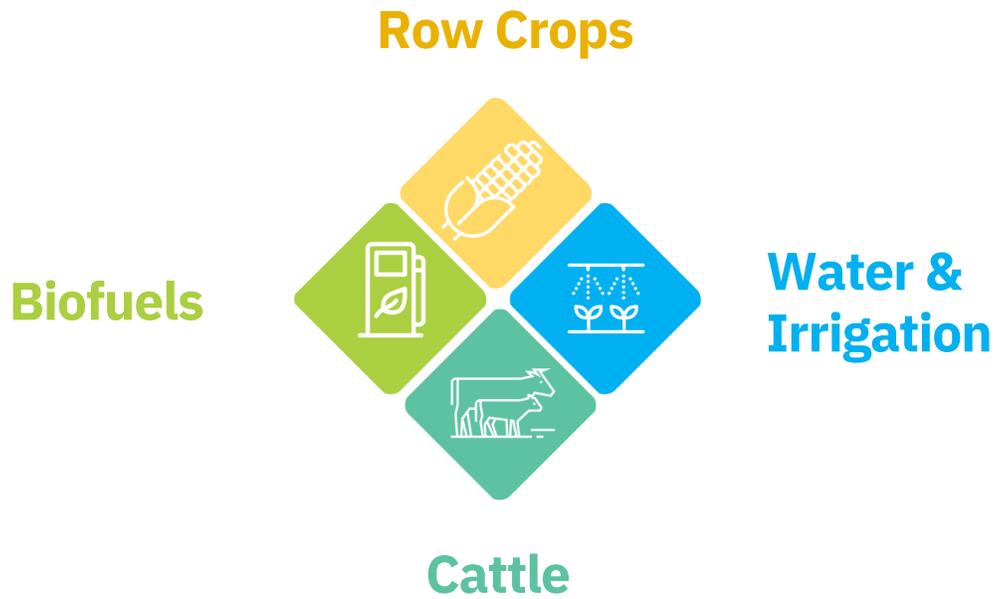
**Opportunity:** Increasing chemical costs and a broader push for more environmentally friendly application practices is creating a stronger demand for precision spraying. There is an international demand for alternative and sustainable solution for the current crop protection practice in order to meet the globally growing demand for food while increasing the profitability and productivity for farmers.



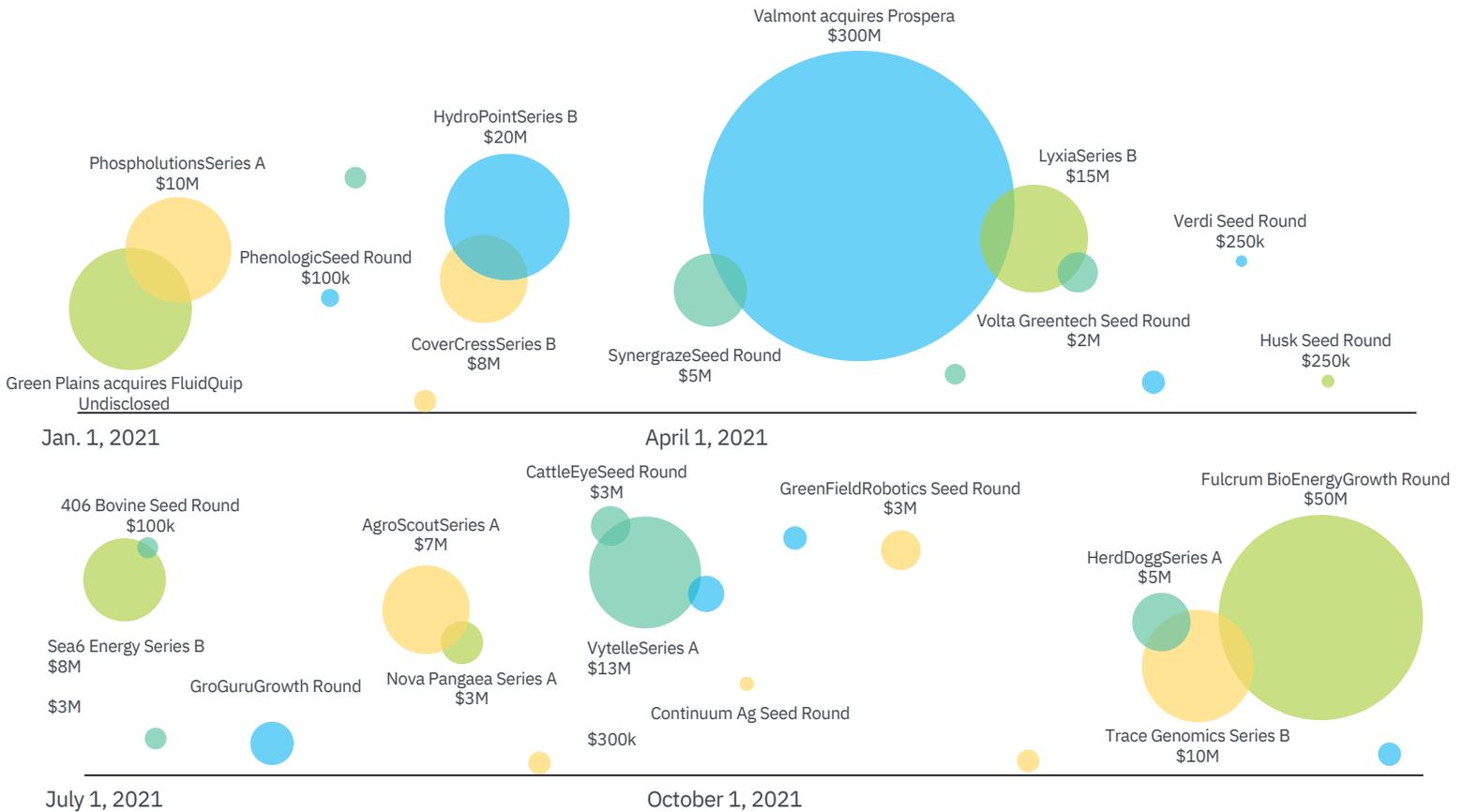
**Company:** Greeneye Technologies is an Israeli based precision ag company expanding to the US. Greeneye utilizes artificial intelligence and deep-learning technology to transition from the practice of broadcast and wasteful spraying of pesticides to precise spraying in real time.

**Status:** Startup-In-Residence

# 2021 National Funding Highlights for Key Nebraska Sub-Sectors



Nebraska is a leader in the production of food, fiber and fuel. In 2021, many technology companies both located in Nebraska as well as those with strong customer bases, employees or strategic partners in the state saw significant growth. Across a variety of production agriculture sectors, Nebraska producers continue to be a leader in testing and developing the technologies of tomorrow.



# 10 Top National AgTech Developments from 2021

## 1 Farmers Business Network Begins Move Into Animal Health

Farmers Business Network has added an animal health and nutrition platform to its portfolio of services and products, and announced it has acquired the Prairie Livestock Supply businesses to provide more choice for independent livestock producers and more competition for their business. “What’s important to FBN is to help farmers maximize profit potential across the breadth of the farm. For many of our members, livestock is just as important as crop production,” says Charles Baron, cofounder of FBN.



## 2 Benson Hill to Go Public in \$2B SPAC Merger

US Crop genetics startup Benson Hill will become a publicly traded company via a merger with Star Peak Corp II, a special purpose acquisition company (SPAC). Founded in 2012, Benson Hill is developing a gene-edited and selectively bred version of crops used in alt-protein and animal feed production.

BENSON HILL

## 3 Farmers Edge Performs Well In One Of The First AgTech IPOs

Agricultural technology startup Farmers Edge Inc. jumped more than 17.5% in its Toronto trading debut after raising C\$125 million (\$99 million) in its Canadian initial public offering. Farmers Edge uses technology and artificial intelligence to collect and analyze local weather, soil moisture and satellite data to help growers boost crop yields and farm more efficiently. For *FarmersEdge* all the AgTech community, it is exciting to see the company perform so well since it is one of the first IPOs in AgTech.

## 4 Carbon Verification Platform Receives Investment from Cargill & Microsoft

Ag software startup Regrow has raised \$17 million in Series A funding as it proceeds with the US rollout of its monitoring, reporting, and verification tool for carbon sequestration and monetization. Among the companies and organizations that have signed up as paying subscribers to Regrow’s MRV platform and its supporting products are new investor Cargill, agrochemicals major Bayer, and food giant General Mills.



## 5 John Deere Acquires Another Autonomous Tractor Company

Founded in 2017, Bear Flag Robotics develops autonomous driving technology compatible with existing machines – essentially, it retrofits existing tractors with patented artificial intelligence technology. Acquired for \$250M, John Deere leadership commented this will contribute to a future vision in which the farmers are charged a price per acre for the service.



# 10 Top National AgTech Developments from 2021 Cont.

6

## Indigo Ag Acquires Soil Metrics to Boost Carbon MRV Capabilities

Indigo Ag has acquired Soil Metrics, a firm which carries out assessments of soil carbon sequestration, for an undisclosed sum. Fort Collins, Colorado-based Soil Metrics describes itself as a “team of data scientists and climate change wonks who measure and model soil carbon data to shed light on land usage and associated greenhouse gas emissions.” Soil Metrics allow enterprises to “translate beneficial on-farm practices into financial instruments, like traceable sustainability premiums and verified ecosystem credits, for rewarding and promoting farmers’ participation in climate-smart opportunities,” according to Indigo.

indigo

7

## Monarch Raises \$61 Million for Its Fleet of Electric Tractors

Monarch Tractor has raised another \$61 million in capital, in its ongoing efforts to electrify farm equipment. The latest fundraising round, announced by Monarch this morning, includes an undisclosed investments from CNH Industrial, an Italian-American manufacturer second only to Deere & Co. in the market for agricultural equipment, and the venture arm of Trimble Inc., a California-based technology giant specializing in GPS and location-based software.

MONARCH

8

## Bayer Inks New Digital Ag Data Infrastructure Deal with Microsoft

Bayer announced a strategic partnership with Microsoft to build a new cloud-based set of digital tools and data science solutions for use in agriculture and adjacent industries, bringing new infrastructure and foundational capabilities to accelerate innovation, boost efficiency, and support sustainability across value chains. Agriculture and agribusinesses today benefit from a wide range of digital tools and data-powered insights through platforms like Bayer’s Climate FieldView™. Bayer will work with Microsoft to co-develop new solutions that address critical industry scenarios.

BAYER

9

## Bushel Acquisition of FarmLogs

Fresh off its recent fundraise US grain-trading platform Bushel has acquired FarmLogs, a farm management app aimed at row crop operations. “FarmLogs is a pioneer in bringing approachable user experiences to the farm,” said Jake Joraanstad, CEO and Co-founder of Bushel. “By bringing capabilities of FarmLogs to Bushel’s platform, we elevate the digital relationship across the grain supply chain. The two companies realized that farmers were likely double-entering data from Bushel regarding their scale tickets, grain contracts, and other information.

BUSHEL

10

## John Deere Launches See & Spray

Making every pass in the field more economically feasible and optimizing the systems with which they farm is paramount for farmers. To help farmers achieve that, John Deere is investing in technology that ensures every plant has an equal opportunity to be as robust as it can be in the field while using the least amount of inputs possible. See & Spray uses computer vision and machine learning to precisely spray herbicides only where weeds are present.



## THE NEBRASKA CORN BOARD

Through responsible stewardship, new genetics and improved management practices, Nebraska corn farmers are growing more corn with less – less fertilizer, less chemicals, less water, less land and less of an impact on the environment. Sustaining innovation – an unwavering commitment to doing a better job in every row, on every acre, on every farm, every season. It’s how family corn farmers in Nebraska and the nation are ensuring the long-term viability of their industry and our natural resources.

Since 1980  
**CORN FARMERS REDUCED  
 SOIL EROSION BY NEARLY**  
**45%**  
**WITH EVERY BUSHEL GROWN**

NATIONAL  
 CORN GROWERS  
 ASSOCIATION

Nebraska  
 Corn

Nebraska’s corn farmers – and their fellow corn farmers across the U.S. – continue to make significant advancements that have a direct impact on the sustainability of corn production and the natural, environmental and social systems that are connected to it. These growers are among the first to adapt new technologies and innovation.

SUSTAINABILITY	TRADE & TRANSPORTATION	BIOFUELS	WATER	BIOTECHNOLOGY	SOIL HEALTH	NEW USES	LIVESTOCK
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VISIONARY SPONSOR OF THE COMBINE



## THE ECONOMIC DEVELOPMENT ADMINISTRATION

In 2020, the U.S. Economic Development Administration awarded Invest Nebraska a Build to Scale Award to expand its efforts with the Combine Incubator. One of the key opportunities in ag innovation is hardware and robotic design and development.

In December 2021, Invest Nebraska in partnership with several community partners that collectively make up the Heartland Robotics Cluster Coalition, was named by the Economic Development Administration (EDA) as a finalist in the \$1 billion Build Back Better Regional Challenge, beating out nearly 500 applicants from 50 states and five U.S. territories.

The Heartland Robotics Cluster Coalition is part of a regional coalition of stakeholders from government, business, nonprofits and academia. Partners include The Combine AgTech Incubator, Nebraska Innovation Studio, Metropolitan Area Planning Agency, Northeast Community College, the University of Nebraska College of Engineering, Metro Community College and the Nebraska Manufacturing Extension Partnership.

### 2021 Build Back Better Regional Challenge Finalists



Image Provided by the U.S. Department of Commerce

## VISIONARY SPONSOR OF THE COMBINE



# 10 Top Nebraska AgTech Developments from 2021

1

## Valmont Acquisition of Prospera for \$300M

Since 2019, Valmont and Prospera have successfully integrated AI technologies with center pivot irrigation to develop real-time crop analysis, in-field machine learning and anomaly detection solutions, resulting in strong adoption and greater returns for the grower. “Today’s acquisition is a testament to our commitment to make the farm more efficient and increase productivity while dramatically improving sustainability ” said Valmont President and Chief Executive Officer Stephen G. Kaniewski.



2

## Novozymes Announces \$300M Alternative Protein Facility in Blair

Novozymes recently announced an agreement to enter the plant-based industry. This is the latest to join a cluster of major producers, including Evonik, Corbion and NatureWorks, with a presence on the Cargill campus. “Novozymes can unlock significant value by building on decades of experience with fermented catalytic proteins” said CEO Ester Baiget. Construction of the facility is expected to begin in 2022 and be completed by 2023.



3

## Scoular Launches New Business Division

Scoular has launched a new division called Emerging Businesses that will be dedicated to early-stage business development as well as an incubator for strategic investment opportunities. The company’s new division will focus on areas like biofuels, renewable energy, carbon markets, investments in AgriFood tech, and other growth ventures.



4

## Nebraska Startups Succeed in Farm Bureau Ag Innovation Challenge

Three Nebraska startups were named in the top ten finalists in the American Farm Bureau Federation’s Ag Innovation Challenge. The American Farm Bureau Federation, in partnership with Farm Credit, announced finalists of the Ag Innovation Challenge on Oct. 5, 2021. Three of the ten finalists are Nebraska-based startups, all of whom are part of The Combine Incubator program based in Lincoln. The finalists include Grain Weevil in Aurora, Birds Eye Robotics in Herman, and Marble Technologies in Lincoln.



5

## Burlington Capital & Invest Nebraska Announce Launch of \$11 million Seed Fund

Burlington Capital along with Invest Nebraska, announced the launch and initial closing of a new \$11 million venture capital seed fund focused on Midwest AgTech Innovation. “We are excited to be partnering with Invest Nebraska and other agriculture stakeholders in creating a new platform that will assist in the advancement of agricultural entrepreneurship in the Midwest.” said Lisa Roskens, Chairman and CEO for Burlington Capital. The fund will focus on startups with a high impact on row crops and animal health.



## 10 Top Nebraska AgTech Developments from 2021 Cont.

6

### CropX Acquires Dacom

CropX, a global agricultural analytics leader, has announced the acquisition of Dacom Farm Intelligence, a leading European crop optimization platform. Adding Dacom's proven crop protection capabilities, CropX now offers the only comprehensive farm management platform with active irrigation technology, hardware-based soil data, fertilizer management and crop protection capabilities. The acquisition also gives CropX a new stronghold across Europe as it continues to actively expand its global footprint.



7

### Marble Technologies named finalist for 2021 FoodBytes Competition

Combine Startup-In-Residence Marble Technologies was named a finalist for the Rabobank FoodBytes Competition. Rabobank's multi-week food and agriculture innovation program drives collaboration between startups, corporate leaders and investors to develop solutions to food system challenges. The fifteen companies advancing to the virtual pitch competition were selected based on their groundbreaking technologies and products.



8

### Bushel Acquires Grain Bridge

GrainBridge which was initially billed as a grain marketing platform and a joint venture between ADM and Cargill, was acquired by Bushel. Bushel efficiently connects North American farmers to the global marketplace using innovative solutions built on 200+ years of agribusiness expertise. Bushel is positioned as a grain marketing solution and a risk management and sustainability solution. Bushel's financial risk management solution provides different contract structures for farmers, market insights, trend analysis, and risk planning expertise.



9

### Case Acquires Raven for \$2.1 Billion

CNH Industrial revealed it will acquire Raven Industries in a \$2.1 billion deal. The applied technology division (precision ag) has annual revenues of \$165 million, accounting for 40% of the company's revenue. CNH has a manufacturing operation plant in Grand Island although no plans have been announced on any additional operations affecting CNH plants across the country.



10

### Startup-In-Residence Greeneye Technology announces \$22M in Funding

An Israeli startup plans to have a handful of precision spraying units out in the field this spring applying herbicides only where its artificial intelligence system has identified weeds by growth stage and species. Greeneye Technology has been in the field with its machines in Israel for the past three years—merging and building technologies around machine learning, artificial intelligence, and automation.

